Reclaiming the Right of Way:
A New Infill Model for the Urban US
A Seattle Case Study

Kristian T. London

A thesis

submitted in partial fulfillment of the

requirements for the degree of

Master of Urban Planning

University of Washington

2020

Committee:

Rachel Berney

Richard E. Mohler

Program Authorized to Offer Degree:

Urban Design and Planning

University of Washington

Abstract

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Chair of the Supervisory Committee:
Assistant Professor Rachel Berney, PhD
Department of Urban Design and Planning

Like many US cities, Seattle is facing a housing affordability crisis. Could its streets serve as an unrecognized publicly-controlled asset to combat this crisis while also disincentivizing private vehicles? Expanding on recent trends towards pedestrianization and greenways, this study explores building low-rise infill housing in the right of way as an alternative density strategy to high-rise construction. Achieved by layering "medieval" fabric over three urban village sites near transit hubs, the proposed interventions tap human-scale, incrementalist design to see formal housing where none presently exists. The culmination: a proposal for a novel street type for Seattle, *pedestrian place*. As envisioned here, the insertion of housing into shared streets boosts the equity and public space gains of concepts like Barcelona's superblocks. Primarily a conceptual rationale, this design proposal does not delve into legal or policy hurdles, instead tapping dense urban fabrics of the past to re-imagine a future for US cities.

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ACKNOWLEDGEMENTS

First and foremost, I'd like to thank my thesis committee members, professors Rachel Berney and Rick Mohler. In addition to being top-notch classroom and studio instructors, both exhibited extreme patience during the advising process and a welcome open-mindedness towards my topic.

The majority of faculty and my cohort from the Department of Urban Design and Planning contributed to my education, but those who deserve my particular gratitude for influences that shaped this thesis include PhD students Chungho Kim and Susmita Rishi. I'd also like to call out Daniel Winterbottom, Christine Bae, David Blum, and Nicole Huber as College of Built Environments faculty who organized incredibly rewarding study abroad experiences I had the good fortune to participate in. A big thanks to the department's administrative staff, Neile Graham and Diana Siembor, for their expert support in navigating degree and certificate requirements and university systems, to CBE librarian Alan R. Michelson for the stimulating conversation and feedback on resources, and to all those at the college who challenged, coaxed, inspired, and taught me since my first Arch 101 course with Judith Swain in the summer of 2013.

On a more personal note: Steven Novak, thank you for recognizing my potential as a young man and vouching for me decades later. Patrick, you were the first to model a creative life for me; it was a revelation, and I am grateful. Mitch, thank you for your incredible generosity of spirit during difficult days and for sharing the best view in the city with me. I couldn't have done it without you. And Juha, my immeasurable gratitude for your unfailing support and friendship through lessons in love, loss, and life.

Elämä on.

DEDICATION

For all those urban designers, both recognized and unsung, whose eye and effort have built those vibrant, cacophonous, glorious, quiet, exhilarating, resilient, ever-transforming and ever-transformative estates of human encounter we know as cities.

DEFINITIONS

Definitions of selected terms referred to in this thesis are presented below. Some are specialist terms from the field of urban design and planning, some relate specifically to the City of Seattle, and others are commonplace terms used in specific ways in this thesis.

density "A measurement of the concentration of development on the land, often expressed in the number of people, housing units, or employees per acre" (Seattle Office of Planning & Community Development, 2019, p. 194). In this thesis, I measure density in *dwelling units per acre*, or *DUA*.

fabric As used here, the *spatial-behavioral fiber* of an urban environment, including its form, grain, activities, and activity levels.

form As used here, the *overall spatial configuration* of an urban environment, generally expressed in a figure–ground relationship, contours, or massing. The relationship between solids and voids, as viewed from above, in section, or in perspective.

grain As used here, the *spatial-experiential texture* of an urban environment. A fine-grained environment suggests variety and richness of experience, a pedestrian scale, and varied proprietorship (e.g., a village street); a coarse-grained environment suggests larger masses and monotony of experience, a vehicle scale, and monopoly proprietorship (e.g., an industrial park). A continuum.

highest and best use A concept used in North America to determine the market value of a piece of land. "The reasonably probable and legal use of property, that is physically possible, appropriately supported, and financially feasible, and that results in the highest value" (Dybvig & Appraisal Institute of Canada, 2010).

HALA The City of Seattle's Housing Affordability and Livability Agenda. The HALA committee was established in 2014 and brought together a wide range of stakeholders, from affordable housing advocates to for-profit developers, to hammer out a set of policies that all could undersign as "...a bold agenda for increasing the affordability and availability of housing in our city" (City of Seattle, n.d.-b). The recommendations of the HALA committee continue to shape many of Seattle's zoning and housing affordability policies (HALA committees and staff, 2015).

high-rise A City of Seattle zoning category that allows buildings up to 440' in height (Chapter 23.45.514 - Structure Height, 2020). For the purposes of this thesis, a high-rise is any building over 80'.

infill "Development of vacant or underused land within areas that are already largely developed" (Seattle Office of Planning & Community Development, 2019, p. 196). Infill generally improves efficiency of land use, connects to already-laid utilities, and takes advantage of existing infrastructure and services.

livability "The sum of the factors that add up to a community's quality of life, including built and natural environments, economic prosperity, social stability and equity, educational opportunity, and cultural, entertainment, and recreational possibilities" (Seattle Office of Planning & Community Development, 2019, p. 196). In the 2015 HALA recommendations, the project's sole livability goal is characterized thus: "Promote the Livability of Seattle's Neighborhoods: Deliberate planning for how new housing is built should be guided by the values of equity and sustainability to create cohesive, resilient communities with good transportation choices, open space and amenities that ensure a good quality of life for all" (HALA committees and staff, 2015).

low-rise A City of Seattle zoning category that allows buildings up to 30' in height, with 40–50' allowed in certain circumstances (Chapter 23.45.514 - Structure Height, 2020). The low-rise-zoned sites covered in this thesis are included in these 40–50' areas.

mid-rise A City of Seattle zoning category that allows buildings up to 60' in height, with 80' allowed in certain circumstances (Chapter 23.45.514 - Structure Height, 2020). The mid-rise-zoned sites covered in this thesis are included in these 80' areas.

right of way Three relevant definitions for the term *right of way*, or *ROW*, are:

1) As used in the title and most instances in this thesis, right of way is the *linear space* between two city blocks (or in the case of alleys, block-halves) that contains the street or roadbed, parking strip, sidewalk, and any public land between the sidewalk and the property line of adjacent parcels.

2) I also use right of way in the sense of the *right of public access and passage* to that linear space stablished when a parcel is deeded; hence the term "right of way." This easement forms the basis for the physical right of way described above.[1]

3) Finally, the City of Seattle municipal code defines right of way as *legal precedence* of "one (1) vehicle, bicycle, pedestrian or device" over another in instances of possible collision (Chapter 11.14.525 - Right-of-Way, 2020). I do not use the term in this sense here.

shared space As used here, an unmarked, slow-speed public space allowing a variety of activities and granting access to all private transportation modes, but not necessarily all instances of all modes (i.e., bicycles, motorcycles, mopeds, cars, vans, and trucks are all legal, but their access may be restricted in some way). Two common types of shared space are *shared*

[1] A common misconception shared by me well into the writing of this thesis is that the physical right of way is owned by the governmental jurisdiction in which it is located, but this is generally not true (Rey, 2017; Vernez Moudon, 1987). The right of way is technically an easement granted by the owner of the adjacent properties. Now, although the governmental jurisdiction generally *does not own* the land, it nevertheless does have *legal control* over it: "Despite its easement status, municipalities have broad authority to manage and regulate the rights-of-way. That authority stems from the police power under the Washington State Constitution (Article XI, Section 11), as well as statutes such as RCW 35A.11.020, which provides code cities with broad power 'in regard to the acquisition, sale, ownership, improvement, maintenance, protection, restoration, regulation, use, leasing, disposition, vacation, abandonment or beautification of public ways'" (Rey, 2017). This poses interesting legal questions in terms of this thesis, where the proposal involves building what would amount to permanent structures in the right of way while continuing to allow the through-passage and utility delivery for which the easement was originally established. The City of San Francisco, at least, has envisioned locating affordable housing in right of way reclaimed from vehicular traffic—the legal mechanism for doing so is not detailed in the vision plan (City of San Francisco Municipal Transportation Agency, 2016).

streets, basically an interchangeable term with stronger connotations of path than shared space, and *woonerfs*, which generally allow parking and are frequently governed by signage and speed-reduction features installed in a roadbed.

urban center

"Key features of the regional growth strategy; relatively small areas that are expected to accommodate the highest densities of development for both housing and employment" (Seattle Office of Planning & Community Development, 2019, p. 199). Aside from two exceptions, this refers to downtown Seattle and adjacent areas, including the Capitol Hill North and South sites from this thesis. (The darkest blue areas in the map below are urban centers.)

urban village

"Areas designated in Seattle's Comprehensive Plan for future growth. These are generally areas that include long-standing neighborhood business districts along with zoning that can accommodate further development. The three types of urban villages in Seattle are urban centers, hub urban villages, and residential urban villages" (Seattle Office of Planning & Community Development, 2019, p. 199). The Beacon Hill site is located in a residential urban village. (In the map, medium blue means a *hub* urban village; light blue indicates *residential*.)

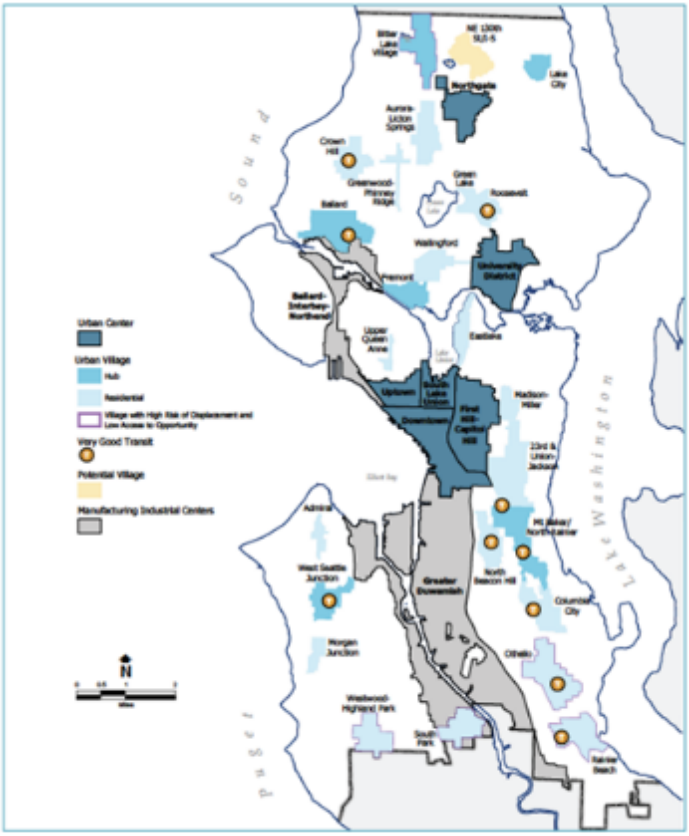

Figure 0.1.1. Seattle's Urban Centers and Villages

source: seattle.gov

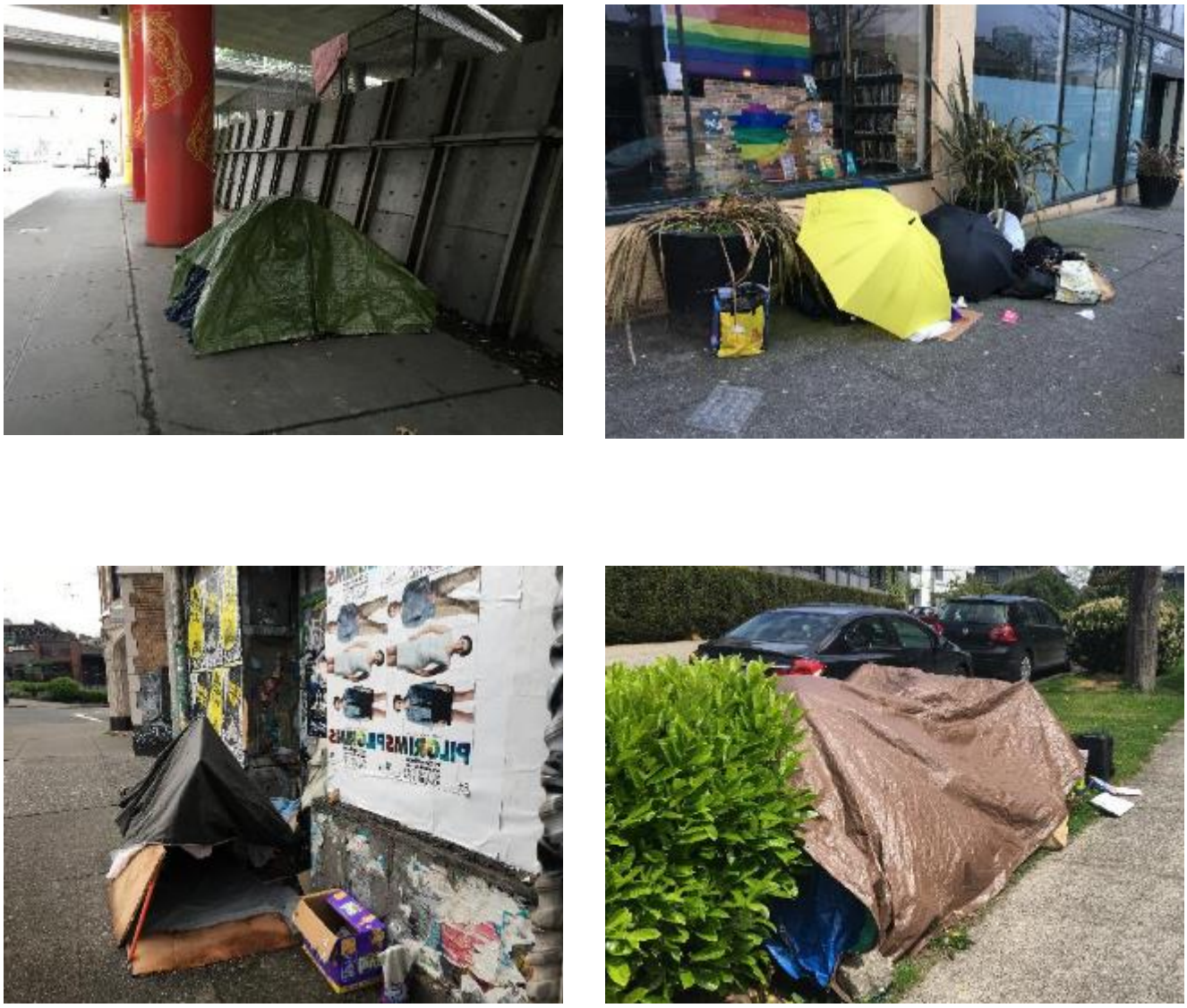

Figure 0.1.2. Infill Housing in the Right of Way Today

Chapter 1. INTRODUCTION

We must always say what we see. Above all, and more difficult, we must see what we see.

The Athens Charter (Le Corbusier, 1933)

Greater Seattle is undergoing unprecedented growth that shows little sign of abating. Estimates by the Puget Sound Research Council predict a regional population growth of almost 40 percent to over 5.8 million by 2050 (Puget Sound Regional Council, 2018a). Not coincidentally, despite slowing in recent quarters, the increase in real estate prices in the Seattle metropolitan area has been the highest among United States metropolitan areas for the past decade, making it the second-most difficult housing market in the US for home buyers to enter (Puget Sound Regional Council, 2018b; Zillow, 2019). And while rents have plateaued in recent quarters, a sharp rise 2012–2019 made the rental market challenging for low- and medium-income renters despite constant construction of new units (Puget Sound Regional Council, 2018b; Zillow, 2019). Unsurprisingly, Seattle also has one of the nation's highest rates of houselessness, which has been recognized as a crisis by the mayor's office (City of Seattle, n.d.-c, 2015).[2]

At the same time, the Puget Sound region has relatively strict urban growth boundaries. Passed into law in 1990, the Washington State Growth Management Act places physical limitations on a city's spread (RCW 36.70A Growth Management Act, 1990). As with Oregon's pioneering growth management policies, two of the objectives of the Washington law are to steer cities towards concentrating growth and combatting sprawl, with an eye towards sustainable management of population growth (Municipal Research and Services Organization, n.d.-a).

[2] Following the lead of Professor Rachel Berney, I adopt the term "houseless" as opposed to homeless to indicate social structures can create a sense of home whether or not one has a physical home in the traditional sense (Al-Abweh, 2017).

Along with these growth boundaries, zoning continues to be a contributing factor to housing affordability (Seattle Planning Commission, 2018). The Seattle Planning Commission calculates the amount of residentially zoned land in the city zoned as single-family housing at 75 percent, a proportion some housing advocates is inconsistent with Seattle's affordability aims (Eliason, 2018; Seattle Planning Commission, 2020).

What is a city to do? Land and housing prices are sky-high, construction is at capacity, and the city is in desperate need of more housing, both to house people and to bring down housing prices.

Seattle's officials and residents have engaged in vigorous public debate about the best way to address housing affordability in a city with a significant population influx and where land is in limited supply. The Housing Affordability and Livability Agenda, or HALA, an initiative of former mayor Ed Murray approved in 2014, brought together affordable housing advocates, non-profit and market-rate developers, community representatives, and other stakeholders in an attempt to create a practical framework to address housing affordability and livability (City of Seattle, n.d.-b). Despite the breadth of the stakeholder coalition that prepared HALA, it immediately ran into resistance from neighborhood groups, primarily from neighborhood councils in wealthier neighborhoods, which since the 1970s had grown accustomed to a strong consultative relationship with the city regarding neighborhood plans (Durning, 2020).[3] Nevertheless, in early 2019 HALA took a step forward when the Seattle City Council approved new zoning laws that came into effect in April 2019, making an affordable housing contribution

[3] Concerns I personally noted at various public meetings held by the community council in Wallingford, originally a streetcar suburb and traditionally a middle-class, single-family residential neighborhood, included changes to zoning, urban form, and neighborhood "character," loss of parking, and a provision that allows developers to pay into an in-lieu fund rather than being forced to build affordable housing on-site.

mandatory in all of the city's 27 designated urban villages and expanding upzoning into 6 percent of the city's single-family zones (City of Seattle, n.d.-d). While the implementation of the mandatory housing affordability, or MHA, component of HALA is expected to provide at least 6,000 affordable units, others argue the numbers are low considering how much housing is needed in the region (City of Seattle, 2019; Trumm, 2018a).

Attempts to resolve the housing affordability crisis in the Puget Sound region have also been married to the parallel sustainability goal of improving public transportation, with policies favoring affordable housing and transportation-oriented development (TOD) built into funding for regional transportation initiatives (Sound Transit, n.d.). As a result, new areas of mid- and high-rise zoning are being proposed and built at regional light rail stations. Inside Seattle City limits, these stations are all located in designated high-density areas: urban villages and urban centers (City of Seattle, 2018). This TOD will surely contribute to the number of affordable housing units in the city, but at what scale?[4] And how well do high-rises serve the livability aspect of HALA, which is, after all, an *affordability* and *livability* agenda?

A second major livability problem assailing Seattle and cities like it is time spent in traffic. Seattle's geography, lack of residential density, and continued influx of new residents have contributed to increasing congestion on roads and highways, making it some of the worst in the country (TomTom, 2019). Federal funding for a rail system was voted down by Seattle voters in the early 1970s, and a series of back-and-forth initiatives during the 1980s and 1990s eventually

[4] As of May 2018, "over 1,300 housing units have been built or are planned for Sound Transit surplus property, with over 80 percent of them affordable to those earning 80 percent of area median income or below" (Sound Transit, n.d.). Meanwhile, "According to our estimates, we need 156,000 more affordable homes today and another 88,000 affordable homes by 2040 to ensure that no low-income or working households are cost burdened" (Regional Affordable Housing Task Force, 2019). The latter estimate is for King County, and if it is anywhere near accurate, the housing gap in the region is tremendous.

led to the construction of light-rail system (Hadley & Murakami, 2002; "Seattle Mass Transit Proposal Pleases Everybody but Voters," 1970). Bus rapid transit has been introduced along a handful of routes; two streetcar lines have also been constructed, with a new leg of track linking the two slated for delivery in 2026 (J. Clark, 2019; King County Metro, n.d.). But for the most part, and despite having been nationally recognized for its public transportation, Seattle suffers from traffic stuck in the quintessential Western US pattern: very vehicle oriented, with over 80 percent of households owning a vehicle—close to if not the highest proportion of any major city in the US—and public transportation usage rates recently flatlining after a decade of growth (Balk, 2019; McCann, 2019; Ryan, 2019; Schaller, 2019).[5]

If we look further afield, we can find examples of projects intended to offer a different future. Zaha Hadid's office recently announced an ambitious plan for pedestrianizing much of London, which includes proposals for significant amounts of infill housing on already-built parcels (Zaha Hadid Architects, 2018). What if we extrapolated such schemes to Seattle? Yes, brownfields, parking lots, and underutilized lots exist in Seattle, and many urban designers and decision-makers would gladly see dense residential and mixed-use construction replace them. But in the US, these solutions rely on private-market compliance, and there is a limit to the mediative effects of the private market (Trumm, 2019b). In this sense, Seattle may be an extreme

[5] Current modal split for commuters to downtown Seattle jobs is approximately 46 percent public transit, 26 percent drive-alone, with 49,000 transit riders added and drive-alone dropping by 9 percentage points 2010–2019. (Commute Seattle, 2020). Downtown commuting on foot has increased from about 8 percent in 2010 to over 12 percent in 2018, while commuter cycling has remained relatively flat, bouncing on either side of 4 percent (Ryan, n.d.). Car ownership also dropped 3 points, to 81 percent of households, over this period. (The figures for New York City and Washington, D.C., are 55 percent and 65 percent, respectively.) (Balk, 2019). These are in some instances impressive numbers, but they do not tell the whole story: they only cover downtown commutes and indicate nothing about how people use transit during free time or commutes to other locations. For instance, ridership on King County Metro buses has basically flatlined since 2016, and Link light rail boardings were 12 percent lower than projected for 2019 (Ryan, 2019).

case, but it is by no means an anomaly: private-market housing is becoming unaffordable in US markets, even for the middle class (Joint Center for Housing Studies of Harvard University, 2020; Sisson, 2019).[6] Meanwhile, looking into the not-too-distant future, climate change may well bring about unanticipated impacts on the population and density of our cities (Poon, 2020; Sisson, 2018). In short, imminent upheaval in housing markets as a result of a confluence of factors is far from an impossibility.

I propose that, as US decision-makers attempt to build dense cities that are livable and affordable while reducing reliance on private vehicles, it is worthwhile expanding on the work of predecessors in revisiting the fabric of the city—specifically the amount of land dedicated to vehicular circulation (Global Designing Cities Initiative, 2016, pp. 187–320). The fact is, housing and cars compete for physical space. Studies on induced demand have shown that increasing physical capacity for vehicles does little to combat congestion and may indeed have the opposite effect (Schneider, 2018). So, what if we decreased the amount of land available for vehicles at strategically selected sites? Would public transportation grow more convenient and more popular? Would reliance on private vehicles decrease?

This thesis, then, examines the twin sustainability issues of affordable housing and de-prioritizing automobile-based transportation by seeing the public resource of right of way in a new light: as land that could be partially (re)leased for housing. In one sense, it could be considered a further exploration of the topics HALA addressed: livability and affordability. But whereas the HALA project is a real-world project with the attendant constraints, this thesis proposes more radical revisioning of how publicly controlled land in the city is allocated.

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[6] This development has certainly been exacerbated by paradigm shifts like AirBnB-type rental services as well as the increasing appeal of residential real estate to Wall Street investors and those hoping to park international capital in stable countries governed by rule of law (Andrews, 2019; Holder, 2019; Semuels, 2019; Vipal, 2019).

Yet the concept presented is not as farfetched as it might seem. In questioning Seattle's housing and land divestment policies, City Councilmember Teresa Mosqueda has floated the notion of leasing city-owned land to affordable housing developers or even building affordable housing itself instead of relying on for-profit and non-profit developers (Trumm, 2018b). One source of such real estate is public land we generally don't see at all and certainly don't see as buildable, because it is primarily dedicated to cars.

Approximately 27 percent of Seattle's land consists of rights of way (Green Futures Lab, 2014). If we use the real estate test of highest and best use, does reserving a slice of land 60' x 300' for one block of through-traffic and parking a handful of cars pass? Or could it be released in part for other uses while continuing to allow the required through-passage and utility delivery while retaining public control? Is there a public asset hiding in plain sight that, with imagination and long-term vision, could serve as one weapon in the arsenal against the housing crisis? Is there potential in our grid of streets we do not see because we take certain conditions, like the existing right of way, as immutable givens?

If we were to allow ourselves to play with the idea of replacing through-streets with housing, where would we look for models of a suitable urban fabric, one where the ratio of buildings to right of way favors housing and pedestrians to cars and parking? A brief tour of Seattle demonstrates that the houseless have already adopted the informal housing strategies of the Global South, building on any bit of unoccupied public land. But what about a more formal system? Still-vital medieval neighborhoods that predate the car, like Ribeira in Porto and Gamla Stan in Stockholm, are thriving despite high densities and small percentages of right of way (Erickson, 2011; Soyinka, 2019). These centuries-old developments, some of which are former

slums, are now considered desirable because of their urban form, walkability, and proximity to the center of town (Global Citizen Solutions, 2019; *Where to Live in Stockholm*, 2015).

What opportunities, if any, open up when we lay their "medieval" fabric over a quintessential American grid? Does the resulting hybrid offer potential directions for US cities absorbing growing populations, dedicated to combatting sprawl, and interested in investigating novel approaches to providing affordable housing for a wide range of populations? Can we imagine a revisited form of traditional density that fundamentally changes the built form of certain neighborhoods, but in a more livable way than canyons of high-rises would? Does density always mean building *up*, or can it mean building *in*?

This thesis is structured as follows: after formulating the thinking above into specific research questions and aims in Chapter 2, I review the methods, tools, and data I utilized to investigate these questions in Chapter 3. Chapter 4 is a literature review of key considerations that need addressing before delving into the design work proper.

Chapters 5–8 cover the design process and its outcomes. Chapter 5 describes the sites and their selection. Design inspirations, guidelines and site-specific design responses are documented in Chapter 6, which concludes with the presentation of a new street type for Seattle, one that redistributes public space currently occupied by cars to pedestrianized space and formal housing.

Chapter 7 projects my understanding of the primary scoped ramifications of piloting this new street type, while Chapter 8 discusses the strengths and weaknesses of the proposal, including feedback from my committee. Chapter 8 also suggests synchronous opportunities and next steps if the City of Seattle finds the proposal warrants further exploration.

Chapter 9 returns to the personal tone of this Introduction, reflecting on the values communicated by the untapped potential of our rights of way, our ability to *see* the cities we

construct and inhabit, and a future where coexisting density approaches bring a new richness to the urban US.

Figure 1.1. Bigger vs. Better? Smaller Streets, More Housing, and Better Public Space

Chapter 2. RESEARCH QUESTION AND AIMS

At the very least, it seems worthwhile to provide the seeds of a different choice.

(Davis, 2012, p. 97)

The fundamental aim of this thesis is simple: to open our eyes to *seeing* the public right of way. I argue that we need not accept the right of way as an immutable given or a sacred set-aside, or cars as the only mobility option for the urban US. Instead, we ought to revisit the right of way as a public resource like any other. This is not the first study to propose reclaiming public land in Seattle from cars; numerous proposals and, indeed, executed plans aim at redistributing right of way among transportation modes or transforming it into green or public space (Gawne, 2018; Goldberg, 2018; Seattle Department of Transportation, n.d.-c). I take these explorations a step further, testing the potential of right of way as a site for infill housing. This entails recognizing its existence as publicly-controlled space, reconsidering its value as a publicly-controlled resource, and questioning whether its present use is the best way of expressing that value.

The primary research question and sub-questions are presented in Chapter 2.1, followed by the study's scope and intended audience in Chapter 2.2. The significance of the research is reflected in the evaluation criteria, which are laid out in Chapters 2.3 and 2.4 respectively.

2.1 Research Question

The primary question this study intends to answer is, simply:

- Would it be physically possible to fit livable low-rise (30–50' height limit) housing in the right of way in Seattle's urban villages?[7]

Secondary questions addressed are:

- What might be the resulting impacts on streetscape and public space?
- What might be the resulting impacts on circulation and parking?
- What might be the resulting impacts on neighborhood form, fabric, and identity?
- What other considerations are critical in the design of such infill development?
- How much density might the city expect to gain?

2.2 Audience and Scope

As with all academic exercises, this thesis is structured to fulfill degree requirements. More importantly, I hope the arguments and illustrations provide Seattle's residents and decision-makers with a sense of what infill construction in the right of way could look and feel like and what the major issues with executing such construction would be. Those readers most interested in the designs and their outcomes may want to skip ahead to Chapters 5 and 6, The Sites and Design Intervention.

The design intervention I explore here is focused on *infill*: the inserting of new structures in already-developed locations (Municipal Research and Services Organization, n.d.-b). Infill is rarely a simple process when it takes place on existing building parcels (Farris, 2001;

[7] In a sense, then, this thesis examines one of the first interchangeable criteria for determining the highest and best use of a plot of land: *physical possibility* (Dybvig & Appraisal Institute of Canada, 2010).

Whittemore & BenDor, 2019). Infill in the right of way introduces a host of new complications. While my intent is to identify the spectrum of such complications, resolving them all satisfactorily is outside the scope of this work. I focus solely on the physical feasibility of introducing infill in three locations in the City of Seattle: would housing fit within the right of way, what physical modifications would this require, and what might the potential impacts be on circulation and other elements of the site? I address these issues in Chapters 6 and 7, Design Intervention and Analysis: Projected Impacts.

The implications of this proposal are both complex and daunting, and the temptation is to immediately leap to legal, fiscal, political, and other potential hurdles and ramifications. To clarify, the following considerations are beyond the bounds of this thesis:

- Legality and property rights issues
- Cost-effectiveness of measures, including costs of moving under-street utilities
- Actual impact on local housing prices and overall housing prices in the city
- Social impacts
- Community and/or bureaucratic engagement and resistance

The scoping is intended to focus attention on a design solution to an interdisciplinary issue and provide readers with enough information to determine whether the proposal warrants further exploration.

One final note on scope: during my studies at the University of Washington, I was frequently distracted by the tendency to refer in shorthand to "cities," when what was meant were American cities. I want this thesis to be part of a continuum of exchange of ideas and best practices across national and cultural boundaries. That said, in this instance, I have taken

inspiration from primarily foreign milieus to focus on a specifically US context and limit the scope of my intervention to Seattle and cities like it.

2.3 SIGNIFICANCE

The proposed intervention is a test. It may have little significance beyond satisfying intellectual curiosity regarding infill in the right of way—especially if the conclusion is that none of the tested scenarios function spatially or generate enough density to justify further exploration of this alternative urban form. On the other hand, it may be groundbreaking, either as the seed of feasible change in Seattle or as one instrument in a sustainable housing and mobility toolbox for urban contexts across the US. Even if the result is negative or inconclusive, I believe the study will have provided useful information. We cannot accurately predict what the future will bring in terms of transportation developments, housing technologies, climate refugeeism, or density pressures on already-built urban spaces (Rauws, 2017). And what may initially seem radical may one day seem obvious.

2.4 EVALUATION CRITERIA

The key quantitative criterion for whether or not to conduct further exploration of right-of-way infill is the density increase that could be expected if the concept were executed.

However, the criteria for evaluating the success of this thesis as a design exercise lie elsewhere. I propose two subjective criteria: firstly, whether or not the case studies thoroughly explore the physical potential of the ROW as infill space, by convincingly and comprehensively introducing the rationale for the design intervention and presenting the primary ramifications of the concept's implementation as scoped.

Secondly, does the concept provoke a reaction in the reader? Does he start wondering where he would park if the concept were piloted in his neighborhood? Does she suddenly think *this would be an interesting test site for right-of-way infill* while cycling around the city? Do they think back to the pleasant square where they kicked back and had a beer that day in Paris, Puerto Vallarta, or even Pioneer Square? Does the thought of having more spaces like that in Seattle seem foreign but intriguing?

If this thesis can open up such space in the reader's mind, I consider it a success.

Chapter 3. METHODS AND DATA

It is unproductive to try to define a rigid dividing line between survey and analysis. The collection of particular *pieces of information implies the use of a preconceived analytical framework*. (Moughtin et al., 2003, p. 73)

With the exception of the inclusion of a literature review, this thesis in many ways mirrors the output of an urban design studio. As such, it employs the attendant mix of methods: site identification and background research, an iterative process to discover and refine designs, and presentation and analysis of results. As with many studio-type projects, it is based on a thought experiment: a *what if?* proposition. Detailed descriptions of the methodologies and data sources follow, as well as some thoughts on biases that have shaped this thesis and its motivations.

3.1 MIXED METHODOLOGY

Data collection and generation took a variety of forms and relied on a broad range of methods. As noted above, key data was provided by the spatial explorations detailed in Chapter 6, Design Intervention. These explorations are critically informed not only by the scope of the thesis, but by theories laid out in key works of urbanism, recent findings from relevant literature, surveying and other techniques developed by urban designers, and qualitative and quantitative data collected either on-site or from public databases.

3.1.1 *Thought Experiment*

Thought experiments are generally associated with highly theoretical subjects of study, such as philosophy, physics, and mathematics, as a means of exploring potential outcomes in instances where the actual experiment is difficult if not impossible to perform (Brown & Fehige, 2019). As

applied here, the present thought experiment is an attempt to a) test a hypothesis—the right of way offers potential for inserting a certain type of infill construction in certain urban contexts—and b) project the potential consequences of this physical intervention in the built environment without (or before) going through the trouble and expense of actually carrying out said intervention (Brown & Fehige, 2019). As noted in Chapter 2.2, Audience and Scope, assessments of real-world feasibility have been strictly limited in this instance: the sole concern is whether such construction would be a potential way of offering dwelling units while retaining certain mandatory aspects of circulation and utility delivery served by the right of way in its present form (Rey, 2017). In nature, this thought experiment is *prefactual*: the attempt is to project if this happens, what the results would be (Sanna, 1998)?

A simple way of characterizing the approach is to take instances of play or imagination—*What if streets were replaced with housing?* or *What if a medieval fabric were laid over a North American grid?*—and apply scientific methods and rigor in formulating a response to those questions.

3.1.2 *Literature Review*

Finding literature on the primary topic—infill in the right of way—proved problematic. Conversations with professors, University of Washington College of Built Environments librarian Alan R. Michelson, and cohort-mates indicated I might have trouble finding precedents, which proved true. Despite the use of various configurations of search terms such as “right of way infill,” “housing infill streets,” “right of way housing,” “building in the street,” I was not able to find any citations that specifically addressed the sort of right-of-way infill being proposed

in either university or public databases.[8] The closest results were perhaps articles on the *superille* of Barcelona and books on street design, along with gems like Untermann and Small's *Site Planning for Cluster Housing* (1977). Searches of academic databases on other topics were more successful and ranged from "history of street grid" and "pedestrianization" to "future of home delivery" and "Japanese European fire engines." As can be seen from these terms, the project shifted in nature somewhat during the writing process, from explorations of historical urban forms to considering a range of real-world ramifications, until finally crystallizing in the present design exercise.

Prior to the design process, I consulted seminal works on urban design I had been introduced to prior to and during my degree studies; these were by authors such as Christopher Alexander, Jan Gehl, Jane Jacobs, and Kevin Lynch. I was also offered direct suggestions by my thesis chair, Professor Rachel Berney.

Active research was complemented by subscription emails sent by online sources as citylab.com, which occasionally provided links to articles cited here. Other online sources intended for public consumption I consulted included theguardian.com/cities, theurbanist.org, sightline.org, and curbed.com.

3.1.3 *Field Observation*

Modeling the work of Camillo Sitte, Grady Clay, Allan Jacobs, Vikas Mehta, and others, I relied heavily on field observation to provide data both prior to and during the design iterations (Clay, 1973, p. 11; Collins & Collins, 1986, p. 138; A. B. Jacobs, 1985, pp. 6–8; Mehta, 2013, p. 79).

[8] I did come across one local request to vacate a street stub for student housing, but as the surrounding parcels are college-owned, the context resembles a campus expansion, not infill in a public street network (Murray, 2017). Another article mentioned "a policy that allowed the development of townhouses in the middle of a suburban street" in an apparently Australian context but did not elaborate (Rowley et al., 2012).

While establishing site selection criteria, I visited multiple sites both physically and virtually, through Google Earth and Google Maps. Once the three sites were selected, my physical visits became more frequent, the primary purpose of each visit depending on the phase of research—photographing the site, sketching the buildings and their silhouettes to gain a grasp of scale, measuring rights of way, conducting parking counts—but ultimately with the aim of developing the sort of understanding of site form and patterns of human activity that can only come with familiarity (A. B. Jacobs, 1985, pp. 6–8). In the instance of Capitol Hill North, this familiarity is at the level of a long-term resident.

3.1.4 *Iterative Design*

The process that produced the proposed designs was an iterative one. A list of two dozen design rules developed during site visits, literature review, conversations with my advisors and others, and early-stage sketching (see Chapter 6.2.2, Design Rules). Site dimensions were predetermined and unalterable; any structures I was going to propose would have to fit within those dimensions. Professor Rick Mohler contributed to my basic understanding of workable unit dimensions during a studio-type session where I presented ideas and he offered suggestions, joining me in roughing out potential unit dimensions and orientations. The goal was to develop an overall design approach for all three sites and then illustrate it at a series of scales, ranging from unit layout to site circulation patterns, that would provide sufficient detail to judge the potential of the concept as scoped.

3.2 Data Sources and Software

Geographical Information System (GIS) data for the City of Seattle was retrieved via the WAGDA portal of the University of Washington. Most of these files had not been updated since

2012, which meant gaps when it came to building outlines and information at the sites. These were added by hand to the GIS maps, using the Edit function of ArcMap to trace over building outlines from ArcMap's World Imagery layer and aerial images pulled from Google Earth, which proved most up to date. Apex information for the buildings was added based on approximations, considered as being of sufficient accuracy for the present thought experiment.[9]

Basemaps and images were produced from a range of sources. ArcCatalog and ArcMap were used to produce all basemaps. Basemap images were edited using Adobe Illustrator software. Hand sketches were produced freehand or by tracing over photographs taken by me. Digital models and floorplans were produced using Sketchup or Adobe Illustrator software.

3.2.1 *Sources of Qualitative Data*

Most qualitative data emerged from personal site surveys (A. B. Jacobs, 1985, pp. 6–8). Qualitative considerations primarily took the form of projected design impacts; no research was conducted on, for instance, resident opinions on their present living environment or reactions to the proposed interventions.

Another, less obvious source of qualitative data was my memory. Several study abroad opportunities during my degree studies afforded me the opportunity to visit foreign contexts that, combined with earlier travel, inspired the initial impetus for the project.

[9] There was a gap of over a year between the production of these sketches and the publication of the thesis, during which some buildings at the sites had been razed and replaced. I deemed these local changes to site fabric insignificant in terms of overall design outcomes.

3.2.2 *Sources of Quantitative Data*

Right-of-way measurements were taken on site using a Bosch GLM 30 Laser Measure and compared against the information provided in the City of Seattle Zoning Map Books (City of Seattle, n.d.-e). Other measurements were retrieved from City of Seattle and King County GIS and parcel databases (King County GIS Center, n.d.; Seattle Department of Construction and Inspections, n.d.-c).

The research aims are explored by a handful of quantitative findings: estimates of parking space and through-traffic displacement and rough estimates of shifts in spatial dedication to the right of way vs housing. For the through-traffic and parking rate baselines, counts were tallied at various times of day to acquire representative figures (see Appendix B). Estimates of current dwelling unit numbers were tallied based on figures retrieved from the King County Parcel Viewer (see Chapter 4.5, How Much Density is Enough?). All quantitative results are projections based on estimated adjustments to baseline figures following the proposed interventions.

3.3 Researcher Bias

As Kevin Lynch and others have observed, any choice regarding the urban fabric reflects the values of the person, persons, or society designing them (Banai & Rapino, 2009; Moughtin, 2003, p. 11). Like any other researcher, I harbor biases that shaped the initial impetus behind the present thought experiment and impact the research as well as its analysis and results. Below, I attempt to make these biases explicit for readers to consider when judging this thesis and its conclusions.

I believe a dense urban fabric is more sustainable than sprawl (Kenworthy, 2006; Toderian, 2013). As urban density increases, I think pedestrianized environments will eventually appeal to enough Americans for it to be a viable alternative for urban living (Soni & Soni, 2016; Wenzl,

2017). I believe that increasing numbers of residents of cities are amenable to tiny- or shared-space living, and that families with young children would consider living in inner-city multifamily units if they were available and affordable (Boterman et al., 2010; Goodsell, 2013; Lilius, 2014). I do not believe high-rises are the only way to achieve sustainable densities, nor do I feel replacing of sound structures with larger buildings is the only or even the wisest way of achieving sustainable densities (Alter, 2020; Badger, 2012).

Public transportation is a necessary element of sustainable development and ought to be prioritized over private vehicle convenience (Kenworthy, 2006). I believe convenience is the key to successful public policy, and that in order for a combination of public transit, carshare, rideshare, and cycling programs to have an appreciable impact on urban mobility and public health, their convenience must be paramount, and conversely the convenience of private vehicle ownership and parking ought to be de-prioritized (Fitzgerald, 2020). I believe predictions regarding smoother traffic flow and reduced congestion as a result of automated vehicles are flawed and these technologies will have little or no impact on congestion (Public Transport Users Association, 2020). I see access to free or cheap parking as a massive public-relations problem that US cities wanting to deprioritize private vehicle ownership must resolve (Fitzgerald, 2020).

I believe any change in the urban fabric creates unforeseen consequences; I also believe this is no reason to not to attempt to improve the physical and social fabric of the city (Rauws, 2017). My view is that, although mitigating all negative impacts for everyone during a paradigm shift is an impossibility, pilot projects offer solid potential for both pinpointing the benefits of and heading off the unintended negative consequences of policy changes regarding urban form (Gehl Studio San Francisco, 2016; Hughes et al., 2020; Rowley et al., 2012).

I believe attempts to assign monetary value to all solutions is a futile exercise, not only because some phenomena are simply too complex for humans to calculate accurately, but because doing so places a dehumanizing priority on monetary value over other values (Sukys, 2009). I am convinced that as housing joins healthcare as a major affordability concern in the US—as increased disparities in income, wealth, and land ownership make urban housing unaffordable for much of even the middle class—the private housing market will require public competition to deliver affordable housing (Dreier, 2018; Gowan & Cooper, 2018; Rowley et al., 2012). The average wage-earner cannot compete with a private real estate market saturated in global capital (Semuels, 2019).

I have an affinity for fine-grained, pedestrian-friendly urban fabrics, am comfortable with compact living, and am generally more excited by vernacular forms and traditional or rediscovered construction techniques than I am by technology-driven futures. I have always been fascinated by small-space living and the super-rational layout of space and storage it entails, and that a growing number of Americans are intrigued by the possibility as well (Kleber & Associates, n.d.). I believe US cities are behind the curve in many issues, including public transit and housing policies, and I believe we can look to the past and other cultures, including those represented in the Global South, for solid, sensible, cost-efficient solutions that prioritize the many over the few (D. Appleyard, 1987; Berney, 2017; Fogel, 2019; Lehmann, 2016; Redman, 2014).

Chapter 4. KEY CONCEPTS AND CONSIDERATIONS

We look at the grids with optimism, for their individual streets and networks alike provide magnificent opportunities to redesign our cities. (Vernez Moudon & Untermann, 1987, p. 132)

Before moving on, a review of core questions involved in reconfiguring the right of way is in order. These questions evolved in an iterative, reciprocal process during the literature review and face-to-face descriptions of the concept of right-of-way infill to professionals and laypeople. The question that was generally the first to arise—*Aren't streets too narrow to fit housing?*—is a reframing of the primary research question, and Chapters 6 and 7, Design Intervention and Analysis: Projected Impacts, are dedicated to addressing it.

The four other fundamental questions I determined must be addressed for the concept to warrant consideration are:

1. Streets are public property; how can you build privately occupied units in them?
2. Why don't you just upzone and build high-rises instead?
3. Won't that be messy?
4. How can you just get rid of streets?

(And if we accept that it can't hurt to play with the idea of inserting housing into the right of way, we can proceed to a fifth key question, namely:)

5. What sort of density increase could we expect?

Chapters 4.1–4.4 cover the first four issues. Although technically beyond the thesis scope, a rudimentary gauging of resulting densities and their sufficiency serves to frame the thought experiment's outcomes in comparison to other methods of achieving density increases; hence its inclusion in Chapter 4.5.

4.1 How Can A Public Good Be Dedicated to Private Use?

In plain words, when there is a chance of making money from urban land, the claims of the public good will be set aside. (Kostof, 1991, p. 124)

Adopted from the field of economics, the notion of *public goods*—assets such as clean air, streetlights, and legal rights, which are collectively owned and utilized freely by the public—is central to urban planning (Black et al., 2009b). At first glance the right of way may seem like a public good par excellence, in that its use is free and available to all (D. B. Lee, 1987). However, there is a temporal aspect to the use of a certain stretch of right of way. Only so many people can use it at the same time, which makes it *rivalrous* (D. B. Lee, 1987). And in instances where parking is zoned or metered, the right of way further takes on aspects of *excludability*: its use is limited by ability to pay. For the purposes of this thesis, I characterize the right of way as an *impure public good*: a good that is generally but not always freely available to all without its use impinging on others' use of it (Black et al., 2009a).[10]

What impact will this thought experiment—reconceiving part of the right of way as housing—have on collective access to this impure public good? Chapter 4.2.1 addresses the justifications for introducing a certain amount of excludability and rivalrousness to it in the form of infill housing. Chapter 4.2.2 follows with a brief discussion of the human impulse towards territoriality and how it impacts our perceptions of ownership of the right of way.

[10] There is clearly an argument to be made that the space making up the right of way should always be viewed as rivalrous and, thus, a *common good* or *common pool resource* (see e.g. D. B. Lee, 1987). However, if right of way is viewed in the sense of a right rather than a space, it is clearly a public good. For simplicity's sake and because the distinction is not crucial in this instance, I have decided that treating it as a public good covers the most terrain.

4.1.1 *Limiting Access to a Public Good*

Right-of-way infill would partially restrict access to a public good: the homes built in the space reclaimed from the street would be privately occupied, making that portion of the public good inaccessible to the public at large. On top of that, the remaining right of way would be converted from a street to shared space for walking, playing, or just being, meaning drivers and cyclists would find access to it severely curtailed. How is this fair?

It's an excellent question, and as the entire intervention hangs on the response, it deserves addressing before proceeding any further.

Instances of restricted access to impure public goods abound in our cities. An act as simple as locking a bicycle to a street lamp prevents someone else from using that same space. Opening hours are a common form of access limitation: public services such as libraries or courthouses are not available around the clock, and users must adhere to certain standards of behavior to access them (Leach, 2004, p. 187). Library books and the picnic areas at public parks are subject to reservations that may cost nothing but are generally accepted as equitable ways of governing rivalrous goods. Ability to pay is another common way of either permanently or temporarily limiting access to a public resource: access to the land on which public golf courses stand, the public pools where children learn to swim, and the streets closed off for festivals like Capitol Hill Block Party is dependent on the resource user's ability to pay an entrance fee (Leach, 2004, p. 187). Income received from the temporary lease of a public good is generally intended to go to public coffers, theoretically compensating the public for the restricted claim on that good. In some instances, the stewards of common and impure public goods—city officials—may choose

to permanently divest such goods, for instance by vacating an alley right of way so the adjacent property owners can develop said land (Seattle Department of Transportation, 2018).[11]

If we look at the impure public good we call the right of way, it is restricted both by reservation—legal statues give either drivers or pedestrians priority of access, depending on the circumstances—and ability to pay. But the cost of parking permits and fees and bus passes, let alone that of owning and operating a vehicle or even a bicycle, mean that large segments of the population are unable to access the physically largest segment of public good of the right of way: the street.

One theoretical approach to the present intervention is to view the infill housing to be built on publicly-controlled land as *extremely* long-term parking spaces, reserved for decades rather than hours, with the party doing the occupying a renter or homeowner instead of a driver or vehicle owner. Will this lead to certain members of the public having greater access to the public good of right of way than others? Absolutely. But that has always been the case. And I argue the public need for

Figure 4.1. We Already Allow Private Occupation of the Public Realm

[11] As noted earlier, Seattle City Councilmember Teresa Mosqueda has questioned whether permanent divestment of publicly-owned or -controlled land is wise policy in an era of increasing land value (Trumm, 2018b). The most flexible approach and one that safeguards the public interest into the future, would seem to be to maintain ownership of land assets even if the city temporarily cedes control to said land through a lease.

housing in general and affordable housing in particular supersedes the public need for parking spaces for privately owned vehicles, or the right to traverse one's residential neighborhood at 30 MPH instead of 10 MPH.

Indeed, when it comes to limiting access, altering access to the public goods of views and daylight, both free to all, gives as much cause for concern as the loss of parking spaces. I understand many of my fellow residents, many of them drivers or high-frequency consumers of home-delivery services, will disagree.

Furthermore, there is a solid argument to be made that rather than reducing access to the public good we think of as the street, the right-of-way infill proposed in this thesis actually has the opposite effect: opening up more public space to the public at large (see Chapter 7.1, Quality and Amount of Public Space).

What we can say with certainty is that reconceiving part of the right of way as housing for people as opposed to parking for cars shifts the access to that public good: some who once enjoyed certain types of access to the space no longer would, and those who were previously denied access would now be free to use it in new ways. Such shifts can make implicit feelings of territoriality explicit.

4.1.2 *Territoriality and Public Space*

Legal and regulatory constructs come into conflict with perceptual and behavioral psychology when it comes to the notion of *territoriality* (Hall, 1966, p. 8). Territoriality, or territorial functioning, is a system of sociospatial sentiments and behaviors involving laying claim to a space through symbolic and physical markers (Mehta, 2013, p. 60; R. B. Taylor, 1988, p. 6). Territoriality is easily illustrated through an everyday example: once I move into my home and have assumed maintenance of the parking strip fronting my house, I will almost inevitably

conceive of it as “mine,” even if I am intellectually aware it is under the city’s control (R. B. Taylor, 1988, p. 166). Legal and social systems can encourage this sense of territoriality—in Seattle, property owners are responsible for keeping the sidewalk in front of their residence or business maintained (Seattle Department of Transportation, n.d.-d). But this does not mean legal control of the land has been turned over to said property owner, as anyone who has been ordered to take down a structure erected without a permit in the right of way can attest (Seattle Department of Transportation, n.d.-a).

Figure 4.2. Territoriality at Work

Despite a street being public space under the city’s control, it is only natural for the present owners or occupiers of the adjacent properties to view it as “my street”—a ubiquitous colloquialism that indicates a sense of ownership and attachment, despite the fact those residents have no more legal claim to said stretch of right of way than any other member of the public. *My street*, *my parking*, *my daylight*, *my view*—this territorial impulse is so deep-seated that it will likely form one of the greatest obstacles to the execution of the proposed intervention in terms of community resistance and buy-in. The introduction of the Barcelona superblocks known as *superille* aroused feelings of territoriality and ownership among neighbors and negative reactions among vehicle owners forced to adjust their parking and driving routines (Roberts, 2019c).

The trick would seem to be to harness this feeling of territoriality. Far from being a negative impulse, territoriality can form the cornerstone of a secure, pleasant, and social urban environment through "eyes on the street," neighbor-initiated beautification plantings in traffic circles, or a shopkeeper keeping "their" sidewalk swept and tidy (J. Jacobs, 1961; Mehta, 2013, p. 62). Territoriality is, then, a natural impulse—nothing more, nothing less—that can further, hinder, or both further and hinder the aims of right-of-way infill (Mehta, 2013, pp. 60–61; R. B. Taylor, 1988, p. xxiv). The critical thing is to recognize the impulse and its inevitable impact, consider them during planning, rollout, and execution, and perhaps devise new strategies for making use of this resource.

Figure 4.3. Territoriality Can Improve the Public Realm

4.2 Why Not Just Go Up?

Tall buildings are the pedestrian's bane. (Rudofsky, 1969, p. 338)

The primary tactic for increasing density in US cities is to *build up*: to replace existing low-rise homes or structures with taller structures containing more units, or to build out brown- or greenfield sites with high-rises (Lehmann, 2016). In Seattle, this takes regulatory form in increased height limits in upzoned urban villages and physical form in the growing forest of residential high-rises stretching north from downtown. Indeed, as long as the current pattern of

streets and building lots is considered inviolable, going up is the only way to substantially increase residential density in neighborhoods primarily zoned for multifamily units.

Another way of achieving density increases is to *build in*: to infill existing parcels with accessory dwelling units (ADUs) and detached accessory dwelling units (DADUs) or even additional houses built as compliments to an existing home (Seattle Department of Planning and Development, 2015). This model has also been adopted by Seattle, which has been promoting ADUs and DADUs since the original HALA recommendations were published in 2015 (HALA committees and staff, 2015).

Right-of-way infill is an extrapolation of this second model of increasing density, albeit one that takes place on public land rather than private parcels. Of course one option would be to combine building up with building in and propose high-rises in the reconceived right of way to maximize density gains. But such infill goes counter to the spirit of the proposed intervention, which is intended as an alternative to mid- or high-rise density. Other arguments against relying solely on mid- and high-rise construction are presented in Chapters 4.2.1–4.2.2.

Furthermore, there are plenty of examples of high-density, mid- to high-rise construction in and near Seattle.[12] The purpose of this thought experiment is to test a new urban configuration that, at least based on my research, has not yet been tested anywhere. It may be that the best answer is to go up. But we will not know if there are other options until we try.

[12] With a reputation as a North American model of urban sustainability, Seattle's northern neighbor of Vancouver, British Columbia has undergone a marked physical transformation over the past two decades (Lehmann, 2016). In order to achieve residential density growth, Vancouver relied in part on the construction of new high-rise developments with a specific profile: narrow towers over pedestrian-friendly podiums that went some way to preserving a pedestrian-friendly streetscape and avoiding the blank walls associated with skyscrapers of earlier decades (Kalman, 2014, p.70). This pedestrian-friendly high-rise model serves as a point of comparison for the present thought experiment.

Figure 4.4. Building Up and Building In – There's a Place for Both

4.2.1 *Sustainability and Equity Perspectives*

The two main aims of this thought experiment—increasing residential density and reducing private vehicle usage—are considered cornerstones of urban sustainability (Lehmann, 2016). Other views have been researched and conflicting results presented, but generally speaking, a dense, compact, pedestrian-oriented city with effective public transportation remains the accepted model for sustainable development (Jenks et al., 1996; Lehmann, 2016; Toderian, 2013). In some ways, right-of-way infill is an importation of scale and ideals embodied in the mid-rise urbanism of many European cities, which lend themselves well to sustainability and livability aims (Lehmann, 2016).

While there may be no definitive answer, there are arguments to be made that low-rise infill has advantages over high-rises from a sustainability perspective (Al-Kodmany, 2018). Some studies have indicated that greater energy use in high-rises can offset any of the other sustainability gains of having substantial numbers of people residing within a compact footprint (Lehmann, 2016; Steadman, 2016). In addition, existing structures are not demolished, an ideal that is gaining traction among sustainability circles (WBDG Historic Preservation Subcommittee, 2019). Preservation of existing structures reduces landfill and material use and creates a smaller carbon footprint (Jackson, 2005; Preservation Green Lab, 2011). The case of right-of-way infill is more ambiguous, though: buildings may not have to come down, but streets and sidewalks will have to be torn up and reconfigured, and even if planned to coincide with utility upgrades, the demolition of existing streets has sustainability impacts, just as demolishing buildings would.

Figure 4.5. Dense Fabrics and Fine Grain Encourage Walking

One could argue that siting the infill in the right of way magnifies its sustainability: barren tracts of concrete will be built up, so the pressure for infill will not expand into green areas like parks or even golf courses and exacerbate heat island effects this way (Poon, 2019). It could incorporate green technologies to ensure the surfaces of the newly-reconfigured rights of way are permeable and are otherwise designed according to best stormwater-management practices. Additionally, both the primary gain (more density) and the primary loss (fewer parking spaces) resulting from the proposed concept further sustainability aims. Replacing parking with housing combats induced demand for private vehicle ownership and use, and fewer cars mean less local noise and air pollution, more pedestrian activity, and could contribute to a shift from private to public transit.[13] In the end of all, this disincentivization may be one of its biggest sustainability impacts (Badger, 2014; Cortright, 2017).

As always, it is impossible to predict all impacts of a planning decision (Rauws, 2017). While it may initially seem there are few sustainability downsides to building in the right of way, simple changes—such as drivers searching longer for parking—may negate some of the

[13] The rapidly evolving field of mobility, from rideshare applications to electric bicycles and automated vehicles, makes me loath to make any predictions about future behavior patterns when it comes to mobility. Seattle has already lost one transportation mode within the last year, when the carshare services ReachNow and Car2Go first merged and then exited the market.

projected benefits (Roberts, 2019c). This is why reversibility is also considered by some as a measure of sustainability: if a solution does not work or generates unforeseen negative consequences, it can be reversed (Lynch, 1981, pp. 172–173). High-rises, once built, rarely come down. In contrast, low-rise structures built strictly within the right-of-way can be relatively easily removed if a city's priorities shift.

If we concede that infill on publicly controlled land has potential benefits from a sustainability perspective, how can we ensure those are equitably distributed? Here again we have another argument for maintaining low-rise height limits on right-of-way infill: high-rise construction, while offering greater DUA figures, also demands resources to which only a limited number of developers have access (Rowley et al., 2012). Maintaining low-rise limits on the infill opens up development to a greater number of developers and interests (Rowley et al., 2012). In addition, at least in the current market, the potential tenants of low-rise construction are not competing for the premium-price units available in high-rise buildings (Kotkin, 2017).

And yet a project intended to advance housing affordability must be carefully planned to ensure that it does not have the opposite impact (Rowley et al., 2012). Although beyond the scope of this research, key decisions such as public vs. private development rights, lease length and pricing, and market-rate vs. affordable housing must be analyzed and monitored closely to ensure the city's stated equity goals are furthered through the project. One equity advantage to infill alluded to above is that, unlike razing older structures and rebuilding, immediate displacement of present occupants does not automatically occur, and any change in market value or rents in surrounding structures is, like the change in the built environment, likely to be incremental (Seattle Planning Commission, 2020).

4.2.2 *Experiential Perspectives*

Since the days of Vitruvius, a triad generally expressed in a variation of *utility*, *function*, and *emotional satisfaction* have been the primary concerns of urban designers. This Chapter addresses the last of these: emotional satisfaction, which I frame in terms of *experiential* reactions. Numerous urban designers have attempted to describe the qualities that make an urban space pleasant; others offer measurements and calculations to back up their claims (Alexander et al., 1977, 1987; Gehl, 2010; A. B. Jacobs, 1993; J. Jacobs, 1961; Lynch, 1962; Mehta, 2013; Sitte, 1945; Whyte, 1980). Meanwhile, processes like design reviews and statutory documents like design guidelines have been developed in large measure to ensure that changes in the streetscape conform to a set of predetermined standards regarding overall experience (Seattle Department of Construction and Inspections, n.d.-a).

In their 2004 article "Cities on Art: Exploring the Possibility of an Aesthetic Dimension in Planning," Emily Talen and Cliff Ellis call for a return of aestheticism—specifically, a broad, imaginative, contextual traditionalism—to the field of urban planning. They highlight the thinking of humanistic planners like Camillo Sitte, Patrick Geddes, Lewis Mumford, and Raymond Unwin, whose preferred idioms were grounded in the collective, the historical, and the complex, notions that fit nicely with the idea of the layering, preservation, and modest scale inherent in low-rise right-of-way infill. The collective, participatory incrementalism they champion seeks to build on the past rather than demolish it and rebuild from the ground up (Talen & Ellis, 2004). This desire to reuse and rehabilitate while considering context, relationships, perspective, movement, and scale, without taking a hard stance on stylistic preferences, fits well with the aims and delicate hand necessary in right-of-way infill (Cullen, 1961, pp. 10–11; Kostof, 1991, p. 92; Lynch, 1962, pp. 221, 271; Mumford, 1961, p. 302)

Often considered one of the first proponents of incrementalism, Patrick Geddes championed an incremental approach characterized by smaller, targeted interventions instead of typical master-planned razing and rebuilding. As opposed to a straightjacketed ideal à la The City Beautiful, Garden City utopianism, Hausmannian demolition and reconfiguration, or modernism's wholesale rejection of the past, Geddes championed a model of thoughtful, context-specific intervention in a problematic urban condition—an attitude emblemized in the metaphor of a precision surgery (Geddes, 1947). In this respect, the ideas of Geddes have had an impact on many subsequent urbanists, informing a school of urban design that is interested in neither recreating the past nor rejecting it, but in examining a present set of conditions, considering which elements serve present needs best through preservation, which through reconfiguration, and which through replacement.

Christopher Alexander alludes to this incrementalism in the introduction to *A Pattern Language*, calling it the "patient piecemeal growth" of human settlements (Alexander et al., 1977, p. xix). This comprehensive work catalogs traditional idioms Alexander and his team deemed contributory to built environments humans experience as pleasant, many of which were adopted in the

Figure 4.6. Not Whole: A Wide Moat Separates Private Fiefdoms

present design responses.[14] For Alexander, the ultimate aim in spatial design is to create a sense of "wholeness": the experience of being in a space that feels comfortable, sensible, pleasing, and stimulating in equal measure (Alexander et al., 1977, p. xiii, 1987, p. 16; see also Rasmussen, 1959, p. 53). Critically for him, this sense of wholeness is impossible to build in toto; it must be allowed to form through the filter of time, through the masterful and sensitive layering of present answers to pressing problems over past forms and solutions—in other words, incrementally.

Incrementalism has its risks: it's conceivable that it could favor an overly cautious approach to problems that genuinely require radical, large-scale solutions. But it also has its rewards: the chance to preserve what works and fostering the layering of time, style, and function that Alexander, Geddes, and other incrementalists argue are a critical element of a rich, diverse cityscape. Building housing in the right of way rather than razing and rebuilding the surrounding parcels allows the continued existence of a local type of residential habitation that, once gone, will be impossible to recreate. This preservation of built form reinforces a sense of continuity and poeticism and can even function as a type of site repair (Alexander et al., 1987, p. 22).

The rub is that Seattle's present policy to concentrate density in urban villages can also be considered incremental: upzoning does not mean all low-rise structures vanish overnight and are replaced with mid-rise structures that max out the zoning. Depending on the lens one chooses to look through, moderate upzoning can be seen as a more incrementalist design approach than right-of-way infill: despite the latter's being limited to narrow strips of land running between existing blocks, it demands some measure of master planning. In both cases, a well-designed project ideally builds on what came before to maintain or improve the site's sense of wholeness.

[14] A list of patterns I found relevant is provided in Appendix B.

So what's the problem with simply upzoning and letting the market and the developers do their work? Any truly valuable buildings will be saved through preservation measures, right?

There is an argument to be made there. But this ignores the inevitable long-term result of an upzone: a site where streets only serve as paths as opposed to places. There is a reason US streets lined with high-rises are generally empty at night: as Jan Gehl puts it, high-rises can bring density, but they do not generate intensity (Gehl, 2010, p. 69). In addition, high-rises and even mid-rises form canyons that shadow public spaces, block daylight and views, and cause wind conditions, compromising the street-level experience (Lehmann, 2016). In addition, US high-rises have traditionally been associated with a coarse urban grain that dulls the streetscape for pedestrians. This is one of the reasons many cities generally considered exceptionally pleasant from a pedestrian perspective—Paris, Copenhagen, Edinburgh—relegate high-rises to areas out of the city center if they allow them at all.

Figure 4.7. A Street Canyon in Formation

The proposed low-rise right-of-way infill is not fully immune to these ills: it will divide the right of way into two narrower spaces at risk of feeling like canyons, albeit shallower ones than those created by high-rises—gullies, perhaps. And the fabric will change markedly. Wide streets and street parking will vanish, alleys grow busier, woonerfs and shared spaces appear, lines between public and private blur—although as we see in Chapter 5.3.2, Variation in Right-of-

Way: Encroachment among the Sites, those lines may not always exist where we think they do anyway. In short: any marked increase in DUA is going to have an impact on the streetscape. Low-rise right-of-way infill and high-rise private-parcel construction both modify the fabric of the city in noticeable ways. But right-of-way infill acknowledges this inevitability and attempts to minimize the negative impacts of this change in terms of sustainability, equity, and street-level experience for both existing and future residents.

4.3 What Happens to Legibility When the Grid is Filled In?

A straight path has clear direction, of course, but so does one…of many slight turns which never yet loses its basic direction. (Lynch, 1960, p. 96)

Like most US cities, the vast majority of Seattle was laid out in rectangular blocks served by a regular grid of streets (Vernez Moudon & Untermann, 1987). The average size of these blocks by site varies to some degree based on the platting; the grid dimensions for the sites I will be looking at are provided below.

Combined with a street naming and numbering system, this grid serves as a framework for reading the city and a key tool for navigating it (Lynch, 1960, p. 4), even if that navigation is generally app-mediated these days. What happens to our ability to read a city when a "medieval" pattern of narrower rights of way is layered over the regular grid? Does it become more difficult to find one's way? What about the rules of the road? As evidenced by their lack of inclusion in Seattle's current guide to right of way design, shared streets are virtually non-existent in Seattle, which means residents have little experience sharing spaces among mobility modes (City of Seattle, 2020). What problems does this pose and how can they be mediated?

Chapter 4.3.1 explains the concept of legibility, while Chapter 4.3.2 explores one approach to mediating the potential disorientation caused by right-of-way infill.

Table 4.1. Grid Dimensions by Site

	Capitol Hill North	**Capitol Hill South**	**Beacon Hill**
Width of Right of Way	~60'	~60'	~80'
Block Dimensions	~250'x350' (x 7 blocks) ~175'x325' (x 5 blocks)	~200'x400' (x 4 blocks)	250' x 250' (x 7 blocks)
Built Acres	~20.5	~7.3	~10
Acres Banked Right of Way	~7	~1.7	~4.1

4.3.1 *The Grid as a Cornerstone of Legibility*

An ancient pattern in urban planning, the grid was used by the Greeks in their colonies, later adopted by the Romans, and spread throughout the Mediterranean and Europe through their garrisons and settlements (Lynch, 1981, pp. 16, 81–84). The Aztec city of Tenochtitlan was laid out in a grid of streets and canals, and regular grids appeared in the pre-modern Asian cities of Mahenjo-Daro, Kyoto, and Angkor Wat. It is no stretch, then, to speak of a universal arrangement in urban planning, one that has the benefits of unbroken sight lines, logical clarity, flexibility in path, and ease of platting and exchanging property (Kostof, 1991, pp. 93–95; Lynch, 1981, p. 378). Largely as a result of this last quality, American towns and cities were laid out in grids during the westward expansion of the nineteenth century, and Seattle is no exception.

A regular grid of streets is often contrasted with an "organic" street pattern associated with the charming twists and turns of medieval European towns (Vernez Moudon & Untermann, 1987). Le Corbusier cemented this distinction by contrasting the highly segregated transportation and living systems of his modernist machine cities with "the pack-donkey's way" of moving through older towns and districts that had escaped razing (Mehta, 2013, p. 46).

In his classic 1960 work *The Image of the City*, Kevin Lynch introduces *legibility* as a crucial concern in urban contexts (Lynch, 1960, p. 2). He defines the legibility of a cityscape as "the ease with which its parts can be recognized and can be organized into a coherent pattern"—in other words, the quality of spatial hierarchies that makes a city easy to "read" or navigate (Lynch, 1960, pp. 2–3). He quickly goes on to fold legibility into the *imageability* for which he is best known, but I question this equivalence (Lynch, 1960, p. 10). Like some others, I prefer to see legibility as a characteristic distinct from imageability, "that quality in a physical object which gives it a high probability of evoking a strong image in any given observer" (Ewing &

Figure 4.8. Highly Legible, Not Imageable

Clemente, 2013; Lynch, 1960, p. 9; N. Taylor, 2009). Parsing out the problematic equivalency between legibility and imageability—which Nigel Taylor illustrates in his description of Venice, a highly imageable city that is also, according to Lynch's definitions, highly illegible—allows us to concentrate on the less-evocative, less-distinctive, less-imageable information that creates the bulk of a city's text: street patterns, street hierarchies, road signs, street naming and numbering, addresses, directions, and sight lines (Lynch, 1960, p. 4; N. Taylor, 2009).

Why does legibility matter so much? Lynch answers thus: "a distinctive and legible environment not only offers security but also heightens the potential depth and intensity of the human experience" (Lynch, 1960, p. 5). Once again, if we parse his thinking and decide "distinctive" = "heighten[ed]…depth and intensity of the human experience," we are left with "legible" = "security." A legible environment feels safe, and as Lynch appears to be arguing, a sense of safety is a key element of the wholeness of a designed space as described in Chapter 4.2.2. I have chosen to underscore this gap between legibility and imageability, viewing them as two extremes on a continuum—the safe, the rational, the secure, the consistent, the legible vs. the stimulating, the evocative, the mysterious, the unique, the imageable.

I would argue the regular grid of urban North America fosters a sense of safety and security that travels well from city to city. In violating the expectations inherent in the grid, one-way streets, dead-ends, T-junctions, odd numbering, and shifts in grid may threaten this sense of security; an even more significant exception like the infill proposed here would be almost certain to do so. The norm violations inherent in right-of-way infill—through-traffic and parking disappear from a street and, in an even more disorienting move, housing is inserted—may well elicit deep emotional reactions not only because they trespass on residents' sense of territoriality or fairness and offend their sense of tradition, but because they make those accustomed to the workings of a regular street grid feel unsafe.

This hurdle poses major problems for right-of-way infill, some of which could be addressed through public relations and rollout strategy (see Chapter 8.2, Some Thoughts on Rollout). But Lynch's work also offers some hints as to how to address this fear through design.

4.3.2 *Emphasizing Imageability to Counter Loss of Legibility*

If modifying the grid has the potential to undermine the security it embodies, the solution to ameliorating this problematic reaction may lie at the other end of the legibility–imageability continuum. The five elements Lynch lists as the foundation of the "city image"—*node*, *edge*, *path*, *landmark*, and *district*—could be used to emphasize a site's imageability, to embrace its stimulating, evocative character so those who encounter it have other powerful emotions to counter the potential unease caused by the disappearance of the street grid they expect to find (Lynch, 1960, pp. 8, 46–48).

A review of *The Image of the City* suggests numerous design strategies to increase imageability and mediate loss of legibility. Introduce landmarks at nodes and within the site to facilitate wayfinding. Give the district (in this case the site) an identity distinct from the surrounding grid through the use of strong edges (Lynch, 1960, pp. 62, 67). Design those edges to form a seam instead of a barrier (Lynch, 1960, p. 65). Infill results in narrower paths where there was once a street, so ensure sightlines erase any doubt as to the basic direction of that path (Lynch, 1960, pp. 5–6, 52). Emphasize variation between enclosure and exposure, embrace the stimulation and choice that the two narrower paths generate; introduce a new rhythm to the space (Lynch, 1960, p. 10). And as the thought experiment is predicated on the insertion of private space into the public realm, design in a way that makes the private, the semi-private, and the public legible. Finally, an element of mystery or surprise can tap into the same instinctual vein as confusion and fear, transforming them into curiosity and excitement (Lynch, 1960, p. 120).

Figure 4.9. The Mystery of Imageable Draws Us In

One intent behind this thought experiment's key design move—draping a dense, irregular fabric over a gridded foundation—is to see whether anything in terms of urban form is to be gained through the overlay. It could well introduce an element of play, surprise, and variation in

public spaces that a straight, broad, open street cannot. The emotional reactions such spaces elicit can already be experienced at private projects not far from the Capitol Hill South site: Chophouse Row and Pike Motorworks are two developments where mid-block pass-throughs lure pedestrians to explore off the grid.

If well designed, the impact of right-of-way infill on site legibility could be neutral for pedestrians. The narrowing of paths alone would indicate that one is exiting an urban space where cars are the priority and entering a pedestrianized district, and wayfinding should not suffer as long a sight lines are maintained and the path direction is clear. For vehicles this is a trickier matter, even if an incremental rollout means drivers will have a chance to adjust street by street. Those drivers hoping to enter the site would have to find their way to alley entrances, which in some instances might inspire dangerous mid-block left turns. Form is a more effective way of controlling speed than posting speed limits; the new site form would have to communicate a space where one drives at a walking pace (B. Appleyard & Cox, 2006). If necessary, bollards could be installed at street-ends to add an exclamation point to the message (B. Appleyard & Cox, 2006). The design of the edge and the paths will be critical in determining whether the disorientation involved in moving from a broader, faster realm to a denser, quieter one is jarring or stimulating for the majority of readers of the city.

4.4 Can We Live with Fewer Streets?

The abundance of streets makes it realistic to rethink the use of street space for many activities other than automobile traffic. (Vernez Moudon, 1987, p. 17)

What is a street? While we often think of streets as pathways for transportation modes, they have served many functions over the millennia (Mehta, 2013, p. 9-10). Streets are not only circulation, utility, and freight networks or arteries, they are also public spaces, interfaces between private and public realms, places of interaction and commerce, playgrounds, and neighborhood meeting places (Mehta, 2013, p. 9-12; Vernez Moudon & Untermann, 1987) . For tens of thousands in the US and millions across the Global South, they are home (Al-Abweh, 2017; Millennium Alliance for Humanity and the Biosphere, 2019; The Council of Economic Advisers, 2019). Some of these functions they share with their grubbier cousins, alleys, which have taken on new prominence in the era of DADUs and laneway houses (Seattle Department of Planning and Development, 2015; Vernez Moudon & Untermann, 1987). These often-neglected urban amenities consist of public space that deserves a second look.

Curiously, the motorized vehicle's domination of streets has lasted only a fraction of the time streets have existed (Vernez Moudon, 1987). Reclaiming the right of way from motorized vehicles is not, then, some fundamental change in the essence of street-ness or a denial of the benefits of the motorized vehicles (Vernez Moudon, 1987). It is rather an acknowledgement that the time has come to examine how much public space we dedicate to vehicles and motorized circulation at the expense of other demands, such as green space, play space, space to cycle or skateboard, space to walk, or space to socialize (D. Appleyard, 1981; Vernez Moudon, 1987). As noted in Chapter 2, Research Question and Aims, this thesis is certainly not the first to question

the amount of space we dedicate to cars; it is, however, potentially the first to propose dedicating that space to providing formalized forms of housing.

Chapter 4.4.1 briefly explores the history of interventions that reprioritize uses of the right of way, while Chapter 4.4.2 takes a look at the untapped potential of our network of alleys.

4.4.1 *Recent Developments: From Pedestrianization to Greenways*

Historically speaking, the monopolization of the street by motorized vehicles was an incredibly rapid development. After millennia of traffic moving no faster than a galloping horse, deadly enough in and of itself, within the space of thirty years cities were suddenly filled with vehicles capable of much more lethal speeds ("1900-1930: The Years of Driving Dangerously," 2015; Mumford, 1961, p. 370). After half a century of organizing cities to accommodate this new transportation mode, the 1960s saw the seeds of a counter-movement to reclaim urban space from motor vehicles and return them to pedestrians (Gehl, 2010, p. 12). Jan Gehl's proposal to pedestrianize of stretches of Copenhagen's Strøget, the first stretches implemented in 1962, proved that fears of reduced business activity were unfounded, and now fifty years later, there is nothing exceptional about encountering pedestrianized areas in metropolises like Paris, London, Los Angeles, Tokyo, and Moscow (Capello, n.d.; Gehl, 2010, p. 13; Quirk, n.d.).

Following Copenhagen's lead, European cities like Freiburg, Amsterdam, and Groningen explicitly prioritize the needs of cyclists and pedestrians over those of vehicles (Buehler & Pucher, 2011; Gronigen Stad, 2015; *How Amsterdam Became Bike Friendly (Again)*, n.d.). The bike lanes of these pioneering cities have now spread around the world, with some of the most exciting implementations taking place in Bogotá and other cities of the Global South (Ferreiro, 2015; *Upgrade of the Cycle Network in Bogotà Dramatically Increases Bike Trips*, 2019). Many major Western cities have implemented bikeshare programs as a zero-emission alternative to

motorized transportation, and developments in electric bikes mean cycling is becoming a realistic alternative for hilly or sprawling cities where distances are great (Huseyin, 2015; *List of Bicycle-Sharing Systems*, n.d.).

Figure 4.10. Getting the Priorities Right

Developments like restricting deliveries to certain times of day, utilizing trams as inner-city freight arteries, and the implementation of city-center tolls for motor vehicles demonstrate a desire to reduce the presence of motorized vehicles in cities, with various rail-, bus-, and even gondola-based forms of public transit serving as preferred modes of motorized mobility (Barber, 2017; Forrest, 2017; Hawkins, 2019; New York City Department of Transportation, n.d.; Seattle Office of Planning & Community Development, 2019).

Meanwhile, in the 1960s and 1970s, a form of local street developed in the Netherlands: the *woonerf* (Kostof, 1992, p. 240; Mehta, 2013, p. 50). The logic behind the woonerf is to share street space among transportation modes and activities, granting the convenience of walking-speed motor vehicle access and parking in rights of way thatgive precedence to other uses (Kostof, 1992, p. 240). The woonerf has been slow to catch on in the US for a variety of cultural reasons: unused to sharing space and jealous of property rights, Americans are also extremely litigious, meaning the legal downsides to woonerfs and their perceived safety risks can easily detract from any potential benefits the adoption of this form might bring (Baker, 2004; Ben-Joseph, 1995).

Figure 4.11. We Have the Dutch to Thank

Barcelona is perhaps the best-known example of a major city developing and carrying out a long-term plan to remove cars from many of the city's streets, turning them into shared spaces with vehicular access reserved for local residents only—a sort of inner-city woonerf. This *superilla*, or superblock, concept keeps through-traffic on arterials and frees up inner-*superilla* intersections for local residents to use as recreational space right outside their doors. Barcelona piloted its first *superille* in 2016 and plans on eventually establishing 500 across the city (Roberts, 2019c).

Since the 1980s, there has been an interest in inserting green spaces in areas that used to be dedicated to sidewalks and parking strips; these are frequently combined with *bike lanes* today to form *greenways* (D. Appleyard, 1981; Seattle Office of Planning & Community Development, 2019). *Swales* for reducing and filtering runoff have been introduced as well; all three of these forms are in common use in newly developed areas of Seattle (Seattle Office of Planning & Community Development, 2019). Yet shaping the street to prioritize bicycling and/or green technology, while compatible with the sustainability aims of the thought experiment, play a supporting role in the two key stratagems of the intervention proposed here: reducing vehicular access to the street (pedestrianization) and physically transforming the street into a shared space (introducing woonerfs).

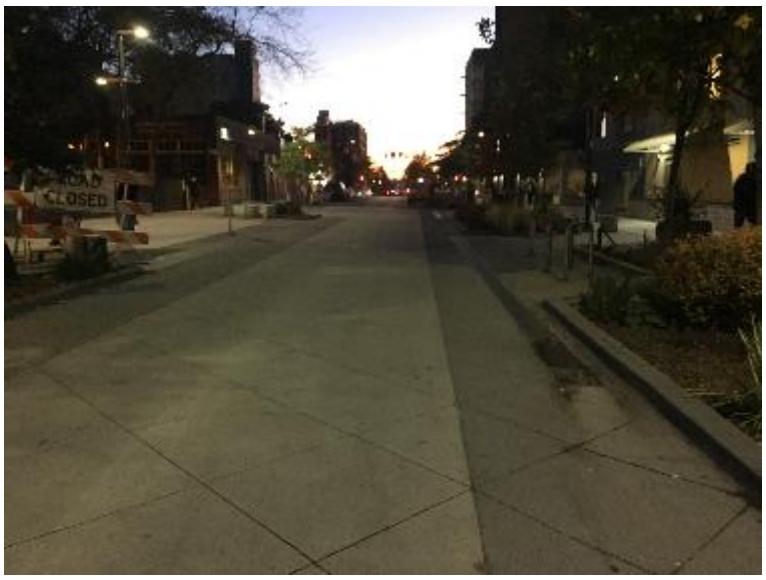


Figure 4.12. Ambiguities in Seattle's Shared Streets

With the exception of street closures associated with farmer's markets, street festivals, and block parties, pedestrianization has not gone far in Seattle. Experiments with street form—the curbless blocks on Denny Way between Broadway and 10th Ave E and just north of the Beacon Hill light rail station—do not include the design elements necessary to create a true shared space.[15] The 12th Street and Bell Street woonerfs are the only two I am aware of, and there are at least demographic if not formal reasons why one won't find children jumping rope or playing tag in either (*Belltown's Bell Street Park Now Open To Pedestrians*, 2013; *Seattle Gains a Woonerf: 12th Ave Square Park Now Open*, 2014). And yet signs encouraging drivers to slow down in neighborhoods where children live signal

[15] Whether or not the designation "festival street" applies to these is ambiguous—evidently that was the designation at the establishment of the curbless street at Beacon Hill, but neither the Beacon Hill nor Capitol Hill sites are mentioned on a still-active seattle.gov website listing festival streets (Bain et al., 2012; Seattle Department of Transportation, n.d.-b).

some measure of interest in regulating vehicular speeds and perhaps even access along certain streets, at least for those who do not live on them (Seattle Department of Transportation, n.d.-e).

Meanwhile, a recent development has definitively answered whether reducing the number of through-streets is feasible. Seattle followed the lead of Milan, Paris, and other cities in taking advantage of the forced social distancing of the 2020 COVID pandemic to temporarily close twenty miles of streets to through-traffic, and in May 2020, this change was made permanent (Baruchman, 2020). Local residents are still allowed to drive into and out of and park on these closed streets, but in establishing this policy, Seattle has given its answer: yes, we can live with fewer streets.

4.4.2 *The Underused Potential of Alleys*

Alleys served a distinct function in North American urban life until their gradual abandonment during the postwar era (Clay et al., 1978, p. 11). By then, urban alleys were viewed as an unnecessary expense and downtown alleyways were sometimes vacated to make way for full-block developments (Linden Living, 2014). By and large alleys have not been introduced to the sprawling US suburbs, although some new urbanist developments have brought variations of them back (*Principles of Urbanism*, n.d.).

Figure 4.13. I See a Lot of Untapped Potential in You

As opposed to streets, alleys are curbless, sidewalk-free shared thoroughfares with cars and pedestrians expected to occupy a narrow space just wide enough for two cars to pass (16' at the sites covered here.) (City of Seattle, 2020). Originally intended as a secondary right-of-way for garage access, back-door deliveries, and waste collection, these days the alley is primarily a space for storing recycling bins and collecting trash (Linden Living, 2014). Alleys thus continue their long association with refuse and its collection.

As a part of this thought experiment, the role of alleys in relation to streets is re-examined to see whether some functions can be reassigned or exchanged. Many Seattle neighborhoods have alleys that form a network of public space that is often underutilized in residential areas. This has been recognized in an alley activation program designed to encourage their intensified use as a

social space (Fialko & Hampton, n.d.).. Under right-of-way infill, the present model would be reversed: activation for social purposes would be more likely to take place in the streetside right-of-way, as most vehicles are diverted to alleys and traffic there increases.

4.5 How Much Density Can We Expect to Gain?

Sustainable development means a movement towards greater social equity for both moral and practical reasons. (Moughtin, 2003, p. 3)

If we are satisfied with the answers to the four concerns addressed in the preceding subchapters:

1. selectively allowing private use of publicly controlled spaces is a legitimate activity borne out by present policies and common practices,
2. achieving density increases through building in rather than up offers intriguing possibilities from sustainability, equity, and experiential perspectives,
3. the legibility lost through transformation of the right of way can be compensated through a focus on imageable design, and
4. the public space presently dedicated to streets is overscaled considering the other demands on it,

we arrive at a final question:

5. What sort of density increases can we expect from right of way infill?

In order to answer it, we will have to have some way of measuring the increase in density achieved through the design interventions. An estimated number of current dwelling units per site is presented in Table 4.2 below. With regard to sufficiency of density, I refer to Seattle's Comprehensive Plan, which has established target densities for each of the three types of urban village (Seattle Office of Planning & Community Development, 2019). As the sites are subsets of their respective urban villages, this calculation is far from perfect: some parts of the village may be more or less dense, offsetting whatever numbers the design intervention generates. Nevertheless, this calculation will provide us with some rough way of comparing densities

achieved through low-rise infill in the right of way versus maximally built-out parcels based on current zoning.

Table 4.2. Current Density by Site

	Capitol Hill North	**Capitol Hill South**	**Beacon Hill**
Built Acres (net)	~20.5	~7.3	~10
Estimated Units[16]	1600	1200	100
Estimated Density (current DUA)	78	164	10
Target Density (taken from the Comprehensive Plan)	Overall residential density: 15 DUA	Overall residential density: 15 DUA (gross acre)	Zoning that allows 12 DUA min (gross acre)
Land Banked in Right of Way	~7	~1.7	~4.1

[16] A very rough estimate. For the Capitol Hill North site, this was calculated by totaling the number of units registered in the King Country Parcel Viewer for four blocks selected randomly, dividing by four, and multiplying it by the number of blocks in the site (12). For the Capitol Hill South site, the unit numbers per building were retrieved from the King County Parcel Viewer for the four blocks in the site and totaled. For Beacon Hill, it was calculated by totaling the number of homes and DADUs visible via Google Maps and adding King County Parcel viewer information and in one case an estimate for the two multifamily buildings within the site boundaries.

Chapter 5. THE SITES

One begins by searching rather aimlessly, forgetting the use to which the area is to be put, looking directly at the site itself, and watching for interesting features and revealing clues. This unsystemic, almost subconscious renaissance produces information that would otherwise be missed. (Lynch, 1962, p. 19)

Three sites within the City of Seattle were chosen as sites to test the concept of right-of-way infill and serve as bases for the design intervention. The locations of the sites within the city are presented in Figure 5.1.

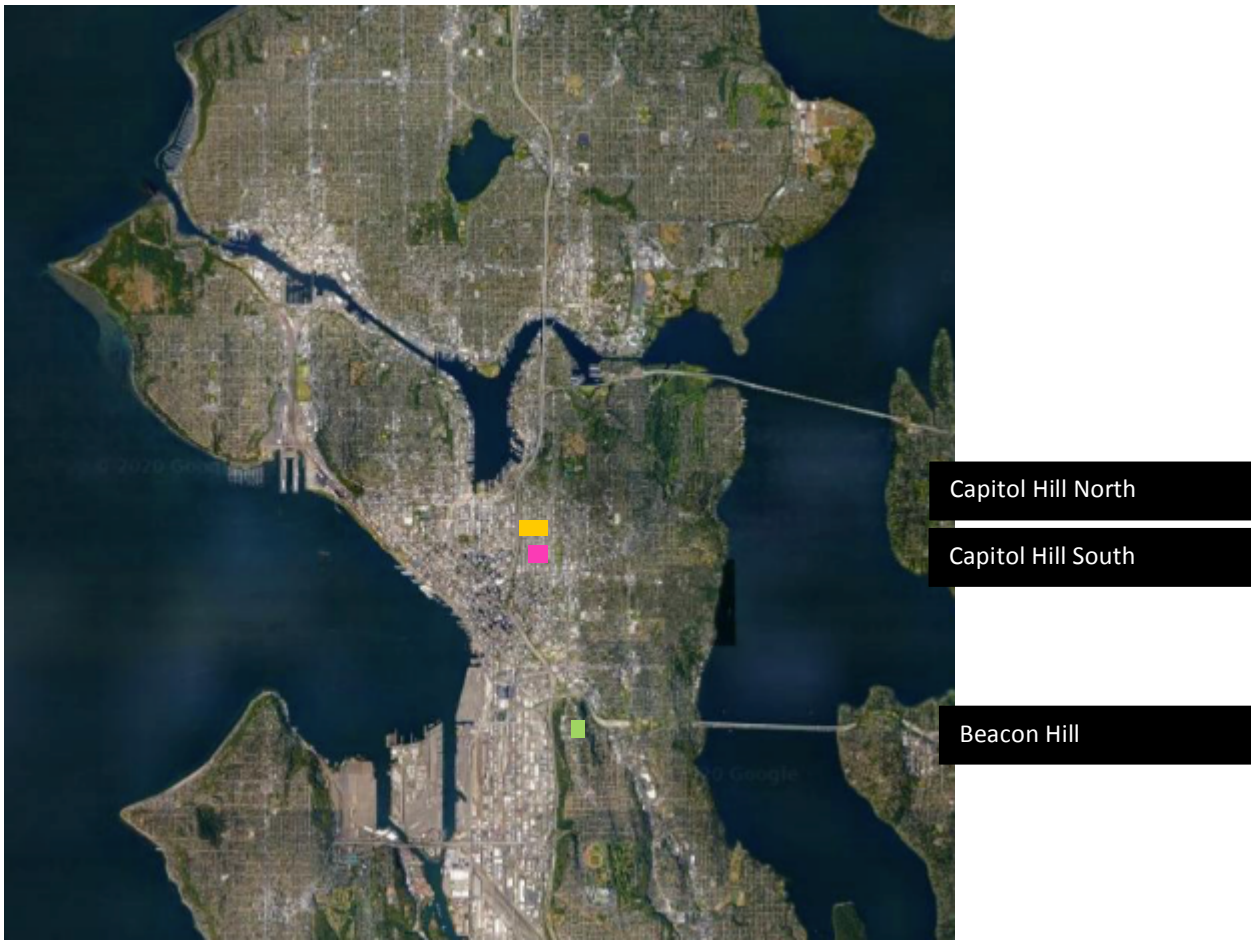


Figure 5.1. The Locations of the Sites within Seattle

Physical differences between these three sites include the surrounding built environment (predominantly multifamily vs. single-family structures), proximity to downtown, era of original development, width of right of way, and grade. Physical similarities shared by all three sites include proximity to a light rail station, alleys running through part or all of the site, and original development reaching back decades. A comparative summary of site characteristics is provided in Table 5.1.

After reviewing the process of site selection in Chapter 5.1, I describe each of the three sites in Chapters 5.2–5.4 as any observer of the urban landscape might (Clay, 1973, p. 11; A. B. Jacobs, 1985, pp. 6–8). Chapter 5.5 reviews some specific observations about the width of and present encroachment into the right of way.

Table 5.1. Comparison of Site Characteristics

	Capitol Hill North	**Capitol Hill South**	**Beacon Hill**
First buildings[17]	by 1905	by 1905	by 1916
Current structure types	Low- to mid-rise multifamily, some single-family homes	Low- to mid-rise multifamily	Single-family homes
Parks, views	2 small, W view	0, no views	1 small, E &W views
Streetscape	Fine-grain urban, green, unkempt to tidy, narrow parking strips, strong grade EW, flat NS	Fine- to coarse-grain urban, barren, unkempt to tidy, no parking strips, strong grade NS, flat EW	Fine-grain streetcar suburb, green, tidy, wide parking strips, flat throughout
Alleys	Irregular	One side of the site	Throughout
Street-side right of way	60' (57'–66'), encroachment common	60'	80' (66'–84')
Walk Scores:[18] **walk / transit / bike**	98 / 87 / 78	97 / 100 / 71	85 / 72 / 93
Owner vs renter, children vs adults (entire census tract) [19]	74.01: 22% owner occupied; 99% over 16	74.02: 20% owner occupied; 81% over 16	100.02: 50% owner occupied; 86% over 16
Estimated DUA	78	164	10
Zoning after 2019 upzone[20]	Primarily MR (M); at the edges MR RC (M), NC3-75, NC3P-75; partially in station overlay district	Primarily MR (M); at the edges NC3-75, NC3P-75; partially in station overlay and Pike Pine conservation overlay districts	LR1 (M1), LR2 (M1), LR3 (M2), NC2-55, NCP-55, NCP-75, RSL (M); partially in station overlay district

[17] As evidenced on available Sanborn maps (Sanborn Map Company, n.d.).

[18] Retrieved from www.walkscore.com, May 6, 2020.

[19] Retrieved from simplyanalytics.com, May 6, 2020.

[20] LR1, LR2, LR3 = classes of low-rise structures from cottages to townhomes, various FAR and height limits (max height 30'–50'); MR = midrise (max height 80'); MR RC = midrise mixed residential/commercial (max height 80'); NC2-55, neighborhood commercial, grocery store or the like (max height 55'); NC3-75 = neighborhood commercial, supermarket or the like (max height 75'); NCP-55, NCP-75 = pedestrian-oriented neighborhood commercial, corner store or the like (max height 55', 75'); NC3P-75 pedestrian-oriented neighborhood commercial, supermarket or the like (max height 75'); RSL = residential small lot. An (M) suffix indicates a mandatory affordable housing obligation for developers (Seattle Department of Construction and Inspections, 2016, 2020). Note the patchwork of zones, particularly at the Beacon Hill site, a worthy if complex attempt at site sensitivity.

5.1 SITE SELECTION

My initial impulse was to test the concept in a wide range of neighborhoods of varying socioeconomic and physical character, but this would have proved unworkable within the thesis scope. In the end, I settled on three sites within urban villages, specific areas designated by the City of Seattle in its Comprehensive Plan to accommodate the bulk of density increases (City of Seattle Department of Planning and Development, 2015). Two of the sites are in Capitol Hill and one on Beacon Hill. Although both featuring multifamily structures, one exclusively so, the two Capitol Hill sites differ markedly from each other in streetscape, and I was curious about the impact this would have on the design intervention. The Beacon Hill site is distinct from the other two in that it is located in what has until recently been a single-family neighborhood and is now zoned for denser living.[21]

The process of selecting sites for the case study was twofold. The original inspiration for this thesis arose during morning walks from my apartment to my local coffee house, located at the edge of what became the North Capitol Hill site. As I made my way down the alley on those mornings, a series of questions occurred to me: Was the alley being used to capacity? Could it serve as the primary vehicle throughway in this neighborhood? Could diverting vehicular traffic to the alley free up the adjacent streets for other uses? These questions dovetailed with others that had arisen during my studies: Are green streets the only option for right-of-way reprogramming? What benefits, if any, would be generated by overlaying our current grid of city

[21] All three sites are impacted by a 2019 upzone that took place concurrently with the thesis writing process and after site selection had been completed. As a result, the Beacon Hill site is now zoned more densely; however, this is not yet evident in the streetscape. Residential small lot (RSL) zoning, which was not used widely in Seattle prior to the upzone, now features prominently in the patchwork of zoning at the Beacon Hill site.

streets with a tighter "medieval" urban fabric that devoted less land to rights of way? Could meaningful density increases be achieved by building into the right of way instead of upzoning?

For me, this process bears a strong resemblance to that described by Allan Jacobs in his work *Looking at Cities*: an urban designer observing his surroundings, adjusting the lens through which he sees the space, allowing ideas to come, and considering what sort of changes in immediate environment those ideas would effect (A. B. Jacobs, 1985; Lynch, 1962, p. 19).

The selection of the original Capitol Hill North site was, then, a subconscious process based on familiarity with the neighborhood. The characteristics of the first site, which I catalogued explicitly and set as the criteria for subsequent sites included:

1. residential area in an urban village as defined by the City of Seattle
2. light rail within easy walking distance
3. high walkability to local businesses and services
4. bordered by major thoroughfares
5. the presence of alleys, and
6. the absence of high-rises.

The importance of the first four criteria is plain. The city has envisioned urban villages[22] as areas of high residential density proximate to transit hubs, and as such they offer the mix of services and transit that make them attractive candidates for pedestrianization. With regard to the fifth criterion: limiting the concept to neighborhoods with alleys struck me as critical during this first study into right-of-way reclamation, as I felt alleys would serve as necessary vehicular

[22] In its most recent version of the comprehensive plan, the City of Seattle has formalized a nominal split between urban centers (previously "urban center villages") and urban villages, of which two types remain: hub urban villages and residential. Both Capitol Hill sites are thus now located in an urban center, while the Beacon Hill site is within a residential urban village (Seattle Office of Planning & Community Development, 2019).

throughways when that function was removed from the streets (Clay et al., 1978, p. 56). The logic behind the final criterion was that a design intervention based on infill would come too late for a neighborhood already shadowed by high rises: a core objective of the proposal is to allow for significant density increases without building up.

Applying these six criteria to half a dozen sites across Seattle, I settled on two other sites that met the control criteria but diverged from the first in site fabric and built environment: a second, more southerly site in Capitol Hill lined exclusively by multifamily structures, and a third site in a predominantly single-family residential neighborhood of Beacon Hill.

5.2 Site 1 Description: Capitol Hill North

Figure 5.2. Capitol Hill North: Typical Streetscape

The Capitol Hill North site centers on E Thomas Street, running six blocks between Melrose Avenue E and Interstate 5 to the west and Broadway to the east, as well as one block north and one block south from Thomas on each of five cross-streets. Alleys exist but are irregular, sometimes ending in T-intersections. Currently zoned for mid-rise construction, the site is made up of low- and mid-rise apartment buildings with a smattering of single-family residential homes. The single-family homes are northwest-style bungalows built a century or so ago; the apparent age of apartment buildings varies from early 20th century to brand new.

King County Metro bus line 47 to downtown crosses the site at Summit and Bellevue Avenues E, following old streetcar routes (www.transitmap.net, n.d.). Buses also run along the major thoroughfares of Broadway E and E Olive Way to the east and the south. The Capitol Hill light rail station and the terminus of the First Hill street car line are within easy walking distance just southeast of the site. Street parking is mostly two-hour zoned, with meters at the far eastern edge bordering Broadway. Many buildings have garages with access from the street or the alley; even so, parking at night is difficult.

Figure 5.3. Capitol Hill North: Concerns about Upzoning

The western view down Thomas is spectacular, giving on to Puget Sound, the Olympics, and the Space Needle. North–south and eastern views are pleasant, with large trees and variation in building era indicating a long-established neighborhood. Shopping and restaurants are plentiful and within

Figure 5.4. Capitol Hill North: Alley…Ooop!

walking distance, with one coffee house–restaurant and a mini-mart located within the site itself and a smattering of business at the Broadway edge. Neighborhood public services (library, post office, elementary school) are easily walkable, while downtown and South Lake Union are a 15–30 minute walk away.

The streetscape is quite tidy, but alleys are frequently littered with trash from the dumpsters lining them, and drug use is prevalent at nearby Summit Slope Park. Curiously, this park remains in relatively good shape, perhaps because of the attached P-patch.[23] In contrast, the Thomas Street Mini Park appears to be both less used and less tidy despite its mature trees and afternoon sun.

[23] Anecdotal evidence supports this: conversations with gardeners indicate their patches are generally left unmolested, despite the refuse and drug paraphernalia discarded elsewhere in the park. The calming effect of P-patches would be worth investigating.

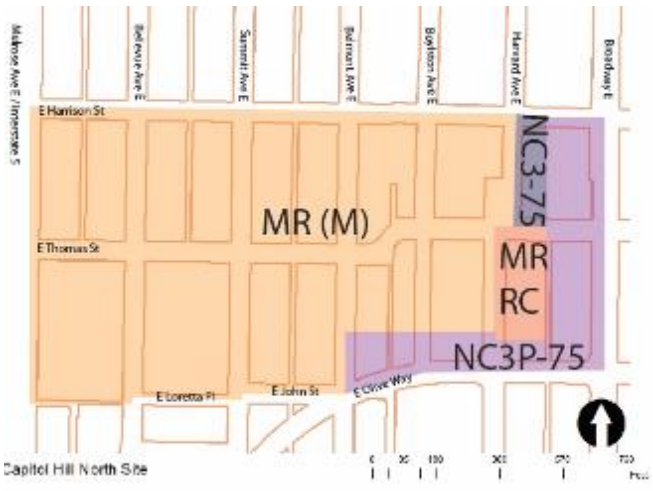


Figure 5.5. Capitol Hill North: Zoning and Location in the City

(Source: Google Maps, seattle.gov)

Figure 5.6. Capitol Hill North: Analysis

5.3 Site 2 Description: Capitol Hill South

Figure 5.7. Capitol Hill South: Typical Streetscape

The Capitol Hill South site centers on Summit Ave, running two long blocks between E Pine Street to the south and E Howell Street to the north, as well as one block west and one block east from Summit along the sole cross-street, E Olive Street. Crawford Place serves as an alley for the block west of Summit; there is no alley in the block east of Summit. Primarily zoned for mid-rise construction, the site is made up of low-rise and mid-rise apartment buildings. Building ages indicate a development pattern similar to that at the Capitol Hill North site.

Figure 5.8. Capitol Hill South: Heal Me

Buses run along the site-adjacent E Pine Street and Bellevue Avenue, following old streetcar routes. More buses run along nearby Broadway, where the Capitol Hill light rail station and the terminus of the First Hill street car line are within easy walking distance. Street parking is mostly two-hour zoned, with meters bordering E Pine Street. Many buildings have garages with access from the street or the alley. Daytime parking is plentiful; nighttime parking is difficult.

The treeless view north along Summit Ave is broad and unrestricted until dead-ending in an apartment building. This sense of confinement applies to the other views as well: the western view down E Olive Street butts into high-rise office buildings, the eastern and southern aspects face upward slopes. Shopping and restaurants are plentiful and within walking distance in every direction. Downtown is a mere 10-minute walk away.

Although relatively tidy, a lack of parking strips and vegetation gives the site a barren feel. A large cinder-block apartment complex in disrepair dominates the north end of the site. The southeastern block is also dominated by a single apartment complex, albeit a well-maintained one. The scale of these complexes lends the site a coarser grain and more anonymity than Capitol Hill North. On the other hand, the stoops of a cluster of buildings providing transitional housing at the north end of the site are frequently used by residents, a type of neighborliness rare in this part of the city.

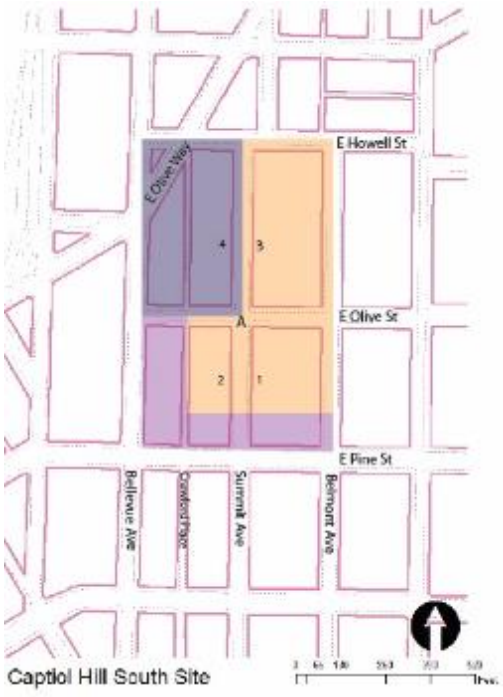


Figure 5.9. Capitol Hill South: Location and Zoning

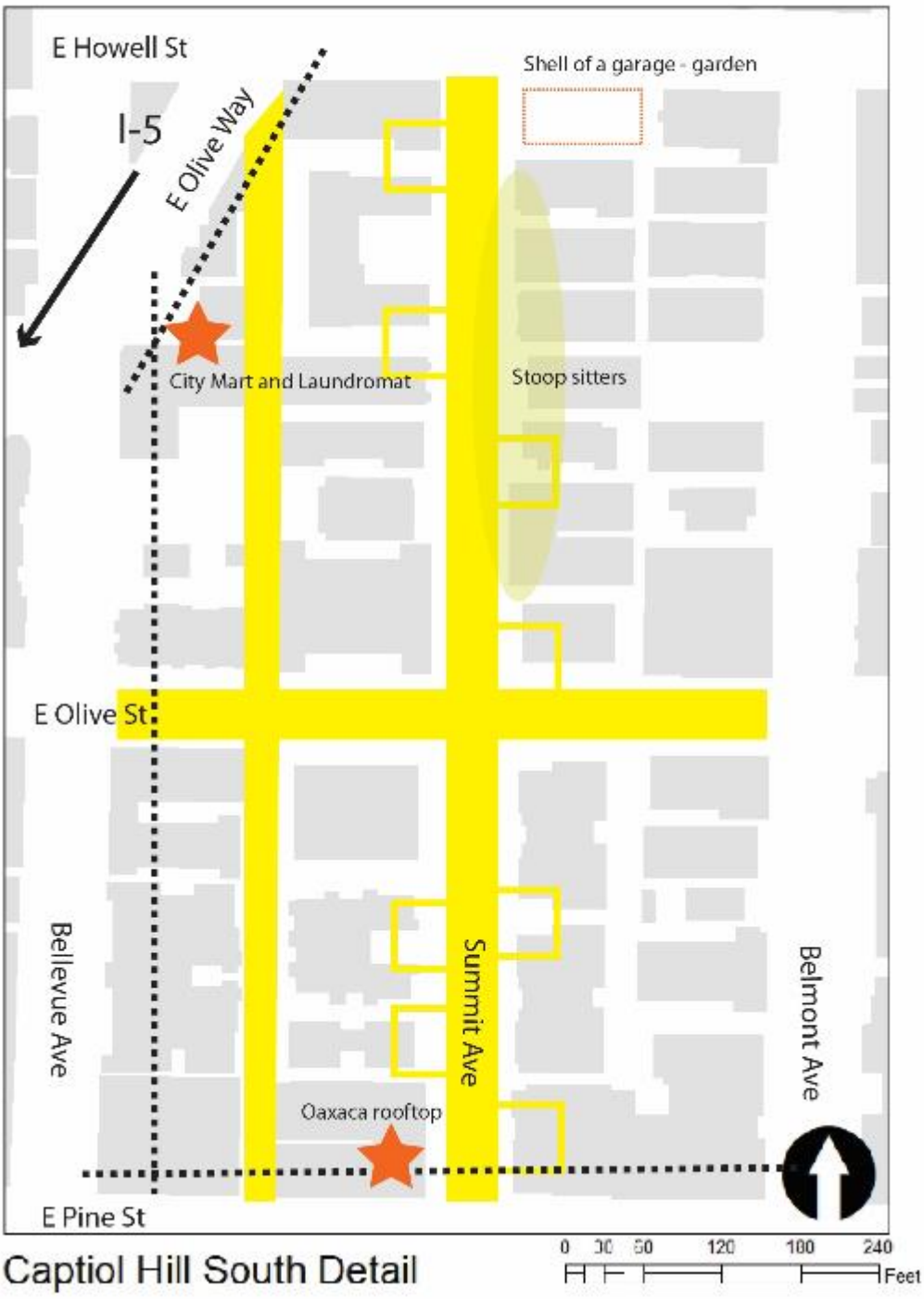


Figure 5.10. Capitol Hill South: Analysis

5.4 SITE 3 DESCRIPTION: BEACON HILL

Figure 5.11. Beacon Hill: Typical Streetscape

The triangular Beacon Hill site tracks along 16th and 17th Avenues S, running three blocks between S McClellan St to the north and S Winthrop Street to the south as well as one block west of 16th and one block east of 17th on each of the two cross-streets. North-south alleys run up the middle of all blocks. The site is made up of single-family residences, with a couple of older low-rise apartment buildings at the fringes. In the 2019 rezone, most of the area was zoned multifamily or residential small lot; no single-family zoning remains within the area.

Bus lines run parallel to the site along 15th Avenue S and Beacon Avenue S, and the Beacon Hill light rail station is more or less kitty-corner from the northeast edge of the site. Street parking throughout the site is two-hour zoned. Shopping and restaurants are in walking distance, and one local brewery is in the site itself. The site also includes a public library, a church, and an auto body shop. Stevens Place, a triangular island of green, appears to get little use; its location along Beacon Ave S feels even more exposed after the recent removal of mature shade trees. Furthermore, all the properties in the site have their own yards, decreasing the need for public green space.

Figure 5.13. Beacon Hill: Underutilized Green Space

Figure 5.12. Beacon Hill: Library and Light Rail

Although basically flat, the hill-crest site offers stunning mountain views to the east and west. The north–south views are pleasant, with green yards, 10'–20' trees in the wide parking strips, and tidy one-or-two-story homes indicating a middle-class neighborhood. Most homes have garages with alley access; parking in parking strips, driveways, and on the street is

common. The alleyways show signs of increased densification: a handful of garages have been converted to DADUs.

Figure 5.14. Beacon Hill: Location and Zoning

Figure 5.15. Beacon Hill: Analysis

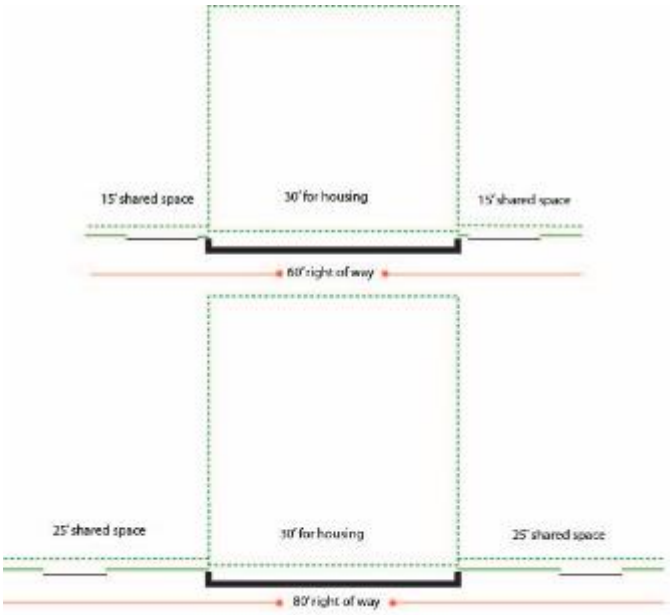
5.5 THE SITES AND RIGHT OF WAY

The quality of the rights of way diverge significantly among the sites. Although the two Capitol Hill sites' rights of way are more or less the same width, North feels lush and enclosed while South feels bare and exposed. The wider Beacon Hill right of way feels open and green.

5.5.1 *Variation in Right-of-Way Width among the Sites*

One key difference among the sites deserves particular attention: variation in the width of street-side right of way, ranging from slightly under 60' to over 80'.[24]

Typical proportions of [street]:[parking strip]:[sidewalk] can be seen below. With minor variations, the rights of way at the Capitol Hill sites are 60'; the official widths according to the zoning maps range from 57' to 66'. The more-generous Beacon Hill rights of way range from 66' to as much as 84', with 80' typical. In other words, the widest street-side right of way at the Capitol Hill sites is as wide as the narrowest right of way in Beacon Hill. This 20' difference has a significant impact on the configurations of public space and housing the sites can accommodate with right of way infill.



[24] Although construction did not begin at Beacon Hill until a decade or more after the Capitol Hill sites, all sites were platted prior to 1905 (Citation). My original assumption that the wider rights of way at Beacon Hill were due to the inroads made by the automobile is, thus, inaccurate. Attempts at determining the reason for the wider rights of way at Beacon Hill have so far proven fruitless.

Figure 5.16. Spatial Equity at 60' and 80'

Figure 5.17. Which Capitol Hill Right of Way is ~60'? (Answer: Both)

Figure 5.18. Land Bank: 80' Right of Way at Beacon Hill

5.5.2 *Variation in Right-of-Way Encroachment among the Sites*

As Rudolf Kostof notes, "encroachment and blockage/privatization have been around for millennia—the impulse to take public goods for private use" (Kostof, 1992, p. 177). Seattle is no exception. Both the Capitol Hill North and the Beacon Hill sites feature substantial occupation of the right of way by neighboring property owners, but the character of this occupation diverges radically between the two.

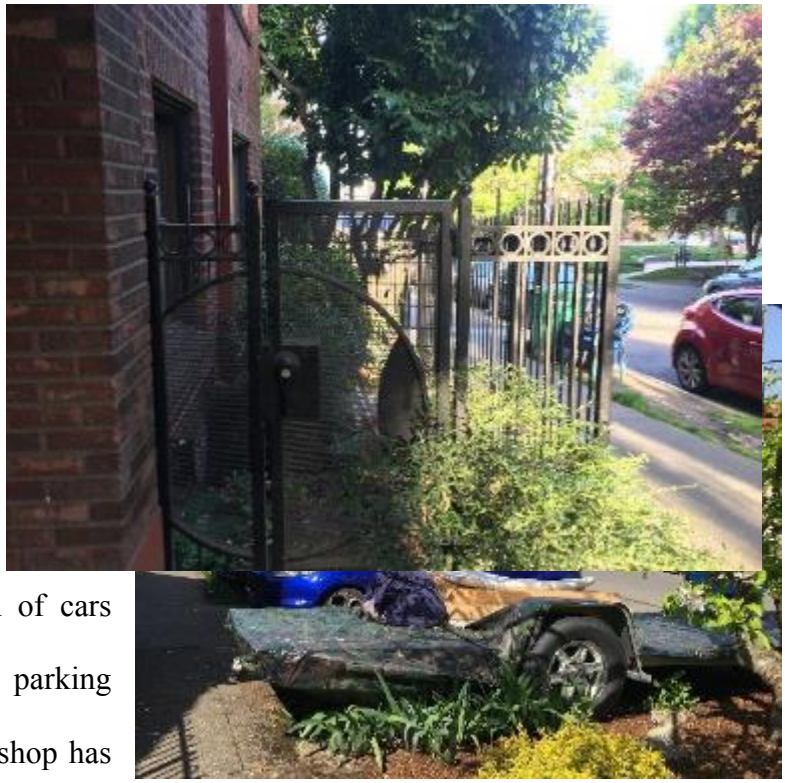


Figure 5.19. Why Store It on Your Land When the City Will Do It for You?

At the Beacon Hill site, property lines are generally easy to discern, and the right of way as measured from outer sidewalk edge to outer sidewalk edge matches the official measurements recorded in the city's zoning books. Right-of-way encroachment here takes the form of cars and a boat trailer parked in the parking strips. Furthermore, the auto body shop has claimed the adjacent parking strip for off-site parking, a classic case of territoriality extending into the public realm fronting one's residential or commercial property (R. B. Taylor, 1988, p. 166).

Capitol Hill North initially confused and then surprised me: encroachment into the right of way is permanent and invisible here. Initial measurements from outer sidewalk edge to outer sidewalk edge in Google Earth generated right-of-way measurements ranging from 45' to 55' in locations where the city's zoning books indicated a range from 60' to 66'. On-site measurements revealed encroachment in the form of greenspace, parking spaces,

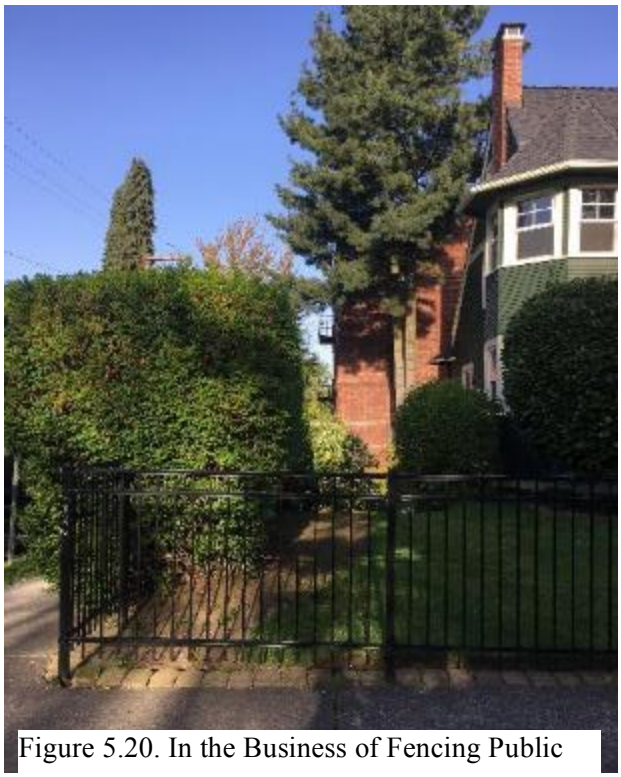


Figure 5.20. In the Business of Fencing Public

parking lots, and even fences erected in the public right of way, with the actual parcel line often coinciding with the building's facade. This difference between perceived right of way and actual right of way is frequently as much as 15', or one-fourth of the 60' easement. In other words, the neighboring property owners are using one-quarter of the public right of way at the Capitol Hill North site as they see fit.

Presumably there are practical and historical reasons for this—ease of access and parking for residents, lower maintenance costs for the city—but uncontested decades of occupation will likely introduce additional logistical and public-relations complications were the city to begin asserting a claim to the land, especially for purposes other than vehicular through-travel. In addition, at Capitol Hill North, alleys are lined with trash and recycling dumpsters and bins, narrowing the right of way; Residents plainly have a hard time accommodating necessary services on their parcels.

Figure 5.21. Spilling Over into the Right of Way

Chapter 6. DESIGN INTERVENTION

We should…add our own pieces sympathetically to this collective artifact, with a feeling and love for the whole. (Kostof, 1991, p. 93)

Answering the research question—*Would it be physically possible to fit livable low-rise housing in the right of way in Seattle's urban villages?*—entails a design intervention: the layering of two distinct urban fabrics at the three sites described in Chapter 5, The Sites. The existing base layer, blocks of rectangular parcels served by a regular street grid, represents the vast majority of urban fabrics in the US. In this proposed layering, the base layer remains unchanged.

The overlay, associated with concepts such as "organic," "medieval," "incremental," and Le Corbusier's "pack-donkey's way," is much rarer in the US for the historical reasons cited in Chapter 4.3, What Happens to Legibility When the Grid is Filled In?. Two major variations appear in the overlay layer that distinguish it from how such fabrics are often conceived. Firstly, it would be built rapidly instead of developing over generations or centuries (Gehl, 2010, p. 41). Secondly, like medieval settlements within walls or cloisters, it would be inserted into an existing structure rather than shaped to the contours of "virgin" terrain.

To begin, Chapter 6.1 shows examples of precedents that inspired this thought experiment. In Chapter 6.2, I briefly describe the overall design approach before delving into the broader conceptual building blocks and specific rules that determined the public space and housing schemes that shape the proposed modifications to the right of way. Those schemes come together in site-specific design responses presented in Chapters 6.3 and culminate in a proposal for a new street type to be adopted by the City of Seattle, presented in Chapter 6.4.

6.1 PRECEDENTS: MEDIEVAL, MODERN, LOCAL

Although the world abounds with examples of livable urban environments with high ratios of building footprint to right of way, I limit myself to precedents I have personal experience of (Rasmussen, 1959, p. 33).[25] These precedents offer real-life examples that either subconsciously or consciously shaped the design responses: partially or fully pedestrianized streetscapes, cultures of shared street use due to the narrow scale of right of way, and a network of winding paths linking small plazas.

The first contexts to come to mind were the three World Heritage sites whose present-day fabrics date back to the 14th–19th centuries. These lead into two relatively recent developments from Barcelona, a city deservedly recognized for its forward-thinking approaches to urban design (Roberts, 2019a).[26] One of the Barcelona precedents is contemporaneous with the last of the three "medieval" fabrics; the other has been executed within the last decade.

Finally, Seattle itself has seen new residential and mixed-use developments that mirror many of the public space and housing schemes applied in the present intervention. Seattle decision-makers and residents can easily visit these privately-owned examples to get an experiential sense of what the proposal might feel like were it realized in the right of way.

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[25] The sole exception is Barcelona's *superille.* The ratio of building footprint to right of way is not unusually high in the impacted districts, nor have I visited the city since the concept was implemented. I include it because it is a project that has received worldwide attention and provided critical material on the reclamation of public space from cars and public responses to it (Davies, 2017; O'Sullivan, 2017; Schmitt, 2017; Vox, 2016). Furthermore, *superille* have caught the attention of Seattle City Councilmember Teresa Mosqueda (Trumm, 2019a).

[26] This is not to say that Barcelona's interventions have been unproblematic. For instance, the construction of the famed pedestrian concourse of La Rambla displaced thousands of residents, many of the working class (Degen, 2018). One of the benefits of the proposed right-of-way infill is that it avoids this equity issue.

Gamla Stan, Stockholm, Sweden

Gamla Stan (literally "Old Town") is the medieval heart of Stockholm and home to many national institutions, including the Parliament and the Royal Palace (*Gamla Stan*, n.d.). Nevertheless, the primary attraction of the area is the ambiance afforded by the narrow streets and small shops and restaurants built into the old structures, some of which may date back to the 13th century (Lembke, 2017). Considered a slum until the 1970s and 1980s, it is now desirable real estate (*Where to Live in Stockholm*, 2015).

Figure 6.1. Gamla Stan: The Allure of Human-Scale Paths and Spaces

Figure 6.2. Medieval Fabric: A Progression of Spaces in Gamla Stan

Ribeira, Porto, Portugal

The form of the Ribeira (literally “the Riverside”) area of Porto has changed little since the medieval era of Europe. Located on a steep grade, the Ribeira was long a working-class neighborhood that has recently undergone gentrification (Global Citizen Solutions, 2019). The network of narrow streets, bisected by the Rua de São João in the mid-18th century, run between the river and the upper city, both of which were once bounded by the city walls (*Fernandine Walls of Porto*, n.d.; *Ribeira Square*, n.d.).

Figure 6.3. Precedent Form: Ribeira

(Source: Google Maps)

Stone Town, Zanzibar, Tanzania

Estimates put the construction of the first stone buildings in Stone Town in the late 18th century or early 19th century (Zanzibar Stown Town Heritage Society, n.d.). Built centuries later than the European precedents mentioned above, the form of this Arab settlement nevertheless shares some similarities with many medieval European towns, including a constrained site—in this case an island, like Gamla Stan. I can say from experience that it is incredibly easy for those unfamiliar with the site to get lost in the dense maze of narrow streets. Building heights are generally lower than in either Gamla Stan or Ribeira.

Figure 6.4. Precedent Form: Stone Town

(Source: Google Maps)

La Barceloneta, Barcelona, Spain

Originally frequented by fishermen and sited beyond the city walls, La Barceloneta was developed in the mid-18th century to house those displaced by the construction of the fort known as the Citadel (*La Barceloneta*, n.d.). An approximately contemporaneous development with Stone Town, La Barceloneta's master-planned regular grid of blocks nevertheless presents a stark contrast to the meandering experience of the former. Located near the beach, the area has been amply impacted by the recent wave of gentrification washing through Barcelona, displacing many of the area's original working-class inhabitants (Barcelona Laboratory for Urban Environmental Justice and Sustainability, 2017).

Figure 6.5. Precedent Form: La Barceloneta

(Source: Google Maps)

***Superille*, Barcelona, Spain**

Barcelona is also home to one of the first major pedestrianization projects to receive global attention. First piloted in September 2016, *superille* are a right-of-way reclamation intervention aimed at increasing the amount of local public space available to residents, reducing through-traffic and air and noise pollution, and disincentivizing car use while boosting cycling and pedestrian activity (Roberts, 2017). Each *superilla* is a superblock formed of nine existing blocks; the plan is to take the lessons gained during the pilots and expand the network of superblocks until a total of five hundred have been established across the city (Roberts, 2019c).

Figure 6.6. Precedent Concept: Superille

(Source: https://vimeo.com/282972390)

Chophouse Row, Seattle, USA

An award-winning mixed-use development located near the Capitol Hill South site, Chophouse Row exemplifies many of the experiential outcomes and some of the spatial ratios employed in the present design responses (*Chophouse Row*, 2017). While the scale of the pedestrian through-way and the mid-block plaza offer a sense of how a right of way reorganized according to the proposed scheme might feel, the height of the adjacent buildings is overscaled in comparison to the present proposal. Furthermore, project complexity and perhaps costs detract from its use as a direct model for right-of-way infill (FIX, n.d.).

Figure 6.7. Local Precedent: Chophouse Row

Other Precedents, Seattle, USA

Various other local developments, some newer, some older, demonstrate the range of forms and scales that could be adapted to right-of-way infill. These examples are all taken from within a few minutes' walk of the Capitol Hill North and Capitol Hill South sites.

Figure 6.8. Local Precedent: Walk up to Ava Apartments

Figure 6.9. Local Precedent: Pass Through Pike Motorworks Apartments

Figure 6.10. Local Precedent: The Other End of the Scale: Summit Avenue Cottages

Figure 6.11. Reclamation Starts from the Garage at 712 Summit Ave E

6.2 APPROACH

The approach to the design response was three-pronged. First, after site selection, I visited the sites on numerous occasions—Beacon Hill half a dozen times; the Capitol Hill sites more frequently. The purpose of these visits was to get a feel for the sites, sketch and measure the existing buildings, note garage and driveway access, and conduct the parking space, vehicle, bicycle, and pedestrian counts laid out in detail in Appendix C.

Second, a concurrent literature review on Western and US urban design provided historical perspective and useful design approaches. The thinking of Christopher Alexander, Jan Gehl, Allan Jacbos, Jane Jacobs, Kevin Lynch, Camillo Sitte, and William Whyte influenced the broader building blocks and specific design rules I applied in envisioning the infill structures and attendant public spaces.

Thirdly, previous studio work and literature on housing typologies served as the basis for public space schemes and unit floorplans developed in consultation with committee members Professors Rachel Berney and Rick Mohler.

6.2.1 *Conceptual Building Blocks*

A series of conceptual building blocks emerged during site visits, literature review, and committee meetings and serve as the theoretical foundation for the design rules delineated in Chapter 6.2.2. In no particular order, these building blocks are:

- *Woonerf-inspired pedestrianization*: Street-side rights of way become multimodal woonerfs. Loading zones are incorporated; parking and through-traffic are not.
- *Intersections become pedestrianized squares*: Pedestrianized intersections become squares, and these new public spaces serve as outdoor living rooms for the neighborhood.
- *Vehicles to alleys*: The prevailing alley activation model is reversed. Former streets are activated for pedestrians; existing alleys become slow-speed vehicle thoroughfares.
- *Short walk to arterial*: Residents enjoy pedestrianized living with a short walk to public transportation, rideshare services, and shopping.
- *Low rooflines*: Infill fits into the existing environment, neither dominating nor detracting from it, but complementing or augmenting it. Daylight and views are considered.
- *Site sensitivity*: The opportunities and affordances of each site determine the design.
- *Hiding and revealing*: Sense of enclosure and enticement vary to ensure a stimulating pedestrian experience.
- *Human scale*: Traditional scales of urban design are applied to street and square dimensions and building heights.
- *Greenery*: The amount of green space is maintained or increased.
- *Legibility:* Those entering the site can navigate it easily. Distinctions between public and private spaces are intuitive; the integrity of existing property lines is respected.

6.2.2 *Design Rules*

While useful as general guidelines, the conceptual building blocks listed in Chapter 6.2.1 required refining into more precise design rules that would govern the crafting of the public space and infill housing schemes applied in the design responses. The structure and content of these rules derive primarily from works by Christopher Alexander, Jan Gehl, Cliff Moughtin, and others (Alexander et al., 1977; Gehl, 2010; Moughtin, 2003). For a list of patterns applied from A Pattern Language by Alexander et al., see Appendix B (Alexander et al., 1977).

Site Sensitivity

1. Appropriateness: Is infill appropriate? Is it the best use of the site?
2. Site repair: Start from blocks of least aesthetic interest.
3. Low-hanging fruit: Start from the least complicated and/or smallest block.

Access and Property Rights

4. No changes to grid boundaries.
5. Intersections are transformed into pedestrianized public space; structures are rare.
6. No encroaching on existing private property or structures.
7. Infill construction takes place exclusively in the right of way; no joining of public property to private parcels or structures.
8. Minimize blocking of existing windows, views, and sunlight.
9. Access to existing garages is considered.
10. Parking is relegated to alleys or site fringes. Disabled parking places are reviewed, and if necessary, replaced one to one either in the alley (preferred) or in the reconfigured right of way.

Character of Resulting Shared Space

11. Resulting pedestrianized right of way has a sense of entrance and enclosure but sight lines are retained.

12. Variation in path and streetscape: a visible widening into a plaza and a visible alternating between wide and narrow paths every half a block or so.

13. Preserve or improve street views whenever possible.

14. Preserve mature trees and significant green elements whenever possible; add vertical and rooftop green. Consider stormwater management and green elements at plazas in particular.

15. Clear hierarchy of new shared-space paths: a wide one that reads as a through-way and a narrower one that reads as building access. Both are wide enough for vehicular access.

16. Lighting, signage, and street furniture are integrated.

Scale and Dimensions

17. Minimum width of resulting shared-space right of way is 10'. At garage entrances, expands to 16'–20'. Every building has access to a 16'-wide loading zone.

18. Building height: three stories, or 35'. Stepping of upper story encouraged.

19. Variation in building height: avoid monolithic structures and monotony.

20. Intersection squares and mid-block plazas are scaled and placed based on the site. Generally dimensions do not exceed 80' x 80'.

6.2.3 *Circulation Scheme Transformation*

The circulation scheme that was settled on divides the right of way into two: a wider, more open woonerf that clearly reads as public shared space, and a narrower, more sheltered walkway that reads as semi-private. Entrances to first-floor homes in the infill housing would more likely face the private side, but stairways to the second and third floors facing the more public side would enliven the streetscape. Pedestrian-speed cars are allowed to enter for loading but through travel is inconvenient or prevented, perhaps with the use of bollards.

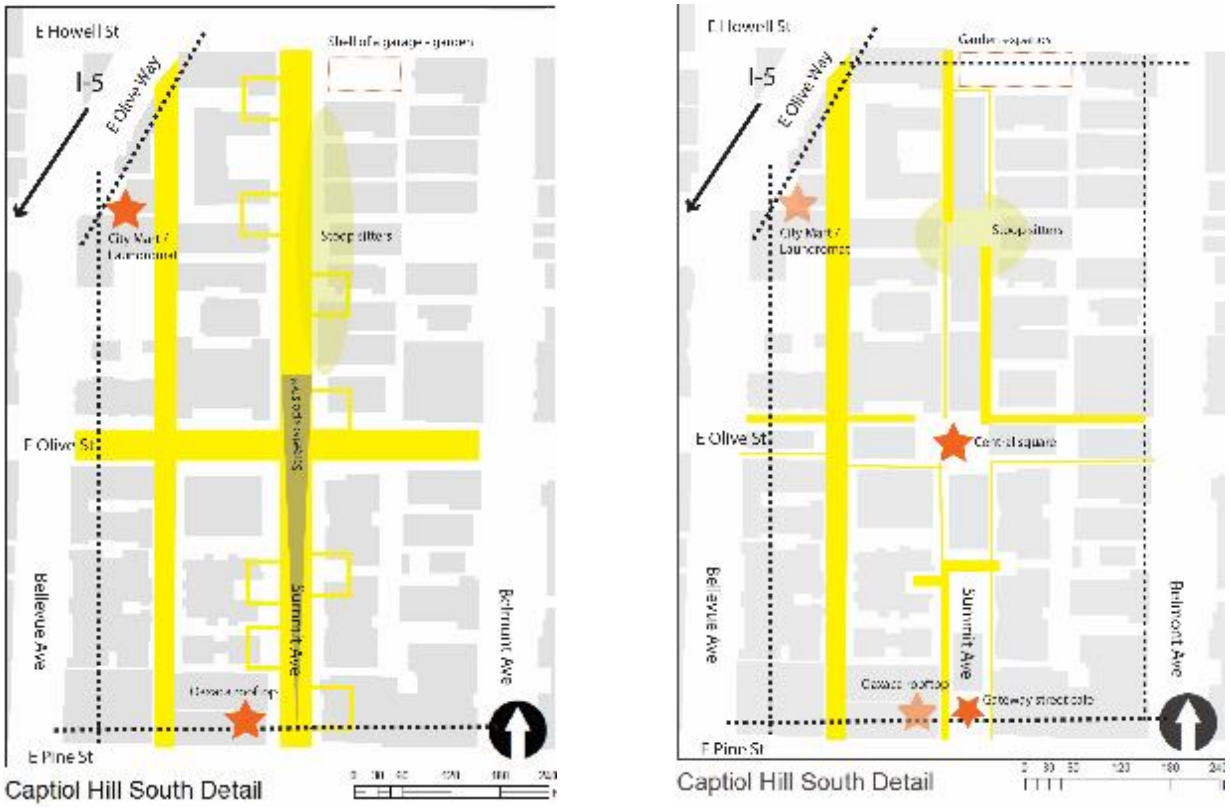

Figure 6.12. The South Capitol Hill Site Goes on a Serious Road Diet

Figure 6.13. Greenery and Other Privacy Measures

Figure 6.14. Bollards for All

6.2.4 *Housing Types*

The design rules defined the scale of the infill structures that could be built in the decommissioned streets. At the Capitol Hill sites, the parcel width that remained after subtracting the space needed for shared-space throughways was about half of the right of way: 30', give or take. The planned infill housing would have to fit into this strip of land. Beacon Hill, where the right of way was wider, left a maximum of 50', affording more flexibility in both public space and housing schemes.

A worthwhile reference is Untermann and Small's comprehensive work *Site Planning for Cluster Housing* (1977). A variety of housing typologies, including townhomes, walk-ups, stacked flats, live-work spaces, and shared or dorm-type housing are good fits for the sites. The type of housing most urgently needed in Seattle is, however, the "missing middle": affordable two- to three-bedroom units for families and multi-generational households that are inefficient for the private market to supply (*The Cost of Affordable Housing: Does It Pencil Out?*, n.d.). A modular approach would seem to be the best approach to offering a range of housing sizes, with an emphasis on this missing middle.

Figure 6.15. No Need to Look Any Further – Seattle Abounds with Narrow Structures

6.3 DESIGN RESPONSES

The design responses presented in Chapters 6.3.1–6.3.3 are loose sketches based on the site's unique characteristics and context.

6.3.1 *Capitol Hill North*

The Capitol Hill North site proves to be an anomaly. Design Rule 1, Appropriateness, suggests the spine of the site, E Thomas Street, be converted to a public space without infill construction—a stair interwoven with a bike route; this bike path would ideally cross Interstate 5 and lead to South Lake Union and Elliott Bay. At the east end, this combined bike route and public stair ends at another new public amenity: Harvard Square. Originally intended as a park, the intersection of Harvard Ave E and E Thomas Street is perfectly scaled to serve as a neighborhood plaza. The cross-streets of Harvard, Boylston, Belmont, and potentially Summit Ave E take infill housing between E Olive Way/E John Street and E Harrison Street. Alley access to existing structures determine the placement of the infill structures.

Figure 6.16. Capitol Hill North: Design Response

6.3.2 *Capitol Hill South*

The response to the Capitol Hill South site is governed by Design Rule 2, Site Repair. The insertion of infill housing along Summit Ave improves its barren aspect and removes very little in the way of greenery. The alley of E Crawford Place serves the western blocks; the lack of an alley in the eastern blocks is problematic. The entrances to the site, particularly those at Bellevue Ave/E Olive Street and Summit Ave/E Pine Street read as gateways. The heart of the site, the intersection of Summit Ave and E Olive Street, becomes a perfectly scaled plaza that can be hardscaped for local use.

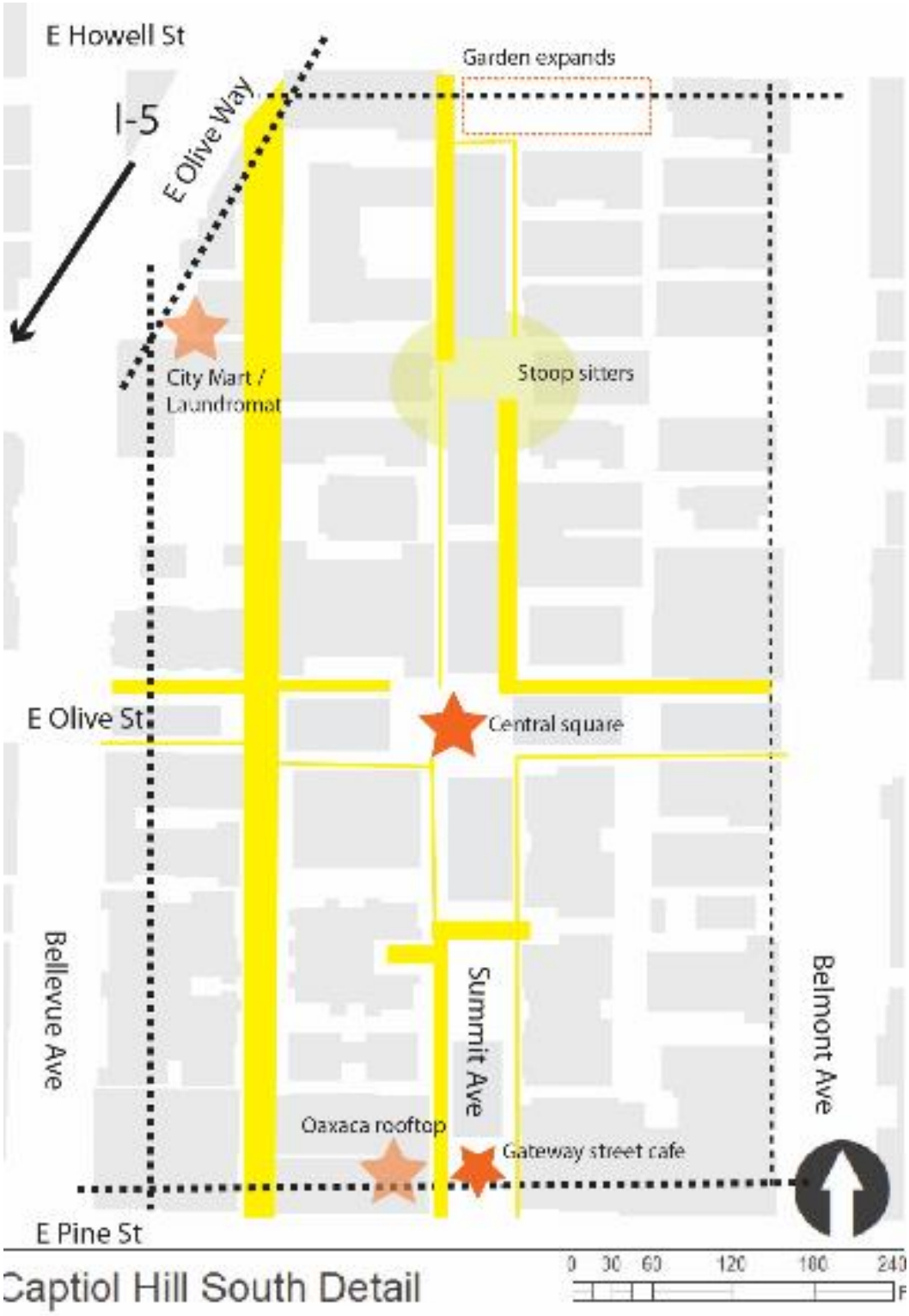

Figure 6.17. Capitol Hill South: Design Response

6.3.3 *Beacon Hill*

At Beacon Hill, the combination of an original 80' right of way and regular alleys simplifies a number of complications that impacted both Capitol Hill sites. Even after infill, the site retains its open, green aspect. New construction on E–W streets is oriented towards the mountain views. Stevens Place is sheltered from Beacon Ave S, making it usable. Alleys and garages throughout the site mean resident parking is theoretically less of a problem than at either of the Capitol Hill sites.

Figure 6.18. Beacon Hill: Design Response

6.4 A New Street Type for Seattle: Pedestrian Place

Seattle has codified its streets according to a typological classification system (City of Seattle, 2020). Taken as a whole, the design responses described in Chapter 6.3 suggest the creation of a new category: *pedestrian place*. Its placement within Seattle's Streets Illustrated classification hierarchy is shown in Table 6.1 below (ibid.).

Table 6.1. Pedestrian Place within the Seattle Street Hierarchy

Downtown: Located within the Downtown Urban Center	Downtown	Principal Arterial	
	Downtown Neighborhood	Minor and Collector Arterials	
	Downtown Neighborhood Access	Non-arterials	
Urban Village: Located within an Urban Village	Urban Village Main	Principal Arterial	High intensity retail, moderate intensity commercial and office and low to mid-rise residential
	Urban Village Neighborhood	Minor and Collector Arterials	Moderate intensity retail, low intensity office and low- to mid-rise residential
	Urban Village Neighborhood Access	Non-arterials	Predominantly low- to mid-rise residential with sporadic ground floor retail
	Urban Village Pedestrian Place	**Shared Streets**	**Predominantly low- to mid-rise residential with sporadic ground floor retail and low-rise right-of-way infill**
Other Arterials	Urban Center Connector	Principal and Minor Arterial	
	Neighborhood Connector	Principal, Minor, and Collector Arterials	
Industrial: Located in Manufacturing/Industrial Areas	Industrial Access	Principal and Minor Arterial	
	Minor Industrial Access	Non-arterials	
Residential not in Urban Villages	Neighborhood Yield	Non-arterials	Low intensity residential
Alley: Located within Urban Center or Village	Commercial Alley	Alley	Moderate to high intensity commercial and residential loading

A mini-district of interconnected pedestrian places would form a *pedestrian village*: a compact, pedestrianized neighborhood no more than a few blocks across featuring a distinct fabric, ambiance, and identity. If—and it's a big if—these right-of-way infill developments are planned properly in terms of design and economic equity, they could become sought-after neighborhoods for residents and families of varying size and socioeconomic status. The city benefits as well: it disincentivizes car ownership, gains density and housing near transit hubs, opens up public space, and makes strides towards its social equity objectives—without any of the downsides of relying on mid-rise or high-rise construction.

Chapter 7. ANALYSIS: PROJECTED IMPACTS

…deliberate disorder of local streets may be created to discourage through movement…[and] can also be used in small areas, within a more rational layout, to give a sense of intimacy, mystery, and special character. (Lynch, 1962, p. 124)

An alteration to streetscape and circulation as radical as the proposed pedestrian place would have a wide range of impacts, some inevitably unintended (Rauws, 2017). Site-specific impacts on form and circulation were illustrated in Chapter 6.3, Design Responses; this Chapter is an attempt to capture the majority of generalized impacts the *pedestrian place* concept would have if it were implemented at the sites or similar locations. These impacts are grouped under four overall headings in Chapters 7.1–7.4: I start from public space, move on to circulation and access, follow with delivery of public utilities, and conclude with projected impacts on land use.

As noted in Chapter 2.2, Audience and Scope, political, legal, economic, social, and community relations ramifications are beyond the scope of this thesis; nevertheless, they are touched on in Chapter 8.4, Suggestions for Further Study.

7.1 Quality and Amount of Public Space

Perhaps counter-intuitively, inserting infill housing into former streets dramatically increases the amount of public space available to local residents. Although an ~30'-wide housing parcel consumes half the space made available through reprogramming a 60' right of way, combining a sidewalk, parking strip, and property edges into a cohesive woonerf-style shared space provides ~30' feet of public space divided on the two sides of the building parcel, more than twice the amount of two 6' sidewalks added together. An 80' right of way offers even more flexibility, with

as much as 30'–50' of public space replacing 12' of sidewalks, depending on the final infill scheme.

Equally dramatically, intersections would form nicely scaled local plazas. These outdoor living rooms could be hardscaped immediately or programmed incrementally as the pedestrian village forms (Roberts, 2019b).

In other words, pedestrians' narrow paths would become more generously scaled places. It is true that the clear hierarchy of divided paths demanded by the design rules would mitigate the amount of space that reads as truly public; the wider path would read as the primary shared space and throughway, while the narrower one would read as semi-private (Design Rule 17). The resulting public space would also feel more enclosed (or confined) than the removed street and may feel less green, depending on the character of the original site and the success of Design Rule 15 implementation. Regardless, the proportion of public space dedicated to cars:pedestrians:housing shifts from roughly 3:1:0 to 0:2:2 (60' right of way) or even 0:1:3 (80' right of way).

The following subchapters explore changes to the public space in greater detail, focusing on the streetscape, wayfinding, amount of daylight, and safety considerations.

7.1.1 *Streetscape and Sense of Wholeness*

The most prominent experiential change brought about by pedestrian places would be the wholesale reorganization of the streetscape: the scale of the resulting shared spaces would be unlike anything residents and visitors would experience the urban United States except in the oldest areas of the oldest cities or at a pedestrian shopping mall. This is the introduction, then, of a wholly new idiom into the residential vocabulary of the urban United States.

In Lynchian terms, the *edge* between the pedestrian village and the rest of the city would be sharply drawn, strengthening the identity and imageability of the village. Gateways would indicate that one is entering a pedestrianized *district*. *Nodes* would transform from traffic intersections to local plazas, which might also serve as *landmarks*. The new *paths* would have to be planned with extreme care, by bringing in and testing best global practices, then adapting them to American signage standards and psychologies of perception (Balcetis & Lassiter, 2010, p. 69; Shinar et al., 2004). The few vehicles temporarily parked in integrated loading zones or any required disabled spaces would read more prominently than they do on streets lined with parking spots.

Figure 7.1. Green Walls Replace Concrete Floors

At sites like Capitol Hill South, a finer grain would be introduced, as low-rise structures and small courtyards and plazas replaced a broad, barren streetscape. A sense of enclosure and enticement would also appear, as pedestrians and slow-moving cycles wind through a site-specific pattern of paths connecting those small-scale public places.

At greener sites like Capitol Hill North and Beacon Hill, some existing trees and plantings in the right of way would have to be cut down or torn out. A tree survey would be necessary to identify special trees to consider in the site-specific development plans. The ultimate goal would be to replace any removed greenery with vertical and rooftop greenery in instances where the paths do not allow for green swaths at ground level. Plazas could be designed to include as much or as little green as is relevant in each particular instance, taking into consideration the city's sustainability goals.

Figure 7.2. Clean Up the Street: Utilities Underground

Figure 7.3. Seeing Integrated Furniture in a New Light

Finally, with utilities underground and street lighting integrated into the new structures and pavement, the present jumble of telephone poles, wires, and fire hydrants would disappear, in the best instances leaving a cleaner, more cohesive streetscape. I would argue that this adds to the city's sense of incrementally achieved wholeness; others may feel that maintaining the grid would better serve that purpose.

7.1.2 *Legibility*

As mentioned above, pedestrian place paths would have to be planned with care. Introducing a new street type requires drivers and cyclists learn to navigate slower speeds, the presence of pedestrians, and a narrower roadbed. The number of paths would multiply, with alleys handling the majority of vehicle traffic and the earlier street-side right of way divided into two paths running along either side of the infill buildings. Visiting vehicles entering the pedestrian village might have some initial trouble navigating the new alley-based vehicular grid; advance communication of upcoming changes would facilitate the acclimatization of residents and take their needs into account (Castillo-Manzano et al., 2014; Roberts, 2019c).

Meanwhile, the preservation of the framework grid means pedestrians can simply follow the paths they always took, with sight-lines narrower but still unbroken (Design Rule 11). The compact nature of the pedestrian villages—maximum 3 blocks across in any direction—would help ensure they do not transform into impenetrable mazes.

Finally, the address system would have to be carefully considered. One alternative would be to leave existing addresses alone and add new addresses for the infill units, for instance, Summit Place, E Olive Place, or 17th Place S.

7.1.3 *Daylight and Views*

A major sacrifice exacted by the implementation of the pedestrian place concept is the loss of

daylight on the street and in any buildings shaded by the infill housing. Additionally, the lower stories of the infill structures will have less daylight than they would if sited on a traditional 60'–80' right of way. This is an unavoidable consequence of narrower rights of way. Despite any positive impacts less direct sunlight and less heat might have during an era of climate change, this challenge needs to be taken seriously, with site-specific designs responding to it.

Site specificity should also guide the resolving of a similar challenge: the changing views caused by the infill. Existing residents may lose nice views; pre-project communication with the public is the best tool for (imperfectly) resolving these concerns. One option would be to design views into the new plazas that form at intersections and/or extend those plazas onto the roofs of infill structures at graded sites, bringing views to residents who did not have access to them in the past.

On a related note, the windows of the infill units need to be placed with an eye to ensuring and maintaining the privacy of all residents.

7.1.4 *Health and Safety*

Fewer vehicles traversing a site theoretically leads to lower levels of air and noise pollution, although in the case of, for instance, Barcelona's Poblenou *superilla*, there is some indication that traffic on adjoining streets increased slightly after it was redirected from the interior of the superblock (Roberts, 2019b). Nevertheless, cities with pedestrianization projects that resulted in lower levels of reported pollution include Istanbul, Hong Kong, and Pontevedra, Spain (Dodd, 2020; Kam, 2001; Kose, 2015). If the concept results in increased public transit ridership and decreased use of private vehicles, these benefits could be expected to multiply.

Other presumed health benefits would include increased walking and recreation among children and adults encouraged by the newly available open space (Dodd, 2020). In some

instances, children would be able to cycle safely to local services such as libraries and schools, and developing a social practice around cycling could mean exactly the sort of cycling Seattle is trying to encourage (Nettleton & Green, 2014; Seattle Office of Planning & Community Development, 2019).

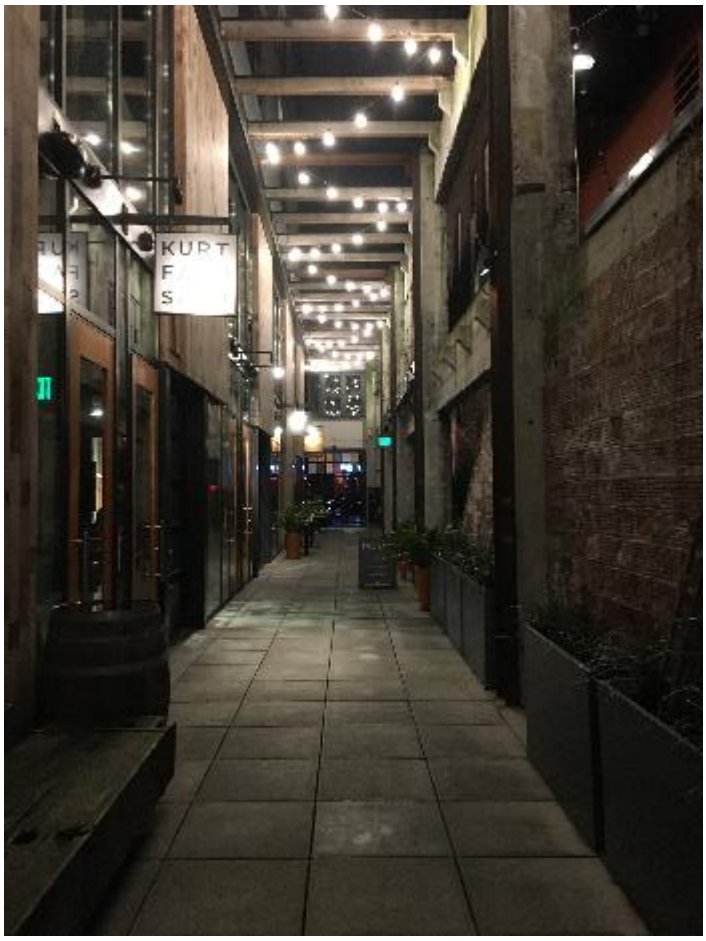

Figure 7.5. Narrow, not Dark

While one could argue the concept is unambiguously beneficial in terms of public health, the narrowing of paths gives pause when it comes to public safety, both perceived and real. The finer grain of the infill makes for more eyes on the street, a clear safety benefit (J. Jacobs, 1961, p. 35; Mehta, 2013, p. 122; Moughtin, 2003, pp. 55–56). But the narrower pedestrian paths need to be analyzed from a safety perspective. Work has been done on the topic of safety in the design of similar public spaces in, for instance, South Korea (Seoul Solution, n.d.). In this instance, two approaches suggest themselves: a focus on street lighting, and ensuring the safety needs of all populations—including children, the elderly, LGBTQ+ people, women, and the houseless—play a key role in public space layouts and their interface with housing designs (Chalfin et al., 2019).

7.2 CIRCULATION

Many of the main impacts of inserting infill housing into the right of way involve mobility and circulation. The pedestrianization of paths and intensified vehicular use of alleys mean a wholly different approach to local circulation, making it more convenient for some and less convenient for others. Add to this paradigm shifts brought about by developments ranging from self-driving vehicles to drone delivery and circulation becomes an incredibly complex issue. Analyses will need to be commissioned during the pilot phase to address the constantly evolving sociological and technological dimensions of circulation. While these analyses should take resident concerns into account, if those concerns are in direct contradiction to the city's sustainability aims, the city's aims ought to prevail. General projections of impacts brought about by pedestrian place circulation are covered by mode and access type in Chapters 7.2.1–7.2.5.

A summary of vehicle and pedestrian counts per site is presented in Table 7.1. As can be seen, the denser Capitol Hill sites have more traffic in general, with the Capitol Hill South site being particularly pedestrian heavy and pedestrian counts exceeding vehicle counts at two of the Capitol Hill North intersections about half the time. Capitol Hill North intersection A has the most vehicular traffic. The less densely-populated Beacon Hill site sees much less vehicle or pedestrian traffic regardless of time of day, with relatively even counts except during rush hour, when pedestrians exceed cars in the streetscape. These counts give some indication as to how much displacement of vehicles would take place at each site and which intersections, if removed from the grid, would have the most impact on the surrounding streets.

Table 7.1. Vehicle and Pedestrian Counts by Site

	Capitol Hill North A	**Capitol Hill North B**	**Capitol Hill North C**	**Capitol Hill South**	**Beacon Hill A**	**Beacon Hill B**
Vehicles / Pedestrians						

Rush hour	**62** / 28	29 / **41**	**33** / 26	26 / **44**	8 / **17**	**14** / 13
Day	**42** / 21	**26** / 24	42 / **46**	21 / **30**	5 / **6**	**8** / 7
Night	**47** / 24	32 / **47**	23 / **27**	20 / **29**	**3** / 0	**3** / 2

7.2.1 *Pedestrian and Cyclist Access*

As noted in Chapter 7.1, Quality and Amount of Public Space, pedestrian corridors would increase in scale if not in number. The two sidewalks would disappear and be replaced by two wider shared-space paths, one that reads as public and the other that reads as semi-private but both open to all. Pedestrians should thus suffer no adverse effects in terms of convenience, just the opposite: they will have more room to move, rest, socialize, or play. The presence of faster-moving runners, skateboarders, and scooter riders might pose minor problems; these would have be monitored and addressed during pilot projects.

Fast-moving cyclists, on the other hand, would be inconvenienced: in most instances, the streets they presently use to cross the sites would be replaced by slow-speed shared spaces. Children learning how to ride a bike would benefit, but cycling commuters intent on moving through the site at maximum speed would have to use alternate routes, presumably dedicated cycle lanes on high-speed arterials. One potential mitigating element here could be the introduction of bike paths instead of infill along certain stretches of street, such as E Thomas Street at the Capitol Hill North site (see Chapter 6.3.1, Design Response: Capitol Hill North).

7.2.2 *Resident Vehicular Access*

Vehicular access would diminish appreciably in the pedestrian place scheme. The concept does not allow for through-traffic, so non-locals accustomed to using certain routes will have to adjust course to other nearby streets, preferably arterials.

Alleys become workhorses for getting local traffic into, out of, and across the sites. In some instances, this would require getting little accustomed used to: for instance, at the Capitol Hill South site, E Crawford Place already serves this purpose. Vehicle speeds might increase in alleys as drivers grow more acclimatized to their use, and new bottlenecks might appear as the right of way diminishes from the flexible 16'–30' of streets to the harder 16' of the alleys. All designs would need to be site-specific, with an eye to maintaining alley and/or shared-space access to existing garages. The logic is to disrupt the lives of present residents as little as possible, so the benefits of the changed right of way outweigh the inconveniences.

7.2.3 *Parking and Loading Zones*

I see parking and loading as issues with considerable potential for introducing unintended consequences. The pedestrian place concept would remove street parking within the site, which could have impacts on surrounding areas. Existing disabled spots could be marked in the shared space if it proves impossible to relocate them to the alley after verifying their continued need.

In order to gauge the estimated the numbers of parking places that would disappear, parking counts were conducted during the day, rush hour, and night at each of the three sites. The results are presented in Table 7.2 below (for details, see Appendix C). As is clear, the amount of street parking at the Beacon Hill site is

Figure 7.6. Business as Usual

drastically overscaled, with anywhere from a third to a half of the street parking space sitting perpetually empty depending on the time of day. In addition, all lots have alley access and presumably garages, meaning many of these cars have somewhere to go if on-street parking is removed. The story at the Capitol Hill sites is different; both sites have approximately one-fifth to one-fourth capacity during the day but almost none at night. Nearby streets could conceivably absorb some measure of this capacity if redesigned for maximum parking, and of course some residents could take advantage of the increased demand, renting their dedicated garage or lot space to car owners who want one of relative convenience. But the lack of parking in general could make the concept a harder sell in Capitol Hill.

There is a church within the Beacon Hill site. Decisions would have to be made regarding such instances of sporadically intense street parking.

Table 7.2. Displacement of Parking Spaces by Site

	Capitol Hill North	**Capitol Hill South**	**Beacon Hill**
Blocks with street parking	18	4	18
Parking spaces lost to infill	155	56	154
Disabled spaces to incorporate	5	3	3
Minimum unused capacity	9 (night)	1 (night)	51 (rush hour)
Maximum unused capacity	29 (rush hour)	16 (day)	81 (night)

The 3-minute loading zones directly outside building entrances all but vanish, with carshare pickups and drop-offs centralized at the nearest arterial. Loading is allowed for moving vans or residents transporting cumbersome loads, as are trucks making daily deliveries to coffee houses and mini-marts within the sites. The vast fleet of private vehicles and UPS, FedEx, and Amazon vans delivering mail-order packages to consumers are more difficult to accommodate. It would be easier for them if not their customers to drop all non-perishable packages at a nearby arterial location that is both secure and centralized (Urban Freight Lab, 2020). The door-to-door delivery

of takeout food by bicycle is not an issue, but in Seattle much of this delivery takes place via car or van, which would mean an inconvenience at one end or another of the delivery chain.[27]

All loading in the new shared spaces will need to be carefully monitored during pilots to ensure pedestrian places do not turn into parking lots.

7.2.4 *Special Cases: Emergency Vehicles and Construction Equipment*

Emergency personnel access is one of the most fraught issues involved in pedestrian places: a single parked vehicle or bottleneck in the pedestrianized right of way could put lives at risk during a life-or-death situation. The new right-of-way configuration must not hamper the ability of medics, firefighters, and police officers to reach residents suffering an emergency. Bicycle police would have no problems accessing the site, where the proposed circulation paths are also wide enough to accommodate the first aid cars and police vehicles currently in use in Seattle. And while 16' is technically wide enough for Seattle's fire engines, the irregular paths would have to be designed in such a way that allows for fire lanes that reach the pedestrian village's interior. Seattle might refer to alternatives used in Japan, Singapore, and European countries where streets are generally narrower than in the US (Poon, 2016). Considering such options might prove forward thinking: discussion of the benefits of

Figure 7.7. Nimbler Options Exist

[27] The mail-delivery bicycles in use on the University of Washington campus offer a low-tech solution to the last-block delivery of goods and packages, while high-tech solutions like drones and robots might radically change the delivery landscape anyway (H. L. Lee et al., 2016).

smaller firefighting equipment and motorcycle emergency response is taking place within the profession in the US, and appears to be centered around cost advantages and flexibility, including the specific mention of narrower streets (Avsec, 2019; *Motorcycle Response Units in EMS*, 2018).

Whatever the final implementation, emergency access needs to carefully considered in final circulation plans, and the agencies responsible surveyed in regarding their needs, equipment, and technology developments they see in the pipeline. Projects like the Emergency Response & Street Design Initiative can aid in this endeavor (Emergency Response & Street Design, 2009).

Construction equipment shares some similarities: while its presence is temporary, its large size and heavy weight may place special requirements on placement of pedestrianized paths and pavement composition.

7.2.5 *Public Transit*

Depending on the final implementation of the concept at the Capitol Hill North site, it would be tempting to move the northward route of bus route 47 from Summit Ave E to run alongside its southward route on Bellevue Ave E. As no other arterials cross any of the sites, pedestrian places have little impact on public transit routing. Logic would indicate that public transit ridership would increase with population density; the need for increased capacity on bus routes could be monitored through King County Metro's regular ridership inventories. The wild card here is private vehicle disincentivization: what sort of impact would the lack of street parking and vehicle through-access have? Would current residents find the changes so distressing they move, or would they adapt to some combination of walking, cycling, public transit, and rideshares?

7.3 PUBLIC SERVICES

One of the primary functions of the right-of-way easement is to allow space for the provision of public services, from utilities like water, electricity, and network connections to the removal of waste, whether sewage, recycling, or landfill (Seattle Office of Planning & Community Development, 2019; Vernez Moudon & Untermann, 1987). Shifting to new forms of utility delivery and waste collection and disposal might serve as precursors to broader efforts in the city, as pedestrian villages offer superb sites for piloting such service models.

7.3.1 *Utilities*

Utility delivery would have to be reconfigured entirely in pedestrian places. Telephone poles and streetlights would come down. Utility conduits would require moving from their present roadbed channels to the edges of the right of way, where they would lie beneath public paths, not the infill structures. If possible, fire hydrants could be integrated into the infill structures, obviating the need for the stand-alone version we are used to seeing on the street. And lighting and permeable surfaces could be introduced into the pavement, with physical integration of overhead street lighting mandatory for the infill structures.

Subterranean capacity requires further analysis to find a model where all utilities—water, sewage, electricity, gas, Internet—are delivered through the narrower under-street channels. The bigger problem is the moving of existing subterranean utilities from the roadbed to what is now the sidewalk: inconvenience aside, the expense would be a huge strike against the concept. Phasing pedestrian place implementation with necessary utility system upgrades could mitigate some of these costs; for instance, the older neighborhoods the sites are located in are overdue for sewer-system upgrades (Seattle Office of Planning & Community Development, 2019).

As with circulation, utility delivery would be worth a more detailed analysis of its own.

7.3.2 *Waste Removal*

Figure 7.8. Collective Collection

Recycling and landfill is presently collected by truck, primarily from alleys. The potential increase of vehicular traffic in alleys might cause frustrating bottlenecks for both waste removal companies and residents. If necessary, these could be mitigated by establishing recycling points at the edges of the sites, integrating waste and recycling systems into the infill structures, and/or offering localized composting—all practices that have been successfully implemented in other cities around the world (Galchen, 2020; Piippo, 2013).

7.4 LAND UTILIZATION

The present thought experiment arose out of questioning the way land is used in the city; as noted in Chapter 2, Research Question and Aims, its primary aim is to get us to *see* right of way as public land like any other and a potential resource for addressing the housing crisis. Extrapolating from the design responses, the apportionment of structures vs. right of way at the sites would shift as follows:[28]

Table 7.3. Site Changes in Percentage of ROW to Built Land through ROW Infill

(figures in acres)	**Capitol Hill North**	**Capitol Hill South**	**Beacon Hill**
Total ROW	**~7**	**~1.7**	**~4.1**
Vehicle ROW: pre-intervention	~3.5	~.85	~1.5
Vehicle ROW: post-intervention	**~.77**	**~.19**	**~.16**
Total change: (-78/84%)	-2.7	-.66	-1.34
Pedestrian ROW: pre-intervention	~3.5	~.85	~2.6
Shared space: post-intervention	~5.6[29]	~1.36	~3.5
Total change: (+ 60/0% of vehicle)	+2.1	+.51	+.9
Built land: pre-intervention	~20.5	~.7.3	~10
Built land: post-intervention	~21.9	~.7.65	~11.34
Total change: (+ 40/100% of vehicle)	+1.4	+.34	+1.34

In other words, xx percent of the public land dedication shifts from vehicular through-passage and parking to housing and pedestrianized public space.

Estimates on the overall impact on residential density is discussed in Chapter 7.4.1, followed by a brief assessment of the concept's compatibility with Seattle's current zoning categories in Chapter 7.4.2.

[28] Pre-intervention vehicle ROW includes alleys and streets, including on-street parking. Post-intervention vehicle ROW refers to alleys only. Built land includes all private parcels (pre-intervention) and private parcels + right-of-way infill (post-intervention). Pedestrian ROW consists of sidewalks and parking strips; shared space is the street-side right of way post-intervention.

[29] In the proposed design for Capitol Hill North, this shared space includes a dedicated bike lane and pedestrian stairs on E Thomas St that will not be accessible to vehicles.

7.4.1 *Density*

Accurately projecting density gains resulting from the design responses would require further study. It is plain that building a MR zone to capacity on all lots will bring in more density than building maximum one half of the number of units from one side of the street, not to mention both sides. So upzoning to capacity brings in more density, but does it deincentivize car use to the same degree as right-of-way infill? It certainly does nothing to add more quality public space for residents. It also comes with the downsides presented in Chapter 4.2, Why Not Just Go Up?: the loss of historical layering in the streetscape, the homogenization of neighborhoods, the displacement of residents and businesses, and the creation of pedestrian-unfriendly canyons.

7.4.2 *Zoning*

Small adjustments to Seattle's current zoning likely sufficient to cover pedestrian villages. The current commercial pedestrian zone (indicated with a P in present zoning categories, such as NCP-55) applies in large measure, with the exception on the prohibition of or limits on live-work spaces and residential units at street level (City of Seattle, n.d.-a). Either such P zoning could be refined to include an amendment for pedestrian places, or a PP zone could build on the existing P. This PP category could then refer to LR2 as the existing low-rise housing category most appropriate for right-of-way infill (Seattle Department of Construction and Inspections, 2020).

Another zoning issue is infill compatibility with adjacent height limits: if all existing structures at the mid-rise-zoned Capitol Hill North and South sites were demolished and the parcels built to capacity, the result would overshadow the infill structures and narrower right of way. Squaring low-rise infill with surrounding MR zoning is problematic: zoning adjustments to surrounding areas might be necessary, an unwelcome complication. For areas currently zoned MR, it may be this concept has arrived too late.

On the other hand, if a neighborhood's residents want to absorb mandatory density increases without demolition of existing structures and the attendant disruption and displacement, pedestrian places have the potential to meet the city's sustainability aims in what some would argue is a more livable configuration than canyons lined by 80' buildings. Resident desire to maintain character serve as a powerful force in introducing the concept.

Chapter 8. DISCUSSION

Power designs cities, and the rawest form of power is control of urban land.

(Kostof, 1991, p. 52)

"There are three main goals of urban design: they are to design and build urban developments which are both structurally and functionally sound while at the same time giving pleasure to those who see the development" (Moughtin, 2003, p. 2). If we apply Moughton's characterization of an urban designer's task to right-of-way infill, how does it fare? Structural soundness is an issue of execution and is not addressed here. But does the pedestrian place scheme demonstrate sufficient functional and aesthetic promise to warrant further exploration?

One central design discovery, obvious in retrospect, is the amount of site sensitivity this infill model would require. There may be a need to design review each project, which goes counter to some recent developments in Seattle (Seattle Department of Construction and Inspections, n.d.-b). At the least, each pedestrian village would require a master plan that considers site-specific elements such as the interface between infill structures and the reconfigured right of way, the uses and forms of the new squares and plazas, and any conflicting or complementary uses—see, for instance, the bike route indicated for Capitol Hill North in Chapter 6.3.1, Design Response: Capitol Hill North. If master planning and/or site-specific reviews are deemed an acceptable burden on the execution of these infill developments, I have no doubt the other issues—structure, function, and delight—can be resolved through wise planning and design.

Chapter 8.1 addresses the overall success of the concept and the research process. It begins with a review of the general strengths and weaknesses of the scheme. Chapter 8.1.3 discusses

how well right-of-way infill aligns with Seattle's values, goals, and policies as laid out in its Comprehensive Plan. Chapter 8.1.4 concludes with a comparative summary of the concept's strengths and weaknesses by site.

Ideas for integrating the concept into other newer developments in urban planning are briefly covered in Chapter 8.2. Chapter 8.3 presents ideas on piloting the scheme; these lead into suggestions for next steps in Chapter 8.4.

8.1 Success of Proposed Intervention

Before delving into the success of the intervention results, I'd like to address where the research process could have been improved, as it to some degree is reflected in the outcomes. An overly broad approach at the outset detracted from the focus, which could have been more clearly married to Seattle's goals and policies as stated in its Comprehensive Plan. The broadness of approach also dulled the design process, with too much time devoted to written rationales instead of allowing the design output to do the arguing and inspiring. Interviews with relevant personnel at city offices could have fleshed out some arguments for or against the concept, but could have also thrown unnecessary distractions into the concept during this thought experiment stage. Finally, in retrospect, I would have expanded the Capitol Hill South site to make it more comparable in size to the other sites and ensured one of the sites was located in a hub urban village to cover the three categories of urban center, hub urban village, and residential urban village.

On to strengths and weaknesses of the proposal. Chapter 2.4, Evaluation Criteria, laid out three classes of criteria for determining the success of this thought experiment. Only one of these is quantitative. While the potential figures do not approach the densities that could be achieved if every parcel within the sites were built to capacity, I believe they justify further exploration of

spatial reconfigurations like pedestrian places that shift control of urban land from the private market and global capital back towards cities and their residents.

The other two criteria are subjective. Firstly, is the scoped rationale for right-of-way infill presented convincingly and comprehensively? I see equity as the fundamental issue. Who is best served by the current private-market approach: the city's residents or outside investors? What is the trajectory? Is urban land in Seattle distributed in a way that will continue to serve the majority of its residents and the city's sustainability goals into the foreseeable future? If this thesis arouses doubts in this regard, it has served one of its main aims.

The second goal is to get readers to *see* the status quo for what it is, that our current land use prioritizes cars we claim to want to move away from over housing we claim to want to provide (Seattle Office of Planning & Community Development, 2019; Seattle Planning Commission, 2020). Once we see this, are we not obligated to do something about it?

8.1.1 *Strengths*

The primary strengths of the right-of-way infill model are twofold: freeing underutilized land for housing development under the city's control, and freeing underutilized public space for activities other than driving and parking. Furthermore, a review of the current Comprehensive Plan suggests that the concept is line with dozens of the city's stated goals and policies and in contradiction with only a handful. For an item-by-item review, see Appendix A.

One of the chief obstacles to building affordable housing is the cost of land (Rowley et al., 2012). By turning over right of way at no cost to non-profit developers who build exclusively affordable housing, by building social housing itself in the right of way, by long-term leasing of these parcels to for-profit developers at market rates with the proceeds going into the cities' housing coffers, or by some combination of the three, the city can extract the value of the land

for the public good more effectively than it does now (see e.g. Vernez Moudon & Untermann, 1987). The racial equity that Seattle purports to want to achieve could be advanced by providing affordable and/or missing middle housing in pedestrianized inner-city neighborhoods with walkable access to food, healthcare, and other services in the city's best-served transit locations. Affordable CLT and prefab housing could be tested and developed for widespread adoption. On a purely financial level, less displacement also means a greater tax base, and this solution only increases the number of tax payers in the city. And the scheme is reversible, so the public space can be repurposed for other uses if and when the need arises—immediately after the pilots, or a hundred years from now.

At the same time, as through-traffic disappears and local traffic decreases markedly, localized decreases in noise and air pollution seem likely, as do increased ridership figures for public transit. The scheme would clearly communicate Seattle is ready to take radical action to reduce the number of cars on its roads, as the City's Planning Commission seems to be calling for (Seattle Planning Commission, 2020).

There is no reason the expanses of concrete that would be removed could not be replaced by green-roofed structures, shared space designed to include swales or other stormwater infrastructure, and public space that markedly increases the tree canopy in certain instances. Utility performance upgrades or the introduction of new, district-level utility delivery could be integrated into the project, meaning less overall demolition and disturbance for residents living on adjacent properties. In other ways as well, the scheme is a superb fit for many of the continuing equity, displacement, housing, emission-reduction, public space, public health, and density problems pointed out by the Planning Commission in its reviews of current City practices and their outcomes with regard to the City's goals as stated in the Comprehensive Plan (Seattle

Office of Planning & Community Development, 2019; Seattle Planning Commission, 2018, 2020).

Wide adoption of pedestrian villages could transform Seattle's public spaces in positive ways. They offer site enhancement, greater intensity and vitality, and the chance to socially and physically activate people who our present public space configuration does not serve. Although everyone stands to benefit, families with children, the elderly, the disabled, and others whose use of public space may well be limited based on whether they enjoy immediate access on their doorstep stand to benefit the most. Pilot projects to increase intergenerational living and interaction in the city and to decrease marginalization and social isolation and exclusion would find it much simpler to work within a physical framework that does not involve the need for a car or even a bus ride. Live/work configurations or even light manufacturing in the city could support a vital, vibrant streetscape in an era when paradigm shifts in consumer behavior make it more difficult to lease street-level spaces for retail. New urban fabrics can be introduced, broadening our conception of American urbanism and building Seattle's reputation as a city prepared to think—and act—outside the box to meet its sustainability and diversity aims. Pedestrian villages can also offer a venue for piloting other sustainability measures in line with the Comprehensive Plan. Our current measures are not enough; it is time to bring in new approaches (Seattle Planning Commission, 2018, 2020).

8.1.2 *Weaknesses*

Many of the foreseeable weaknesses with right-of-way infill lie in topics beyond the scope of this thesis: the near-guaranteed resistance of residents to major changes in their neighborhood, the potential for lawsuits, and the fundamental costs involved in reshaping the streets and reconfiguring utilities. Of these, the critical weakness is the ambiguous nature of the city's

jurisdiction with regard to the right of way. I am actually pleased I did not learn the city only controls but does not necessarily own the right of way until well into the this thesis process; knowing this at the outset could have hobbled the imagination and prevented the proposal from ever seeing the light of day. Now, if the proposal seems worthwhile, it is up to the lawyers and their expertise to consult the city on how best to proceed.

Potential weaknesses from a design perspective include the loss of daylight, views, and some trees as well as the increase in the number of pathways, which may mean cost increases and complications when it comes to maintenance. Drivers accustomed to parking at or driving through the sites will find the conversion an inconvenience, and getting used to the new vehicular circulation will involve some trial and error. The resulting pedestrianized areas, a rarity in the urban US, entail some risks to safety as the users of different mobility modes learn how to share the space. Emergency services would have to be carefully consulted with regard to access and fire lanes. And the construction itself would prove an inconvenience for local residents, even if they are not displaced.

The complexity of the effort means unforeseen consequences are sure to arise, and some of these are sure to be negative for some residents (Rauws, 2017). One example: if the value of the surrounding parcels increases due to the infill housing, there may be more pressure to take advantage of maximum heights allowed by zoning. The converted right of way might then be surrounded by mid-rise structures overshadowing the improved space and new housing, countering some of the aims of the project.

8.1.3 *Success Across the Sites: A Comparison*

A comparative summary of concept success by site is provided below. The results do not establish any of the sites as a clear "winner"; each has pluses and minuses. The comparison should nevertheless offer some indication of the issues involved at that site or similar sites.

As a clarification, it must be noted that the pedestrian place concept is not intended as a blanket urban form to introduce throughout the city. Downtown and other dense areas where the rights of way are used intensely and already shadowed by high-rises are not suitable; either are major arterials or industrial areas. At the other end of the extreme, residential neighborhoods far from transit would not be a place to begin. Residential streets that would benefit from the expansion and improvement of public space are the best fit; these could range from primarily single-family to clearly multifamily areas, but they would have to be within a ten-minute walk of a light-rail station and frequent bus lines, be proximate to necessary services, and have a form that lends itself well to bounding into a clear neighborhood unit or mini-district. Alleys help. Substantial overshadowing of neighboring buildings is a strike against implementation. Without further exploration, a three-by-three-block area seems like a good place to begin, with arterials never more than a block and a half away.

Table 8.1. Success Across the Sites: A Comparison

	Capitol Hill North	**Capitol Hill South**	**Beacon Hill**
Community type	**Few homeowners = less resistance**	**Few homeowners = less resistance**	More homeowners = more resistance
Right of way width	60', high encroachment	60', low encroachment	**80', low encroachment**
Alleys, presence of	Frequent but irregular	Half the site	**Throughout, regular**
Alleys, parcel access	Irregular	Irregular	**Consistent throughout**
Site repair	Not necessary	**Necessary**	Not necessary
Trees in right of way	Many, mostly mature	**Negligible**	Many, mostly young
Zoning history	Stable MR	Stable MR	**Recent changes from single-family**
Max height	80'	80'	**80' at edges to 50'**
Parking spaces lost	155	56	154
Max vehicle reroutes	~ 60 (rush hour)	~ 25 (night)	~ 14 (rush hour)
Standout features	**Harvard Square, bike path/pedestrian stairs**	**Site repair, new plaza**	**Unit variety, views**
Alignment with neighborhood plan from Comprehensive Plan	Encourages diversity of housing types, sustains current dense, varied character	Increases density, creates distinct identity, prioritizes pedestrians	Increases density near station while retaining single-family character, improves open spaces and increases eyes on the street
Summary	Neatly delineated area centering on bike path = immediate amenity	Great starting point, site repair, mostly renters, flat N-S	Alley access to existing homes, most space, but homeowner resistance?

8.2 Some Thoughts on Rollout

Rollout arose as a major concern in the literature on pedestrianization and *superille* (Castillo-Manzano et al., 2014; Roberts, 2019c). As right-of-way infill would involve even more radical changes to the sites than those concepts, communication and rollout would have to be planned carefully.

Lessons to be gleaned from the introduction of *superille* to the Poblenou area of Barcelona include timely communication with the public and ensuring that the public is offered something to replace the good that was perceived as lost—in this instance, street parking and a sense of control over the immediate environment, as well as whatever personal experiential losses

residents may experience (Roberts, 2019c). A city intent on maintaining the goodwill of residents while transforming the function and form of the right of way will have to demonstrate a combination of firmness and flexibility: unambiguously asserting its control while acknowledging the psychology of the circumstances and encouraging a positive sense of territoriality and ownership (Dodd, 2020). Communication and community engagement would have to be balanced: although viewpoints can and should be gathered and residents offered opportunities to impact designs—the features of an attached plaza, for instance—the city should not fall into the trap of allowing the loudest voices to quash programs that would increase overall equity in Seattle through the provision of housing (see e.g. Appleyard, 1987; Harrington et al., 2019).

The city could get creative in offering incentives to residents on adjacent parcels to increase goodwill for the concept. Although complex to implement, a scheme that shifts property tax burdens away from communities that implement pedestrian places would conceivably serve as a nice carrot in a city where property taxes are a perpetual complaint, or even a hardship (Balk, 2018; K. M. Clark, 2018).

Nor does it have to limit its creativity when promoting the concept either. As part of an annual arts festival, the City of Helsinki commissioned a piece from Japanese artist Tatzu Nishi in 2014: a one-room hotel enveloping Havis Amanda, an iconic statue located in the heart of town. This temporary space was open to the public during the day; it was also possible to book a night and sleep in this unusual setting (Helsinki Art Museum, 2014; Howarth, 2014). The City of Seattle could take a similar approach to the piloting of pedestrian places. A temporary spring/summer pilot could generate interest and goodwill in the concept as well as call attention to the disparity between the need for housing and the over-dedication of right of way to streets (Lehmann, 2016). Depending on cost of construction and utility configurations, the city could erect a block of prefab units to allow residents and others to test right of way infill for themselves: popup shops and cafes at street level, residential units above, terraces up top. Prefab companies could be invited to participate as a way of showcasing their products, reducing the city's investment. Some of the units could be rented through Airbnb or the like, while leaving others open for the general public to experience. Drivers and pedestrians would get a chance to practice sharing space. The positive attention might convince reluctant neighbors that there are benefits to be gained from the concept. Two of the sites explored in this thesis immediately suggest themselves for this: the Harvard Square edge of Capitol Hill North and the southern arm of the Capitol Hill South site.[30]

Figure 8.1. Invite Them In: Hotel Manta
(Source: Helsinki Art Museum)

If the results of the temporary pilot suggest the concept is worth implementing on a more permanent basis, it would be wise to have plans in place for rapid construction while the momentum exists. Monitoring reactions and necessary adjustments during the pilot and having

[30] Street stubs not included in this thesis but potential sites for pedestrian place pilots include E Harrison St between Bellevue Ave E and Melrose Ave E and E Howell St between Summit Ave and E Olive Way/Bellevue Ave.

prefab or cross-laminated timber (CLT) builders lined up to reduce construction times and inconvenience to neighbors would be smart moves.

In short: think outside the box when it comes to communication and incentives, and find ways of defusing a potentially inflammatory concept by inviting city residents and tourists to participate and highlight the exciting aspects of the change. Meanwhile, the city could also investigate the integration of piloting complementary concepts gaining traction in urban planning today.

8.3 Futures-Based Opportunities

The movement towards sustainable housing, transportation, and land utilization dovetails with other developments in urban forms and services, offering the potential for synchronicity in piloting and more widespread implementation of the pedestrian place concept. Some of these opportunities are listed below.

Increasing Equity / City as Housing Developer

As noted in Chapter 1, Introduction, Seattle City Council Member Teresa Mosqueda is willing to look at city taking on the role of developer to combat the housing crisis (Trumm, 2018b). Regardless of whether this happens, and assuming any legal challenges to the proposed concept are dealt with, control of the right of way makes it possible for the city to set requirements on what sort of infill is built and who builds it, granting much more control over—and responsibility for—equity impacts. Those on fixed or lower incomes should not have suffer long commutes or food deserts simply because they cannot afford to live in neighborhoods with pedestrian-accessible services. As an equity initiative, pedestrian villages would have to be carefully

planned and monitored to ensure unforeseen negative impacts are kept to a minimum (Rowley et al., 2012).

Changing Lifestyles and Demographics

Pedestrianizing swaths of the city increases access to public space, making it more suitable for outdoor socializing, recreation, and multi-generational living. The combination of pleasant inner-city public space, affordable housing, and proximity to transit and services could make pedestrian villages appealing to the elderly, including those who want to downsize and remain in the city but are on a fixed income (Seattle Planning Commission, 2020). Importantly, residential infill could provide the "missing middle" of multi-bedroom units suitable for families, which private-market and current zoning structures discourage (Kolson Hurley, 2016). In Europe, increasing number of families are making the choice to remain in the city instead of moving to suburbs, at least while children are pre-school age (Boterman et al., 2010; Lilius, 2014). From a sustainability perspective, this would be a welcome trend in the US as well. Groups of families could even come to together to lease land from the city and build their own developments.

Socialization and Activation

Opening up new public spaces means an opportunity for increased socialization and activation. Helsinki established an innovative program in 1997 with features that lend themselves well to the pedestrian place concept. For decades, Karhupuisto park, a triangle of green in the formerly working-class neighborhood of Kallio, had been occupied by alcoholics, making it unwelcoming to others. Through the cooperation of the parks department, the police, and local seniors, the city named a group of those local seniors "park godparents" to maintain the park after its renovation.

The seniors met there every weekday around 2 PM. Officially the reason for the meeting was park maintenance—the seniors would deadhead blooms, tend and water the flowerbeds, rake the gravel, and the like, with tools provided by the parks department and stored on-site. But they would bring along thermos coffee and pastries, and it was apparent that the real reason was the socialization. The park was in pristine condition and more people began to use it thanks in part to a revitalized café-kiosk located in one corner. While gentrification played a role in changing the park's atmosphere, the model gave seniors a sense of purpose and a chance to socialize and get a little exercise, relieved the city of much of the maintenance burden, and made the park a colorful, inviting place for local parents to let their toddlers run around while they sat with friends and neighbors at the outdoor café. Some of the local plazas and squares in pedestrian places could function the same way, with the "godparents" responsible for sweeping, weeding, and simple maintenance, or setting out and putting away movable seating, offering a low-threshold way to meet one's neighbors without having to spend any money. It's not a perfect model—much of it hinges on the activity of one or two individuals, and at times the head "godmother" took her authority too far—but it was infinitely preferable in terms of equity, public space, public health, and socialization to what existed before (Maunula-Seura, n.d.). Investigating ways of piloting new programs for populations in danger of marginalization could be worthwhile, especially considering the increased neighborhood interaction and sociability reported from Barcelona after the implementation of *superille* (Fesler, 2018)

Revisiting Zoning: Manufacturing and Home as Workplace

The present tumult in retail poses a challenge for a growing city like Seattle, where finding commercial tenants for street-level units of new developments can be problematic (Johnson &

Outcalt, 2020). First-floor residential units can be raised above street level to offer privacy, and services like daycares could fill some of the space (City of Seattle, n.d.-a; Seattle Office of Planning & Community Development, 2019). But what about bringing back small-scale manufacturing to the city through experimental zoning (Dubicki, 2020b)? These changes could be taken incrementally, encouraging such enterprises to occupy retail or restaurant spaces that would otherwise go unoccupied. The flexible re-integration of work and residence could also take place in a more robust shop/home framework that appeals to entrepreneurial families with children looking for a way to come back into the inner city (Davis, 2012, pp. 3, 9, 92, 205). Issues such as delivery, loading, noise, and emissions would have to be evaluated and monitored, but the added vitality is worth investigating (Davis, 2012, p. 8; Dubicki, 2020a).

Utility, Service, and Consumer Goods Delivery

One of the greatest costs involved in the implementation of pedestrian places is the need to move all utilities towards subterranean conduits at the edges of the right of way, locating them under the shared-space pathways as opposed to the infill housing. Seattle's sewage system capacity needs to be expanded, and as other utility upgrades grow imminent or near-imminent, pedestrian places offer an excellent opportunity to reconceive and test new forms of utility delivery (Seattle Office of Planning & Community Development, 2019). District heating and cooling could be introduced into new areas, stormwater management technologies upgraded, waste collection rationalized, mail and package delivery centralized, street lighting integrated into the pavement, and the streetscape enhanced through the relocating of power and data lines and cables underground. Emergency services could test compact equipment and flexible forms of service provision; fixed rideshare and food delivery stops could be introduced along nearby arterials.

Prefab and CLT Construction

Prefab, modular, and cross-laminated timber (CLT) construction are experiencing a surge in interest thanks to their labor efficiency, overall sustainability, and potential cost effectiveness. Concepts like the Urban Village Project offer a system that appears well-suited to right-of-way infill, which could offer a superb milieu for testing these housing technologies on a full-block scale (SPACE10 & EFFEKT Architecture, n.d.). One major benefit is rapidity of construction: prefab can shave 20–50 percent off construction times while bringing in units of structural and aesthetic quality comparable to those built by traditional methods with minimum disturbance to surrounding residents (Bertram et al., 2019). One such project in nearby Vancouver, B. C. saw the completion of over 600 units on ten sites in under 18 months from first meeting with the architect to issuance of occupancy permits (Logan, 2019).

Figure 8.2. Pedestrian Village In a Box? *(Source: effect.dk)*

While the jury is still out on overall cost-effectiveness, efficiency of labor is another benefit that can be tapped immediately in markets like Seattle where construction workforce is in short supply (Bertram et al., 2019). Finally, the use of timber-based construction would marry a local

resource with Seattle's urgent need for affordable housing, a win-win for the region (Trumm, 2019b)

8.4 Suggestions for Further Study

As noted in Chapter 2.2, Audience and Scope, many critical questions fell outside the scope of this study. Before pedestrian places could be brought to life as real-world implementations, further research is required.

Firstly, a review of legal ramifications is necessary, to discover if any parties would be justified in raising legal objections, what form might those objections take, and how they could be resolved. The major issue would be jurisdictional control of the right of way: could the city legally build housing in an easement dedicated to through-passage, and could it do so without compensating the owners of the adjacent properties? Maybe the city could find a creative way to legally classify the housing as traffic-calming measures, or replace the few displaced parking spots below the housing and call it parking—not ideal from a car disincentivaztion perspective, but the city would still get the housing and the public space. State codes on minimum right-of-way widths for traffic and utility and emergency services provision would have to be examined, as would legislation regarding modal precedence in woonerfs (for information on how other major US cities have approached this, see Delaware Valley Regional Planning Commission, 2018).

The reality of highest and best use would be wise to take into consideration. A calculation of the value of a street in its present use versus its value as a site for infill housing would likely support the implementation of concepts such as the pedestrian place.

The funding and development model needs resolving: would the land be set aside exclusively for affordable or low-income housing, or would some other model make more sense?

Would the city act as the developer, or would it turn over development rights to other entities through land leases? How would the city determine the length and price of such leases? What would be the best ways of ensuring equitable distribution of the leases?

Alongside the legal and financial dimensions, site selection would have to be explored at greater length, not only to decide where to site pilot projects, but to determine their scale. Housing and public places would have to be designed and planned. Utilities would need to be surveyed, as planned utility or stormwater management upgrades could impact the choice of site. Emergency services and utility providers would have to be consulted to canvas their needs and any interesting opportunities for synchronicity.

A detailed circulation and mobility analysis is required and would need to provide information on best practices for ensuring responsible driver behavior and safety in the shared spaces. Delivery, loading, and parking would require monitoring during pilots to forestall any unforeseen negative impacts.

Research on potential social, sustainability, equity, public health, and public safety impacts could lend support to the scheme and raise issues not addressed in this thesis.

Investigating the possibility of partnering with other cities to share the risks and learnings of the model might be worthwhile, as could partnering with prefab and CLT construction companies, street furniture and lighting manufacturers, and pavement developers interested in being involved in a high-profile project (Lehmann, 2016). Organizations like the Urban Freight Lab at the University of Washington might be interested in getting involved to test and monitor new means of centralized delivery (see e.g. Stiffler, 2020).

Finally, research into best practices regarding communicating the scheme and the changes it will bring to neighbors' lives, addressing resident concerns, surveying public attitudes pre- and

post-intervention, and adjusting the scheme based on feedback and pilots would form the framework for an effective community engagement plan—and lay the foundation for a new alternative to denser city living in the US.

Chapter 9. CONCLUSIONS

We can choose. (Martin, 1972, p. 26)

Cities are reflections of the values of those who design them (Moughtin, 2003, p. 11). Does a regular grid in cities like Seattle still communicate the values once attributed to it: ease of property demarcation and transfer, fairness, explicitness, flexibility, even democracy (Kostof, 1991, pp. 100–102)? Or what other values might an overscaled right of way embody in the urban US of today? Income disparity? Rigid adherence to unsustainable transportation modes, passive acceptance of race- and income-based exclusion? It depends on the lens one looks through, but these latter values are contrary to Seattle's stated aims (Seattle Office of Planning & Community Development, 2019; Seattle Planning Commission, 2020).

When I first returned to Seattle after a decade living abroad, I remember being both amused and bemused by the never-ending stream of Volvos and Subarus with Obama and Coexist bumper stickers pulling up to the organic donut shop, vying for the closest free parking spot in the rush to get their precious cargo to school. For me, that somewhat absurd vignette epitomized the Seattle paradox: a highly educated city dedicated to progressive values and sustainability in their most palatable forms yet unable (or unwilling) to envision a car-free existence, a city where responsible parenting demands driving, racial segregation and income disparity are accepted as vaguely unfortunate but inevitable, and resistance to changes in the status quo runs high.

In this context, the chances for implementing a concept like pedestrian place might seem low.

But Seattle has changed since 2010. As noted in the Introduction, housing prices and rents have risen beyond the limits of affordability for many. And the City has attempted to and in

some cases bravely responded to those needs: Seattle was a pioneer in establishing a 15-dollar minimum wage, and HALA created mechanisms that function within the existing framework to encourage the production of high-quality housing and livable neighborhoods (Durning, 2020; Zeitlin, 2019). There are also hints of a more substantial shift in the values terrain, as evidenced by the 2013 rise of Kshama Sawant to the Seattle City Council, the first election of a socialist to the position in a hundred and forty years (*Kshama Sawant*, n.d.). Councilmember Teresa Mosqueda's floating the notion of the city developing social housing is another call to look beyond current market-based solutions, no matter how creative, to problems that seem intractable despite significant amounts of attention, energy, and money dedicated to them. I am not the first to wonder why the city will adopt incredibly complex taxation and funding solutions to ensure the primacy of the private market in housing development instead of dedicating that same effort to investigating how to import more straightforward systems used in places like the Nordic countries or Vienna, where homelessness and to a lesser degree housing affordability are not issues. It's clearly not an issue of exertion or imagination—it's an issue of priorities and whose priorities matter (Durning, 2020; Trumm, 2018b).

The time may be ripe for Seattle to revisit the limits of its present approaches to resolving several critical issues, including housing, sustainable transportation modes, vehicular emissions, public health, and equity (Seattle Planning Commission, 2020). Could policy priorities be brought into closer alignment with the city's stated values and goals?

In *Good City Form*, Kevin Lynch distinguishes various classes of values related to city form: strong, wishful, weak, hidden, and neglected (Lynch, 1981, pp. 54–55). He wisely notes the conflict between publicly stated strong values—such as meeting the demand for housing, or reducing carbon emissions—and hidden ones, "often enough, the prime movers of policy," such

as political expediency and power. The notion of the city as an arena of such conflict is picked up by Donald Appleyard, who argues that there is no public interest, but a range of vying interests claiming to be public; he goes on to state "it should be public policy to achieve the greatest good for the greatest number." (D. Appleyard, 1987; Lynch, 1981, p. 340). This may not always be simple; and introducing housing in the right of way is one such case. But as Appleyard states, it falls on urban designers to use our ingenuity to design streets for maximum use and offer new visions of what streets can be (D. Appleyard, 1987). His co-author in the same volume, Anne Vernez Moudon, is blunter: "many streets of the future will need to be reclaimed for the public at large" (Vernez Moudon, 1987). Her stance is neither anti-car nor pessimistic, simply realistic and even optimistic: the (over)abundance of space presently dedicated to cars could be used for any variety of other activities.

The recognition that US cities do not use space effectively is shared by theorists like Larry Ford, who notes that "certain types of spaces may be greatly altered or even eliminated altogether as society changes" (Ford, 2000, p. 11). The message is echoed by Jan Gehl: "when in doubt, leave space out" (Gehl, 2011, p. 91). Neither was referring specifically to streets, but the idea is worth considering in the context of a framework as flexible and as neutral as the street grid, which Spiro Kostof argues "carries no inherent burden of its own" (Kostof, 1991, p. 204; Martin, 1972, p. 15). It is what we make it. Why not housing?

During a study-abroad lecture I attended in Copenhagen in 2016, the then-mayor of transportation recalled having once been asked by a foreign colleague: How can you afford to invest so much money in bicycling infrastructure? His response: *How can you afford not to? It is much more cost-efficient than investing in infrastructure for cars*. Are there strategies Seattle implements that serve those who benefit from the status quo over those who do not, regardless of

the cost? It is only natural for our vision to be blinkered to what has been done before, either here or elsewhere. But might it be worth shifting our lens enough to reconsider a cornerstone of urban American existence as fundamental as the perceived right to a regular grid of through-streets, if the rewards were great enough?

What would be the potential rewards of right-of-way infill? Pedestrian villages for those who value truly urban living, the old folks doing tai chi at the little square down the block, car-free neighborhoods, buses every five minutes, children cycling independently to school, families in the city, aromas wafting from the bakery downstairs, the delivery driver making eye contact with morning commuters as he navigates the shared street, a daycare playground where cars used to drive, mingling of household types, incomes, backgrounds—it's one eminently livable alternative among many sustainable fabrics that could coexist in a future Seattle.

For some Seattleites, it may seem like an unrealistic vision, yet another urban designer utopia.

For others, it may seem like an idea whose time has come.

Either way, here it is now for the seeing.

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APPENDIX A: ALIGNMENT WITH COMPREHENSIVE PLAN

A comparison of right-of-way infill to Seattle's current Comprehensive Plan suggests it aligns well with the city's growth, land use, transportation, housing, and energy strategies (Seattle Office of Planning & Community Development, 2019). Each relevant item is listed below and marked with one of five symbols: +, ++, and +++ indicate the potential pedestrian places have to realize the goal or policy; ! indicates a policy during to consider during design or implementation of pedestrian places; - indicates instances where pedestrian places are in potential conflict with the Comprehensive Plan. Neighborhood-specific alignment is presented after city-wide goals.

No.	***Description***	***Right-of-way Infill***
GROWTH STRATEGY: URBAN VILLAGE STRATEGY		
GS G1	Keep Seattle as a city of unique, vibrant, and livable urban neighborhoods, with concentrations of development where all residents can have access to employment, transit, and retail services that can meet their daily needs.	+
GS 1.2	Encourage investments and activities in urban centers and urban villages that will enable those areas to flourish as compact mixed-use neighborhoods designed to accommodate the majority of the city's new jobs and housing.	+
GS 1.5	**Encourage infill development in underused sites, particularly in urban centers and villages.**	+++
GS 1.6	Plan for development in urban centers and urban villages in ways that will **provide all Seattle households, particularly marginalized populations, with better access to services, transit, and educational and employment opportunities.**	++
GS 1.7	**Promote levels of density, mixed-uses, and transit improvements in urban centers and villages that will support walking, biking, and use of public transportation.**	+++
GS 1.8	Use zoning and other planning tools to shape the amount and pace of growth in ways that will limit displacement of marginalized populations, and that will accommodate and preserve community services, and culturally relevant institutions and businesses.	+
GS 1.9	**Distribute public investments to address current inequities**, recognizing the need to also serve growing communities.	++
GS 1.13	**Provide opportunities for marginalized populations to live and work in urban centers and urban villages throughout the city by allowing a variety of housing types and affordable rent levels in these places.**	+++
GROWTH STRATEGY: DISTRIBUTION OF GROWTH		
GS 2	**Accommodate a majority of the city's expected household growth in urban centers and urban villages** and a majority of employment growth in urban centers.	++
GS 2.3	**Accommodate a substantial portion of the city's growth in hub and residential**	+++

	urban villages	
GS 2.4	Work toward a distribution of growth that eliminates racial and social disparities by growing great neighborhoods throughout the city, with equitable access for all and with community stability that reduces the potential for displacement.	+
GROWTH STRATEGY: URBAN DESIGN		
GS G3	Maintain and enhance Seattle's unique character and sense of place, including its natural setting, history, **human-scaled development, and community identity,** as the city grows and changes.	++
GS 3.2	Design public facilities to emphasize physical and visual connections to Seattle's natural surroundings, with special attention to public vistas of shorelines, *the Olympic Mountains, and the Cascade Range.*	!
GS 3.3	Encourage design that recognizes natural systems and *integrates ecological functions such as stormwater filtration or retention with other infrastructure and development projects.*	!
GS 3.9	Preserve characteristics that contribute to communities' general identity, *such as block and lot patterns* and areas of historic, architectural, or social significance.	-
GS 3.10	Design public infrastructure and private building developments to *help visitors understand the existing block and street patterns* and to reinforce the walkability of neighborhoods.	!
GS 3.12	**Design streets with distinctive identities that are compatible with a citywide system that defines differences between types of streets and that allows for different design treatments to reflect a particular street's function, right-of-way width, and adjoining uses.**	+++
GS 3.13	*Preserve, strengthen, and, as opportunities permit, reconnect Seattle's street grid* as a means to knit together neighborhoods and to connect areas of the city.	-
GS 3.14	**Design urban villages to be walkable,** using approaches such as *clear street grids*, **pedestrian connections** between major activity centers, **incorporation of public open spaces,** and commercial buildings with retail and active uses that flank the sidewalk.	+-
GS 3.15	**Design multifamily zones to be appealing residential communities with high-quality housing and development standards** that *promote privacy* and **livability,** such as appropriately scaled landscaping, **street amenities, and, in appropriate locations, limited commercial uses targeted for the local population**.	+-
GS 3.16	Encourage designs for *buildings* and **public spaces** that *maximize use of natural light and provide protection from inclement weather*.	+-!
GS 3.17	Encourage the use of land, *rooftops*, and other spaces *to contribute to urban food production.*	!
GS 3.18	**Use varied building forms and heights** to enhance attractive and walkable neighborhoods.	++
GS 3.21	**Limit the negative impacts of tall buildings on public views and on sunlight in public streets** and parks by defining upper-level building setbacks and lot coverage or by using other techniques.	++
GS 3.22	*Encourage street widths and building heights that are in proportion with each other* by reducing setbacks from the street and keeping reasonable sidewalk widths for lower buildings.	!
GS 3.24	**Encourage innovative street design that expands the role of streets as public spaces and that could include use for markets, festivals, or street parks.**	+++
GS 3.25	**Promote well-defined outdoor spaces that can easily accommodate potential**	+++

	users and that are well integrated with adjoining buildings and spaces.	
GS 3.26	**Design public spaces that consider the nearby physical context and the needs of the community.**	+++
GS 3.27	*Use the principles of crime prevention* through environmental design for public spaces, where appropriate.	!
LAND USE: CITYWIDE LAND USE		
LU G1	Achieve a development pattern consistent with the urban village strategy, concentrating most new housing and employment in urban centers and villages, while also allowing some infill development compatible with the established context in areas outside centers and villages.	+
LU 1.3	Provide for a wide range in the scale and density permitted for multifamily residential, commercial, and mixed-use projects to generally achieve the following overall density and scale characteristics, consistent, at a minimum, with the guidelines in Growth Strategy Figure 1: • In urban centers, a moderate to high-density and scale of development • In hub urban villages, a moderate density and scale of development • In residential urban villages, a low to moderate density and scale of development • Consider higher densities and scales of development in areas near light rail stations	+
LAND USE: USES		
LU G2	Provide zoning and accompanying land use regulations that • allow a variety of housing types to accommodate housing choices for households of all types and income levels; • support a wide diversity of employment-generating activities to provide jobs for a diverse residential population, as well as a variety of services for residents and businesses; and • accommodate the full range of public services, institutions, and amenities needed to support a racially and economically diverse, sustainable urban community.	+
LAND USE: OFF-STREET PARKING		
LU 6.6	**Limit the off-street impacts on pedestrians and surrounding areas by restricting the number and size of automobile curb cuts, and by generally requiring alley access to parking when there is an accessible, surfaced alley.**	+++
LAND USE: MULITFAMILY RESIDENTIAL AREAS		
LU G8	**Allow a variety of housing types and densities that is suitable for a broad array of households and income levels, and that promotes walking and transit use near employment concentrations, residential services, and amenities.**	+++
LU 8.2	**Maintain a variety of multifamily zoning classifications that allow development at different densities, scales, and configurations and that are well suited to the variety of specific conditions and development goals in diverse areas of the city.**	+++
LU 8.3	**Provide housing for Seattleites at all income levels in development that is compatible with the desired neighborhood character and that contributes to high-quality, livable urban neighborhoods.**	+++

LU 8.5	Allow multifamily areas to be reclassified to compatible pedestrian-friendly commercial/mixed-use areas, when such action is consistent with the urban village strategy or approved in an adopted neighborhood plan.	+
LU 8.7	**Encourage multifamily developments with units that have direct access to residential amenities, such as ground-level open space, to increase their appeal for families with children.**	+++
LU 8.8	**Allow a variety of attached housing types to accommodate a wide diversity of households in multifamily zones.**	+++
LU 8.9	Establish lowrise multifamily zones to accommodate various housing choices in the low- to moderate-density range suitable for a broad array of households and incomes, including walk-up apartments, town houses, row houses, duplexes, triplexes, and cottage housing.	+
LU 8.12	**Emphasize residential character in the development standards for midrise multifamily zones and allow for scale and building types that differ from those in less intensive residential areas to accommodate a greater density of development to support nearby businesses.**	+++
LAND USE: COMMERCIAL/MIXED USE AREAS		
LU 9	Create and maintain successful commercial/mixed-use areas that provide a focus for the surrounding neighborhood and that encourage new businesses, provide stability and expansion opportunities for existing businesses, and promote neighborhood vitality, while also accommodating residential development in livable environments.	+
LU 9.6	**Encourage housing in mixed-use developments in pedestrian-oriented commercial/ mixed-use areas** to provide additional opportunities for residents to live in neighborhoods where they can walk to transit, services, and employment.	++
LU 9.12	**Allow street-level residential uses outside pedestrian-oriented areas** and apply standards that give *ground-floor tenants privacy* and to create visual interest along the street front.	++!
LU 9.17	Use a development pattern, mix of uses, and intensity of activity generally oriented to pedestrian and transit use in pedestrian-oriented commercial/mixed-use zones to achieve • **a compatible blend of commercial and residential uses;** • strong, healthy business districts that reinforce a sense of place while providing essential goods, services, and livelihoods for Seattleites, especially residents who are within walking distance of these places; • mixes of commercial activity that are compatible with development in adjacent areas; • **residential development that is both appealing to residents** and compatible with the desired commercial function of the area; and • **an active, attractive, accessible, walkable pedestrian environment** with continuous commercial street frontages.	++
LU 9.18	Apply pedestrian-oriented commercial zones in places where residential uses are in close proximity and where the allowed development intensity conforms in size and scale to the community it serves.	
TRANSPORTATION: MAKING THE BEST USE OF THE STREETS WE HAVE		
TG 2	Allocate space on Seattle's streets to safely and efficiently connect and move people and goods to their destinations while **creating inviting spaces within the rights-of-**	++

	way.	
T 2.1	**Devote space in the street right-of-way to accommodate multiple functions of mobility, access for** commerce and **people, activation,** landscaping, and storage of vehicles.	++
T 2.2	**Ensure that the street network accommodates multiple travel modes,** including transit, freight movement, **pedestrians, people with disabilities, bicycles,** general purpose traffic, and shared transportation options.	++
T 2.3	*Consider safety concerns,* modal master plans, *and adjacent land uses when prioritizing functions in the pedestrian,* travelway, and flex *zones of the right-of-way*.	!
T 2.4	Use pedestrian design guidance in the Right-of-Way Improvements Manual and policy guidance from the modal master plans to determine adequacy of the pedestrian realm, before allocating space to the flex zone or travelway. Within the pedestrian realm, prioritize space to address safety concerns, network connectivity, and activation.	+
T 2.8	Employ the following tactics to resolve potential conflicts for space in the right-of-way: • Implement transportation and parking-demand management strategies to **encourage more efficient use of the existing right of way** • **Allocate needed functions across a corridor composed of several streets or alleys, if all functions cannot fit in a single street** • **Share space between travel modes and uses where safe and where possible over the course of the day** • **Prioritize assignment of space to shared and shorter-duration uses** • **Encourage off-street accommodation for nonmobility uses, including parking** and transit layover	++
T 2.14	**Maintain, preserve, and enhance the City's alleys as a valuable network for public** spaces and **access, loading and unloading for freight, and utility operations.**	++
T 2.15	**Create vibrant public spaces in and near the right-of-way that foster social interaction, promote access to walking, bicycling, and transit options, and enhance the public realm.**	+++
TRANSPORTATION: TRANSPORTATION OPTONS		
TG 3	Meet people's mobility needs by providing equitable access to, and encouraging use of, multiple transportation options.	+
T 3.3	Consider the income, age, ability, and vehicle-ownership patterns of populations throughout the city in developing transportation systems and facilities so that all residents, especially those most in need, have access to a wide range of affordable travel options.	+
T 3.10	**Provide high-quality pedestrian,** bicycle, and bus transit **access to high-capacity transit stations, in order to support transit ridership and reduce single-occupant vehicle trips.**	++
T 3.11	Develop and maintain bicycle and pedestrian facilities, including public stairways, that enhance the predictability and safety of all users of the street and that connect to a wide range of key destinations throughout the city.	+
T 3.13	**Prioritize** bicycle and **pedestrian investments on the basis of increasing use,**	++

	safety, connectivity, equity, health, livability, and opportunities to leverage funding.	
TRANSPORTATION: TRANSPORTATION EFFECTS ON THE ENVIRONMENT		
TG 4	**Promote healthy communities by providing a transportation system that protects and improves Seattle's environmental quality.**	+++
TG 4.1	**Design and operate streets to promote green infrastructure, new technologies, and active transportation modes while addressing safety, accessibility, and aesthetics.**	+++
TG 4.2	*Enhance the public street tree canopy and landscaping in the street right-of-way.*	!
TG 4.3	**Reduce drive-alone vehicle trips, vehicle dependence, and vehicle-miles traveled in order to help meet the City's greenhouse gas reduction targets and reduce and mitigate air, water, and noise pollution.**	+++
TRANSPORTATION: SAFETY		
TG 6	**Provide and maintain a safe transportation system that protects all travelers, particularly the most vulnerable users.**	+++
T 6.2	**Enhance community safety and livability** through measures such as **reduced speed limits,** lane rechannelization, and crossing improvements.	++
T 6.3	**Consider lowering speed limits on residential streets** and arterials as a way to reduce collision rates and improve safety.	++
T 6.4	*Minimize right-of-way conflicts to safely accommodate all travelers.*	-
T 6.6	*Invest in education measures that increase mutual awareness among motorists, pedestrians, and bicyclists.*	!
T 6.9	**Use complete street principles, traffic-calming, and neighborhood traffic control strategies to promote safe neighborhood streets by discouraging cut-through traffic.**	+++
TRANSPORTATION: FUNDING		
T 10.5	**Make strategic investment decisions consistent with City plans and policies.**	+++
T 10.6	**Prioritize investment by considering life-cycle costs, safety, environmental benefits, reduction of greenhouse gas emissions, and public health benefits. Race and social equity should be a key factor in selecting transportation investments.**	+++
T 10.9	Develop prioritized lists of projects, consistent with City policies, and actively pursue funds to implement those projects.	+
T 10.11	**Explore innovative means of reducing maintenance costs such as converting right- of-way into other uses when appropriate.**	+++
HOUSING: EQUAL ACCESS TO HOUSING		
H G1	**Provide fair and equal access to housing for all people in Seattle.**	+++
H 1.2	**Promote a diverse and inclusive city through housing programs that serve lower- income households.**	+++
H 1.3	**Work to overcome historical patterns of segregation, promote fair housing choices, and foster inclusive communities that are free from discrimination through actions,** such as affirmative marketing and fair housing education and enforcement.	++
H 1.6	*Work to decrease disparities in homeownership by race and ethnicity.*	!
H 1.7	**Support the development and preservation of affordable housing in areas with a high risk of displacement through tools and actions such as** land banking, public or non-profit acquisition of affordable buildings, and **new affordable and mixed-income development.**	++
HOUSING: HOUSING SUPPLY		

H G 2	**Help meet current and projected regional housing needs of all economic and demographic groups by increasing Seattle's housing supply.**	+++
H 2.1	**Allow and promote innovative and nontraditional housing design and construction types to accommodate residential growth.**	+++
H 2.2	**Identify publicly owned sites suitable for housing and prioritize use of sites, where appropriate, for rent/income-restricted housing for lower-income households.**	+++
H 2.4	**Encourage use of vacant or underdeveloped land for housing and mixed-use development,** and promote turning vacant housing back into safe places to live.	++
HOUSING: DIVERSITY OF HOUSING		
HG 3	**Achieve a mix of housing types that provide opportunity and choice throughout Seattle for people of various ages, races, ethnicities, and cultural backgrounds and for a variety of household sizes, types, and incomes.**	+++
H 3.1	**Identify and implement strategies, including development standards and design guidelines reflecting unique characteristics of each neighborhood, to accommodate an array of housing designs that meet the needs of Seattle's varied households.**	+++
H 3.2	*Allow and encourage housing for older adults and people with disabilities, including designs that allow for independent living, various degrees of assisted living, and/ or skilled nursing care, in or near urban centers and urban villages where there is access to health care and other services and amenities.*	!
H 3.3	**Encourage the development of family-sized housing affordable for households with a broad range of incomes in areas with access to amenities and services.**	+++
H 3.4	**Promote use of customizable modular designs and other flexible housing concepts to allow for households' changing needs, including in areas zoned for single-family use.**	+++
H 3.5	**Allow additional housing types in areas that are currently zoned for single-family development inside urban villages; respect general height and bulk development limits currently allowed while giving households access to transit hubs and the diversity of goods and services that those areas provide.**	+++
HOUSING: HOUSING CONSTRUCTION AND DESIGN		
H 4.1	*Provide programs, regulations, and enforcement to help ensure that all housing is healthy and safe and meets basic housing-maintenance requirements.*	!
H 4.2	**Encourage innovation in residential design, construction, and technology,** and implement regulations to conserve water, energy, and materials; reduce greenhouse gas emissions; and otherwise limit environmental and health impacts.	++
H 4.4	*Increase housing opportunities for older adults and people with disabilities by promoting universal design features for new and renovated housing.*	!
H 4.6	*Promote access to public decision-making about housing for all Seattleites.*	!
H 4.7	Promote housing for all Seattleites that is safe and free from environmental and health hazards.	+
H 4.8	**Explore ways to reduce housing development costs.**	+++
HOUSING: HOUSING AFFORDABILITY		
HG 5	**Make it possible for households of all income levels to live affordably in Seattle, and reduce over time the unmet housing needs of lower-income households in Seattle.**	+++
H 5.1	*Pursue public and private funding sources for housing preservation and production to provide housing opportunities for lower-wage workers, people with special needs,*	!

	and those who are homeless or at risk of being homeless.	
H 5.2	**Expand programs that** preserve or **produce affordable housing, preferably long term, for lower-income households, and continue to prioritize efforts that address the needs of Seattle's extremely low-income households.**	++
H 5.3	**Promote housing affordable to lower-income households in locations that help increase access to education, employment, and social opportunities, while supporting a more inclusive city and reducing displacement from Seattle neighborhoods or from the city as a whole.**	+++
H 5.7	**Consider that access to frequent transit may lower the combined housing and transportation costs for households when locating housing for lower-income households.**	+++
H 5.16	*Consider implementing a broad array of affordable housing strategies in connection with new development, including but not limited to development regulations, inclusionary zoning, incentives, property tax exemptions, and permit fee reductions***.**	**!**
H 5.20	**Implement strategies and programs to help ensure a range of housing opportunities affordable for Seattle's workforce.**	+++
H 5.22	*Continue to promote best practices in use of green building materials, sustainability, and resiliency in policies for rent/income-restricted housing.*	**!**
H 5.24	*Support financially sustainable strategies to provide homeownership opportunities for low-, moderate-, and middle-income households, especially for families with children, in part to enable these households to have a path toward wealth accumulation.*	**!**
H 5.25	**Work to mitigate the potential demolition of housing units that are affordable to low-income households without subsidies.**	+++
H 5.26	*Explore implementation of models that could provide opportunities for affordable homeownership, such as* community land-trusts, down payment assistance, *mixed-income housing requirements and limited equity housing co-ops.*	**!**
UTILITIES: SERVICE DELIVERY		
UG 1	*Provide safe, reliable, and affordable utility services that are consistent with the City's aims of environmental stewardship, race and social equity, economic opportunity, and the protection of public health.*	!
U 1.2	*Coordinate planning, programs, and projects for City utilities with those of other City departments to lower costs, improve outcomes, and limit construction and operational impacts.*	!
U 1.4	*Support innovative approaches to service delivery, such as the development of distributed systems or joint ventures by City and non-City utilities, where they could further overall goals for utilities.*	!
UTILITIES: COORDINATION IN THE RIGHT OF WAY		
UG 4	*Coordinate right-of-way activities among departments to meet transmission, distribution, and conveyance goals; to minimize the costs of infrastructure investment and maintenance; to manage stormwater; and to support other uses such as transportation, trees, and public space.*	!
U 4.1	*Engage departments in early coordination and collaboration on transportation and utility projects in the right-of-way to avoid space conflicts, identify joint project opportunities, and minimize life-cycle costs across all City departments.*	!
U 4.2	*Coordinate construction to limit cost and public inconvenience caused by road and right-of-way disruption.*	!
ECONOMIC DEVELOPMENT: COMMERICIAL DISTRICTS		
ED G 1	Encourage vibrant commercial districts in urban centers and villages.	+
ED 1.7	Seek new tools to support the creation of spaces attractive and affordable to	+

	businesses threatened with displacement so that small locally-owned businesses are able to remain in their neighborhoods.	
ECONOMIC DEVELOPMENT: ENTREPRENEURIAL AND SMALL-BUSINESS DEVELOPMENT		
ED 5.4	Establish incentives to encourage property owners and building owners to offer affordable spaces for start-ups and small businesses.	+
ENVIRONMENT: LAND		
EN 1.2	*Strive to increase citywide tree canopy coverage to 30 percent by 2037 and to 40 percent over time.*	!
EN 1.3	*Use trees, vegetation, green stormwater infrastructure, amended soil, green roofs, and other low-impact development features to meet drainage needs and reduce the impacts of development.*	!
EN 1.4	*Increase the amount of permeable surface by reducing hardscape surfaces where possible and maximizing the use of permeable paving elsewhere.*	!
ENVIRONMENT: LAND		
EN G 3	Reduce Seattle's greenhouse gas emissions by 58 percent from 2008 levels by 2030, and become carbon neutral by 2050.	+
EN 3.1	Expand transit, walking, bicycling, and shared-transportation infrastructure and services to provide safe, affordable and effective options for getting around that produce low or zero emissions, particularly for lower-income households and communities of color.	+
EN 3.2	**Implement the urban village strategy with the goal of meeting the growing demand for conveniently located homes and businesses in pedestrian-friendly neighborhoods where residents can walk to a variety of recreation and service offerings, in order to increase the number of trips that do not require automobile use and increase access to opportunity for lower-income households and communities of color.**	+++
EN 3.3	**Implement innovative policies,** such as road pricing and parking management, **that better reflect the true cost of driving and therefore lead to less automobile use,** while employing strategies that mitigate impacts on low-income residents.	++
PARKS AND OPEN SPACE: ACCESS TO OPEN SPACE		
P 1.2	**Provide a variety of** parks and **open space to serve the city's growing population** consistent with the priorities and level-of-service standards identified in the City's Parks and Open Space Plan.	++
P 1.10	**Create** healthy **places for children and adults to play, as well as areas for more passive strolling, viewing, and picnicking.**	++
P 1.12	**Design open spaces that** protect the natural environment and **provide light, air, and visual relief within the built environment.**	++
P 1.13	**Make the most of the limited available land by developing** parks and **open spaces so that they can accommodate a variety of active and passive recreational uses.**	++
P 1.14	Provide for access by transit, bicycle, and foot when siting and designing new park facilities or improving existing ones.	+
P 1.17	**Create innovative opportunities to use existing public land, especially in the right of way, for open space and recreation, including street plazas, pavement to parks, parklets, lidding of reservoirs and highways, and community gardens.**	+++
CAPITOL HILL URBAN CENTER (NORTH CAPITOL HILL SITE)		
CH P-4	Strengthen and enhance the character of the major residential neighborhoods and encourage a greater range of housing choices affordable to a broad spectrum of the entire community.	

CH G-2	An enhanced neighborhood with diverse land uses, a mixture of housing types including single-family and dense multifamily, and vibrant commercial districts.	
CH-P5	Encourage the preservation of the neighborhood's architectural quality, historic character, and pedestrian scale.	
CH-P6	Support integration of transit-oriented development with local transportation and open space improvements.	
CH-P8	Enhance and protect the character of the diverse residential districts.	
CH-G3	A community with a full range of housing types from single-family homes to multifamily contributing to a diverse, densely populated neighborhood.	
CH-P12	Seek tools to retain and increase housing affordable to households with incomes at and below the median income.	
CH-P13	Strive to preserve and provide a variety of housing types, including some single-family and other small-scale dwellings.	
CH-P14	Encourage a range of homeownership options for households with a broad spectrum of incomes.	
CH-P15	Encourage the preservation of existing housing structures and the maintenance of properties.	
CH-P16	Encourage the development of high-quality new housing that blends with historic housing.	
CH-P19	Seek opportunities for the development of new parks and open spaces to adequately serve all Capitol Hill residents, including children, youth, and seniors.	
CH-P20	Encourage the development of open spaces complementary to commercial corridors and Sound Transit stations.	
CH-P26	Support a variety of transportation modes that provide alternatives to using a car.	
CH-P27	Encourage traffic-calming measures in residential neighborhoods.	
CH-P28	Discourage commuter and employee parking in the neighborhood.	
PIKE / PINE (SOUTH CAPITOL HILL SITE)		
P-P1	Strengthen the neighborhood's existing mixed-use character and identity by encouraging additional affordable and market-rate housing, exploring ways of supporting and promoting the independent, locally owned businesses, seeking increased opportunities for art-related facilities and activities, and encouraging a pedestrian-oriented environment.	
P-PG3	A neighborhood that welcomes increased residential densities, with additional affordable and market-rate housing, and proper infrastructure to support the densities.	
P-P8	Encourage diversity of housing while seeking to maintain existing low-income housing.	
P-P12	Promote the development of mixed-use structures in general commercial areas of the Pike/Pine neighborhood, especially compatible mixed-uses such as artist live– work space.	
P-PG5	A neighborhood with a distinct identity that provides a distinct and active pedestrian environment and a balance of basic amenities that serves a dense urban center village.	
P-P18	Encourage the attraction and passage of pedestrians to and from Downtown and adjacent neighborhoods by seeking to provide improved environments along key pedestrian streets.	
P-P21	Seek to enhance sidewalks and alleys to make a better overall environment for pedestrians as well as retail activities.	
P-P22	Seek to enhance available open space and seek additional opportunities for pocket	

	parks, community garden, children's play spaces, and other recreational activities.	
P-P24	Seek opportunities to enhance parking and traffic-calming opportunities on primarily residential cross streets, along Pike and Pine.	
P-P25	Encourage the use of traffic-calming measures to enhance pedestrian and bicycle travel, slow vehicular traffic, and direct through-traffic away from non-arterial streets.	
P-P26	Support the designation of key pedestrian linkages as green streets.	
P-P27	Seek to provide safer and easier crossings for pedestrians throughout the neighborhood.	
P-P28	Promote the improvement of primary sidewalk systems and pedestrian connections.	
P-P37	Promote the reduction of car ownership by residents to minimize parking demand.	
NORTH BEACON HILL (BEACON HILL SITE)		
NBH-G1	A well-defined mixed-use residential neighborhood where the lives of Beacon Hill residents are enhanced, in part, through affordable and diverse housing options available throughout the neighborhood.	
NBH-G2	A vibrant mix of housing close to the light rail station.	
NBH-P6	Encourage the development of housing close to the light rail station.	
NBH-P7	Capture the opportunity created by light rail to support affordable housing development close to the light rail station by including homes appropriate for different family sizes, so that residents are able to stay in the neighborhood, even as the housing market changes over time.	
NBH-P8	Seek to maintain the character of low-density multifamily areas in the northern portion of the urban village while providing opportunities for additional mixed-use residential development in the retail core in the southern portion of the urban village.	
NBH-P9	Allow alternative housing types, such as cottage housing, in single-family zones to support affordable choices while preserving the single-family character.	
NBH-G5	Higher-density development surrounds the light rail station and is responsive to the neighborhood context at a variety of scales, from single-family houses to multistory buildings.	
NBH-P18	Encourage additional eyes on the street over the course of the day and evening through community programs and festivals, the design of new developments, and other means.	
NBH-G9	An urban village that is a pleasant place to walk with good access to alternative transportation, where lively, friendly, and safe streetscapes encourage pedestrians and bicyclists, and where roadways are seen as public access for walkers, bicycles, and buses as well as cars.	
NBH-P21	Provide for improved and safe pedestrian access to the North Beacon Hill Library through the design of surrounding streets and walkways.	
NBH-P25	Recognize the existing residential character of many streets within the urban village and support mechanisms to protect these streets from increased traffic.	
NBH-P26	Strive to implement neighborhood traffic-calming control devices and strategies that protect local residential streets from through-traffic, short-cutting, high volumes, and high-speed traffic as growth occurs within the urban village.	
NBH-G14	An urban village that provides open space amenities and utilizes design guidelines for future development that benefits the neighborhood and contributes to a livable environment.	
NBH-G15	A range of well-maintained parks and community open spaces in the urban village core with programs that accommodate a diversity of uses and users.	

NBH-P33	Recognize that public streets are part of the open space network within the urban village and strive to improve the physical character and quality of the key pedestrian streets.	
NBH-P34	Consider the development of pedestrian and bicycle trails through publicly owned greenbelts throughout North Beacon Hill.	
NBH-P37	Seek to create small pocket parks throughout the urban village, either through City acquisition or private development.	
NPH-P39	Seek to preserve scenic views from parks located within the neighborhood.	

APPENDIX B: PATTERNS THAT INSPIRE

The conceptual building blocks and design rules for the interventions were adopted or adapted from several sources, including some general patterns taken from A Pattern Language by Christopher Alexander et al. (1977). These patterns are listed below.

Overall Patterns Adapted from *A Pattern Language* (Alexander et al., 1977)

Design dimension	#	**Pattern name** *** = XXX** **** = XXX**	**Description**
Social life	8	Mosaic of subcultures**	Define distinct areas where different subcultures thrive
	19	Web of shopping*	Serve communities with points of local shopping rather than linear clustering
	26	Life cycle*	Vibrancy, exposure, mental and social health, equity
	35	Household mix*	Mix of units for all household sizes
	57	Children in the city	Dedicated "children's paths" and safe places
	85	Shopfront schools	New educational model
Legibility	13	Subculture boundary*	Don't believe in 200 feet wide, major arterial is enough
	14	Identifiable neighborhood**	300 yards across, size of a neighborhood ranges from 1-7 blocks, with 2-3 common, protection from heavy traffic
	15	Neighborhood boundary*	Limit access to neighborhoods, clear gateways and limited through-traffic
	53	Main gateways**	Implement physical gateways as boundary markers
	120	Paths and goals*	String goals along a straight or slightly curving path
Transportation	16	Web of public transportation*	Interchanges critical, make private transportation obsolete
	49	Looped local roads**	Structure local roads so impossible for through traffic to use
	52	Network of paths and cars**	Place pedestrian paths at right angles bisecting car paths, phase them in
	54	Road crossing	Knuckle road crossings
Parking	22	Nine percent parking**	Street parking probably came close; rely on surrounding streets? Some underground? Or public spots in alleys?
	97	Shielded parking*	Parking structures/lots concealed, entrances visible
	103	Small parking lots*	Infrequent shielded lots
Scale	21	Four-story limit**	Density without canyons, more equitable and sustainable, eyes on the street
Organization	28	Eccentric nucleus*	Informs service and residential patterns, horseshoe with density at edges, side nearest major center important
	30	Activity nodes**	See Gehl, all paths lead to a small number of small squares (perhaps 45x60 ft), activity nodes 300 yds/1000 ft apart
	31	Promenade**	See and be seen, link activity nodes?
Safety	33	Night life*	Public safety, 24/7 activity, perhaps deliveries at night
Privacy	36	Degrees of publicness**	Critical in such close quarters, offering options for all

			tastes, will require exceptional design
	59	Quiet backs*	Narrow green building backs, full sun for rest
	111	Half-hidden garden	The narrower pedestrian path, terraces and/or rooftop
Housing	37	House cluster**	Adapted, so housing units are bunched in small groups, easy access to common space, ownership
	38	Row houses*	Shallow rather than deep, 20x30' measurements apply here
	39	Housing hill	On sloped areas, not towers, housing mirrors slope?
	48	Housing in between**	Mixed-use pattern for maintenance and vitality, with a blend of businesses and housing in close proximity
	95	Building complex**	Ensure even large buildings are not monolithic
	107	Wings of light**	Ensure residential wings are no more than 25 feet wide
	108	Connected buildings*	Avoid gaps between buildings
	109	Long thin buildings*	String rooms out
	112	Entrance transition**	Mark transition between street and front door
Green	51	Green streets**	Paving stones and grass instead of traditional asphalt
	118	Roof garden*	Make roofs usable as rooftop gardens
Public space	61	Small public squares**	Frequent squares as public living rooms but keep them small: max 70 feet across x whatever length
	67	Common land**	25 percent of land near house clusters to shared public land
	106	Positive outdoor space**	Make outdoor spaces between buildings positive
	114	Hierarchy of open space*	Create public spaces so there's a "back" and a primary view
	115	Courtyards which live**	Sheltered courtyards with natural paths crossing them
	119	Arcades**	Arcade gestures connect buildings, minor shelter for peds
	121	Path shape*	Bulge in the middle of a path: place, not just path
	122	Building fronts*	No setbacks
	124	Activity pockets**	Squares need to be activated at the edges
	125	Stair seats*	Incorporate changes in level for ped seating
Streets	88	Street café**	Local cafés on busy corners
	100	Pedestrian street**	Pedestrian streets for social interaction in the public realm
	125	Stair streets	Sitting stairs incorporated into pedestrian hills
Services	87	Individually owned shops**	Encourage owner-owned and -managed businesses
	89	Corner grocery*	Bodega every 200-800 yards
Priorities	104	Site repair**	Start development from sites most in need of healing
	105	South facing outdoors**	Orient buildings for maximum sun
	9	Scattered work**	Reintroduce mixed zoning, live-work
	41	Work community	Live-work, small businesses, coworking
	11	Local transport areas**	Combine with mosaic of subcultures – ¼ mile across, all trips inside this taken by bike, foot, etc
	64	Pools and streams*	Natural water features for psychological benefit
	68	Connected play*	Safe place for children to play
	79	Your own home**	Encourage "ownership," even in rentals

APPENDIX C: PEDESTRIAN, VEHICLE, AND PARKING COUNTS

In order to gauge the impact of shutting down right of way to motor vehicles, a series of vehicle/pedestrian counts were conducted at 1-3 intersections at each site; these are complemented by counts of parking spaces in the site and occupancy rates of those parking spaces. The intersection counts were conducted in ten-minute stretches for each intersection at three distinct times of day: rush hour (either morning or evening), midday, and nighttime. The aim was to capture variation in street usage throughout the 24-hour cycle. The figures presented can be considered indicative, as they were collected only once for each time category for each site and do not take into account variation due to weather, season, or events in the vicinity. Nevertheless, they provide a valuable snapshot of how the right of way is used at various times of day, what intersections see the most activity, and most of all, what sort of displacement is likely to result due to the proposed vacation of the right of way. Not surprisingly, intersection-traverse counts were generally highest during rush hour and lowest late at night for both vehicles and pedestrians at all sites. The parking counts for both Capitol Hill sites indicate that the current street parking spaces are near full capacity during the day and at full capacity at night. The Beacon Hill site, in contrast, has a glut of unused parking spaces, with parking place occupancy ranging from approximately 30–50%, depending on the time of day. Furthermore, most of the homes in this area also have garages accessible from the alleys, which at least theoretically could be used as space to offset any reductions in right of way. One common pattern of note in Beacon Hill was not parking on the street at night, but in the parking strip or the stretch of driveway that crosses the parking strip. (Zoom in!)

Circulation and Parking Counts – Capitol Hill North

ERSECTION COUNTS

ersection	Time	Personal vehicles	*Of which non-through traffic*	Other Vehicles		Total vehicles	Bicycles	Pedestrians
	7:50-8:00 AM	58	1	4	*Bus, Police, Moving, Construction*	62	6	28
	7:35-7:45 AM	27	4	2	*Motorcycle, Construction*	29	1	41
	8:10-8:20 AM	32	2	1	*Taxi*	33	1	26

KING COUNTS

	CAPACITY: # SPACES BY TYPE							OCCUPIED: # SPACES BY TYPE							UNUSED CAPACITY: # SPACES	
ck #	Parking (2h/Zoned)	Load (30 min)	Load (3 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total available	Parking (2h/Zoned)	Load (30 min)	Load (3	Comm ercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)
1	10						10	9						9	1	1
2	0						0	0						0	0	0
3	10						10	10						10	0	0
4	6	1		2			9	6	1		1			8	1	0
5	16	2			1		19	13						13	6	3
6	10						10	10						10	0	0
7	10						10	10						10	0	0
8	15	2					17	14	1					15	2	1
9	5						5	4						4	1	1
10	3						3	3						3	0	0
11	0						0	0						0	0	0
12	11	1			1		13	9	1			1		11	2	2
13	4	1			1		6	4	1			1		6	0	0
14	0						0	0						0	0	0
15	16	1			2		19	16						16	3	0
16*	7	1		1			9	1						1	8	6
17	0						0	0						0	0	0
18	0					15	15	0					10	10	5	0
al	123	9	0	3	5	15	155	109	4	0	1	2		126	29	14

id parking 8 AM-10 PM

MIDDAY, 12:40-1:40 PM, Wednesday, 25-Apr-18, Sunny, 70 F

INTERSECTION COUNTS

Intersection	Time	Personal Vehicles	*Of which non-through traffic*	Other Vehicles		Total vehicles	Bicycles	Pedestrians
	12:40-12:50							
A	PM	41	1	1	*Delivery*	42	2	21
B	12:55-1:05 PM	23	1	3	*Motorcycle, Delivery, Utility*	26	2	24
C	1:30-1:40 PM	37	2	5	*Garbage, Construction, Delivery, Utility, Moving*	42	5	46

PARKING COUNTS

	CAPACITY: # SPACES BY TYPE							OCCUPIED: # SPACES BY TYPE							UNUSED CAPACITY: # SPACES	
Block #	Parking (2h/Zoned)	Load (30 min)	Load (3 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total spaces	Parking (2h/Zoned)	Load (30 min)	Load (3	Comm ercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)
1	10						10	9						9	1	1
2	0						0	0						0	0	0
3	10						10	9						9	1	1
4	6	1		2			9	4			2			6	3	2
5	16	2			1		19	13						13	6	3
6	10						10	10						10	0	0
7	10						10	9						9	1	1
8	15	2					17	11	2					13	4	4
9	5						5	5						5	0	0
10	3						3	3						3	0	0
11	0						0	0						0	0	0
12	11	1			1		13	9	1					10	3	2
13	4	1			1		6	3	1					4	2	1
14	0						0	0						0	0	0
15	16	1			2		19	16						16	3	0
16*	7	1		1			9	5	1		1			7	2	2
17	0						0	0						0	0	0
18	0					15	15	0	2				11	13	2	0
Total	123	9	0	3	5	15	155	106	7	0	3	0		127	28	17

* Paid parking 8 AM-10 PM

NIGHTTIME, 9:30-10:15 PM, Thursday, 26-Apr-18, Clear, 65 F

INTERSECTION COUNTS

Intersection	Time	Personal Vehicles	*Of which non-through traffic*	Other Vehicles		Total vehicles	Bicycles	Pedestrians
A	9:50-10:00 PM	46	*0*	1	*Delivery*	47	1	27
B	9:35-9:45 PM	31	*1*	1	*Motorcycle*	32	1	47
C	10:05-10:15 PM	22	*2*	1	*Combined bicycle/mobile home*	23	1	27

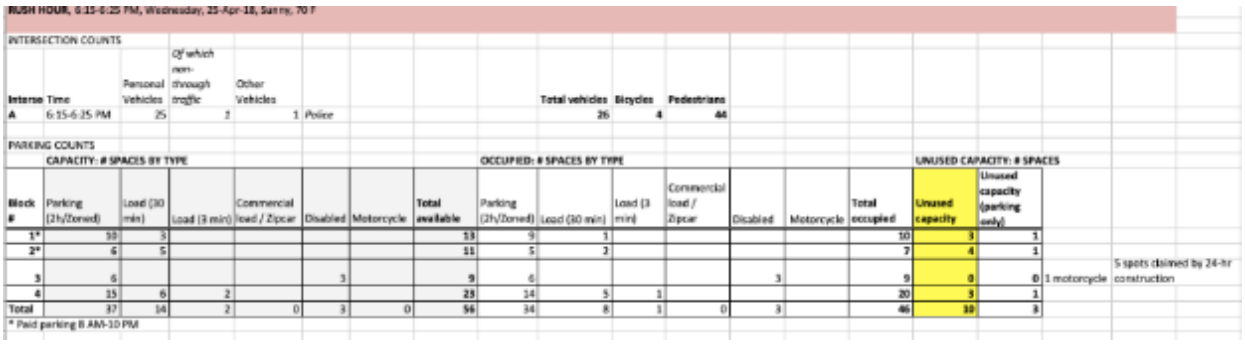
PARKING COUNTS

	CAPACITY: # SPACES BY TYPE							OCCUPIED: # SPACES BY TYPE						UNUSED CAPACITY: # SPACES		
Block #	Parking (2h/Zoned)	Load (30 min)	Load (3 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total spaces	Parking (2h/Zoned)	Load (30 min)	Load (3	Commercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)	
1	10						10	10						10	0	0	
2	0						0	0						0	0	0	
3	10						10	12						12	-2	-2	
4	6	1		2			9	5	1		1			7	2	1	
5	16	2			1		19	16	1			1		18	1	0	1 motorcycle
6	10						10	11						11	-1	-1	
7	10						10	10						10	0	0	
8	15	2					17	18	1					19	-2	-3	3 motorcycles
9	5						5	3						3	2	2	
10	3						3	3						3	0	0	
11	0						0	0						0	0	0	
12	11	1			1		13	9				1		10	3	2	
13	4	1			1		6	3	1					4	2	1	
14	0						0	0						0	0	0	
15	16	1			2		19	19	1	1				21	-2	-3	
16*	7	1		1			9	4			1			5	4	3	
17	0						0	0						0	0	0	
18	0						15	15	0				13	13	2	0	
Total	123	9	0	3	5	15	155	123	5	1	2	2		146	9	0	

* Paid parking 8 AM-10 PM

Capitol Hill North Intersection and Block Numbers

Circulation and Parking Counts – Capitol Hill South



RUSH HOUR, 6:15-6:25 PM, Wednesday, 25-Apr-18, Sunny, 70 F

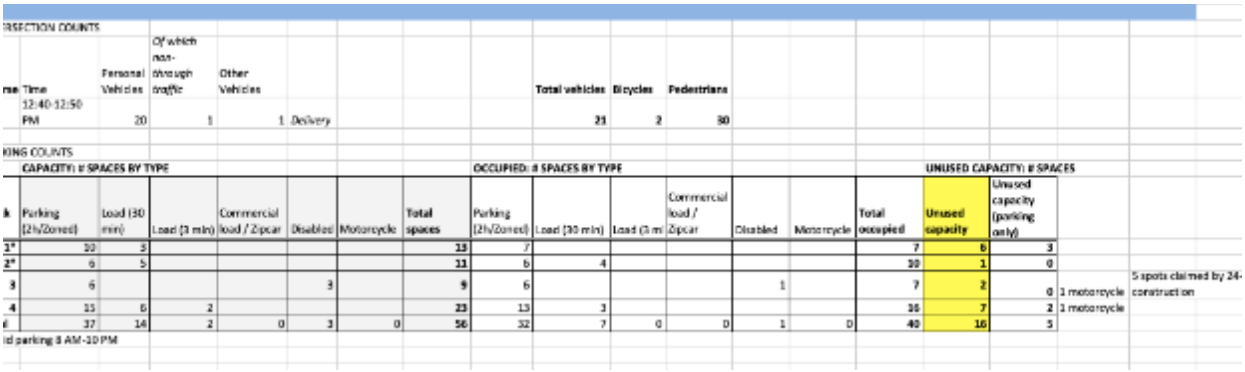
INTERSECTION COUNTS

Intersection	Time	Personal Vehicles	Of which non-through traffic	Other Vehicles		Total vehicles	Bicycles	Pedestrians
A	6:15-6:25 PM	25	1	1	Police	26	4	44

PARKING COUNTS

	CAPACITY: # SPACES BY TYPE								OCCUPIED: # SPACES BY TYPE							UNUSED CAPACITY: # SPACES			
Block #	Parking (2h/Zoned)	Load (30 min)	Load (3 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total available	Parking (2h/Zoned)	Load (30 min)	Load (3 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)		
1*	10	5					15	9	1					10	5	1		
2*	6	5					11	5	2					7	4	1		
3	6				3		9	6				3		9	0	0	1 motorcycle	5 spots claimed by 24-hr construction
4	15	6	2				23	14	5	1				20	3	1		
Total	37	16	2	0	3	0	56	34	8	1	0	3		46	10	3		

* Paid parking 8 AM-10 PM



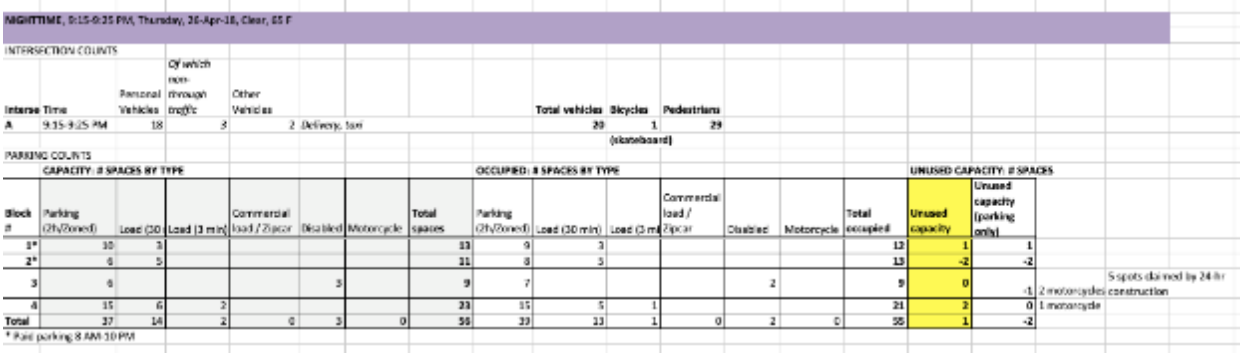
RSECTION COUNTS

ne	Time	Personal Vehicles	Of which non-through traffic	Other Vehicles		Total vehicles	Bicycles	Pedestrians
	12:40-12:50 PM	20	1	1	Delivery	21	2	30

KING COUNTS

	CAPACITY: # SPACES BY TYPE							OCCUPIED: # SPACES BY TYPE							UNUSED CAPACITY: # SPACES			
k	Parking (2h/Zoned)	Load (30 min)	Load (3 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total spaces	Parking (2h/Zoned)	Load (30 min)	Load (3 mi	Commercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)		
1*	10	5					15	7						7	8	3		
2*	6	5					11	6	4					10	1	0		
3	6				3		9	6				1		7	2	0	1 motorcycle	5 spots claimed by 24-hr construction
4	15	6	2				23	13	3					16	7	2	1 motorcycle	
	37	14	2	0	3	0	56	32	7	0	0	1	0	40	16	5		

id parking 8 AM-10 PM



NIGHTTIME, 9:15-9:25 PM, Thursday, 26-Apr-18, Clear, 65 F

INTERSECTION COUNTS

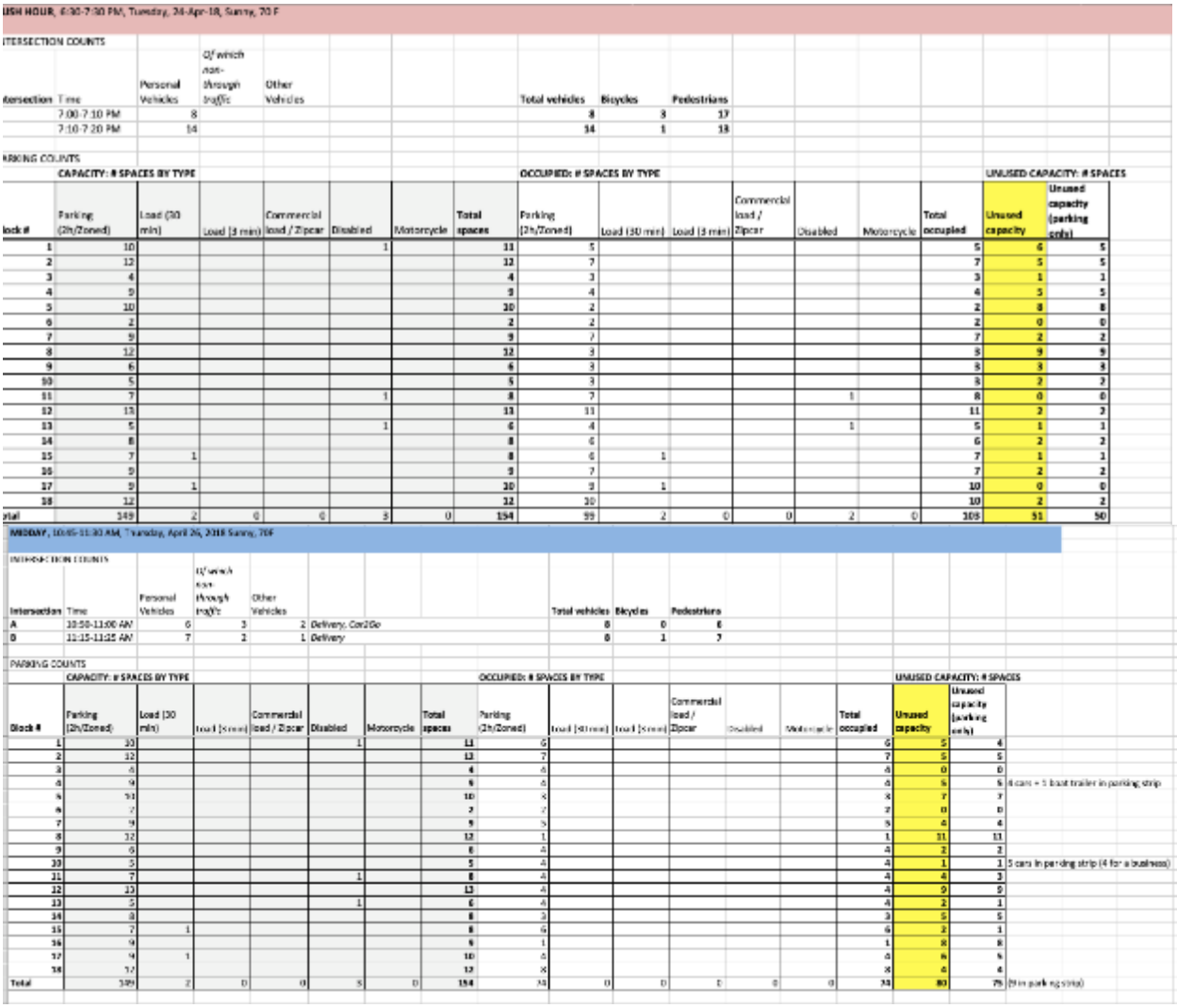
Intersection	Time	Personal Vehicles	Of which non-through traffic	Other Vehicles		Total vehicles	Bicycles	Pedestrians
A	9:15-9:25 PM	18	3	2	Delivery, taxi	20	1 (skateboard)	29

PARKING COUNTS

	CAPACITY: # SPACES BY TYPE							OCCUPIED: # SPACES BY TYPE							UNUSED CAPACITY: # SPACES			
Block #	Parking (2h/Zoned)	Load (30	Load (3 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total spaces	Parking (2h/Zoned)	Load (30 min)	Load (3 mi	Commercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)		
1*	10	3					13	9	3					12	1	1		
2*	6	5					11	8	5					13	-2	-2		
3	6				3		9	7				2		9	0	-1	2 motorcycles	5 spots claimed by 24-hr construction
4	15	6	2				23	15	5	1				21	2	0	1 motorcycle	
Total	37	14	2	0	3	0	56	39	13	1	0	2	0	55	1	-2		

* Paid parking 8 AM-10 PM

Circulation and Parking Counts – Beacon Hill



RUSH HOUR, 6:30-7:30 PM, Tuesday, 24-Apr-18, Sunny, 70 F

INTERSECTION COUNTS

Intersection	Time	Personal Vehicles	Of which non-through traffic	Other Vehicles	Total vehicles	Bicycles	Pedestrians
	7:00-7:10 PM	8			8	3	17
	7:10-7:20 PM	14			14	1	13

PARKING COUNTS

	CAPACITY: # SPACES BY TYPE							OCCUPIED: # SPACES BY TYPE							UNUSED CAPACITY: # SPACES		
Block #	Parking (2h/Zoned)	Load (30 min)	Load (5 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total spaces	Parking (2h/Zoned)	Load (30 min)	Load (5 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)	
1	10				1		11	5						5	6	5	
2	12						12	7						7	5	5	
3	4						4	3						3	1	1	
4	9						9	4						4	5	5	
5	10						10	2						2	8	8	
6	2						2	2						2	0	0	
7	9						9	7						7	2	2	
8	12						12	3						3	9	9	
9	6						6	3						3	3	3	
10	5						5	3						3	2	2	
11	7				1		8	7				1		8	0	0	
12	13						13	11						11	2	2	
13	5				1		6	4				1		5	1	1	
14	8						8	6						6	2	2	
15	7	1					8	6	1					7	1	1	
16	9						9	7						7	2	2	
17	9	1					10	9	1					10	0	0	
18	12						12	10						10	2	2	
Total	149	2	0	0	3	0	154	99	2	0	0	2	0	103	51	50	

MIDDAY, 10:45-11:30 AM, Thursday, April 26, 2018 Sunny, 70F

INTERSECTION COUNTS

Intersection	Time	Personal Vehicles	Of which non-through traffic	Other Vehicles		Total vehicles	Bicycles	Pedestrians
A	10:50-11:00 AM	6	3	2	Delivery, Car2Go	8	0	6
B	11:15-11:25 AM	7	1	1	Delivery	8	1	7

PARKING COUNTS

	CAPACITY: # SPACES BY TYPE							OCCUPIED: # SPACES BY TYPE							UNUSED CAPACITY: # SPACES		
Block #	Parking (2h/Zoned)	Load (30 min)	[illegible]	Commercial load / Zipcar	Disabled	Motorcycle	Total spaces	Parking (2h/Zoned)	[illegible]	[illegible]	Commercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)	
1	10				1		11	6						6	5	4	
2	12						12	7						7	5	5	
3	6						6	6						6	0	0	
4	9						9	4						4	5	5	4 cars + 1 boat trailer in parking strip
5	10						10	3						3	7	7	
6	7						7	7						7	0	0	
7	9						9	5						5	4	4	
8	12						12	1						1	11	11	
9	6						6	4						4	2	2	
10	5						5	4						4	1	1	5 cars in parking strip (4 for a business)
11	7				1		8	4						4	4	3	
12	13						13	4						4	9	9	
13	5				1		6	4						4	2	1	
14	8						8	3						3	5	5	
15	7	1					8	6						6	2	1	
16	9						9	1						1	8	8	
17	9	1					10	5						5	5	5	
18	12						12	8						8	4	4	
Total	189	2	0	0	3	0	194	113	0	0	0	0	0	113	80	75	(9 in parking strip)

NIGHTTIME, 10:30-11:15 PM, Thursday, 26-Apr-18, Clear, 60 F

INTERSECTION COUNTS

Intersection	Time	Personal Vehicles	Of which non-through traffic	Other Vehicles	Total vehicles	Bicycles	Pedestrians
A	10:55-11:05 PM	5			5	1	
B	10:50-11:00 PM	5			5		2

PARKING COUNTS

	CAPACITY: # SPACES BY TYPE							OCCUPIED: # SPACES BY TYPE							UNUSED CAPACITY: # SPACES		
Block #	Parking (2h/Zoned)	Load (30 min)	Load (4 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total spaces	Parking (2h/Zoned)	Load (30 min)	Load (4 min)	Commercial load / Zipcar	Disabled	Motorcycle	Total occupied	Unused capacity	Unused capacity (parking only)	
1	10				1		11	8						8	2	1	
2	12						12	7						7	5	5	
3	4						4	3						3	1	1	
4	9						9	5						5	4	4	5 in parking strip - 1 boat launch
5	10						10	7						7	3	3	1 in parking strip
6	7						7	7						7	0	0	
7	9						9	4						4	5	5	4 in parking strip
8	12						12	1						1	11	11	
9	6						6	4						4	2	2	1 in parking strip
10	5						5	3						3	2	2	4 in parking strip (3 for business)
11	7				1		8	4						4	4	3	1 in parking strip
12	13						13	7						7	6	6	
13	5				1		6	2						2	4	4	
14	8						8	4						4	4	4	1 in parking strip
15	7	1					8	0						0	8	7	
16	9						9	4						4	5	5	2 in parking strip
17	9	1					10	5	1					6	4	4	
18	12						12	7						7	5	5	
Total	140	2	0	0	3	0	154	72	1	0	0	0	0	73	81	77	(13 in parking strip)

Capitol Hill South Intersection and Block Numbers

Beacon Hill Intersection and Block Numbers