C O N T O U R

Walk the historic landscape of Seattle's only river delta

Lauren Corn

A thesis submitted in partial fulfillment of the requirements for the degree of
master of Landscape Architecture and Urban Design & Planning

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Co-Chairs
Lynne Manzo
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Abstract

Contour: Walk the Historic Shoreline of Seattle's Only River Delta

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Within my academic studies in Urban Design & Planning and Landscape Architecture, I am interested in human-created landscapes, with a specific emphasis on mobility infrastructure and its impact on multi-species residents. This thesis, titled the Contour Project, examines the transformation of the Duwamish River into the Duwamish Waterway through a selection of place-based stories that address how settler changes to the landscape have impacted human and more-than-human communities. These twenty-one publicly accessible stories link via a QR code to a website. Some relationships between the landscape and its inhabitants have become obscured beneath concrete and forgotten over time. While other stories explore deep-rooted connections with regional symbols such as the salmon, unveiling the interplay between landscape alterations, driven by infrastructural requirements, and their ramifications on the multi-species inhabitants of the area. The purpose of this thesis is to bring all these stories to the front and place them within the contemporary landscape. By critically examining the values that have shaped the infrastructure and topography of the Duwamish, this project underscores the imperative to acknowledge the diverse range of communities present in the historic Duwamish River Delta. Understanding the various impacts on these communities is crucial for contemporary residents to fully comprehend the consequences of past actions. If we wish to avoid the shortfalls of past landscape alterations and revert the loss of cultural and biological diversity, we must make known more nuanced narratives that integrate all living processes in our histories of place. Through a better understanding of the inhabitants of our shared home, we can make more equitable decisions about changes to our infrastructural landscapes.

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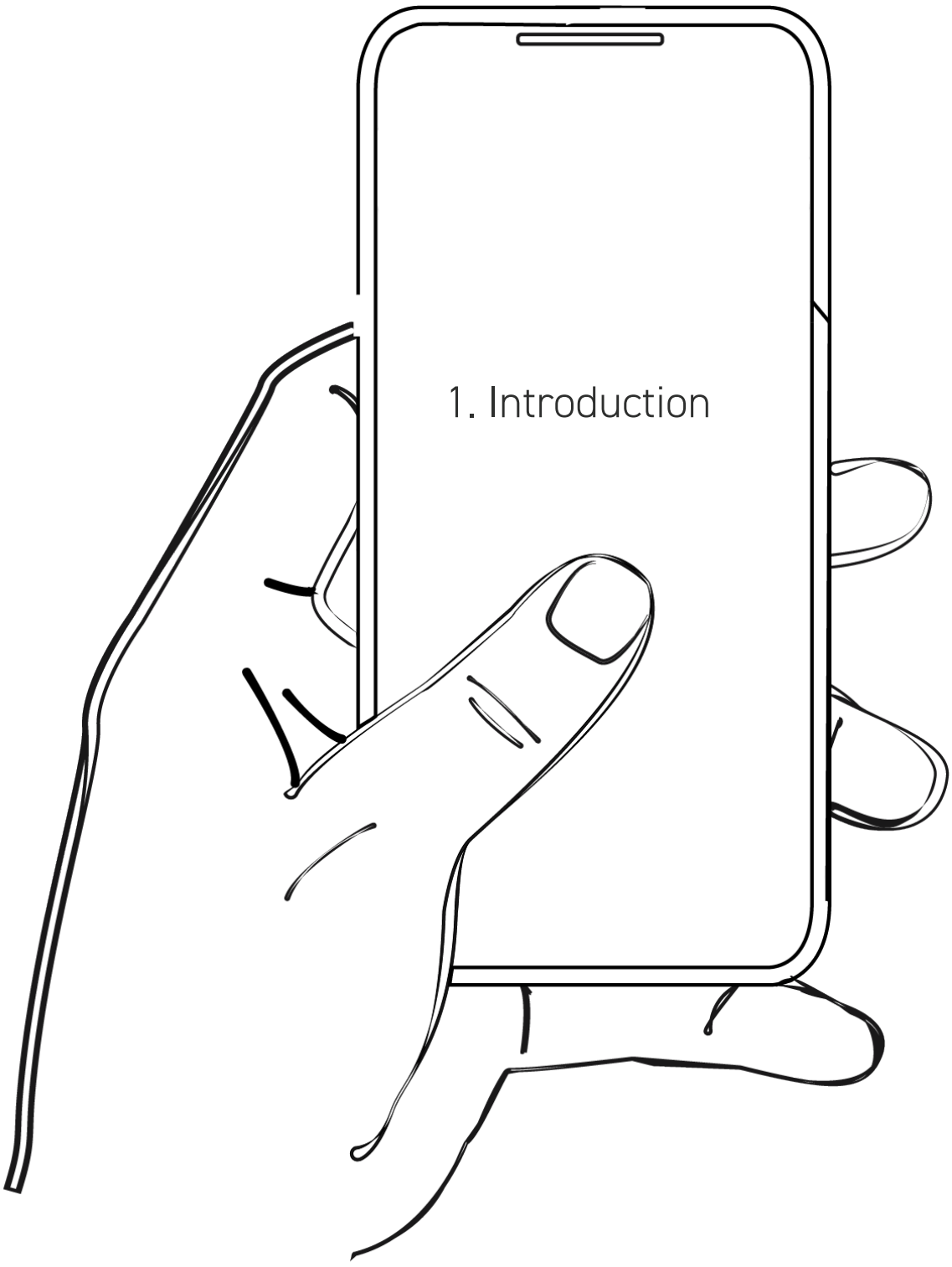


Challenge: Hidden Histories

This thesis delves into the challenges of preserving urban histories, particularly within Seattle's colonial urban development, because of the environmental transformations and cultural erasure. The destruction of forests, prairies, and wetlands by settlements and cities, coupled with policies that allowed for the influx of new settlers, resulted in the removal and replacement of multiple different species and peoples, further complicating the preservation of historical narratives. In the case of the Duwamish River, complete ecosystems were replaced and transformed. As a result, the task of unearthing past narratives becomes increasingly difficult.

The process of industrialization often gives rise to a place-less environment, devoid of the memory of communities that once thrived there. Despite all landscapes possessing rich histories, industrial landscapes have become particularly difficult to read. Instead, these landscapes are shaped solely for the purpose of production and the movement of people and goods, neglecting their prior ecological and social values. The settlers chose the Duwamish River Delta as the site of their industrial ambitions. The flat topography of the tideflats and proximity to Elliott Bay made them ideal for the new development. Settlers treated the tideflats of the Duwamish River as a blank canvas upon which industry and infrastructure could impose their own purpose – neglecting prior ecological and social uses of the area. The tabula rasa mindset left few legible indicators of the past.

As a result, contemporary neighborhoods that stand upon the historic tideflat area lack opportunity to encounter place-based histories within their urban, industrial space. The absence of ruins that serve as a reminder or plaques commemorating transformative changes exacerbates the challenge of recognizing the historical layers embedded in the landscape. Without legible tangible markers, there is a temptation to perceive places as devoid of history, thus perpetuating the notion that the contemporary landscape is predetermined, without a meaningful prior form. However, traces of the past continue to exist, and contemporary areas can mirror past conditions, but without a historic lens, these moments lack legibility. This project's central challenge lies in identifying these contemporary historical traces in the Duwamish landscape and connecting these moments with compelling historic stories that resonate with the modern viewer.

This research endeavors to unearth the hidden narratives of industrial landscapes along the Duwamish River, shedding light on the profound alterations imposed by settlers on the landscape to meet their needs. Connecting our present to these historical moments provides residents with a comprehensive understanding of our colonial, constructed legacy and its impact on the urban fabric. The urban environment on top of the historic tideflats carries few indicators of its past. Few plaques tell the story of this transformation and few fragments of the ecosystem remain to show how it once flourished. To bring forward place-based stories in an industrial environment takes an adaptive approach to storytelling both in the act of selecting histories and communication. Through interdisciplinary methodologies and the integration of diverse sources, this study reveals forgotten histories in order to restore a sense of place and continuity to the Duwamish River's contemporary urban landscape. This research challenges the prevailing narrative of predetermined urban development, fostering a more nuanced appreciation for the city's layered histories and the lessons they impart for the future.

Opportunity: Reconnect History with Place

The landscape of the Duwamish River has undergone profound transformations over the past 150 years, driven by the settlers' dual objectives of enhancing mobility and fostering industrial growth (Armbruster, 2016) (Williams, 2017). However, many of these landscape alterations failed to account for their cultural and environmental contexts. This lack of consideration has disastrous consequences. The United Nations has found that native species across all land habitats have fallen by at least 20% since 1900 and delta habitats have suffered some of the greatest losses (UN, 2023). If we wish to avoid the negative impacts of past landscape alter-

ations and revert loss of cultural and biological diversity, we need to make known more complex narratives that integrate all living processes in our histories of place. By cultivating such comprehensive awareness, we can make more equitable and sustainable decisions regarding infrastructural landscape modifications.

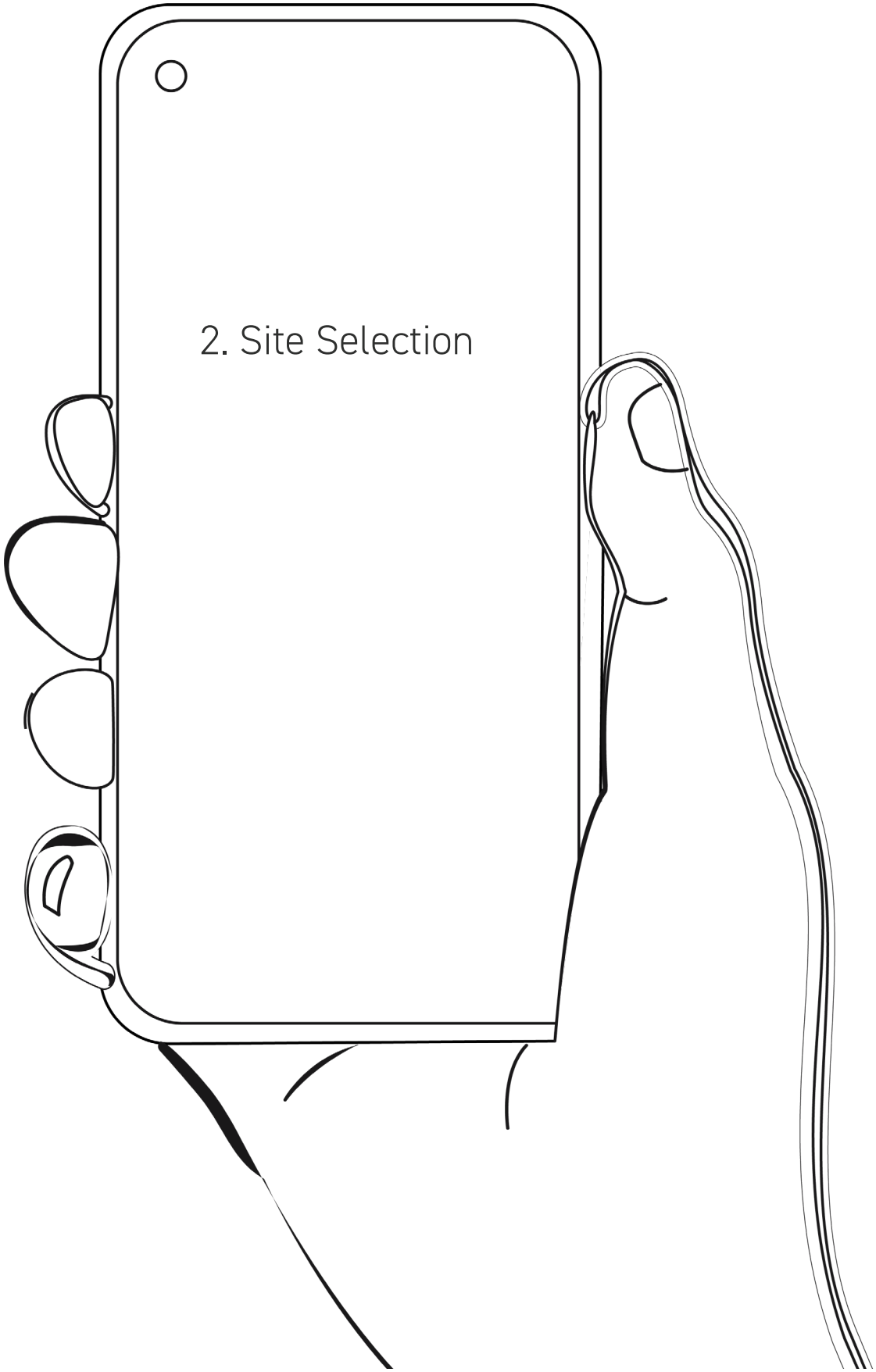
Historian Matthew Klingle (2009) astutely asserts that thinking historically requires perceiving the past as "...a different place, the result of complex causes and effects unfolding... through time... and we live with the outcomes" (p. xii). Moreover, he cautions the contemporary citizen to not ignore these connections to place for doing so will "... reap the returns of historical ignorance. To face it squarely, though, is first to acknowledge the consequences of human actions, past and present, and then to develop a more expansive ethic of place" (p. xii). History is subversive because it shows us that things can be different—that residents of Seattle can have a different, perhaps better, relationship with our landscapes. The Duwamish has transformed into a landscape unrecognizable to its 1850s form within a century and a half. The scale and speed of these transformations early in Seattle's settler history beckons us to envision Seattle's potential in another 150 years. While this project refrains from dictating a future landscape for its audience, it aims to dissolve the boundaries between the past and the present, empowering individuals to embark on the profound task of reimagining the future.

Actualization: The Contour Project

Through a series of connected stories, this project describes the interaction between the environment, humans, and the more-than-human communities of Seattle around the Duwamish River. I chose to highlight histories from this area of Seattle because modern infrastructure has so dramatically altered this area of the city, making it challenging to remember and appreciate histories – especially marginalized histories – before such alterations (Bullard et al., 2012).

The incorporation of publicly available QR codes flag places where historic narratives are shared as part of the Contour Project, enabling people to appreciate the historical significance embedded in their surroundings. By fostering an understanding of the past, individuals are encouraged to envision future landscapes that harmonize contemporary social and ecological values. The act of sharing history highlights the potential for transformative change through a grounded understanding of our geographically situated histories.

This project lives in the public realm. Twenty-one artistically rendered QR code stickers that adhere to the surfaces of infrastructure. These codes link to the Contour Project's online platform. Once people scan the QR code, they can access the walking path to explore the edge of the historic Duwamish tideflat landscape and read about the history of each stop.


2. Site Selection

Site Selection

Within the scope of my academic studies in Urban Design & Planning and Landscape Architecture, I am interested in human-created landscapes, with a specific emphasis on mobility infrastructure. I have directed my thesis research towards an exclusive focus on the Duwamish River tideflats. By centering my inquiry on this vital area, I aim to illuminate the multifaceted interactions and implications inherent in large-scale infrastructure and industrial projects, offering valuable insights for urban planning and landscape architecture practices.

The transformation of the Duwamish River into the Duwamish Waterway represents changing temporal priorities and divergent notions concerning the value of water and delta ecosystems. Throughout history, rivers

Contemporary & Historic Duwamish Shoreline

Figure 1. Duwamish Shoreline Changes 1850-2023
(Map by author)

have served as vital resources for sustenance, facilitating mobility, and serving as a repository for waste. Notably, rivers that bridge the realms of freshwater and saltwater foster unparalleled levels of biodiversity and nutrient dispersal. These ecosystems support a wide array of flora and fauna in both the upriver freshwater regions, the nearshore saltwater habitat, and an intermediate zone accommodating specialized organisms that traverse between the ecosystems of the delta. Given the distinctive narratives intertwined with water, this site becomes particularly captivating in the context of this research project.

Moreover, the significance of the Duwamish River in Seattle's colonial history cannot be overstated. Originally, the Duwamish waters attracted diverse indigenous communities and supported thriving ecological ecosystems, serving as a vital source for sustenance, commerce, and transportation (Cummings, 2020). In the early 1850s, the first wave of settlers arrived at the Duwamish River– drawn by the prospects of new land and the establishment of a northwestern regional city. These new settlers, aspiring to establish their city as a rising western urban area, felt that they needed to incorporate technological advancements in mobility and industry. An example of these desired advancements included a modern railroad – a feature that came to dominate the Duwamish River landscape.

However, by the 1890s, it became evident to these settlers that the existing landscapes of Seattle were inadequate to fulfill their aspirations for a railroad and industrial district, prompting the need for their transformation (Williams, 2017). The period between 1895 and 1925 witnessed a remarkable shift as Seattle's landscapes underwent significant reshaping to accommodate colonial expansion and industrial pursuits. At the Duwamish River, settlers removed steep hillsides and used that refuse to fill low points including marshes, tideflats, and wetlands (Williams, 2017). This era serves as a pivotal turning point for the multi-species characters featured in thesis. Between 95 and 99% of the pre-settlement habitat has disappeared and various human communities became included or excluded from the resulting landscape (City of Seattle, 2001) (Cummings, 2020). The present-day landscape stands as a direct outcome of the extensive alterations made during this thirty-year period.

The condensed timeframe within which these transformative changes occurred, coupled with the diverse array of characters inhabiting the Duwamish River, give rise to high-contrast historical moments that are distinctive to the river itself. These moments serve as compelling storytelling elements embedded within the river's history.

Mode of Communication

This project has two parts: this written thesis and the online Contour Project. Most residents will not interact with this written document, as a result, I launched a publicly accessible website. I decided to use the Esri platform StoryMaps to build the digital portion of this project because Esri has a powerful interface compatible with phones and computers. Through this platform, I can geolocate each of these stops allowing for convenient navigation. Customizable functions within SoryMaps enable me to set a consistent visual scheme while using pre-made templates including a timeline or customized picture frames. StoryMaps is particularly adept at transforming ArcMaps into an online platform.

In addition to this online form of communication, I have taken the initiative to create a unique sticker that will be placed at each tour stop to signal to viewers that they are encountering a significant location within the Contour Project. The sticker serves as a visual cue, capturing the attention of visitors and emphasizing the connection to the broader project. Consistency in sticker placement height is crucial for ease of discovery and navigation. Each sticker will be positioned at the average height for adult eye level, approximately 57" off the ground (West Park Gallery, 2017). This standardized height ensures predictability along the tour route, enabling participants to locate and engage with the stickers more easily. The distinct design and consistent placement will help create a sense of cohesion and unity among the various stops along the tour.

3. Literature Review

Storytelling

Telling the stories of resilient human and more-than-human communities navigating a shifting landscape necessitates the employment of an interdisciplinary framework. In this chapter, I describe the research encompasses a broad spectrum of disciplines, spanning from historic analysis, historic preservation theory, and environmental equity to the insights gleaned from interview with local Seattle historians such as David Williams and Mathew Klingle. This investigation explores different methods of interpretation through virtual and in-person strategies. These diverse resources, situates this project within the contextual framework of pertinent history and theory, enriching the scholarly discourse.

This project is centered around and is broken down into two core themes: Story and Telling. The interplay of these components provides insight into the substance of the stories being conveyed and the methods employed for their communication. While these sections split the literature review into two parts, it is important to note that the selection and telling of the stories was iterative: the selection of stories influenced the way they were told, and the choice of communication methods or availability of historical resources often entailed prioritizing certain narratives over others.

The inclusion of literature on equity facilitates a meaningful dialogue between these two thematic sections, particularly in examining the role of power within the recording of stories and in the practice of telling. By engaging with the concept of equity, this project recognizes the influence exerted by power structures and aims to shed light on the ways in which these dynamics shape narratives.

Overall, this project demonstrates a holistic approach that intertwines the exploration of stories and the art of storytelling, recognizing their mutual influence and the crucial role played by considerations of power and equity.

Story

Stories make up the essence of this project. This section serves as an introduction to the significant literature that underpins the historical context of Seattle. The primary focus centers on a diverse array of characters, encompassing both human and more-than-human entities within the landscape. Most of these stories follow three distinct phases: the

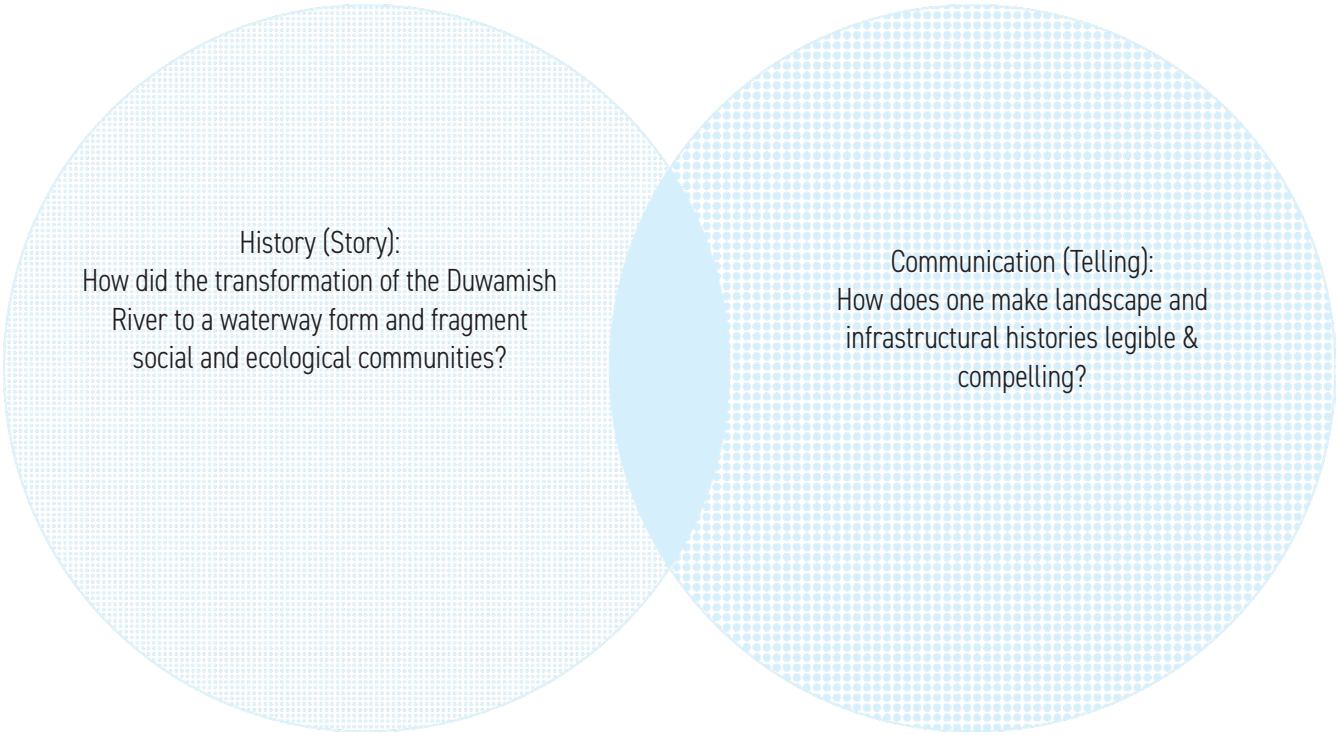


Figure 2. Pulling Apart Storytelling
(Image by author)

Figure 3. Flow Chart of Literature Review
(Image by author)

pre-altered settler landscape, the transformative thirty-five-year period between 1895 and 1930, and the present state of these communities. This section serves as an introduction to the significant literature that underpins the historical context of Seattle. The primary focus centers on a diverse array of characters within the landscape. However, it is important to acknowledge the vast abundance of potential narratives surrounding the Duwamish River's landscape and its communities, making the selection process for this project both challenging and essential.

To guide my selection process, I employed the lens of environmental equity, which served as a filtering mechanism to determine the genre and nature of the stories I sought to bring forth. Environmental equity guided my exploration by shedding light on underrepresented communities, reframing forgotten characters as integral components of the landscape, and elucidating the impacts of landscape changes on each individual or entity. By employing this framework, I aimed to highlight the interplay between environmental equity and the landscape alterations that accompanied Seattle's industrialization era.

Collectively, these narratives serve as an account of a river and its multi-species inhabitants, revealing the profound effects of landscape changes during Seattle's industrialization period on both human and more-than-human communities, emphasizing the interdependencies between them.

Duwamish River as a Passage

For centuries, the necessity of traversing between freshwater and saltwater environments has been essential to human existence. Indigenous communities adeptly navigated this dynamic landscape, recognizing the advantages of migrating between different villages for cultivating seasonal crops and seeking refuge during varying seasons (Cummings, 2020). Traveling by foot often entailed arduous journeys, involving the ascent of steep hillsides, navigating dense brushlands, and circumventing numerous water bodies scattered across the region. In comparison to overland travel, waterways emerged as an efficient mode of transportation. Water-based transportation allowed for people to transport more goods and enabled a more streamlined movement through the terrain (Williams et al., 2017).

Above all other resources, water played a defining role in the early colonial success of Seattle (Williams et al., 2017). The presence of water bodies such as Elliott Bay, Salmon Bay, the Duwamish River, and expansive Lake Union and Washington bestowed upon the region abundant habitats for procuring sustenance, seeking refuge, and facilitating mobility. In addition to providing avenues for industrial endeavors, enhanced mobility, and fishing and trade, waterbodies fostered intricate social and ecological systems within the Duwamish area.

Despite the complexity of these interconnected systems surrounding the Duwamish River, the river's sluggish, shallow nature and the tidal variations at its mouth imposed limitations on the aspirations of the burgeoning population. Over 150 years, the transformation that unfolded along the Duwamish River rendered its current state unrecognizable, fundamentally altering its character and features.

The early settlers, driven by their specific priorities, selectively discarded elements of the waterways they deemed unappealing, such as slippery mudflats, dense marshes, or even communities of different peoples (Williams, 2017). Their actions aimed to facilitate regional and local movement with greater ease. The underlying rationale behind these alterations to the landscape reflects a belief among the new residents that the lands required "fixing" and that engineering held the key to achieving this objective (Williams, 2017). Unfortunately, settlers gave little consideration to the presence and well-being of the other communities that had long inhabited these lands.

Regrettably, this ideology of transformative engineering continues to persist in modern times, as our contemporary landscapes bear a resemblance to the ideals espoused by the colonial settlers. Our landscapes, both past and present, are shaped by our inherent biases, and in turn, these landscapes perpetuate and reinforce those same biases. This interplay between human prejudices and the resulting built environment underscores the enduring legacy of the settlers' mindset, with far-reach-

ing implications that extend into our present-day relationship with the land and its various communities.

Timeline of Events

Prior to 1850

The Duwamish River was formed by the convergence of volcanic debris and retreating ice sheets. It served as a gathering point for waters originating from a vast expanse of over 1,400 square miles, spanning from Mount Rainier to Everett. Numerous water sources, including Lake Sammamish, Lake Washington, the Cedar River, the Green River, the Black River, and the White River, converged at the Duwamish before flowing into the valley (Cummings, 2020). As the water descended into the valley, the river's distinctive sinuous curves began to take shape (Sato, 1997).

These striking bends in the river form through a fascinating process of both time and disturbance. When a small weakness in the bank occurs on one side of a river, the quickly moving water further carves away this portion of the river. As the section of the river's bank erodes, it diverts the flow of water towards the opposite bank. The slower-moving water along the inner curve of the river then deposits sediments, further reinforcing the sinuous shape that characterizes the Duwamish River (MinuteEarth, 2014). This natural phenomenon has left a lasting imprint on the landscape, shaping the river's distinctive course, and contributing to its historical significance (see figure 5).

The flat terrain of the Duwamish Valley provided favorable conditions for annual flooding, which, in turn, facilitated the deposition of sediment across the expansive landscape. These sediment deposits, enriched further by the ash resulting from indigenous cultural burning practices, played a pivotal role in shaping the region's ecological characteristics. Cultural burning involved the intentional use of controlled, low-grade fires to shape and maintain desired landscape and ecological conditions (US NPS, n.d.). This ancient practice, carried out by indigenous communities, led to the flourishing of fertile meadows abundant with wild game and edible plants such as common stinging nettle (Urtica dioica), bracken fern

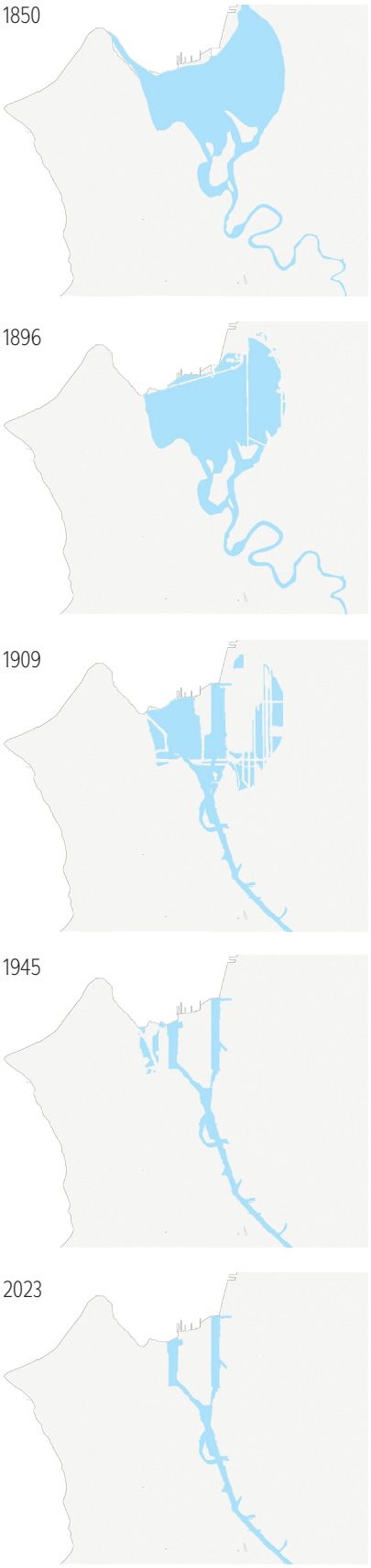


Figure 4. Timeline of Duwamish Shoreline Changes 1850-2023 (Maps by author)

TImeline of the Duwamish

WATER

Prior to 1850: Five major rivers drained into the Duwamish-Green Watershed: the Black, White, Green, Cedar, and Duwamish.

1906: After a log-jam, the White River changed course and emptied into the Puyallup River

1912: Diversion of the Cedar River into Lake Washington

MORE-THAN-HUMAN

Prior to 1850: this region had some of the world's richest salmon runs, impressive biodiversity, and largest and most ancient forests

More-than-human communities are negatively impacted by colonial extraction processes

1900s: Chemical and by product runnoff from industries on the Duwamish entered waterways, poisoning unknown numbers of humans and more-than-human species

GEOLOGY

Prior to 1851: The River's geology is characterized by 4 factors: volcanic sediments, glacier activity, fresh water, and salt

1858 - 2001: Settlers use tidal waters as repositories for urban waste

Amount of soil moved on the Duwamish tideflat over time

1895 - 1897: Semple depended the Duwamish to 35 ft deep. The dredged materials created 75 acres of new land

1901 - 1904: Semple attempts to excavate a canal through Beacon Hill sluicing 2,000 cubic yards of earth which created 52 acres of land

1917: Toxic chemicals began entering the soils around the Boeing plant

HUMAN

Prior to 1851: Indigenous people lived along the Duwamish since 8000 BCE. Multiple villages with longhouses populated the Duwamish River

1851: The Collin's family arrived at the Duwamish as the first settlers

1865: The Exclusion Ordinance that expelled indigenous people from Seattle is passed

1886: White settlers rioted and removed Chinese residents from Seattle

1917: Boeing company is formed and begins production by the Duwamish River

Majority of settler landscape chang
during this time period

1840 1860 1880 1900

1916: The Ship Canal opens lowering Lake Washington & drying up the Black River

1920: Completion of second dredging phase the canal is now 50 ft deep

1958: Metro installed 11 Combined Sewer Overflows to discharge untreated overflows of sewage and stormwater into the river

1962: Construction on the Green River dam was completed. The dam reduced peak flows in the river by 75%

TODAY: Multiple community groups work to report replant native species and report water contamination to the EPA

TODAY: Modest habitat restoration has support-ed surviving species in the Duwamish River

By 1943, nearly 125 acres of dry land replaced the tideflats and salt marshes

1972: Clean Water Act was signed into law

1936: The second Boeing river facility is built (Plant 2)

1958: Creation of the King County Metro Authority with the purpose of building a regional sewage treatment system.

2000: EPA declared the Duwamish area a Superfund site, contaminated with over 40 chemicals above recommended levels for human and more-than-human health.

ges occurred

1920 1940 1960 1980 2000

(Image by author)

(Pteridium), camas (Camassia), wild onion, nutritious roots, and berries (Ferrell, 2019).

The indigenous people of the area used this bountiful land for both cultivation and hunting purposes. The combination of the region's unique geology, controlled burnings, and the ongoing deposition of sediments through recurrent floods fostered a remarkably productive environment. These fertile conditions propelled the valley to become a thriving agricultural region of significant importance from the late 1800s through the 1910s (Cummings, 2020).

At the confluence of the Duwamish River and Elliott Bay, a vast expanse of tideflats stretched from the base of Beacon Hill to the edges of West Seattle, encompassing the present-day areas of SODO and the Industrial District. This dynamic coastal landscape experienced the ebb and flow of tides, creating a striking transformation of the terrain twice daily. During high tide, the waters from Elliott Bay would blanket the flats in a sheet of water, reaching depths of 10 to 15 feet (Armbruster, 2016). Conversely, at low tide, the water receded, revealing expansive mudflats.

The tideflat and estuarine ecosystem of this region supported an extraordinary array of biodiversity. It encompassed three distinct ecosystems: the freshwater lotic ecosystem to the south, the brackish estuary ecosystem that bridged the river and the bay, and the nearshore marine environment of Elliott Bay (Krackeberg, 1995). Within these rich habitats, numerous species thrived, including shorebirds, clams, algae, and many others. Of particular significance, the estuarine conditions and the protective cover provided by nearshore plants, such as eelgrass, played a crucial role in supporting the life cycle of the eight salmon species. These salmon species utilized the estuary and relied on the sheltered eelgrass groves for osmoregulation as they transitioned from freshwater to saltwater environments (Kennedy, et al., 2018). Likewise, young salmon, known as smolt, undertake the same osmoregulation process within these eelgrass habitats when migrating from the river to the ocean (CIAA, 2022).

1850

Figure 5. 1850 Duwamish River Shoreline (Map by author)

For the Duwamish Tribe, the land and waterways of the region were intricately woven into their seasonal movements and sustenance practices. They would traverse the valleys and lakes, following the abundance of food sources that sustained their communities. They skillfully harvested fish and ducks from the river, dug clams from the tidal flats, caught herring off the shores of Elliott Bay, gathered berries and camas from the meadows, and collected reeds and wapato from the shores of Lake Washington (Thrush, 2008). These resources provided vital sustenance and played a central role in the cultural and subsistence practices of the indigenous people.

1851-1870: Transition from Indigenous to a Settler Landscape

Upon the arrival of the first settlers in 1851, the Duwamish Valley was already a well-established home to the Duwamis people, with seventeen distinct villages and over ninety longhouses scattered across the region that would later become Seattle. Within this intricate web of indigenous settlements, five villages with fifteen longhouses were situated in the lower portion of the Duwamish Valley.

However, what the early settlers failed to appreciate upon their arrival was that the seemingly available land had been carefully tended by the indigenous communities for countless generations. Radiocarbon dating has revealed that the Duwamish Valley has been inhabited by indigenous

peoples since before the sixth century AD. The expansive meadows that the settlers viewed as vacant were, in fact, intentional landscape creations by the tribes who regularly employed controlled burning techniques to maintain and enhance food sources. The indigenous peoples' profound understanding of the land, cultivated over centuries, contributed to the remarkable productivity and ecological diversity of the Duwamish Valley that the later settlers would benefit from.

Prejudice led Seattle's non-indigenous inhabitants to remove indigenous people from their lands. These prejudices emerged through the discriminatory legislation, known as Ordinance No. 5. This ordinance marked the first official act of the newly incorporated city of Seattle in 1865. "Be it ordained... that no Indian or Indians shall be permitted to reside or locate their residences on any street, highway, lane, or alley, or any vacant lot within the town of Seattle" (Ordinance of the Town of Seattle, 1865). Enacted along with the Treaty of Point Elliott, Ordinance No. 5 completed the dispossession of indigenous peoples from their ancestral land.

Under this ordinance, indigenous individuals were prohibited from remaining in Seattle after dark, unless provided housing by their employers. The government's actions forced the Duwamish and other indigenous communities in the region onto reservations, severing their connection to their homeland. With limited options available, some indigenous people chose to stay within the city for employment, while others resided on the outskirts or merged with other tribes on outlying reservations. The removal of indigenous people from their lands set in motion a process where colonial settlers began envisioning a new future for the Duwamish Valley.

1870-1880: Limiting Landscape

Various settler groups perceived the landscape of the Duwamish Valley according to their respective needs. Citizens sought a designated area to dispose of waste, industrialists sought to expand their commercial ventures, and farmers aimed to manage floodwaters more effectively. Although these groups held distinct priorities, they shared a common view that the existing landscape fell short of fulfilling their requirements.

Figure 6. 1896 Duwamish River Shoreline (Map by author)

Therefore, they looked to alter the landscape to meet their needs.

Landscape alterations in the Duwamish Delta were already underway before any formal landscape planning took place. The mills situated around the tideflats, such as the Stetson and Post facility, took the initiative by filling in the flats. They utilized large quantities of sawdust, off cuts, and discarded materials, depositing them along the periphery of the tide flats (Williams, 2017). As surrounding neighborhoods contributed their share of waste and debris, these materials further augmented the process, resulting in the gradual formation of new land around the mills. This early intervention set the stage for subsequent landscape transformations in the area.

Various settler groups had aspirations of transforming the tideflats to suit their respective ambitions. Among them were those advocating for the introduction of a transcontinental railroad line to Seattle. Advocates for the railroad were the first group who advocated for and began filling in of the tide flats. In order for a railroad to function efficiently, a level terrain with minimal curves was essential. While the Duwamish River provided the least topographically challenging access point to Seattle, the delta itself posed challenges with its daily tides and soft sand (Armbruster,

2016). To address this, settlers initially resorted to propping up the railroad on unstable creosote-covered pilings. However, the longevity of these supports was compromised by the persistent presence of shipworm infestations that weakened and consumed them (Sato, 1997). Consequently, investors in the railroad were eager to find a solution for the predicament posed by the mudflats. By 1896, thin earthen paths supported the railroad across parts of the tideflats (see figure 6).

Seasonally, the Duwamish would overflow its banks along the valley as part of its hydrological cycle. However, as farmers cleared extensive areas of the valley to make way for crops and grazing, they unwittingly exacerbated the frequency and intensity of flooding events beginning in the 1870s. This inadvertent consequence resulted from the removal of native vegetation that previously helped regulate water flow (Cummings, 2020). Recognizing the need to mitigate seasonal flooding, farmers wanted to use new technologies and methods to manipulate the water's course and contain these recurrent floods. They saw the potential in utilizing innovative approaches to modify the natural flow of water and gain control over the seasonal inundations (Sato, 1997).

Around the late 1880s, newly arrived industrialists and investors viewed the Duwamish River as a lucrative opportunity to expand their economic interests by transforming the tidelands into profitable ventures. They recognized that by reclaiming the wetlands and elevating the tideflats above sea level, they could create additional deepwater ports and capitalize on the potential for financial gains. This vision drove their desire to straighten and deepen the Duwamish River, fundamentally altering its natural course and characteristics (Williams, 2017).

While each group possessed distinct motivations for desiring alterations to the Duwamish River before the 1890s, certain overarching themes became evident. Firstly, there was a prevailing belief that the landscape should conform to their human desires and preferences. Secondly, landscapes that did not cater to their specific needs were perceived as devoid of ecological or social value (Klingle, 2009). Lastly, there was a shared conviction that engineering interventions could rectify challenging landscapes without incurring future consequences (Klingle 2009).

1900-1920: Controlling a Regional Watershed

The transformation of the watershed began with the redirection of rivers to align with the preferences of the settlers. In 1906, the diversion of the White River from the Duwamish River occurred due to a logjam following a flood. In 1911, settlers took the initiative to redirect the Cedar River into Lake Washington instead of its original course merging with the Green River, resulting in a significant reduction of seasonal flooding in Renton. Subsequently, the City of Tacoma constructed a dam on the Green River to regulate its flow. The final engineering accomplishment was the disappearance of the Black River, effectively severing the connection between the Duwamish River and Lake Washington in 1916 (Klingle, 2009). These hydrological modifications persist to this day. The Green River and the Duwamish River have seemingly merged due to the elimination and diversion of the Cedar, White, and Black Rivers. Prior to 1916, the Duwamish River encompassed a drainage area of 1,600 square miles, stretching from Mount Rainier to Everett. However, the present-day watershed has been reduced to a mere 480 square miles (Sato, 1997). With the hydrology replumed, the river was ready to become a waterway.

1890-1930: Transforming a River into a Waterway

During the years spanning from 1900 to 1930, the transformation of the

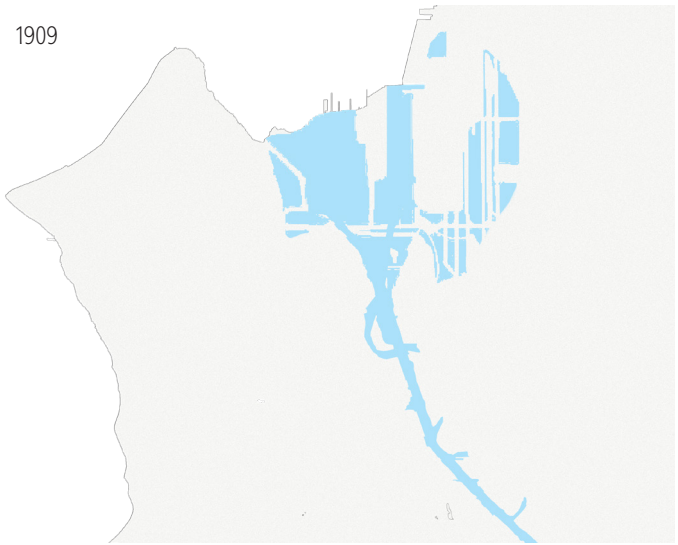


Figure 7. 1909 Duwamish River Shoreline (Map by author)

Duwamish River into a navigable waterway became a prominent endeavor. Early settlers in Seattle recognized the significance of establishing a connection between the city's expansive freshwater lakes and Elliott Bay. Two distinct canal plans were put forth during this period. The first proposal (1886), formulated by Thomas Burke, David Denny, Guy Phinney, and Benjamin F. Day as part of the Lake Washington Improvement Company, involved connecting Lake Washington, Lake Union, and Salmon Bay to the north of Seattle (Williams et al., 2017). This plan aimed to enhance transportation, protect ships from the clams and changing tides of the ocean, and promote commerce in the region. The second proposal, presented by then-governor Eugene Semple (1849-1908), sought to address Seattle's transportation challenges and the limitations posed by the tide flats. This alternative plan, first proposed by Semple in 1892, envisioned a south canal route cutting through Beacon Hill. The intention was to utilize soils sluiced from Beacon Hill to reclaim and subsequently sell former tideflat lands to industries, further fueling economic growth in the area (Hynding, 1968).

In 1894, Semple incorporated the Seattle and Lake Washington Waterway Company to pursue this southern canal option. Semple argued that his project would not only create the much-needed canal for Seattle but also provide a means to fill in the tidelands. Settlers perceived the tideflats as a limiting factor in the growth of Seattle. Semple foresaw a bright future for these lands, envisioning them as the site of both Seattle's future railroad and "the major portion of the manufacturing industries of the city, and these will be of great benefit and will play an important part in making this city the metropolis of the Pacific Coast" (Williams, et al., 2017).

The transformation of the Duwamish River into a navigable waterway necessitated significant modifications to the existing river's course and depth to accommodate the envisioned ships and industries. In 1895, the first deliberate alteration of the Duwamish landscape by settlers took place. Employing the assistance of the dredge vessels Anaconda and Python, mud from the tide flats was suctioned to a depth of 35 feet below the waterline. The extracted soil, along with plants and shellfish, was then expelled in an area located just west of the present-day baseball stadium (Williams, 2017). This extensive dredging process resulted in the creation of 333 acres of dry land across the tide flats by 1904 (see figure 7) (Cummings, 2020).

Figure 8. 1945 Duwamish River Shoreline (Map by author)

In 1909, the transformation of Beacon Hill began. Eugene Semple employed a hydraulic giant, originally designed for the California gold rush, to sluice vast quantities of mud from the side of Beacon Hill onto the tide flats. To this day, the slope where Interstate-5 intersects South Columbian Way in Beacon Hill bears witness to the excavation undertaken (Williams, 2017). However, the immense volume of water required for the project, funded by Seattle taxpayers, proved to be highly resource-intensive and financially burdensome. In 1904, the government terminated Semple's contract, signaling the end of his canal aspirations. Nevertheless, Semple's efforts resulted in the filling of 544 acres of tideflats (Cummings 2020).

Despite the discontinuation of the canal project, Semple's Seattle & Lake Washington Waterway Company persisted in filling the tide flats. Through the concerted efforts of dredging, by 1917, a staggering 1,400 acres of land had been reclaimed (Cummings, 2020). This vast expanse of newly created land would later become the vibrant neighborhoods of SODO, South Park, and Georgetown that we recognize today. The transformation of the landscape during this decade far surpassed any changes witnessed in the previous century.

The availability of new land attracted a wave of settlers who sought to capitalize on the opportunities presented by Semple's efforts. Various industries also emerged within the valley. Notable among them were the Seattle Box Factory, manufacturing facilities, and shipbuilding yards. However, these newcomers possessed limited knowledge of the historical hydrology of the watershed. Their presumption of having tamed the river with dredging and dikes was met with unforeseen consequences. In the subsequent years, the intensity of flooding across the valley increased (Cummings, 2020). It was only after the opening of the Lake Washington Ship Canal to the north in 1917, which diverted the waters of Lake Washington away from the Duwamish River, that the frequency of annual flooding in the Duwamish area began to decrease.

Despite the abandonment of the canal project, it remains the most significant alteration made by settlers to the landscape. By 1920, the Duwamish River had been transformed through straightening and deepening, fulfilling the vision of becoming a navigable waterway for Seattle. The dredges sucked up and buried alive thousands of mollusks under layers of mud, ripped through the diverse array of plant life in the marshlands, and the forced displacement of the original inhabitants were all disregarded in the relentless pursuit of progress. This disregard reflects a lack of consideration for the ecological and cultural significance of the river, as the focus was primarily on achieving desired outcomes.

1920-1980: Landscape of Waste

With the deepening and straightening of the Duwamish River and the filling of the tideflats, the Duwamish Valley became a thriving hub of industry. The once dominant farms quickly gave way to factories, marking a significant shift in the landscape. Notably, the renowned Boeing Company established its facility, Plant 2, on the river's edge, where it played a crucial role in manufacturing the iconic B-17 bombers during World War II. Other industries, such as the Duwamish Manufacturing Company, Malarkey Asphalt Co, and Ash Grove Cement Company, capitalized on the open lands and easy access to the river, transforming the area into a convenient and cost-effective waste disposal site (Cummings, 2020).

Regrettably, the consequences of these industrial activities are evident in the Duwamish River's environmental health. According to the Environmental Protection Agency, the river has been subjected to the dumping of unknown quantities of chemicals, resulting in their accumulation within the sediments of the riverbed. These chemicals, including polychlorinated biphenyls (PCBs), arsenic, carcinogenic polycyclic aromatic hydrocarbons (cPAHs), as well as dioxins and furans, have a significant impact on human health and overall well-being (EPA, 2022). These contaminants pose a significant risk to human health and well-being.

The contamination of the Duwamish River has had devastating impacts on the health and well-being of those living in nearby communities. Exposure to the various pollutants dumped into the river has been linked to the development of different forms of cancer, impaired cognitive function in children, reproductive complications, hindered fetal development, and damage to the immune system (Lower Duwamish Waterway Site Profile," n.d.). Life expectancy there was almost nine years less in South Park than for other Seattleites. These negative impacts are carried predominantly by the poor and BIPOC communities living along the river, such as residents of South Park and Georgetown (Cummings, 2020). The decisions made during the industrialization period have undoubtedly influenced the current state of the river, posing significant challenges to its overall health and safety.

In addition to industrial waste, the Duwamish Waterway was also burdened with municipal waste. Rather than disposing of sewage and stormwater in Puget Sound, King County Metro chose a cheaper alternative. To save $18 million, Metro diverted the combined sewer overflow into the Duwamish River. This waste likely contributed to the expansion of fish death zones in the river (Cummings, 2020). However, instead of acknowledging the role of pollution in the decline of fish populations, officials at government organizations, who had a history of discriminating against indigenous people, wrongly blamed indigenous fisherpeople for the issues.

Indigenous communities began organizing "fish-ins" near hatcheries to assert their fishing rights granted by the Treaty of Point Elliott. Despite

evidence that pollution was the actual problem, indigenous fisherpeople were continuously arrested by the Department of Fisheries, hindering their treaty rights. Stormwater and sewage overflows from an additional 32 square miles of the city were also directed into the Duwamish River (Klingle, 2009). By the 1980s, as much as 25% of the water in the Duwamish River originated from the effluent of the Renton sewage plant (Cummings, 2020). The Duwamish River, which had supported indigenous communities and a diverse ecosystem for centuries, was eventually designated as a Superfund site due to its extensive pollution.

1980-2023: A Messy Rehabilitation

Today, the Duwamish River's final five miles before it reaches Elliott Bay have become one of the most polluted stretches of river in the United States (King County, 2023). The presence of numerous pollutants in the soil, air, water, and wildlife surrounding the river is alarming. The communities residing near the Duwamish, often consisting of marginalized populations such as poor and immigrant communities of color, bear the brunt of these impacts. They experience a shorter life expectancy and are more likely to be diagnosed with cancer due to their exposure to the polluted environment. The pollution also takes a toll on the fish, birds, and shellfish that inhabit the river, disrupting their ecosystems and endangering their health. Plants exposed to certain pH levels and heavy metals in the soils can become stunted. The transformation of the Duwamish River into an urban waste site has disproportionately shifted the ecological costs onto the region's most marginalized residents, further exacerbating existing social and environmental inequalities (Klingle, 2009).

The designation of the Duwamish as a Superfund site has enabled the government to compel historical polluters to take responsibility for the contamination they caused. However, persuading these polluters to invest in the cleanup process can be a challenging endeavor. "Polluted lands want no history" suggests, polluters often resist acknowledging their ownership and responsibility for the pollution, as it can be financially burdensome (Reese, 2016).

Nevertheless, a robust advocacy network comprising Seattle residents

Figure 9. 2023 Duwamish River Shoreline (Map by author)

and tribal groups has emerged to hold the government and private industries accountable for their fair share of the cleanup efforts. In 1975, the Port of Seattle proposed a new shipping terminal along the last unaltered bend in the Duwamish River on the west side of the waterway. When construction began, bulldozers unearthed the remains of the ancient village of Basket Hat. After this discovery, Cecil Maxwell, the great-great grandniece of Chief Se'alth and chairwoman of the Duwamish Tribe, along with the support of other advocacy groups, successfully blocked the Port of Seattle's plan to create a new port at terminal 107 (Cummings, 2020). Despite halting construction of the port, tragically much of the remnants of the village was crushed under bulldozers. Stopping the new terminal symbolized a significant shift in the treatment of the river and its people. For the first time in over 170 years since settlers arrived in Seattle, the voices of indigenous people were recognized as being equal in value to the forces driving infrastructural expansion.

This growing recognition of indigenous and BIPOC voices represents a step toward environmental justice and acknowledges the importance of including marginalized communities in decisions that affect their land, water, and well-being. Organizations including Duwamish Alive!, the Duwamish Cleanup Coalition, River for All, and the Duwamish Valley Youth Corps continue to represent lesser-heard voices along the river. They push for funding, act as EPA watchdogs, remove trash, and plant

native vegetation where they can. It is a testament to the ongoing efforts to rectify past injustices and promote a more equitable and sustainable future for the Duwamish River and its people.

Equity

After addressing the history of the Duwamish River, my research moved toward assessing equity in historic interpretation and environmental equity. By addressing literature on these two types of equity I can balance well-known and iconic relationships with the Duwamish River and lesser-known stories that deserve recognition.

To achieve this, I explored two equity frameworks: environmental equity and interpretive equity. Environmental equity focuses on understanding and addressing the disproportionate distribution of environmental burdens and benefits among different communities, particularly marginalized and underserved groups (Rubiano, 2021). This framework helps ensure that the tour includes stories that shed light on the historical and ongoing environmental injustices experienced by communities living along the Duwamish River.

Interpretive equity, on the other hand, emphasizes the importance of diverse perspectives and narratives in shaping the interpretation of a place (Freeman, 1967). By considering interpretive equity, the tour can include a range of voices and stories that reflect the experiences and perspectives of various stakeholders, including indigenous communities, immigrant communities, more-than-human groups, among others. This approach helps ensure that the tour provides a comprehensive and inclusive understanding of the Duwamish River's significance.

By employing these equity frameworks, the scope of stories for the tour can be narrowed down, ensuring that they contribute to a broader narrative of the landscape and create a meaningful experience for tour participants. Furthermore, incorporating these frameworks strengthens the rationale for the importance of the project by highlighting the historical and ongoing relevance of the Duwamish River and its diverse communities.

Environmental Equity

This portion of the project focuses on environmental equity, examining its definition, application to human communities, and its expansion to include more-than-human groups. Additionally, it explores how theorists have applied the concept of environmental equity to the specific context of Seattle. The insights gained from this section are instrumental in selecting stories that effectively address and highlight the experiences of marginalized communities.

Environmental Equity Defined

This research explores different definitions of environmental equity. Often used in conjunction with environmental racism or environmental justice, environmental equity refers to the uneven distribution of environmental degradation and harm on poor and communities of color. This includes those living in proximity to hazards, waste sites, and other land uses where they do not receive benefits. One influential event in the development of environmental equity was the First National People of Color Environmental Leadership Summit held in 1991, where the above principles of environmental justice were first articulated (Rubiano, 2021). These principles emphasized the need to address environmental racism, empower affected communities, and promote equitable and sustainable environmental practices. From this event grew the modern environmental equity movement.

Some scholars have maintained that justice cannot be perceived in isolation of individual groups (Schlosberg, 2009). Instead, justice manifests in diverse forms for different communities. It acknowledges that justice is not based on a first-come, first-served basis, but rather collective action that is strengthened through diverse experiences and stories. However, the attempt to achieve justice for one community fundamentally cannot succeed. For example, supporting today's migratory salmon population alone will fail in reestablishing salmon runs. Salmon are intricately tied to the wellbeing of the entire multi-species ecosystem. Justice for salmon requires consideration for the eelgrass meadows that nurtured salmon during their osmoregulation process and the forests that keep upstream

waters cool supporting the salmon on their journey. In death, salmon contribute to the human and more-than-human communities of this region by nourishing humans and mammals who catch them, and their remains fertilize the forests surrounding the river. Equity for salmon involves equity for all disenfranchised multi-species communities. This simplified network of cross-species connections is a small example of the vast network of relationships.

This research into environmental equity has impacted the direction of my project by acknowledging the disproportionate burden of inequitable environmental changes borne by certain communities along the Duwamish River. Each community affected by these landscape alterations has a unique experience and narrative. Instead of sharing separate stories, I tried to choose stories that begin to show interconnection with other characters. By weaving these narratives together, the publicly accessible Contour Project aims to enhance recognition and understanding of the diverse and intertwined impacts of development. By amplifying the voices and stories of these communities, the project seeks to foster greater awareness and promote a more inclusive and equitable approach to environmental changes in the Duwamish River region.

Environmental Equity Expanded

The recent expansion of environmental equity to include plants and animals is rooted in the recognition that ecological communities are interconnected with human communities and therefore justice concerns in human communities extends to more-than-human communities. Non-anthropocentric equity acknowledges the intrinsic value of non-human beings and the significant role they play in the overall health and functioning of ecosystems. All species can experience the negative impacts of landscape transformations (Beatley, 1988). This shift towards a more holistic understanding of equity recognizes that environmental justice is not solely a human issue but also encompasses the protection and preservation of the natural world.

Representation of more-than-human members in society becomes one of the crucial steps toward promoting environmental equity. Authors such as Brown and Sutter (2016), who shed light on the significant contributions of various animals to the development of Seattle, and Biehler (2013), who incorporates the narrative of pests into urban histories, all advocate for the recognition of the more-than-human world in our urban narratives. Inspired by these theorists and historians, I have incorporated these concepts into the narratives of the Contour Project, adding stories about animal and plant communities to amplify their presence and significance in shaping the landscape and ecological dynamics of the Duwamish River. By including these narratives, the project aims to foster a greater understanding and appreciation for the interconnectedness of human and non-human beings, promoting a more comprehensive and inclusive understanding of environmental equity.

Environmental theories that emphasize the rights of the more-than-human world often tend to center on animal rights. However, the Contour Project goes beyond this focus by actively engaging with the plant kingdom as well. This presents an opportunity for the project to contribute to a theoretical area that has yet to be extensively explored. By expanding the discourse to include the rights and well-being of plants and fungi, the Contour Project aims to foster a more inclusive and holistic understanding of environmental justice and equity.

Increasing attention has been paid to the rights of landscapes. Christopher Stone's seminal book, "Should Trees Have Standing," originally published in 1972, presented one of the early legal arguments advocating for the inclusion of the natural world within our system of rights (Stone, 1972). Since then, the concept of granting legal rights to environments has gained traction. In 2017, New Zealand's Whanganui River was granted personhood rights, acknowledging its status as a living entity rather than an object that can be owned (Hollingsworth, 2020). Other rivers around the world, such as the Rio Atrato in Colombia, the Ganga and Yamuna rivers in India, and rivers in Bangladesh, have also obtained varying degrees of legal rights, equating their legal status to that of individuals (Westerman, 2019). The concept that a landscape has fundamental rights is relatively new for the western legal system. The emergence of the "Rights of Nature" movement further recognizes that ecosystems have the inherent legal right to exist, thrive, and regenerate without human interference,

such as pollution and destruction. This movement acknowledges that nature should be granted legal protection and affirms the importance of preserving and respecting the intrinsic value of the natural world (Challe, 2021). The first step toward providing more-than-human rights is through creating a compassionate narrative for humans about these different species and places. By shedding light on the stories of the Duwamish and its inhabitants, this project seeks to foster a greater appreciation for the interconnectedness of all life forms and promote a compassionate and inclusive perspective toward the natural world.

The Contour Project draws from these evolving environmental equity principles in choosing stories. The inclusion of animal and plant communities in the project's narratives emphasizes their significant contributions to the shaping of landscapes and ecological dynamics. Furthermore, the inclusion of landscape rights into environmental equity strengthens the rational of this project for adding in stories of landscape changes. By incorporating these elements, the Contour Project aims to bridge the gap between human and non-human beings, focusing the narrative of the Duwamish beyond a singular species, but to a collection of different communities.

Environmental Equity Applied to Seattle

Historian Matthew Klingle (2009) offers a perspective on equity that helps assess the changes Seattle has undergone over time. He highlights the interconnectedness of environmental inequity, industrialization driven by consumption, and social inequality.

Throughout Seattle's history, there has been a recurring pattern of extraction that has evolved over time. In the late 19th century to the 1930s, the economy of Seattle was heavily dependent on material extraction, particularly timber and coal. In fact, Seattle's first railroad and development of infrastructure for its port occurred specifically for the purpose of exporting timber from the lowlands and coal from New Castle (Klingle, 2009). Simultaneously, the labor force that supported this extraction was largely Chinese and indigenous people. Unfortunately, their contributions and the risks they faced were often overlooked. These communities worked in the most hazardous jobs in the rapidly growing city, serving as consumable resources to fuel Seattle's development.

Following World War II, extractive industries expanded to include the consumption of leisure spaces and consumer products. As a result, the Duwamish River became the recipient of the regional waste system, aimed at protecting Lake Washington and the affluent shoreline of large single-family homes (Cummings, 2020). This decision further reinforced environmental inequities, perpetuating ideologies that rationalize and perpetuate social inequality.

The changes to Seattle's landscape over time have contributed to the deepening of inequities and the entrenchment of ideologies that justify and perpetuate social disparities (Williams, 2017). Over and over in Seattle's history, from the filling in of the tideflats to the regrading of Seattle's hills, the relationship between landscape alterations and the generation of inequity are linked (Klingle, 2009). Poor and BIPOC Seattleites tended to absorb most of these negative impacts through displacement, loss of employment, injury, loss of personal and property rights etc. Recognizing this historical pattern of landscape manipulation and its associated inequities is crucial in addressing and rectifying the ongoing environmental and social injustices that persist in the region (Klingle, 2009). By understanding the link between inequality and landscape modification, we can work towards a more equitable and just future for Seattle and its communities.

By incorporating these diverse narratives, we can expand our perspective and challenge dominant narratives that perpetuate inequality. As a result, this thesis attempts to recognize the interconnectedness of human and non-human communities impacted by the transformation of the Duwamish River.

Equity in Historic Interpretation

Through research on the overlap between historic interpretation and equity, I gained valuable insights into the importance of representing diverse narratives and experiences in my design. This exploration

allowed me to critically examine the power dynamics inherent in historical storytelling and the ways in which certain voices and perspectives have been marginalized while others have been centered.

First, this section situates us within historic preservation and considers current critiques of this field. By examining the foundations of historic preservation, we can understand its historical development, the challenges it faces today, and ways that equity can be incorporated. Next, I will explore the emergence of historic interpretation as a distinct discipline and its relevance to my own research. Historic interpretation goes beyond the mere preservation of physical artifacts and structures; it involves the dynamic process of communicating and engaging with the past to create meaningful connections and understanding (U.S. NPS, 2023). By delving into the principles and methodologies of historic interpretation, we can uncover its potential to address issues of equity and representation. Lastly, this section will discuss the application of historic interpretation to landscapes. Landscapes encompass not only built structures but also the natural and cultural elements that shape our surroundings. By incorporating historic interpretation into the study of landscapes, we can uncover hidden narratives, give voice to marginalized communities, and shed light on the complexities of historical events and processes.

Critically examining the intersections of historic preservation, historic interpretation, and landscapes, creates a foundation for a more inclusive and equitable approach to interpreting and presenting history. Overall, the research on the intersection of historic interpretation and equity played a fundamental role in shaping the direction and focus of this tour. It provided a framework for understanding the need to challenge existing narratives, prioritize underrepresented stories, and foster a more inclusive and equitable approach to historical interpretation.

Critique of Historic Preservation

Historic preservation facilitates meaningful encounters with the past by designating and managing heritage sites. Preservation effort not only shapes the physical landscape but also curates a representation of societal values and narratives within public spaces (Avrami, 2020). It goes beyond merely safeguarding interesting artifacts; it provides an opportunity for residents to establish profound connections with history, culture, and identity (Kaufman, 2009).

The intersection of historic preservation becomes evident as preservationists and historians strive to identify and protect places that embody the multifaceted characteristics and qualities of communities. By recognizing and preserving these significant sites, we can foster a sense of belonging and collective memory, allowing individuals to engage with history in a meaningful manner. This allows communities to cultivate a more comprehensive understanding of their past and present.

Those critical of historic preservation point out how the heritage narrative fails to address the diverse peoples in a community and that historic preservation needs to become more inclusive of multiple publics (Avrami, 2020). The narrative presented in public spaces holds the power to shape our understanding of the past and influence contemporary narratives (Hayden, 1995). Within the Duwamish site, this becomes especially important because, as I discovered during my site visits, there is little contemporary evidence on-site of the pre-industrial past.

Positioning this thesis within the context of historic preservation shows that all landscapes contain multiple narratives. It underscores the importance of recognizing and addressing the biases and exclusions present in the built environment, and advocates for a more inclusive and equitable approach to preserving and interpreting our shared heritage.

Equity Implications of Preservation in the Built Environment

Equity in the field of preservations often overlaps with environmental equity because both topics address marginalized communities. However, equity in preservation is distinct because traditionally addresses human communities within the built environment as opposed to multi-species relationships in the landscape. The preservation of specific structures or sites, coupled with the enduring impacts of past decisions, can contribute to the marginalization of certain communities. Throughout history,

marginalized populations, particularly people of color and those facing economic disadvantages, have been subjected to spatial marginalization through land use decisions, zoning policies, restrictive covenants, building codes, transportation planning, and discriminatory lending practices. Redlining and urban renewal, for example, have disproportionately affected vulnerable communities, leaving lasting effects that continue to be felt today (Rothstein, 2017). These examples are illustrative examples of the consequences of preservation. This topic is important for my project to both provide me with a note of caution, so that my stories do not feed into problematic narratives, and an opportunity, when relevant, to point out relevant discriminatory systems in my tour.

Landscape Narrative

In recent years, the field of historic preservation has expanded to include the preservation of culturally significant landscapes. The path of this project aligns with the historical path of the original tideflat landscape, raising important questions about what this transformation from a delta to an industrial district should signify. What narratives does the Duwamish River tell? The recognition of landscapes in our cultural narrative has gained prominence in recent times. The United States National Park Service (NPS), a prominent institution in the field of historic preservation, has acknowledged the importance of cultural landscapes and actively advocated for their protection since 1983. According to the NPS, cultural resources include "tangible items of historic or cultural significance, such as cultural landscapes, buildings, structures, and objects; as well as intangible items, like traditional knowledge, practices, and life-ways" (U.S. NPS, 2023)

The Duwamish landscape encompasses a multitude of narratives associated with diverse communities. These include the indigenous peoples who have inhabited the area for thousands of years, the often-overlooked history of East Asian immigrants who labored on these lands, and the non-human communities that continue to shape the landscape. In my research, I have explored resources such as Potteiger and Purinton's (1988) book, "Landscape Narratives," which has provided insights into various methods, processes, and forms of representing landscape narratives.

While my project diverges from the specific type of representation discussed by Potteiger and Purinton, it draws on the overarching themes of equity and inclusivity in historic interpretation. By connecting landscape narratives with historic interpretation, I aim to incorporate multiple perspectives and foster a more holistic understanding of the Duwamish landscape.

Telling

As important as the narrative itself is the manner in which it is communicated. Building upon interpretation theories, this section explores various methods of interpretive signage and delves into fundamental questions regarding the potential of interpretive signage to raise awareness of place-based stories. The analysis within this section begins by distinguishing historic interpretation from preservation and explaining the reasons behind my choice to follow the examples set by interpretation. Subsequently, I examine the effectiveness of both on-site and virtual interpretations as means of communication. By exploring these different approaches, I aim to determine the most effective way to engage audiences and effectively convey the rich stories embedded within the Duwamish landscape.

Interpretation

In contrast to historic preservation, historic interpretation serves as an educational endeavor that seeks to uncover meanings and relationships rather than simply convey factual information. According to the National Association for Interpretation (NAI), interpretation is defined as "a mission-based communication process that forges emotional and intellectual connections between the interests of the audience and the meanings inherent in the resource" (NAI, 2023). One crucial aspect of interpretation is the rejection of singular place meanings, emphasizing the importance of embracing diverse and contradictory associations with places that change and evolve over time. This recognition acknowledges that the same location can hold different meanings for various individuals, animals, plants, and fungi. In alignment with interpretive theory, my thesis aims to position itself by prioritizing the underlying experiences and connections across landscapes, humans, and species. While conveying information is a part of the process, the primary focus is on fostering a deeper understanding of the interconnectedness and rich experiences within the Duwamish landscape.

Landscape interpretation can follow two routes: on-site and virtual interpretation. The following two sections provide examples about each type of interpretation and the lessons gleaned.

On-Site Interpretation

Memorials, monuments, ruins, plaques, sculptures – all different types of on-site interpretive signage- are directly tied to the landscape because they are embedded in the environment. These traditional on-site interpretations create landmarks for exploration. Often these on-site markers provide information on events, places, or people on site.

On-site interpretation markers can be experienced at all times of the day and night. The physical presence of interpretive signage within the landscape enhances the information conveyed, creating a more immersive and enriching experience. However, a notable limitation of on-site interpretation is its inability to dynamically respond to individual visitors. The information provided remains constant, regardless of the specific visitor or time of visit. While on-site interpretation offers valuable insights and context, it may lack the flexibility to cater to the diverse interests and needs of each visitor (Botanic Gardens Conservation International, n.d.).

In my research, I focused on examining wayside markers used by the National Park Service as a form of interpretive signage. Wayside interpretation refers to any type of sign that enhances the visitor's experience at a site rather than solely attracting attention to the signage itself. According to the Park Service, there are four key factors that contribute to successful interpretation: the presence of a significant landscape feature with a well-documented story, the inclusion of compelling and site-specific graphics that illuminate the story, the provision of a safe and accessible location for visitors, and the regular maintenance of the sign (U.S. NPS, 2009). All four of these elements help inform the placement of my interpretive signs across the Duwamish River landscape.

To create a successful interpretive experience, certain elements of interpretive signage are necessary. Firstly, the sign should be strategically positioned to direct the viewer's gaze towards a compelling view or feature that aligns with the information provided. Additionally, interesting, and captivating titles are essential to evoke an emotional response from the audience and create a sense of intrigue. The interpretive texts should be concise, focusing on describing events and highlighting the physical

characteristics of the landscape. Legible and compelling interpretive signage uses active voice as often as possible and avoids jargon and technical language to ensure accessibility for a wide range of visitors. Finally, a selection of illustrations can be included to reveal hidden elements or provide new perspectives, enriching the overall interpretive experience (U.S. NPS, 2009).

In addition, the United States Department of Agriculture's Forest Service has developed a comprehensive set of design guidelines that address the accessibility of signage. These guidelines consider the needs of individuals who are color blind or visually impaired, providing specific recommendations for color selection and contrast levels. The guidelines also offer insights into font choices, margin sizes, and spacing requirements to ensure optimal legibility and comprehension (USDA, n.d.).

One limitation of on-site markers is their physical inflexibility when it comes to placement in various environments. Due to their size or environmental constraints, on-site markers may not be suitable for every location. This restriction can limit the accessibility of the information they provide and may hinder their effectiveness in certain landscapes or settings.

Using the principles and guidelines established by the National Park Service and the United States Department of Agriculture's Forest Service, the Contour Project aims to create legible interpretive signage. These established principles serve as a valuable resource in designing a compelling virtual experience that reflects the quality of traditional on-site interpretation. By incorporating well-researched narratives, engaging visual elements, accessible locations, and a commitment to regular maintenance, the project aims to effectively convey the rich stories woven into the fabric of the Duwamish landscape.

Through the careful application of these design guidelines, the Contour Project seeks to create an immersive and thought-provoking online experience that captures the essence of on-site interpretation, but benefits from the flexibility of being on-line. This following section will address the opportunities presented in virtual interpretation.

Virtual Interpretation

Through adhering to the above stated principles and guidelines and adding a virtual element, the Contour Project aims to create an interactive virtual platform that inspires curiosity, fosters a sense of connection, and encourages a greater appreciation for the diverse stories and natural environments present in the Duwamish region.

Virtual interpretation has unique strengths, making it distinct from on-site interpretation. Online information allows anyone to access information anytime and anywhere (University of Illinois Springfield, n.d.). In addition, virtual interpretation can have creative elements not possible in on-site interpretation.

Projects that display the strengths of virtual interpretation include the Waterlines Project Map, available as an online pdf, through the Burke Museum. This map displays indigenous names of places along the waters of Seattle before colonization in the mid-1800s. The names on the map are collected from indigenous elders who worked with ethnographers in the 1900s (Sheikh, n.d.). Place names provide proof of citizenship of the historic Seattle lands and are repositories of indigenous stories. The ability for online platforms to zoom in and out of information allows for this map to contain a massive amount of visual and written information all in a single, eligible graphic.

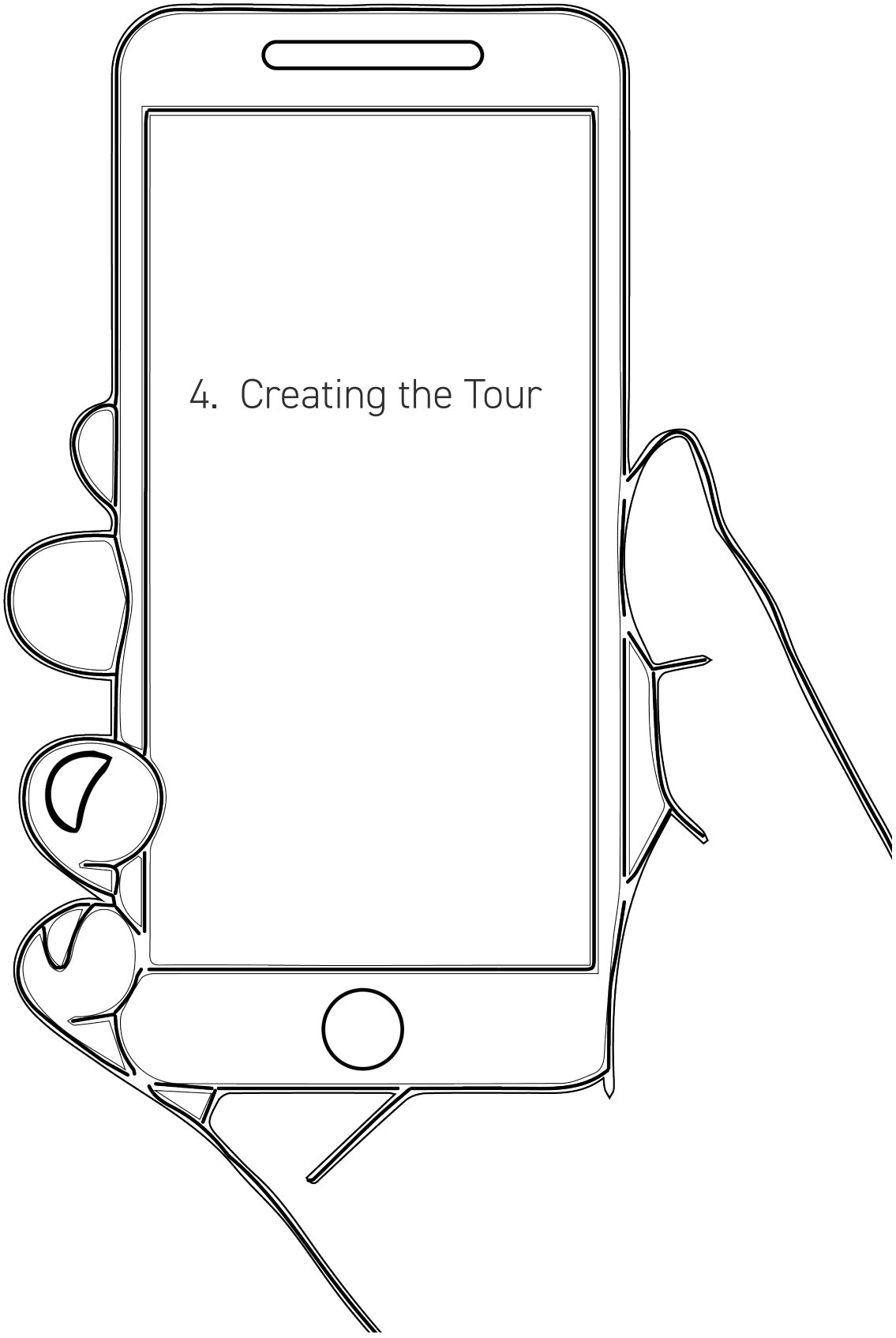
Another creative type of interpretation includes virtual walking tours. I investigated multiple different types of walking tours because the Contour Project is most similar to a traditional walking tour. One particularly successful example is David Williams' Seattle Walks: Discovering History and Nature in the City. This tour gets people out on a dozen different walks around Seattle where they engaged with onsite landmarks. At different moments in the tour, the book asks that the participants stop and observe what is around them. If the past lacks legibility, he provides a rich explanation of their space (Williams, 2017). The benefit of this type of interpretation is that it maximizes moments of Seattle's natural and cultural history. However, participating in one of these tours requires prior planning and cannot be conducted without access to his book.

After I investigated online platforms that will host my tour, I decided to use Esri ArcGIS StoryMaps. ESRI utilizes the mapping power of ArcGIS and the ability to collage these maps with different digital information. Visual, written, and audio information can be added to StoryMaps to illustrate the concepts in the maps (ESRI, n.d.). Stories of place-meaning can be particularly powerful. For instance, the website "Voices of the Grand Canyon," developed by the Grand Canyon Trust, walks the viewers through the stories of the Grand Canyon area. It includes a map of the pre-colonial territories of the different tribes. Another map displays present-day tribal lands where unaffiliated tribes were forced onto reservations in the late 1800s. Following the maps, the website shares the stories of five indigenous people from five different tribes and their contemporary relationship with the land, tribal myths, or traditional knowledge relating to the Grand Canyon (Grandy Canyon Trust, n.d.). I found this narrative component compelling because the platform allowed for written elements to accompany maps and photographs—creating a seamless multi-media experience. This project became foundational for the trajectory of this thesis, because I decided to use StoryMaps as the online platform for the Contour Project. I chose StoryMaps Esri has a powerful interface compatible with phones and computers. StoryMaps is particularly adept at transforming ArcMaps into an online platform.

Virtual interpretation does have equity concerns for poor or marginalized communities that do not have a cell phone, lack digital literacy, or cannot connect to the internet will not have the same access to a virtual tour (University of Illinois Springfield, n.d.). This barrier needs to be acknowledged as it is particularly difficult for the Contour Project to overcome.

I structured this literature review by dividing the act of storytelling into two distinct parts: Story and Telling. The first section, Story, focuses on the process of selecting the stories themselves. From this literatures review, I was able to choose twenty-one narratives. These stories have been thoughtfully selected to provide a comprehensive and engaging experience for the audience. While the second section, Telling, explores various modes of communication and presentation. I have considered both virtual and in-person interpretation methods, ensuring that the project reaches a wide range of individuals. By employing a combination of digital platforms and immersive experiences, I aim to create engaging and accessible ways for people to connect with the stories and the significance of the Duwamish River.

4. Creating the Tour



Throughout the ten-mile circular tour that I developed, I selected designated stops that are strategically placed approximately every half mile to provide opportunities for engagement. At each stop, I will place QR code stickers that allow visitors to access a website that offers site-specific information about the transformation of the Duwamish River and the profound impact of these changes on both human and more-than-human communities. This interactive approach ensures that visitors can delve into the narratives and histories of the landscape while also providing a flexible and accessible means of exploring the tour at their own pace and convenience. In this way, the Contour Project emerges as an experiential moment at the intersection of a set of physical landmark and a virtual tour.

A review of the literature suggests that virtual and in-person interpretive signs each have their own unique strengths. Recognizing the value of these different modes of storytelling, the Contour Project aims to leverage these advantages to enhance the tour experience. On-site experiences offer individuals the opportunity to connect with their physical senses. The sounds of traffic on an overhead viaduct or the horns of passing vessels, along with the scents carried by the winds from Elliott Bay or nearby industrial areas, contribute to the sensory richness of the landscape. Contrasting colors and textures in greenspaces and hardscaped industrial areas highlight the diverse treatment of the landscape. The sense of verticality, whether standing beneath a viaduct or on top of a bridge, adds another layer to the story.

On the other hand, virtual signage provides broad, yet not all encompassing, accessibility. With an online platform anyone with a cell phone can access the information online at their convenience. Virtual communication offers a wide range of formats, including videos, text, and interactive elements, allowing for a more immersive, inclusive, and engaging experience. Additionally, virtual platforms can serve as gateways to further resources and references, enabling the audience to explore related topics and delve deeper into the narratives presented.

Each stop along the Contour Project tour incorporates a virtual component, accessible through on-site QR codes. By scanning these QR codes, viewers are directed to a dedicated website that serves as a gateway to the meaning and significance of each place, as well as the diverse communities, both human and more-than-human, that have shaped the landscape. This digital platform enhances the educational and interpretive experience by providing viewers with a wealth of historical photographs, maps, and textual information, deepening their understanding and connection to the site. Through the use of multimedia, the digital platform offers a dynamic means of connecting with the stories and histories embedded within the landscape. Participants can explore the content at their own pace, delve deeper into specific aspects of interest, and even discover additional resources and avenues for further exploration.

Ideal Pathway Design

From the inception of the Contour Project, my intention has been to design a route that closely aligned with the original Duwamish River shoreline. The goal was to create a circular route that would trace the high-tide waterline to the south and then traverse the mudflats along the low-tide waterline, providing participants with a unique opportunity to experience the fluctuations in water levels throughout the day. By following this route, I aimed to foster a connection between individuals and the dynamic nature of the Duwamish River.

One of the key advantages of the circular route is its flexibility. Individuals can join the Contour Project Tour at any point along the route, as it allows for multiple entry and exit points. This means that participants can tailor their experience to their convenience, interest, and availability. Whether someone begins their journey at a specific site of interest or decides to explore the entire route, the circular nature of the project ensures that they can engage with the narratives and immerse themselves in the transformation of the Duwamish landscape. Regardless of where individuals choose to embark on their journey, the Contour Project invites them to explore and discover the rich narratives that unfold along the route, fostering a deeper appreciation for the evolving landscapes and the interconnected communities that have shaped the area.

Pragmatic Alterations to the Route

When exploring the possibilities of following the Duwamish River shoreline, I encountered certain physical limitations that prevented the exact replication of the historic tideflat shoreline. To follow the edge of the tideflat, the tour would have required crossing the Duwamish River at two points, leading to constraints on the northern and southern boundaries of the route. To complete the circular path, I had to incorporate the 1st

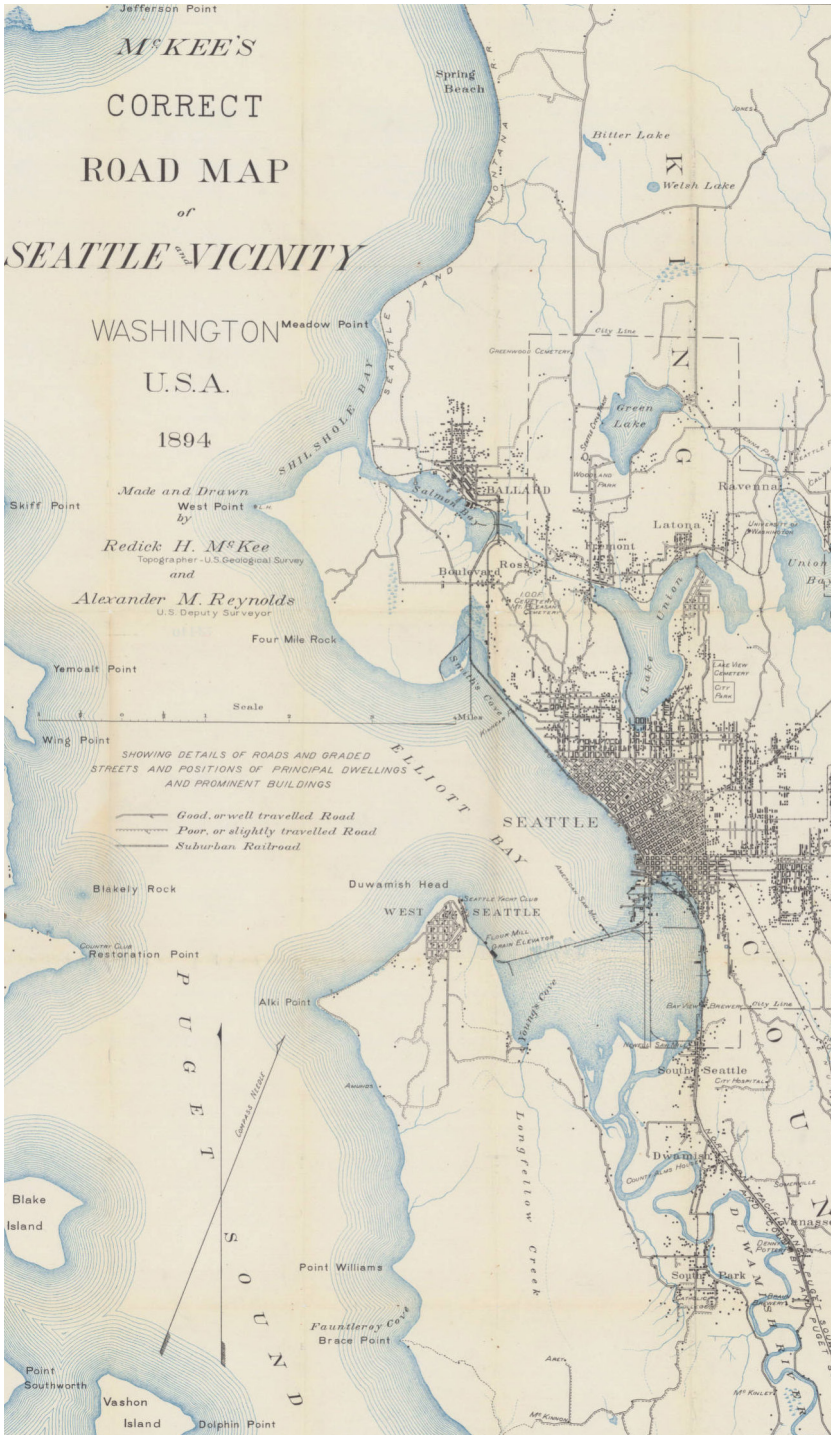


Figure 10. 1894 Road Map of Seattle
(University of Washington Libraries, Special Collections, uwm33; G4284.S4 1894 .M35

Avenue Bridge to the South and the SW Spokane Street Bridge to the north.

Furthermore, the gridded street pattern in the Industrial District, SODO, and Georgetown neighborhoods did not align with the historic site conditions I aimed to reference. Consequently, the path had to zig-zag across the site instead of following the natural curve of the historic shoreline. This deviation was necessary to navigate the existing road network and ensure a coherent and manageable route for participants.

It is important to note that not all roads are equal in terms of pedestrian and cyclist accessibility. During the tour and stop selection process, I prioritized streets that provided safe and pleasant pedestrian experiences. I sought out streets with well-maintained sidewalks, nearby amenities such as shops and parks, and a welcoming environment created by street trees. However, despite these efforts, the tour is not fully ADA accessible to individuals with disabilities due to a lack of curb cuts. This limitation is due to the streetscape characteristics of the neighborhoods and the existing infrastructure.

To accommodate cyclists, I specifically chose roads with bicycle-friendly infrastructure and facilities. This includes streets with sharrows, separate bike lanes, designated greenways, or multi-modal trails. By prioritizing these routes, I aimed to ensure a more enjoyable and efficient experience for cyclists participating in the Contour Project.

While there were constraints and compromises in designing the route, my intention was to create a tour that maximized safety, comfort, and engagement for pedestrians and cyclists. By selecting streets with desirable amenities and accommodating infrastructure, I aimed to enhance the overall experience and encourage active exploration of the Duwamish River and its surroundings.

Figure 11. 1850 Duwamish River Shoreline

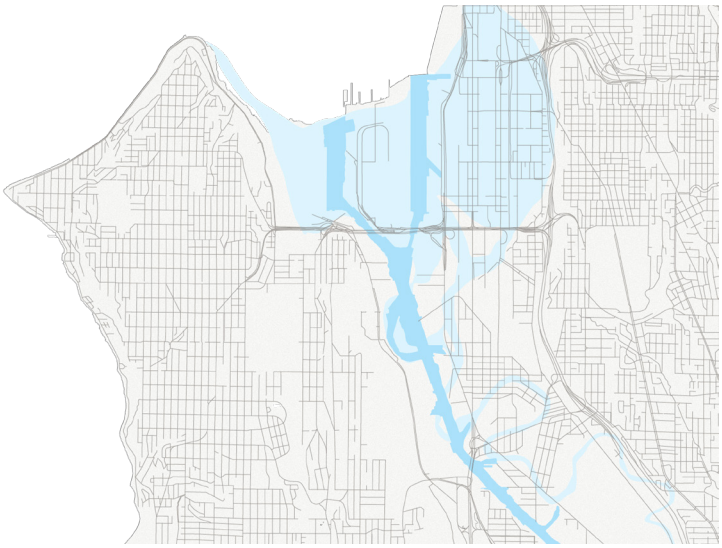


Figure 12. 1850 & 2023 Shoreline with Roads

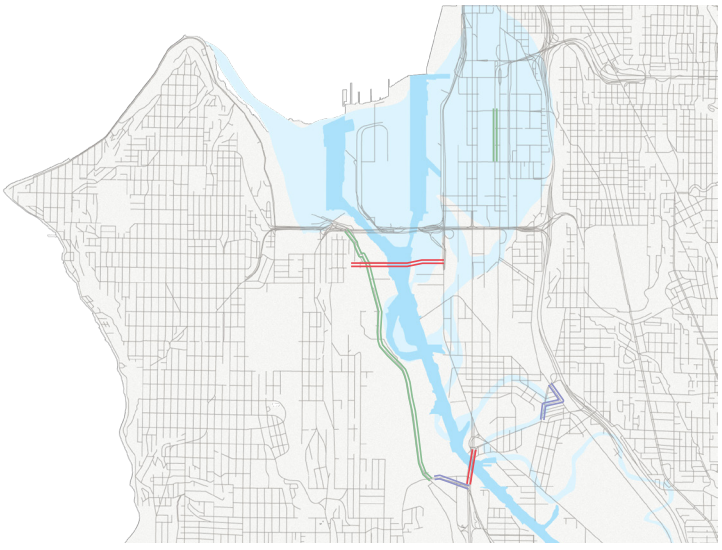


Figure 13. 1850 & 2023 Shoreline with Roads & Protected Pathways
(Maps by author)

Contout Project Circular Pathway with Roadway Considerations

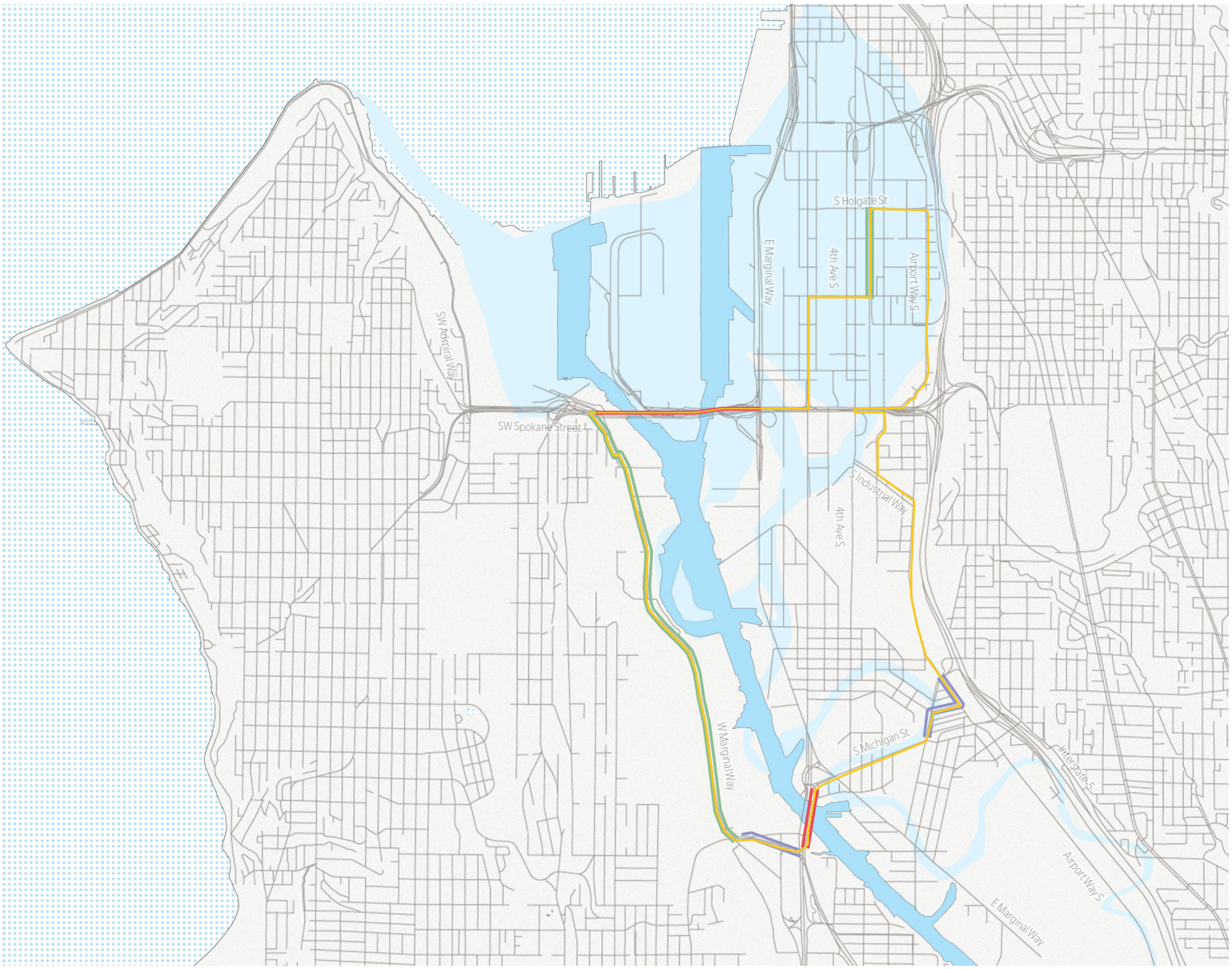


Figure 14. The Pathways with the 1850 & 2023 Shoreline, Roads, & Pathways (Map by author)

The Stops

Twenty-one carefully selected storytelling moments with corresponding QR code stickers form the core of this tour. I chose each stop based on its historical or aesthetic qualities, with the aim of enhancing each story through the environment of its placement. These moments serve as destinations within the industrial landscape, revealing hidden elements and shedding light on the intricate layers of the surrounding environment.

Collectively, these twenty-one stops intertwine to create a rich and multi-threaded narrative of the Duwamish River. Through diverse perspectives and stories, the tour aims to display a picture of the river's past and present. By incorporating elements of history, culture, ecology, and community, the Contour Project offers participants a deep and immersive understanding of the Duwamish River's significance within the larger tapestry of the region.

On-Site Element: QR Codes

On-site stickers play a crucial role in introducing people to the project. Placed strategically at various locations along the tour, these stickers serve as visual cues that aim to capture people's attention and pique their curiosity. Participants can use their smartphones or other devices to scan the QR codes on the stickers. This action directs them to the virtual platform associated with the Contour Project. The virtual platform serves as an expansive resource that offers in-depth information about the specific site and its significance within the broader context of the Duwamish River landscape. Here, participants can access historical photographs, maps, text information, and other multimedia content that enriches their understanding and interpretation of the site. When individuals encounter these stickers, they are encouraged to explore further and discover the stories and meanings embedded within the site through the linked source material at the end of the website.

At each stop along the tour, participants will discover a standardized sticker measuring approximately 4" by 4". These stickers feature a unifying graphic style, depicting a hand holding a phone with a QR code displayed on the screen. The hands holding the phones vary slightly in position and are presented in different shades of blue. This cohesive graphic design connects all the stickers, emphasizing their association with the Contour Project.

Each sticker prominently displays the project title, "Contour," accompanied by a brief description that provides context for the site. Each sticker also lists the site number, to allow the audience to navigate the online platform more quickly. By standardizing the wording, graphic quality, and color scheme across all stickers, participants can easily identify and locate each stop on the tour. The consistent visual presentation of the stickers helps individuals navigate the tour and reinforces the project's cohesive identity.

To effectively incorporate the project's informational stickers within the urban landscape, careful consideration will be given to their placement on highly visible mobility infrastructures. Various elements such as railings, light posts, support columns for bridges or viaducts, signs, and traffic lights offer ideal locations for displaying the stickers. The aim is to strategically position each sticker in relation to the information it

Figure 15. Contour Project Sticker #1 (Illustration by author)

represents, fostering a deeper connection between the audience and the physical environment being discussed. For instance, if the information pertains to the railroad, placing the sticker on the barrier of a railroad crossing can help draw people closer to the physical context of the story. By utilizing existing mobility infrastructure, the project not only maximizes visibility but also leverages the inherent associations and relationships these elements have within the urban landscape.

Consistency in sticker placement height is crucial for ease of discovery and navigation. Each sticker will be positioned at the average height for adult eye level, approximately 57" off the ground ("Rules for Hanging Art, 2017). This standardized height ensures predictability along the tour route, enabling participants to locate and engage with the stickers more easily.

To ensure visibility and accessibility for both pedestrians and cyclists, the placement of stickers along the tour route will consider the presence of sidewalks and bicycle paths. Given that the route follows major arterial roads with four lanes of traffic, each site will have at least two stickers—one on each side of the roadway. This approach minimizes the need for pedestrians and cyclists to cross the street to access the information. Recognizing the importance of providing clear signage for cyclists, additional stickers will be placed at each site, specifically facing the bicycle path. By doing this, cyclists will have a direct line of sight to the stickers, ensuring that the information is readily available to them without any visibility obstacles.

Virtual Component: Contour Project

Once the QR code is scanned, viewers will be directed to the ArcGIS StoryMaps page specifically created for the Contour Project, accessible at https://storymaps.arcgis.com/stories/b96f3c6909ed49d29ae-714528cba8100. This page serves as a central hub for the project's virtual content and provides an interactive and immersive experience for the audience.

Each sticker has a number corresponding to the site. By clicking on the site number on the website, viewers can access a range of information related to that site. This includes a map displaying the various sites along the tour, a historically relevant photograph that helps contextualize the area, and a written description that explores how landscape changes have shaped and impacted both social and ecological communities in the Duwamish region. This combination of visual and textual content aims to deepen the audience's understanding of the site's significance and foster a connection to the historical narrative being presented.

The Contour Project's StoryMaps website offers more than just individual site information. It serves as a comprehensive resource for visitors to the project, introducing the project itself, featuring additional images and maps that showcase the landscape transformations within the Duwamish area, and offering a timeline of events that further illuminates the historical context.

By combining on-site stickers and the virtual platform, the Contour Project ensures that participants can seamlessly transition between physical and digital experiences. The on-site stickers act as entry points, inviting individuals to engage with the project, while the virtual platform provides them with a comprehensive and immersive exploration of the site's stories and significance. This dynamic approach allows for a flexible and accessible experience, catering to a wide range of participants who may have different preferences and abilities in accessing information.

Storytelling Opportunities

All twenty-one stories engage the audience in stories that display the relationship between landscape transformations, human, and multi-species relationships. I chose eleven human and ten multi-species relationships to share in the tour. However, when choosing where these sites are located three main considerations centered the selection of storytelling moments along the path: pedestrian friendly rest spaces, views, and sensory linkages between the content of the story, the historic photograph, and the site.

In addition to designing a pathway that maximizes pedestrian safety and comfort, I wanted to find stops near pedestrian-friendly spaces. Rest stops will make this tour more accessible and allow for participants to incorporate other experiences outside of the tour. Six sites include the pedestrian and shopping street in Georgetown along Airport Way S and the Old Rainier Brewing Building. I also placed three additional sites near parks spaces. These sites include the West Seattle Trail Bridge Trail Fishing Park, Toolalt Village Park and Shoreline Habitat Terminal, the Georgetown Playfields, and Herring's House Park.

In addition to being in proximity to pedestrian spaces, I wanted to maximize sites with relevant sensory experiences. For example, I chose to place six tour moments on bridges and overpasses to give my audience a sweeping view. I placed four sites under roadways and overpasses. The spaces under overpasses and bridges also have a unique quality and enrich these story moments especially when I address relationships with creatures such as clams.

From interviews with local historians Knute Berger and David Williams, I chose sites where historic photos created a now-and-then moment (B. Knute, personal interview, 2023) (D. Williams, personal interview, 2023). Both historians conveyed the popularity of such moments in their reporting. In total, I found eight historic photographs that matched the addresses of modern places. These now-and-then moments maximize the awe at sites where participants can imagine being at the shoreline.

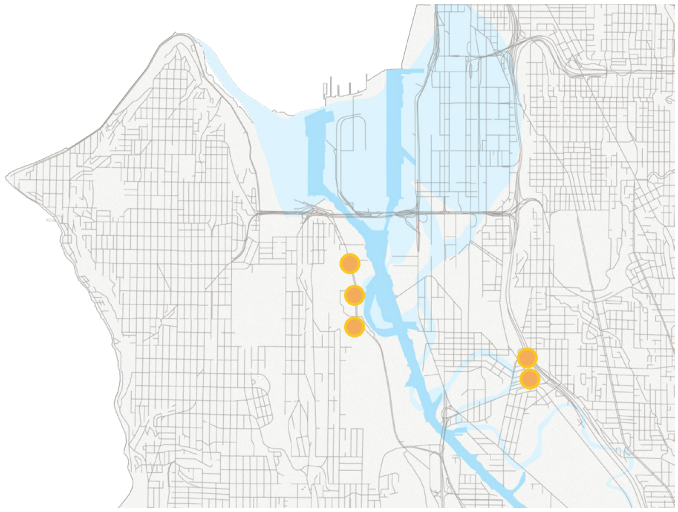


Figure 16. Tour Moments in Proximity to Parks, Plazas, and Rest Areas

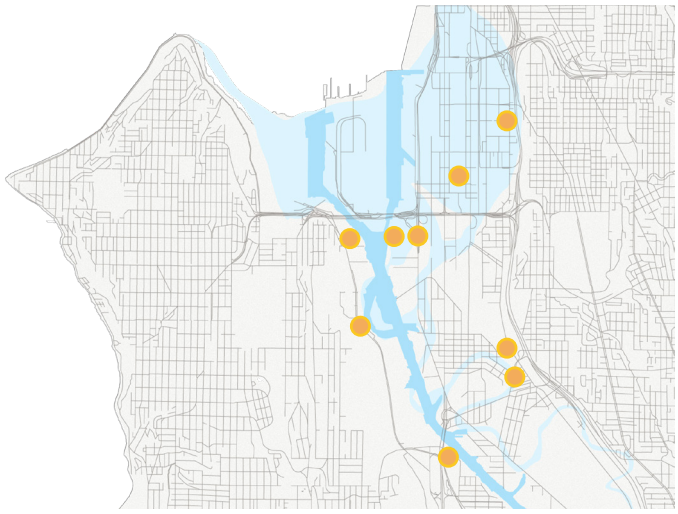


Figure 17. Tour Moments with Views

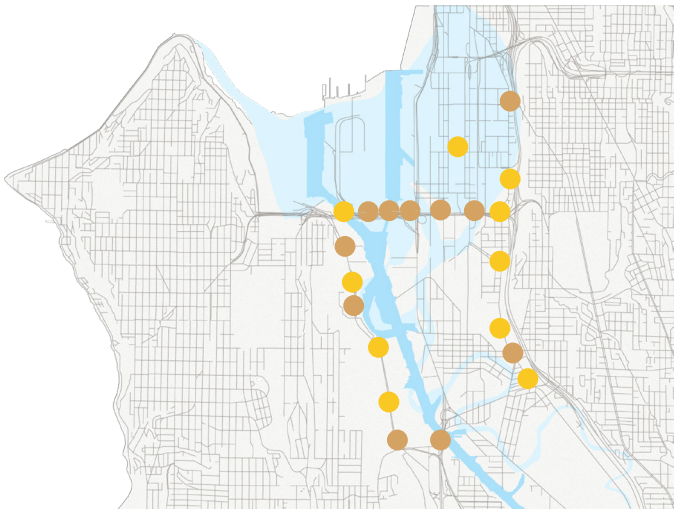


Figure 19. Tour Moments with Ecological and Social History

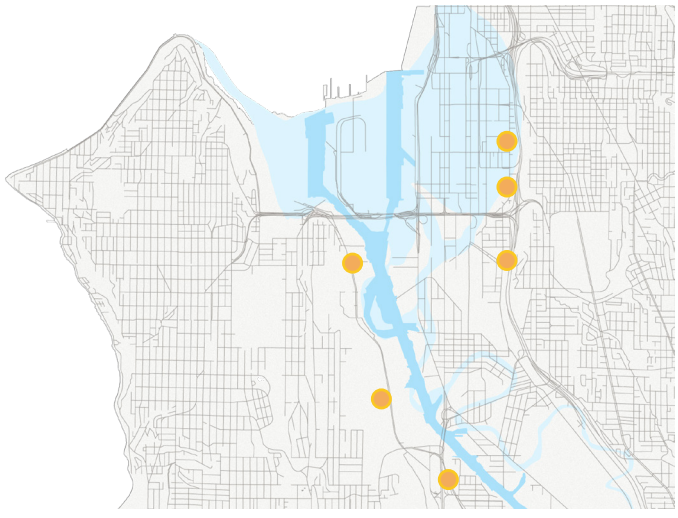
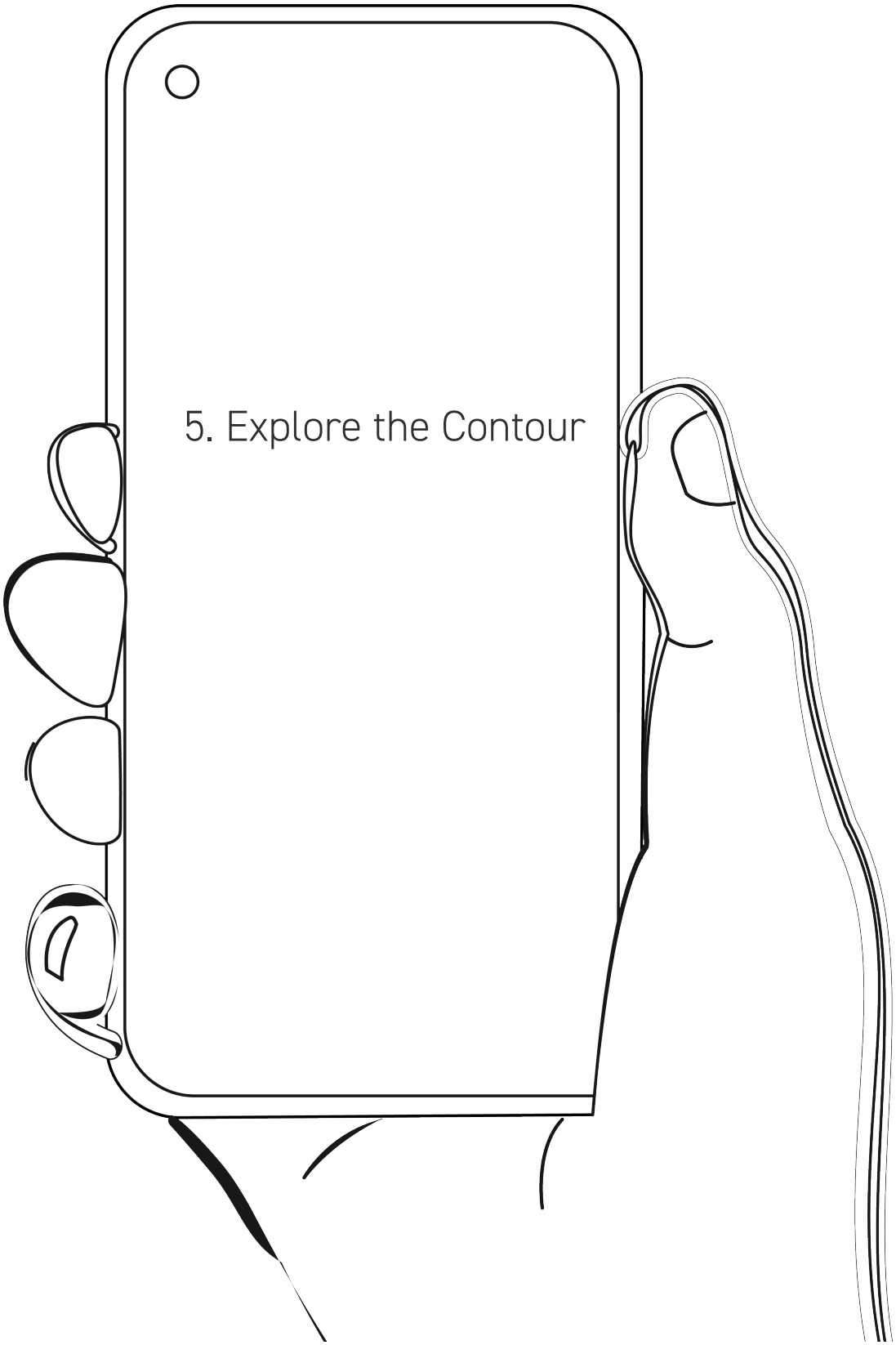


Figure 18. Tour Moments with Corresponding Historic Photographs
(Maps by author)


5. Explore the Contour

In this section, I will serve as your guide, taking you on a journey from site to site across the historic landscape of the Duwamish River. Alongside the information provided on the website, I will provide detailed site descriptions and share my rationale behind the selection of each location. Since, reading about the interpretive tour is not the same as physically traveling to each site, I strongly encourage you to actively participate in the virtual tour by scanning the QR code. By doing so, you can fully immerse yourself in the experience and gain a deeper understanding of the historical and ecological significance of each stop along the way. So, let's embark on this virtual adventure together and discover the hidden stories that shape the landscape of the Contour Project.

Contemporary Duwamish with Sites & Pathway

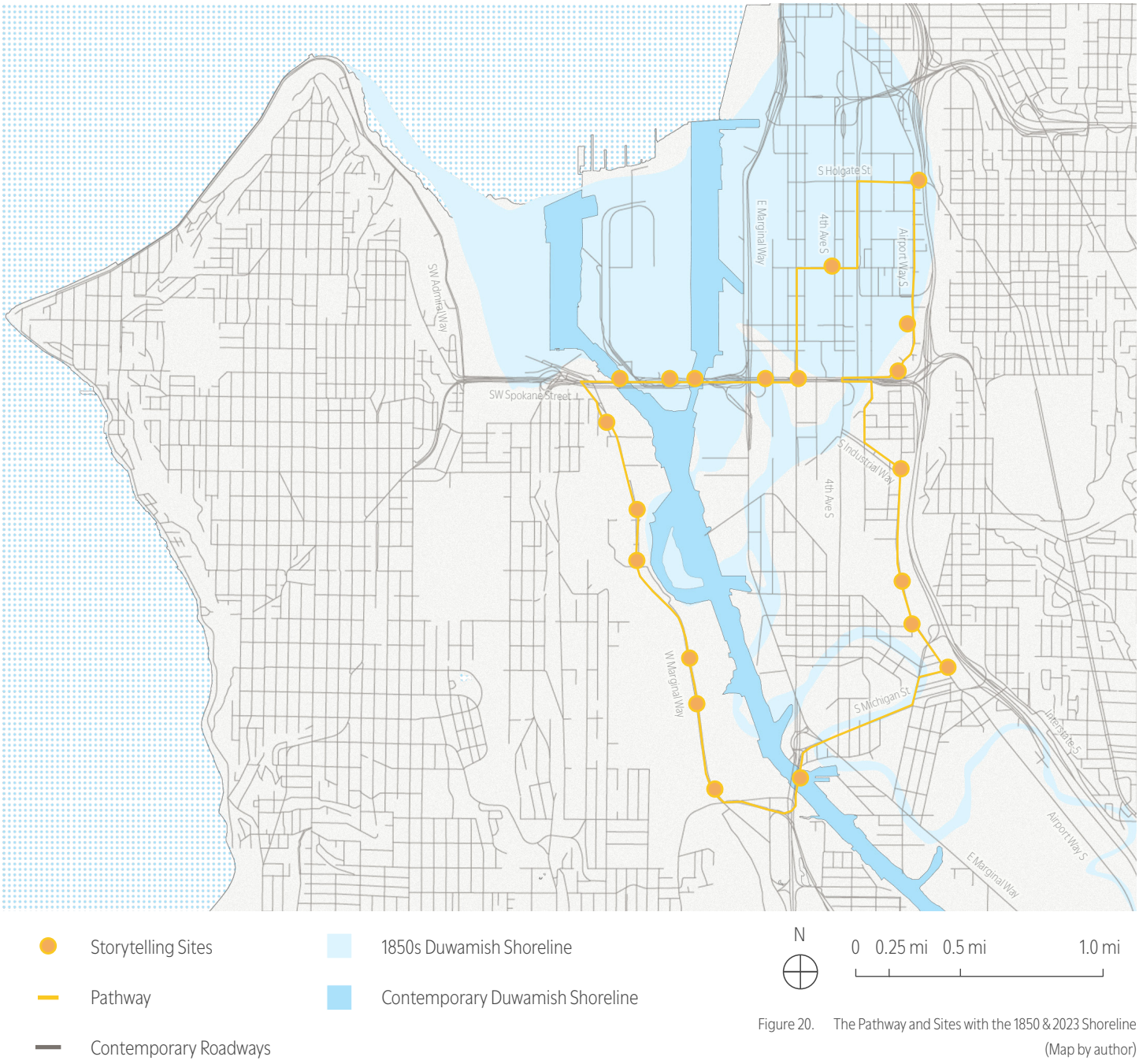


Figure 20. The Pathway and Sites with the 1850 & 2023 Shoreline (Map by author)

Site 1: The Tideflat Ecosystem

Holgate Bridge

Figure 21. Site Photograph at the Holgate Street Bridge

(Photo by author)

Site Description:

The first stop on this interpretive tour brings us to the top of Holgate Street Bridge. From this vantage point, we are treated to a panoramic view down Holgate Street, where the towering cranes at the edge of the Duwamish River come into sight. Although the river itself may not be visible from this spot, our gaze extends across the hidden waters, offering a glimpse of the rolling hills of West Seattle on the other side.

Site Selection:

The Holgate Bridge serves as a fitting starting point for our tour, strategically chosen for its proximity to multiple transit stops. Located within a fifteen-minute walk from the SODO light rail station, an eight-minute walk from the Stadium light rail station, and a twelve-minute walk from the Beacon Hill light rail station, it offers easy accessibility to public transportation networks. The placement near major transit hubs ensures that the tour is more inclusive and reachable for a wider range of participants, as they can incorporate it into their existing travel routes.

The Holgate Bridge offers a captivating view of the industrial landscape along the Duwamish River. Standing atop the Holgate Bridge Viaduct, one's gaze extends down Holgate Street, revealing the imposing presence of the dock cranes that stand as sentinels against the backdrop of West Seattle's hills. Although the river itself remains hidden from sight, there is a palpable sense of its presence in the void between the cranes and the hillside—an acknowledgement of its significance, even if it remains physically inaccessible from this site.

Figure 22. Trestles over the tidal flats, ca. 1903
(Museum of History & Industry, MOHAI, PEMCO Webster & Stevens Collection)

Historic Photograph:

This 1903 photograph captures a glimpse into the past, showcasing the elevated railroads and support piles driven into the sand. The tideflats stretch out, with water reaching the edge of Beacon Hill. To provide a deeper connection between the past and present, our contemporary view intentionally mirrors the angle and position of this historic photo. This "now-and-then" moment creates a compelling addition to our tour, allowing us to observe the changes that have taken place over the years.

The comparison of the historic image to the modern surroundings makes apparent that access to the water has become increasingly limited. The presence of buildings, terminals, and concrete structures obstructs our view of the river. Our contemporary landscape stands in stark contrast to the one captured in the photograph, which depicts a time when one could have easily reached the shoreline of the historic landscape. Today, we find ourselves standing on a concrete street where water was once accessible.

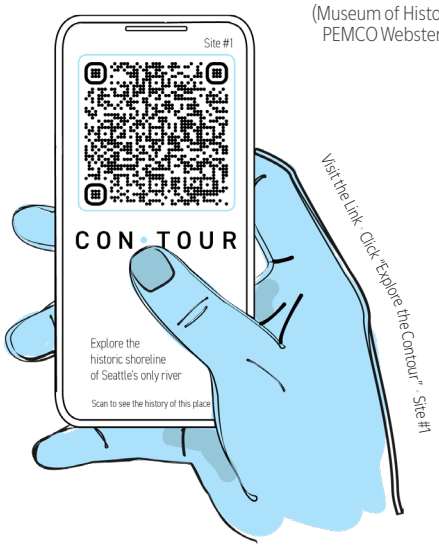


Figure 23. Contour Project Site #1 Sticker
(Illustration by author)

The inclusion of this historic photograph serves as a powerful testament to the transformations that have occurred in relation to the tideflat.

Figure 24. Site #1 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Tideflat Ecosystem:

Before concrete replaced soil, the life cycles of all creatures revolved around the river. While we don't possess photographic evidence of this pre-settlement landscape, standing here on the Holgate Bridge allows us to envision a scene where high tide covered everything below, submerging the area in a sheet of water ranging from 10 to 15 feet deep. Tideflat habitats consist of a nearly flat coastal area that experiences the ebb and flow of tides, alternately being submerged and exposed. Within a tidal basin, the tidal flat occupies the middle ground, situated below the salt marsh that supports vegetation and above the low-tide mark. Looking westward 150 years ago, the vast expanse of mud extended from the base of Beacon Hill to the edge of the West Seattle peninsula. This tideflat stretched for over three-quarters of a mile southward, encompassing the area where the modern-day SODO Costco and Arena Sports now stand. Today cement has replaced mud and 97% of this ecosystem has vanished (Cummings, 2020).

Next Stop: Site #2

Distance: 0.9 miles

Time: 18-minute walk / 6-minute bike

Site 2: Agricultural Industry

Airport Way South and South Stevens Street

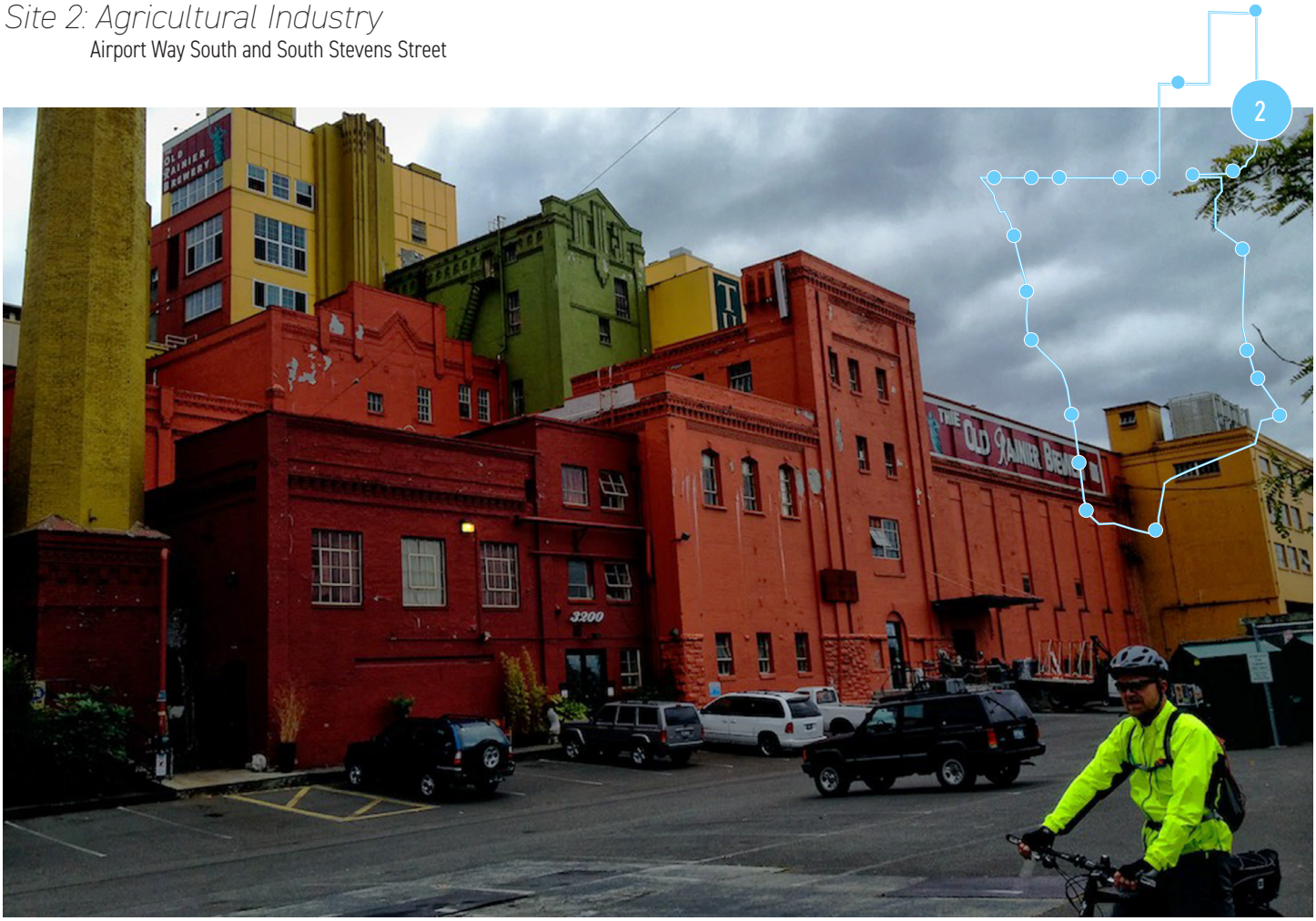


Figure 25. Airport Way South and South Stevens Street (Photo by author)

Site Description:

The Old Rainier Building, with its conspicuous brick façade and letter "R" above the streetscape, contrasts the landscape and other buildings in the area. To the east, Sound Transit docks the cars for the light rail, to the south a nondescript office space abuts the Rainier Building, and to the west, the steep edge of Beacon Hill. The Old Rainier Building stands out due to its enduring allure for both locals and tourists alike.

Site Selection:

The iconic Old Rainier building attracts a diverse range of individuals, including those involved in the brewing industry, commuters along Interstate-5, and visitors exploring the city. The building holds a special place in Seattle's brewing history as it later gained renown for its popular Rainier Beer, capitalizing on the thriving hop industry of the time. Today, the site offers more than just a glimpse into its brewing legacy. It has transformed into a multifaceted destination with practice spaces for local musicians, recording studios, a spa, artist studios, and even a barber shop (The Factory Luxe, n.d.). The bustling pedestrian activity around this historic building provides an excellent opportunity to engage the public with the rich histories and stories associated with the place.

Just one block south of The Old Rainier Building, you'll find a convenient bus stop for Route 124. When planning this tour, I made sure to incorporate bus routes into the route design to broaden accessibility. All seven tour stops along Airport Way South align with bus route 124. Moreover, the tour's first eight moments are all located within a comfortable 10-minute walking distance from this bus route. This strategic approach allows individuals using public transportation to easily navigate and explore the tour, making it accessible and convenient for a wider range of participants.

Figure 26. Seattle Brewing & Malting Company's Building, ca. 1915
(Museum of History & Industry Collection , MOHAI, 1983.10.10091)

Historic Photograph:

Constructed in the 1880s, the iconic Old Rainier building architecturally connects the present to the past. Visitors will be amazed at the similarities between the view of the Rainier Building in 1915 and today. Both images show the iconic building, a modern roadway that has replaced the wood and dirt road of the past, a trolley car replacing Interstate-5 in the background, and the slope of Beacon Hill remains the same.

Figure 27. Contour Project Site #2 Sticker
(Illustration by author)

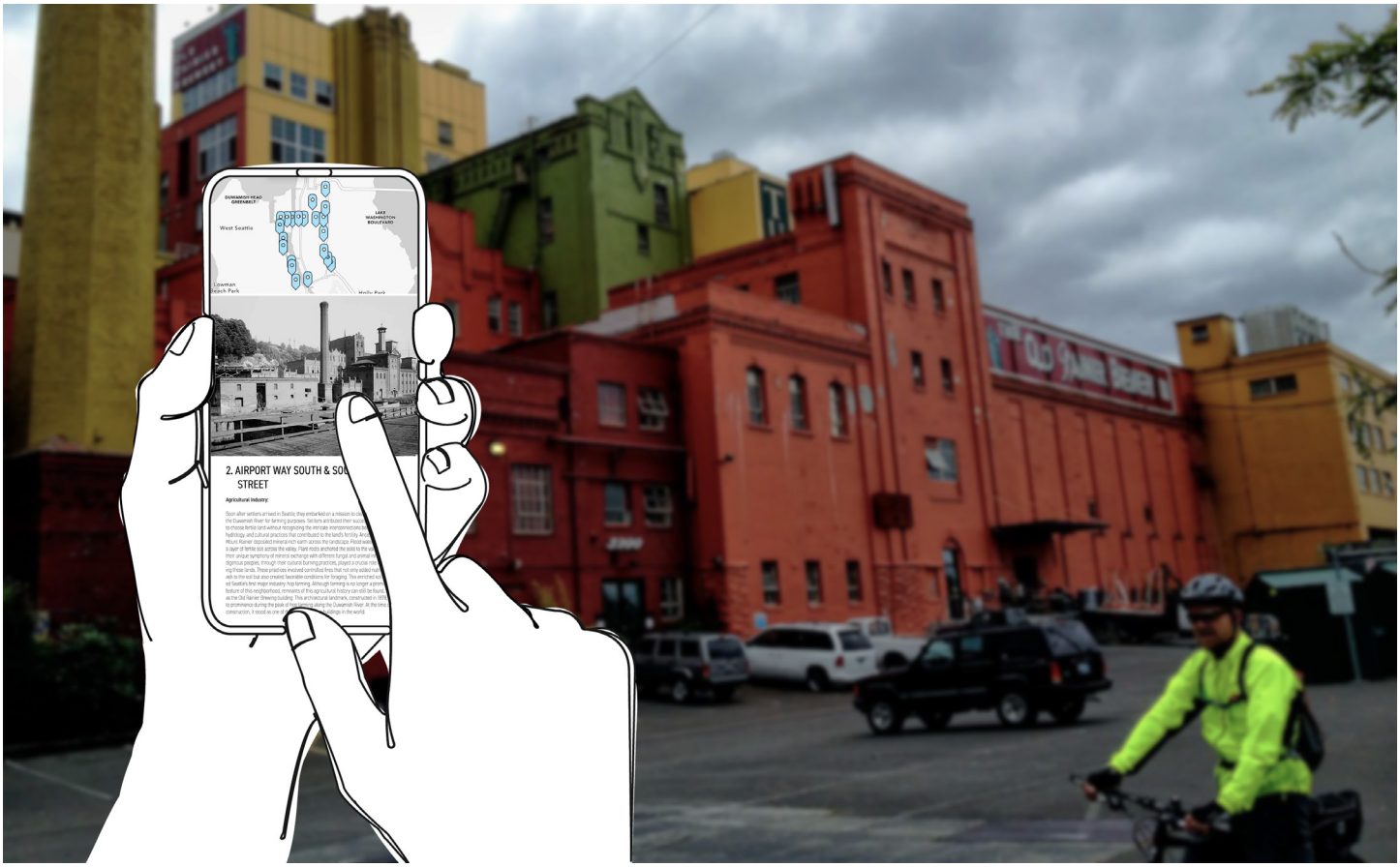


Figure 28. Site #2 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Agricultural Industry:

Soon after settlers arrived in Seattle, they embarked on a mission to clear the land along the Duwamish River for farming purposes. Settlers attributed their success to their ability to choose fertile land without recognizing the intricate interconnections between geology, hydrology, and cultural practices that contributed to the land's fertility. Soon after settlers arrived in Seattle, they began clearing the land along the Duwamish River for farming. Settlers attributed their success to their ability to choose fertile land without recognizing the diverse geological, hydrological, and cultural practices that enabled this fertility. Ancient lahars from Mount Rainier deposited mineral-rich earth across the landscape. Flood waters deposited a layer of fertile soil across the valley. Plant roots anchored the soils to the valley, playing their unique symphony of mineral exchange with different fungal and animal inhabitants. Indigenous peoples, through their cultural burning practices, played a crucial role in maintaining these lands. These practices involved controlled fires that not only added nutrient-rich ash to the soil but also created favorable conditions for foraging. This enriched soil supported Seattle's first major industry: hop farming. Although farming is no longer a prominent feature of this neighborhood, remnants of its history can still be found, such as the Old Rainier Brewing building. This architectural landmark, constructed in 1878, rose to prominence during the peak of hop farming along the Duwamish River. At the time of its construction, it stood as one of the largest brewing buildings in the world.

Next Stop: Site #3

Distance: 0.4 miles

Time: 9-minute walk / 3-minute bike

Site 3: Reshaping Seattle

South Spokane Street and Airport Way South

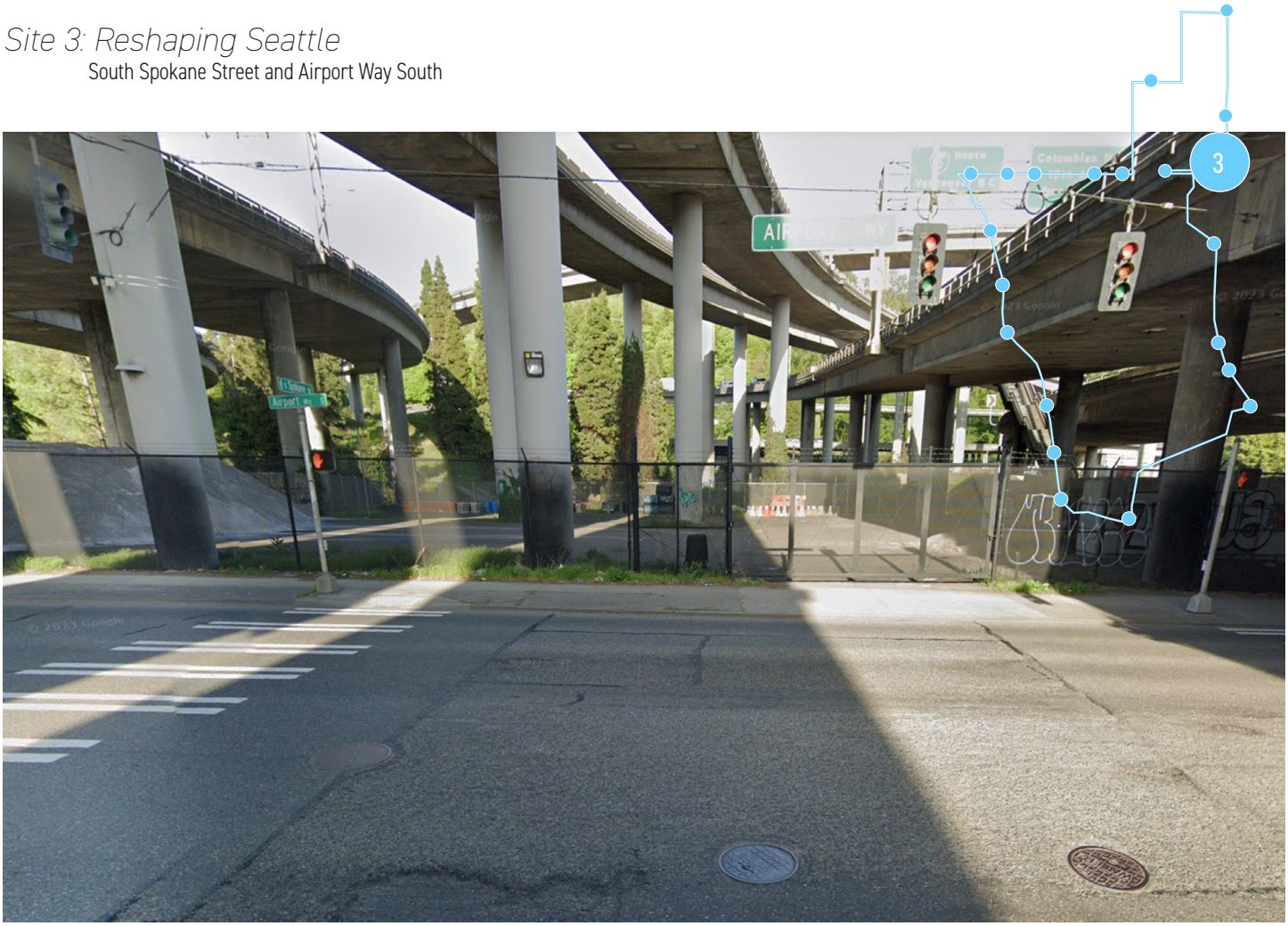


Figure 29. Site Photograph at S. Spokane Street and Airport Way S. (Photo by author)

Site Description:

This site is dominated by concrete and asphalt, creating a stark contrast to the once-lush waterway that existed here. The visual appeal of a flowing river has been replaced by the sight of hundreds of cars streaming through Semple's gash in the hillside. The constant hum and rumble of highway traffic permeate the air, drowning out most other sounds that would typically be associated with a natural environment. The prominence of mobility infrastructure, such as roads and highways, is undeniable in this landscape.

Rumbling from the viaduct above and fast-moving traffic echo off the concrete that dominates this site. While this location does not cater to the pedestrian experience it felt important to include as part of the landscape narrative because of the intensity of this environment and its significance in the story of the Duwamish tideflat. It speaks to the shifting priorities of the people who reside here, where mobility and accessibility have taken precedence over preserving the natural beauty of the river and its surroundings.

Site Selection:

This location holds immense historical significance as it played a pivotal role in the transformation of the Duwamish tideflats. It was here that Eugene Semple and the Seattle and Lake Washington Waterway Company employed hydraulic cannons to blast a canal through Beacon Hill, forever altering the landscape. Including this site in the Contour Project is essential as it allows visitors to experience a now-and-then moment, where they can view the present landscape through a new lens. By tying a specific address to this a historical moment, we provide visitors with a tangible connection to the past. It enables them to envision how this area looked and functioned during the time of its transformation. While the highways and industrial infrastructure may seem detached from their historical origins, they, too, have rich histories worth exploring.

In addition, bus route 124 has a stop right out front, providing convenient public transportation to this site.

Figure 30. Semple's South Canal project showing hydraulic giants at work, ca. 1901
(University of Washington Libraries, Special Collections, UW4227)

Historic Photograph:

Standing in the same location where the photograph was taken, viewers can witness a powerful juxtaposition between then and now. Today, with trees and roadways covering the excavated portion of Beacon Hill, it is difficult to fathom the magnitude of earth that was removed from the hill and added to the Duwamish Tideflats.

This photograph acts as a visual bridge, enabling viewers to grasp the immense scale of the giant hole that was once a prominent feature of the landscape. It provides a glimpse into the transformative processes that took place and helps viewers gain a deeper understanding of the impact of human intervention on the natural environment.

Figure 31. Contour Project Site #3 Sticker
(Illustration by author)

By showcasing this historic photograph, the Contour Project invites viewers to reflect on the changes that have occurred over time and encourages a greater appreciation for the intricate relationship between the natural and built environment. It serves as a reminder that beneath the surface of our modern surroundings lie hidden stories and dramatic alterations that have shaped the landscape we see today.

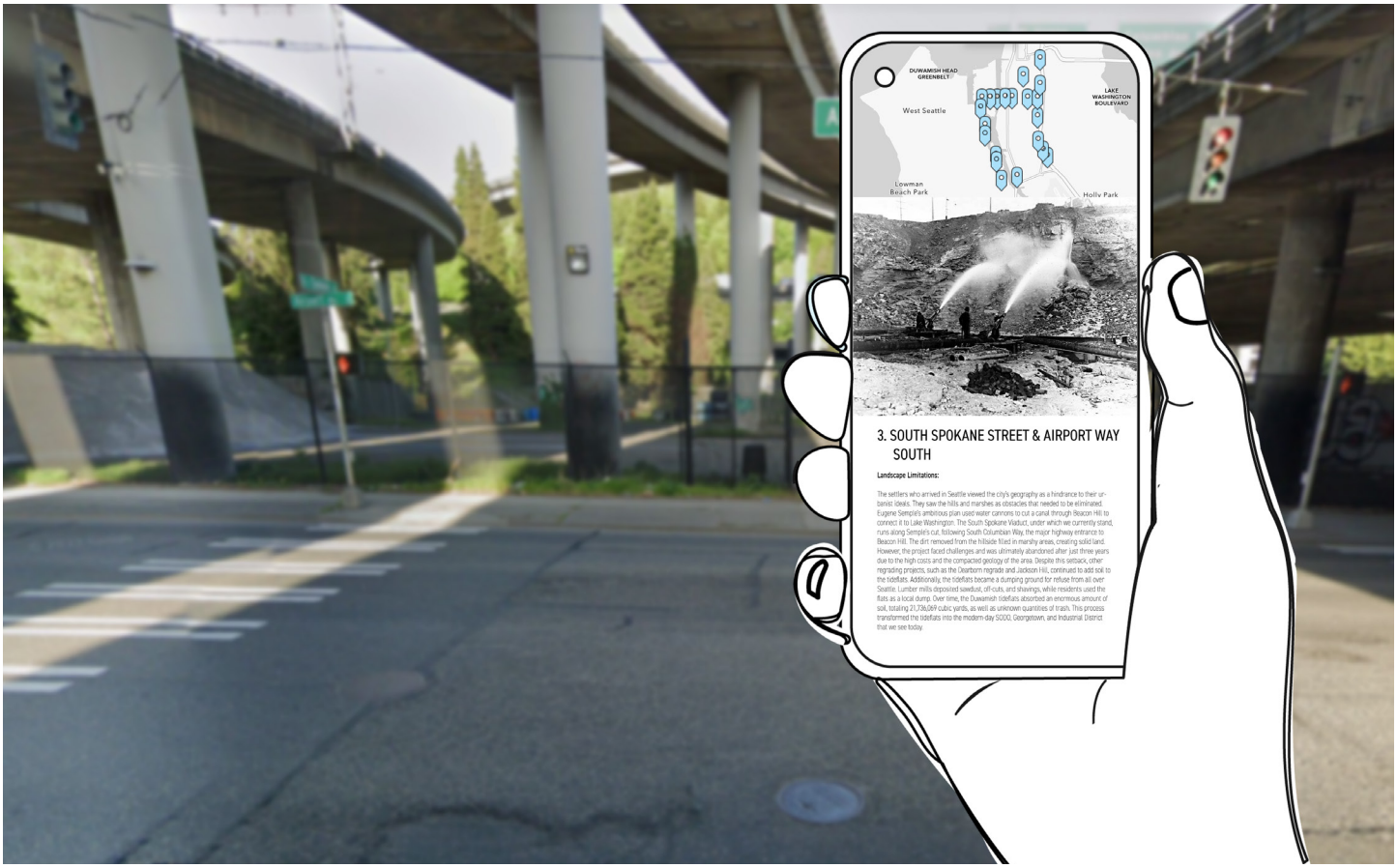


Figure 32. Site #3 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Reshaping Seattle:

The settlers who arrived in Seattle viewed the city's geography as a hindrance to their urbanist ideals. They saw the hills and marshes as obstacles that needed to be eliminated. Eugene Semple's ambitious plan used water cannons to cut a canal through Beacon Hill to connect it to Lake Washington. At this site, under the South Spokane Viaduct, Semple's cut into Beacon Hill today contains the major highway entrance to Beacon Hill. The dirt removed from the hillside filled marshy areas, creating solid land. However, the project faced challenges and was ultimately abandoned after just three years due to the high costs and the compacted geology of the area. Despite this setback, other regrading projects, such as the Dearborn regrade and Jackson Hill, continued to add soil to the tideflats. Additionally, the tideflats became a dumping ground for refuse from all over Seattle. Lumber mills deposited sawdust, off-cuts, and shavings, while residents used the flats as a local dump. Over time, the Duwamish tideflats absorbed an enormous amount of soil, totaling 21,736,069 cubic yards, as well as unknown quantities of trash. This process transformed the tideflats into the modern-day SODO, Georgetown, and Industrial District that we see today.

Site 4: Terrain of Teredos

Industrial Way South & 6th Avenue South

Figure 33. Site Photograph at Industrial Way South and 6th Avenue (Photo by author)

Site Description:

At this site, as with many others on the tour, the landscape is dominated by mobility infrastructure. Above us stretches the Spokane Street Viaduct, a significant elevated roadway that serves as a connection between Beacon Hill and the West Seattle Bridge. Its massive structure looms overhead, carrying the constant flow of cars between these areas. At ground level, we find ourselves amidst four lanes of traffic moving swiftly across South Spokane Street. Adding to the complexity of the scene, a railroad line intersects the flow of automobile infrastructure, highlighting the various modes of transportation that intersect in this area. The columns supporting the viaduct form a distinctive framework that guides the pedestrian's view. They act as vertical elements, drawing attention to the framed views between the columns. This infrastructure shapes the visual experience of the pedestrian, emphasizing the enormous scale and presence of the mobility systems that define this landscape.

Site Selection:

The qualities of location, vertical depth, infrastructure, and the teredo's influence (which will be discussed in the following sections) make this site a compelling choice to host the QR code. First, this site is located in the heart of the historic tideflats. Second, standing beneath the imposing Spokane Street Viaduct overhead creates a sense of vertical depth, reminiscent of the underwater environment that would have existed at this very spot during high tide one hundred and fifty years ago. By intentionally choosing this site, I aimed to evoke a physical sensation that allows visitors to connect with the historical significance of the deep tidal waters. Third, the presence of the Spokane Street Viaduct underscores the theme of mobility and human intervention in the landscape. The railroad visible at this site serves as a connection point between the past and the present. The railroad first galvanized Seattleites to alter the tideflats to strengthen local and regional connectivity. Removing saltwater from

Figure 34. Teredo (Teredo Navalis) (iNaturalist, n.d.)

the flats was imperative to protect the wooden beams from the teredos. It serves as a tangible reminder of the transformation that has taken place over time, shaping the environment we see today. Lastly, this site is intricately tied to the story of teredos that would eat the submerged supports of the railroad. The existing concrete columns emulate the wooden supports used to lift the historic railroad above the waterline. By placing the QR code here, I aim to highlight the historical context and significance and impact of the teredos.

Figure 35. Contour Project Site #5 Sticker (Illustration by author)

Photograph:

Despite the prevalence of teredos in early Seattle history, they have vanished from the environment today because this area no longer experiences tidal inundation. During Seattle's early history, little to no photographs exist showing their presence on this site. Despite their small size, these wood-boring creatures had a substantial impact on the railroad and shipping industries for centuries. Their shells are approximately one and a half inches wide and an inch long, but with a siphon they can extend as far as 2 feet. To provide viewers with a visual representation of these fascinating creatures, I have included a contemporary image showcasing multiple teredos with their siphons emerging from a piece of wood. This image helps viewers grasp the appearance and behavior of these organisms that once posed a significant challenge to early settlers and their wooden structures.

Figure 36. Site #4 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Terrain of Teredos:

Twice daily, the ocean flooded the place where we stand. The tides and soft sand made it unsuitable for the railroad, leading to the construction of wood piles driven 35-65 feet deep into the mud to support an aerial railroad. Unintentionally, these piles became a feast for a small bivalve known as the teredo or shipworm (Teredo navalis). These small clams burrow into the wood and could render the piles unusable within months of their installation. At the beach, you can find logs mined by teredos by their characteristic Swiss-cheese appearance. Lumber mills soaked logs in creosote, coal tar, asbestos, castor oil, and strychnine to try to protect the piles. Unfortunately, these solutions had little impact on the teredos and, in turn, began to leach toxins into the surrounding mud. Frustration with these clams led the settlers to envision landscape alterations with two primary goals in mind. First, they aimed to create a freshwater port since teredos could not survive in freshwater. Second, they sought to transform the landscape into one free from saltwater entirely. To achieve these objectives, the settlers needed to construct a canal with a lock that would separate the freshwater from the saltwater. In addition, they required dirt to raise the level of the area above the high tide mark. These ambitious alterations were driven by the desire to overcome the challenges posed by the teredos and create a more suitable environment for settlement and commerce.

Next Stop: Site #5

Distance: 0.3 miles

Time: 7-minute walk / 2-minute bike

Site 5: Immigrant Built Landscape

Airport Way South & South Industrial Way

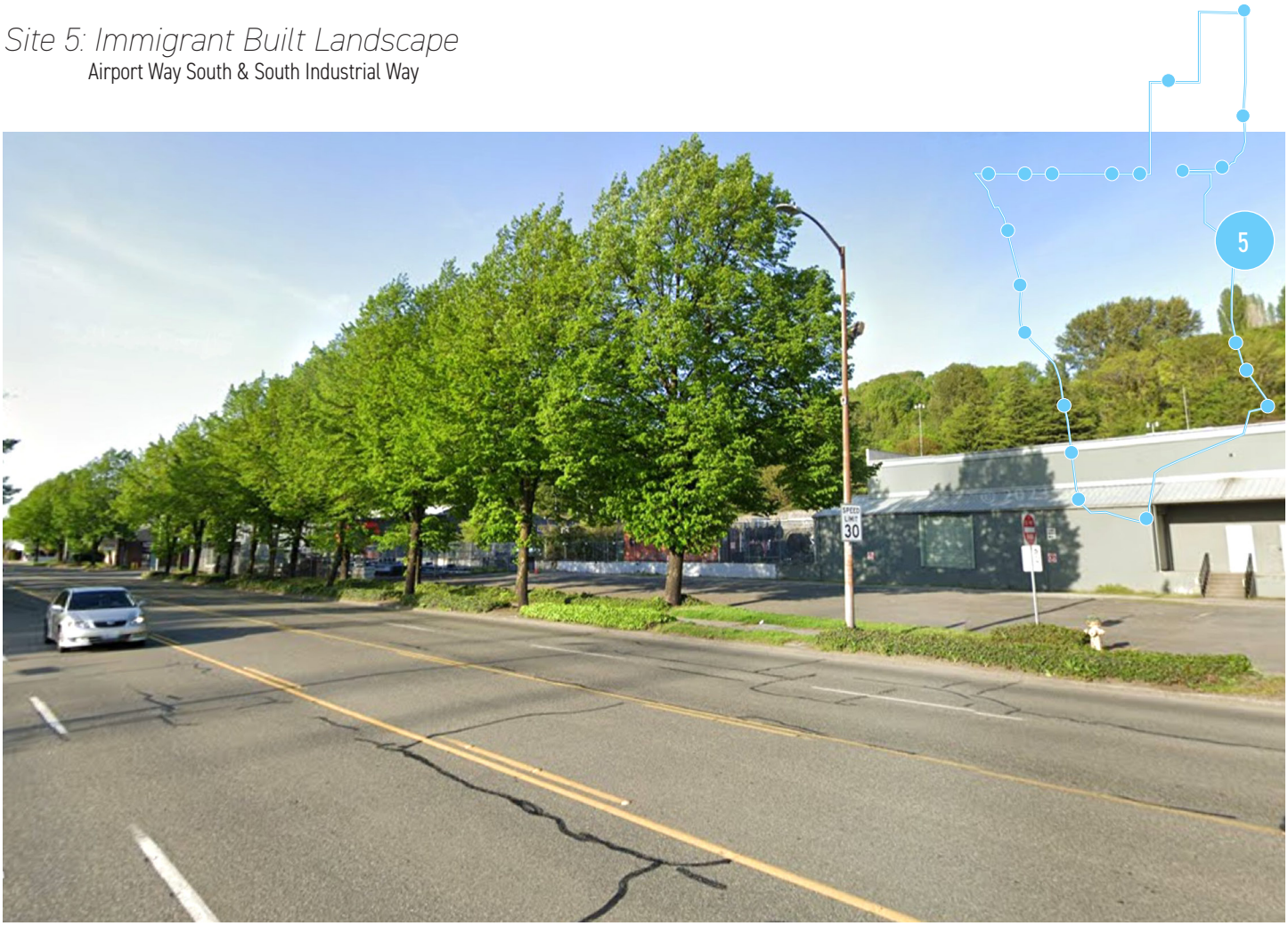


Figure 37. Site Photograph at Airport Way South & South Industrial Way (Photo by author)

Site Description:

This busy intersection, with its five lanes of traffic, shows the prioritization of vehicular transportation in the SODO neighborhood. Mid-rise buildings border this street, limiting the views in all directions. However, if we look beyond the rooftops, we can catch a glimpse of the edge of Beacon Hill.

Site Selection:

Located at the foot of Beacon Hill, this site offers a unique perspective on the historic tideflat that once stretched across this area. As we travel along this route, you will notice that many of the sites are situated along Airport Way, which closely follows the eastern edge of the historic delta. The proximity to Beacon Hill connects this site with the QR code information that follows.

In addition to its historical significance, this site is conveniently accessible for those using public transportation. Just fifty feet south of this intersection, you will find a bus stop for Route 124, ensuring that visitors can easily reach this location and embark on the tour.

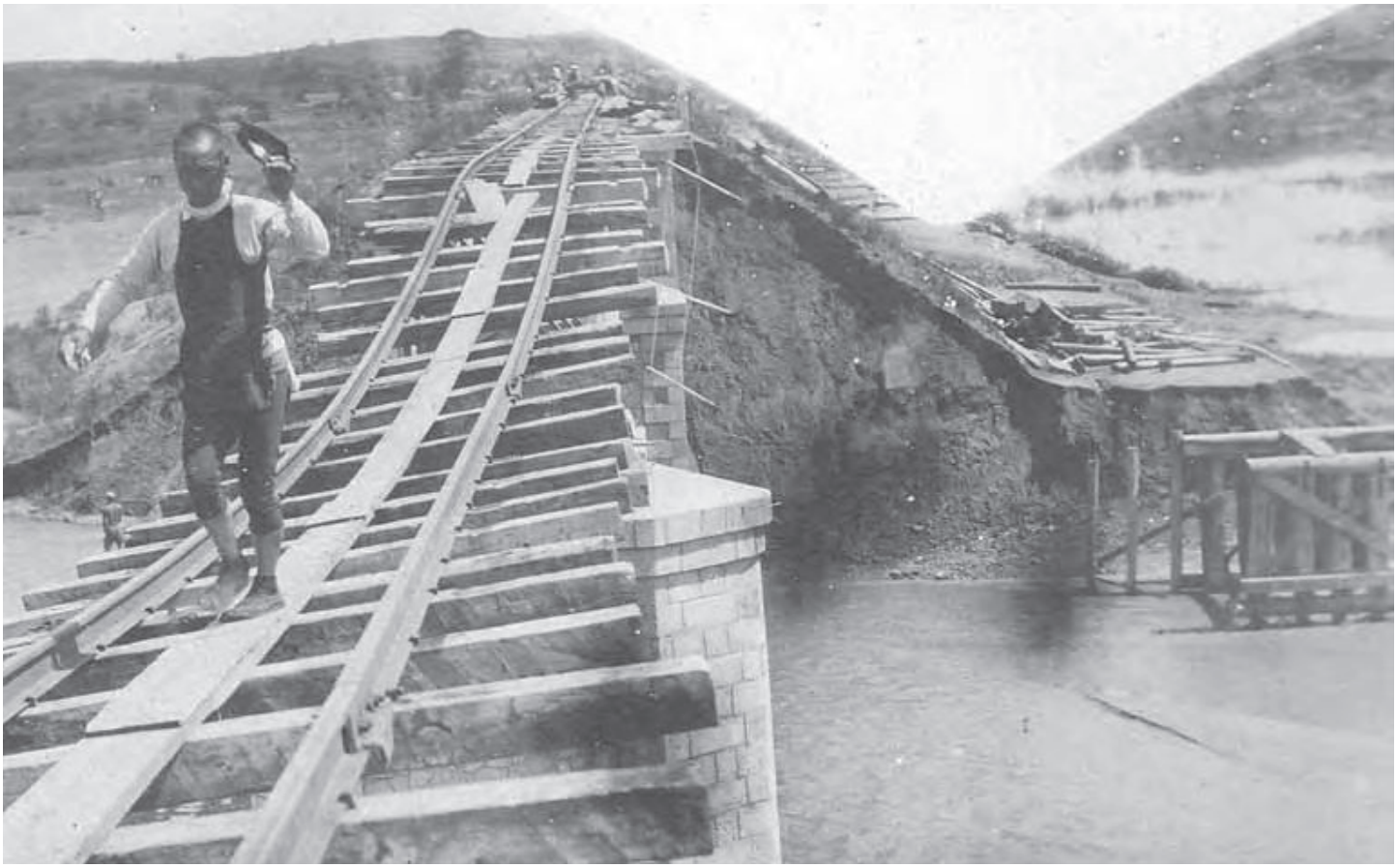


Figure 38. Chinese man crossing damaged railroad trestle, ca 1905
(University of Washington Libraries, Special Collections, CHA133)

Historic Photograph:

During an era of scarce photographs, capturing images of immigrant workers engaged in the construction of the railroad in Seattle was exceptionally rare. The scarcity of these photographs reflects the challenges in reconstructing the historical narratives of immigrant communities. However, the significance of their contributions to the development of Seattle cannot be understated. Despite the limited visual documentation, the presence of the historic railroad near this site serves as a poignant reminder of the immigrant labor that played a crucial role in shaping the city's landscape.

Figure 39. Contour Project Site #5 Sticker
(Illustration by author)

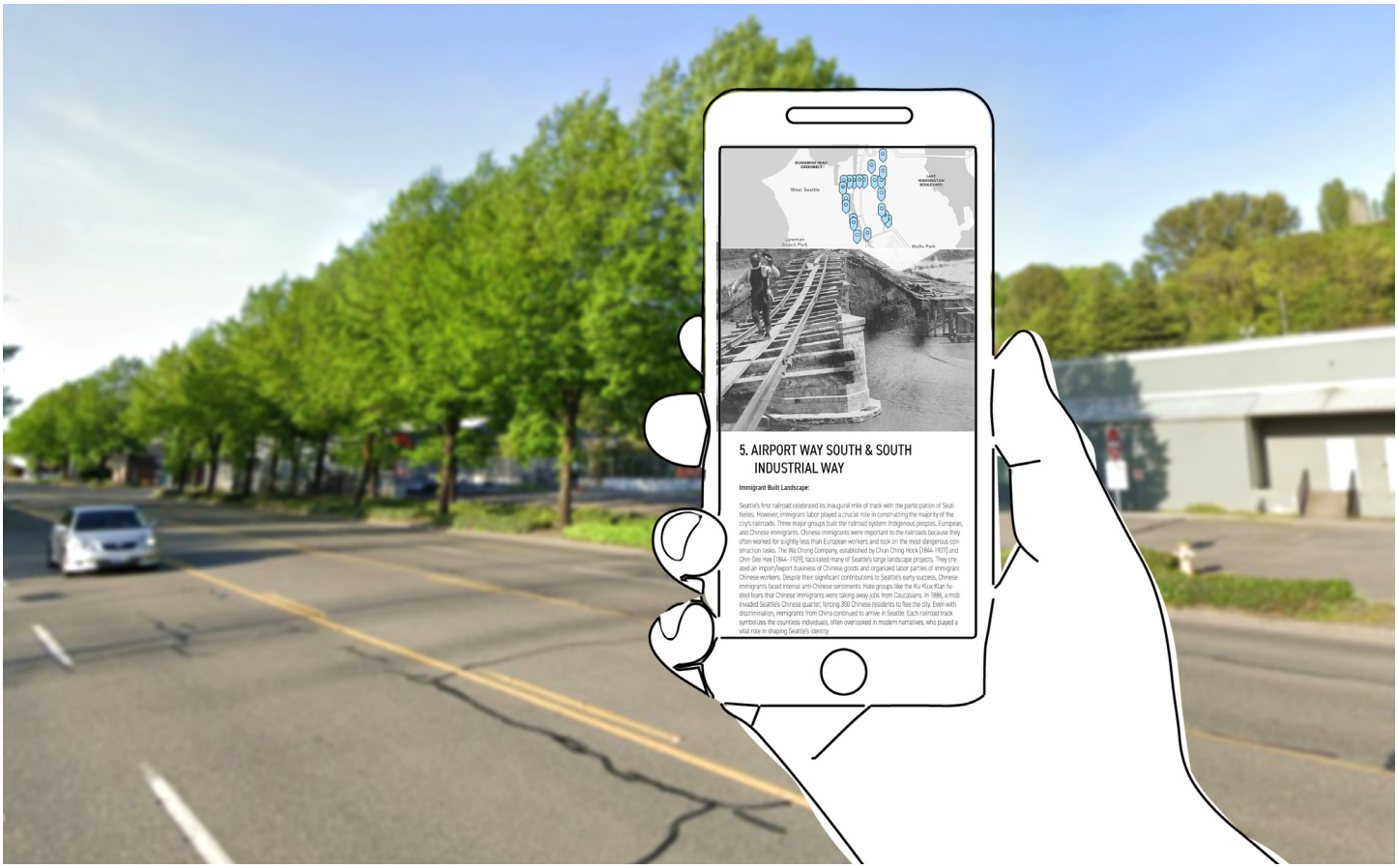


Figure 40. Site #5 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Immigrant Built Landscape:

Seattle's first railroad celebrated its inaugural mile of track with the participation of Seattleites. However, immigrant labor played a crucial role in constructing the majority of the city's railroads. Three major groups built the railroad system: Indigenous peoples, European, and Chinese immigrants. Chinese immigrants were important to the railroads because they often worked for slightly less than European workers and took on the most dangerous construction tasks. The Wa Chong Company, established by Chun Ching Hock (1844-1927) and Chin Gee Hee (1844–1929), facilitated many of Seattle's large landscape projects. They created an import/export business of Chinese goods and organized labor parties of immigrant Chinese workers (historylink, n.d.). Despite their significant contributions to Seattle's early success, Chinese immigrants faced intense anti-Chinese sentiments. Hate groups like the Ku Klux Klan fueled fears that Chinese immigrants were taking away jobs from Caucasians. In 1886, a mob invaded Seattle's Chinese quarter, forcing 350 Chinese residents to flee the city (Berger, 2023). Even with discrimination, immigrants from China continued to arrive in Seattle. Each railroad track symbolizes the countless individuals, often overlooked in modern narratives, who played a vital role in shaping Seattle's identity.

Next Stop: Site #6

Distance: 0.3 miles

Time: 7-minute walk / 2-minute bike

Site 6: Technological Earth Movers

Airport Way Bridge South

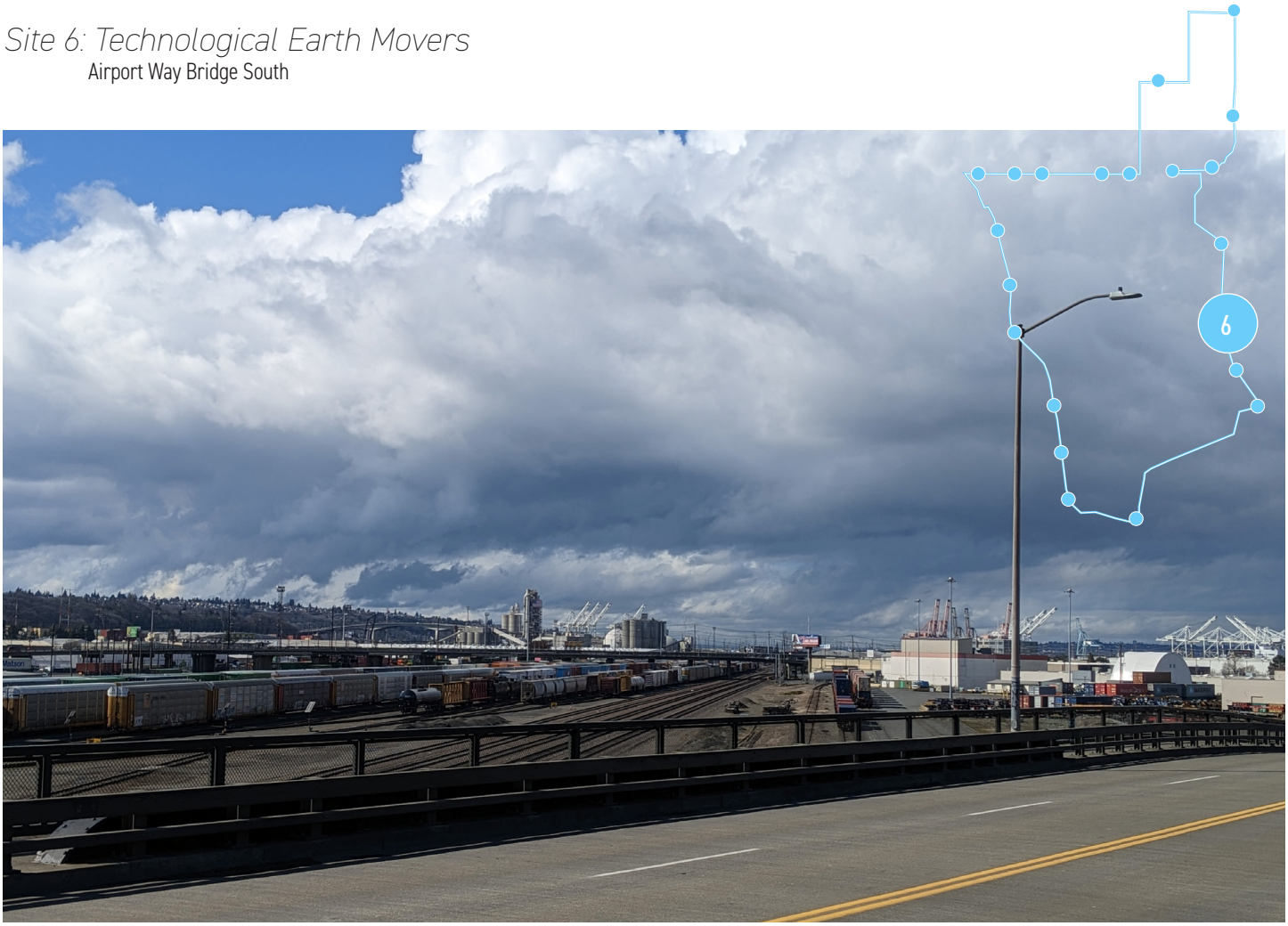


Figure 41. Site Photograph at Airport Way South & South Industrial Way (Photo by author)

Site Description:

From the vantage point of the Airport Way bridge, a panoramic view opens before viewers. To the west, Seattle's largest trainyard stretches out, bustling with activity and the movement of trains. Looking north, one catches glimpses of downtown Seattle's iconic skyscrapers, standing tall against the skyline. And turning one's gaze to the east, the elevated position offers a view that reaches midway up Beacon Hill, revealing a glimpse of the hill's topography and landscape. This unique perspective from the bridge allows visitors to take in multiple aspects of Seattle's urban environment, from the industrial trainyard to the city's bustling core and Beacon Hill.

Site Selection:

The view from the top of this bridge is a little-known gem in the George-town neighborhood. It provides a sweeping vista that encompasses expansive sections of the industrial area, seamlessly connecting with the thematic elements found in this code, particularly the significance of the railroad.

Practically, this bridge has a protected pedestrian and bike path, making it safe and easy to navigate. An important consideration when choosing sites for a large audience to have access to.

Figure 42. Beacon Hill regrading, Seattle, ca 1923
(Museum of History & Industry Collection, MOHAI, Lockheed Shipbuilding & Construction Company Photographs and Publications, 1988.13.7.2.58

Historic Photograph:

This image showcases the remarkable scale of Beacon Hill as workers employ a hydraulic cannon to carve through its slopes. What sets this photograph apart is its ability to convey the enormity of the hill in relation to the individuals operating the machinery.

In addition, the view from the top of the bridge aligns with the historic perspective in this photograph. This combination of a virtual and in-person now-and-then experience provides my audience with a fresh and unique vantage point to observe the landscape's evolution over time.

Figure 43. Contour Project Site #5 Sticker
(Illustration by author)

Figure 44. Site #6 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Technological Earth Movers:

Eugene Semple (1840–1908) planned to fill the tide flats while simultaneously curing a canal through Beacon Hill. Mud sluiced downhill and began filling the perimeter of the tideland. Using technology from the Klondike gold rush, workers pumped water from the Cedar River, and with hydraulic hoses, they blasted water at the sides of Beacon Hill with 14 million gallons of water daily (Williams, 2017). The photo above shows the intensity of these hydraulic machines. The water uprooted trees, homes of immigrant and poor communities located on Beacon Hill, and a monumental amount of earth (Klingle, 2009). Prominent Seattleites argued that the increased real estate value to the now dry tidelands justified the destruction of the canons.

The unique geology of Seattle allowed for this mode of earth moving. As the glaciers retreated after the last ice age deposited three layers of sediment: clay, topped by sand, and encased in a mix of sand, cobbles, and boulders. Without bedrock, hydrophilic canons easily tore through these layers of earth (Williams, 2017).

Next Stop: Site #7

Distance: 0.2 miles

Time: 4-minute walk / 2-minute bike

Site 7: Water's Edge

Airport Way South & Corson Avenue South

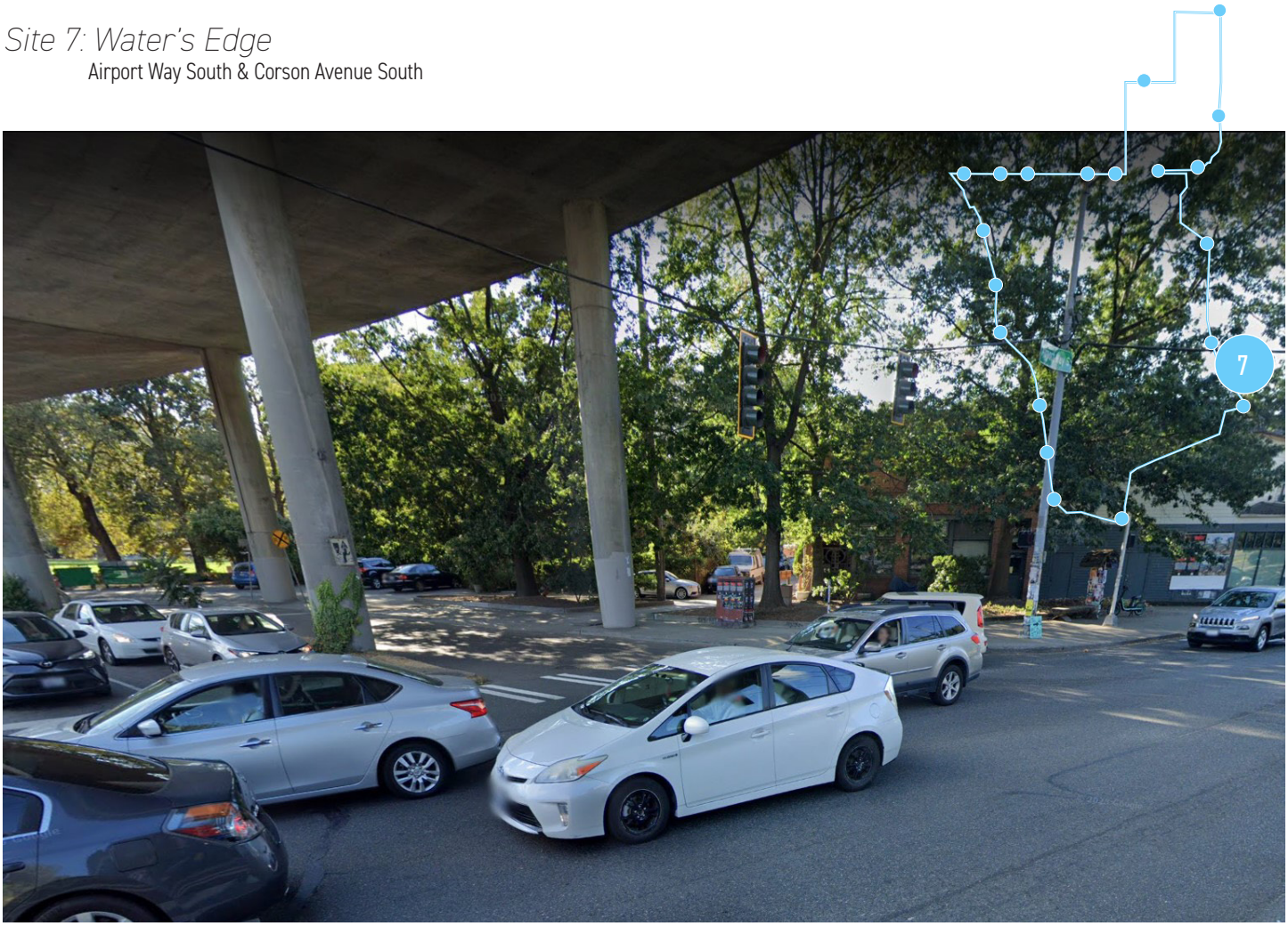


Figure 45. Site Photograph at Airport Way South & Corson Avenue South (Photo by author)

Site Description:

Corson Way begins at the intersection of South Lucille Street and Airport Way South. Like many intersections from Beacon Hill, an overpass shadows this intersection. While concrete structures dominate this intersection, there are notable features that cater to pedestrians, distinguishing it from other locations on this tour. The sidewalks here are more spacious, providing ample room for pedestrians to navigate. Additionally, Georgetown Playfield adds a recreational element to the area, offering a green space for residents to enjoy. A traffic light regulates the flow of vehicles, ensuring safer crossings for pedestrians, and the speed limit decreases from 30 mph to 25 mph upon entering this section of Georgetown, promoting a more pedestrian-friendly environment.

Site Selection:

The elevation difference between Beacon Hill and the Duwamish Valley presents a challenge for roadway crossings, as each crossing requires a viaduct or bridge. Unfortunately, pedestrian walkways are even less common in this area. South Lucille Street stands out as one of the few places that provides a pedestrian sidewalk, connecting Beacon Hill with Georgetown. The high volume of foot traffic at this intersection makes it an ideal location for the project's visibility.

I specifically chose this site because it marks the entrance to the pedestrian-friendly portion of Airport Way South in Georgetown. The surrounding area is lined with numerous restaurants, breweries, stores, and galleries, creating a vibrant streetscape. The speed limit also decreases from 30 mph to 25 mph, enhancing the pedestrian experience. The active

Figure 46. Flooding in the Green River
(Kooy, n.d.)

Georgetown Playfield & Spray Park, located to the west, further contributes to the area's pedestrian appeal. Moreover, a bus stop for Route 124 is conveniently situated just fifty feet north of the intersection.

Georgetown is highly susceptible to flooding, with over 97% of parcels in the area at risk. In particular, the corridor between Corson Avenue and Ellis Avenue has significant flood risk. Heavy precipitation, high tides, and unusual warming during the winter months can cause the Duwamish River to overflow its banks. Furthermore, Georgetown's location at the base of Beacon Hill makes it prone to collecting runoff, further increasing the likelihood of flooding and exacerbating flood conditions. Visually, the South Lucile Street bridge shows this extreme topographic change, making this an appropriate location to present information on flooding in the Georgetown neighborhood.

Figure 47. Contour Project Site #7 Sticker
(Illustration by author)

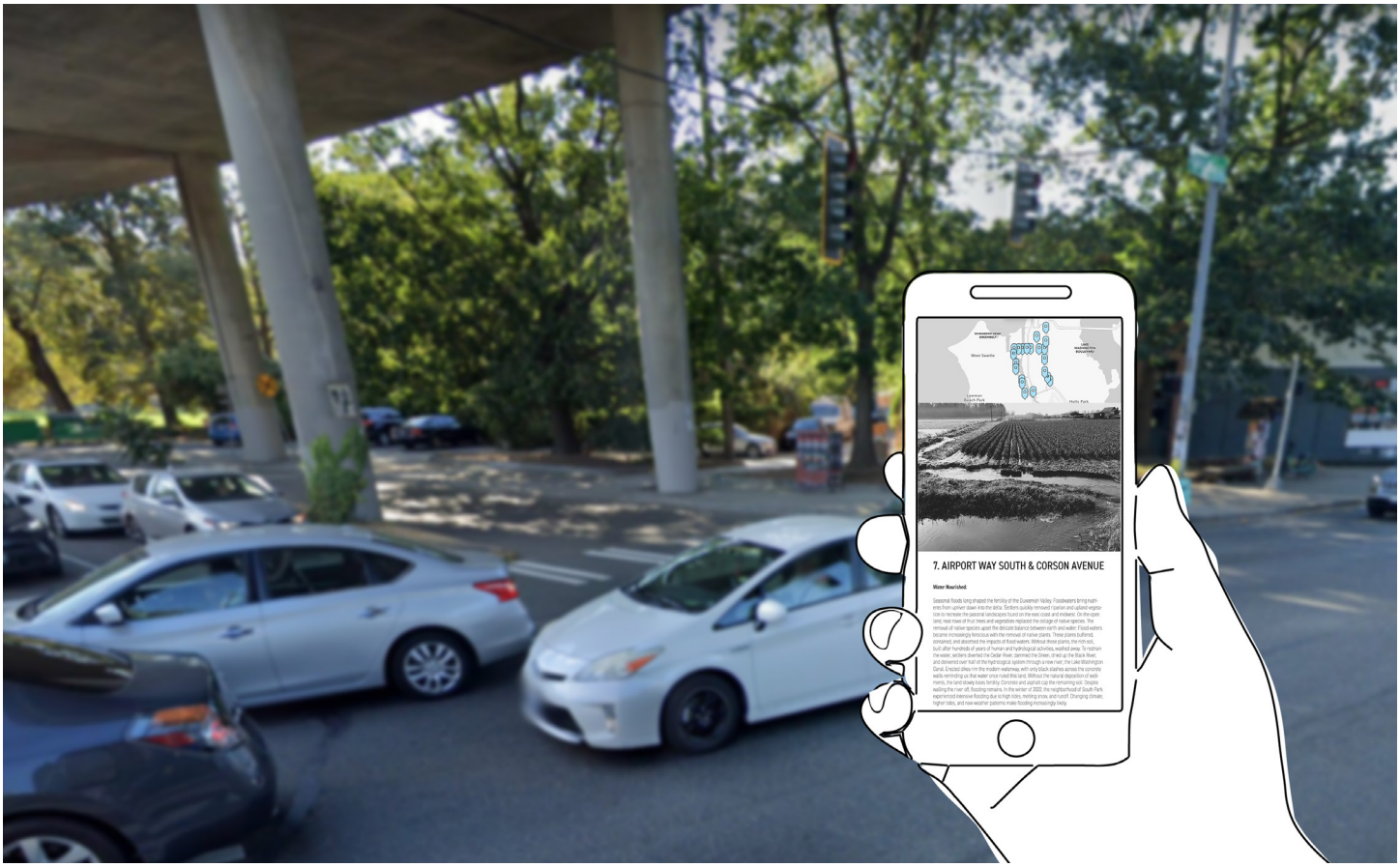


Figure 48. Site #7 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Water Nourished:

Seasonal floods long shaped the fertility of the Duwamish Valley. Floodwaters brought nutrients from upriver down into the delta. Settlers quickly removed riparian and upland vegetation to recreate the pastoral landscapes found on the east coast and midwest. On the open land, neat rows of fruit trees and vegetables replaced the collage of native species. The removal of native species upset the delicate balance between earth and water. Flood waters became increasingly ferocious with the removal of native plants. These plants buffered, contained, and absorbed the impacts of flood waters. Without these plants, the rich soil, built after hundreds of years of human and hydrological activities, washed away (Cummings, 2020). To restrain the water, settlers diverted the Cedar River, dammed the Green, dried up the Black, and delivered over half of the hydrological system through a new river, the Lake Washington Canal. Erected dikes rim the modern waterway, with only black slashes across the concrete walls reminding us that water once ruled this land (Sato, 1997). Without the natural deposition of sediments, the land slowly loses fertility. Concrete and asphalt cap the remaining soil. Despite walling the river off, flooding remains. In the winter of 2022, the neighborhood of South Park experienced intensive flooding due to high tides, melting snow, and runoff (King5, 2023). Changing climate, higher tides, and new weather patterns make flooding increasingly likely.

Next Stop: Site #8

Distance: 0.5 miles

Time: 9-minute walk / 3-minute bike

Site 8: Landscapes of Cultivation

Airport Way South & South Nebraska Street

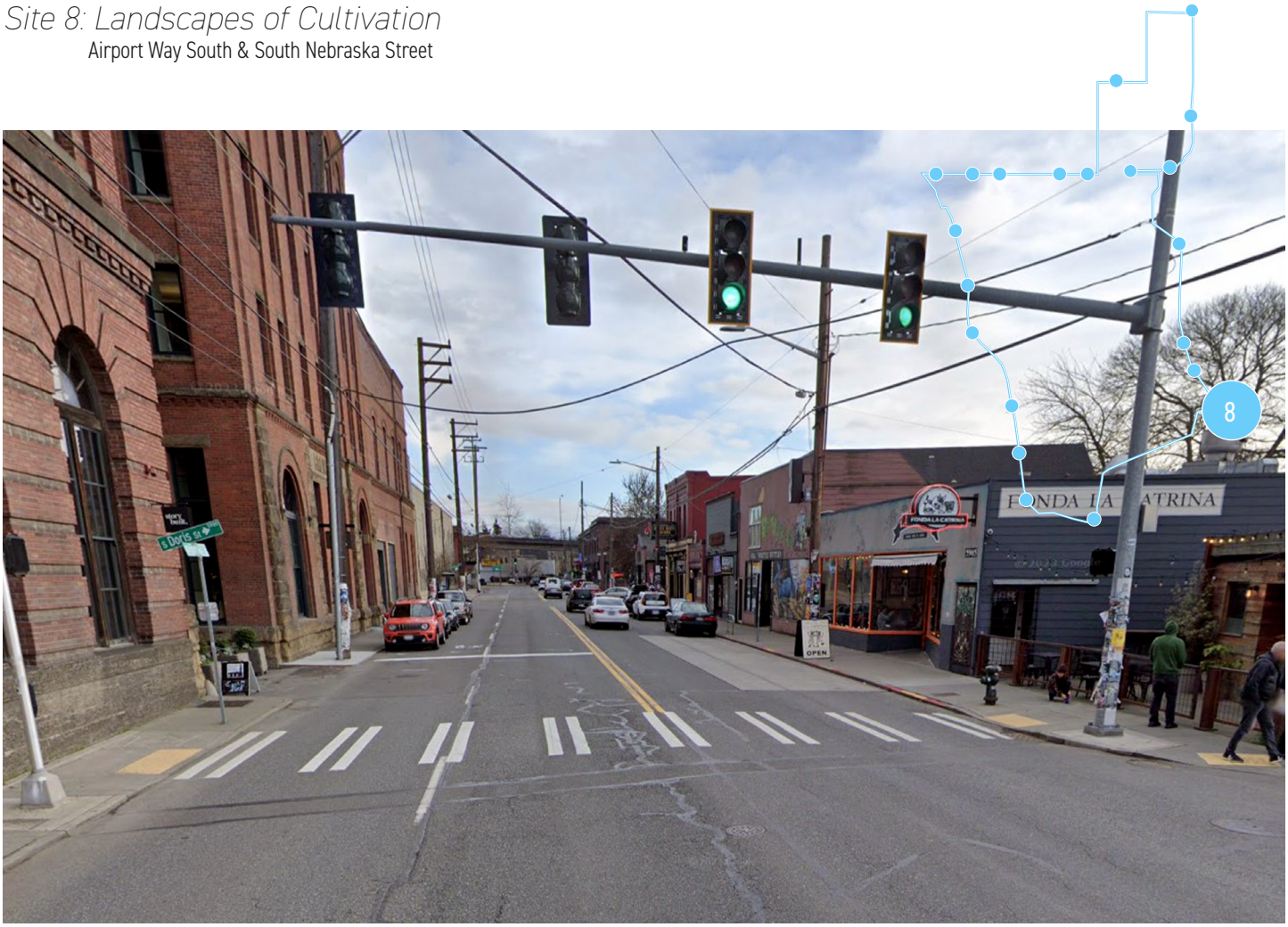


Figure 49. Airport Way South & South Nebraska Street
(Photo by author)

Site Description:

At this spot, Airport Way narrows into a two-lane roadway. Pedestrian-friendly features such as multiple traffic lights and well-marked crossings ensure safe mobility. Low-rise and historic buildings line this street creating an intimate street experience. Local businesses enliven the scene with music, outdoor seating, and eye-catching signage, beckoning visitors to explore.

Site Selection:

Located in the heart of the Georgetown pedestrian zone, this site has the busiest foot traffic on the entire tour. From dawn to dusk, Georgetown offers diverse experiences for various communities. Here, visitors are encouraged to indulge in a leisurely lunch, savor a refreshing beer, or sip a steaming cup of coffee. Ample outdoor seating entices people to relax and soak in the atmosphere. Furthermore, convenient bike racks along the street edge cater to those exploring the area on two wheels.

I selected this location for its exceptional accommodation for pedestrian and bicycle traffic. The presence of various traffic calming measures, including traffic lights, crosswalks, and a lowered speed limit, transforms this area into a pedestrian-friendly street. The inclusion of white sharrow symbols indicates that vehicles are expected to share the road with cyclists. Furthermore, the convenience of two bus stops for bus line 124 within a short distance of this intersection enhances accessibility for public transportation users.

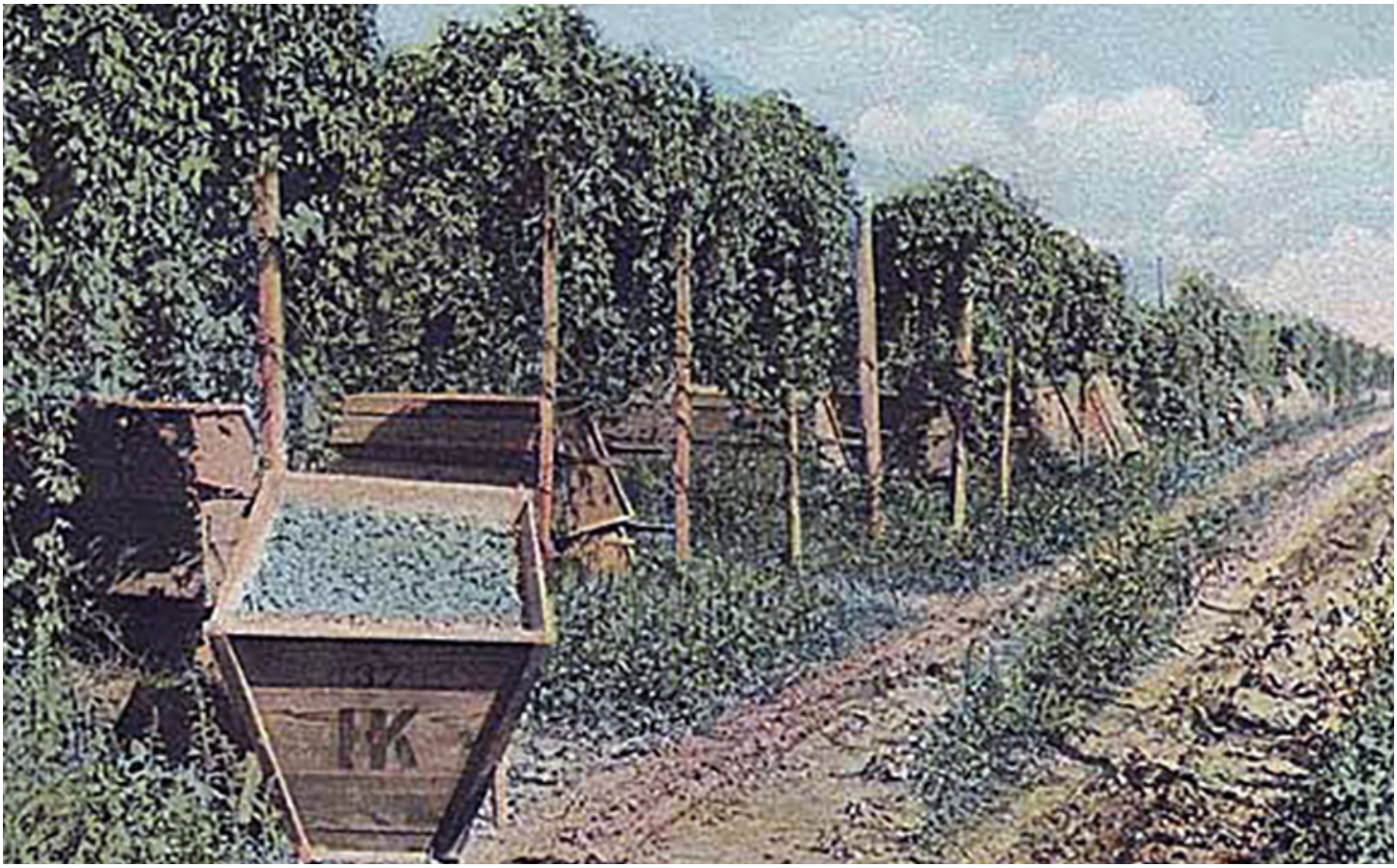


Figure 50. Hop field, ca. 1905
(Museum of History & Industry Collection, MOHAI, 1997.19.55)

Historic Photograph:

Hop growing played a significant role in the early development of the Duwamish Valley. During its peak in 1888, Western Washington harvested over three-quarters of a million pounds of hops. Figure 50 was featured on a postcard promoting the Seattle area, captures the essence of the hop industry. We see a hop box used to store and move the hops. The hop field in the background shows the hop vines climbing the vertical stakes in the field. Today, the agricultural landscape is invisible in the modern industrial neighborhoods of SODO, Georgetown, and the Industrial District. I selected this photograph for its portrayal of expansive vine rows stretching beyond the limits of our sight, showcasing the scale and importance of hop cultivation in the region.

Figure 51. Contour Project Site #8 Sticker
(Illustration by author)

Figure 52. Site #8 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Landscapes of Cultivation:

Before the cement, the soils of the Duwamish Valley were some of the most fertile in western Washington. The first boom industry: hops. Hops are the delicate, lime-green cone that grows on a vine. In the 1860s, settlers introduced hops to the Duwamish. For the new town, farms heavily relied on indigenous labor to farm their fields. Indigenous people would travel from around the Puget Sound region to pick hops in the late summer when the cones were ripe. With indigenous people, farms relied on immigrant laborers from Europe or China. In 1893 hop aphids (Phorodon humuli) infested the hop fields, destroying hop production in the Duwamish Valley after successive infestations (Cummings, 2020). By the turn of the century, the agricultural land that once grew hops transformed to support new crops and livestock. Even though cement replaced the fields, reminders of this industry persist: Georgetown remains Seattle's well-known brewery district.

For more information visit Site #2: Agricultural Industry

Next Stop: Site #9

Distance: 0.3 miles

Time: 5-minute walk / 1-minute bike

Site 9: Industrial Impacts on Salmon

1st Avenue South Bridge

Figure 53. 1st Avenue South Bridge
(Photo by author)

Site Description:

The view to the south from the top of the 1st Avenue South Bridge unveils a striking panorama of the Duwamish River. A procession of cranes, warehouses, and docks lines the industrial river's edge, completely transforming its natural character. From this vantage point, no organic river edge remains.

The bridge itself perfectly complements the surrounding industrial landscape. Thick steel beams and a chain-link fence separate the viewer from the water below, creating a distinct barrier. On the traffic side, robust steel beams provide protection for pedestrians on the walkway, shielding them from the constant flow of eight lanes of traffic. The cacophony of sound emanating from the metal grates on the bridge and the bustling activity of the warehouses below is almost overpowering, immersing the observer in an auditory symphony of industry.

Site Selection:

The 1st Avenue Bridge stands as a pivotal location among the six viewpoints on this tour. Its vantage point offers an unrivaled perspective of the Duwamish River. This view is the only place with an unobstructed view of the modern Duwamish.

As you stand on the bridge, the sounds surrounding you further reinforce the industrial character of the river. The traffic, the rumble of large equipment, and the bustling warehouses all contribute to the perception of an industrial landscape.

This tour aims to shed light on the hidden layers of this environment, showcasing that there is more to this landscape than meets the eye. Despite the opaque nature of the waterway beneath us, it conceals a rich narrative waiting to be unveiled.

9

Figure 54. South Park scene, ca. 1894
(University of Washington Libraries, Special Collections, SEA1617)

Historic Photograph:

The historic photo and our view both look south toward the South Park neighborhood making this a dramatic now-and-then moment. The transformation from the curving river edge in the historic photograph contrasts with the sweeping view of the straightened waterway. Cranes, warehouses, and lifts replace the old-growth conifer forests and riparian vegetation that used to make up the river edge.

The lushness of the river edge depicted in the photo serves as a poignant juxtaposition against the modern panorama, offering a powerful narrative of the Duwamish River's journey as a river transformed. Amidst the ever-changing shoreline, one constant endures—the water itself. This enduring presence continues to sustain a diverse ecological community, resiliently adapting to the evolving landscape.

Figure 55. Contour Project Site #9 Sticker
(Illustration by author)

Figure 56. Site #9 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project:

Industrial Impacts:

The Duwamish River has transformed dramatically from this 1894 photograph to today. Large ships and docks replace the large trees that once shadowed the edges of the meandering river. Changes to the river edge had a significant impact on the health and welfare of the salmon. Fallen trees, reeds, and grasses kept the river temperature between 41-55°F, the temperature for salmon survival (King County, n.d.). This debris provides protection from predators for young salmonoids. Today, no plants protect the water from the sun. As a result, the water temperatures increase past levels that migrating fish can tolerate. While efforts to restore salmon habitat are ongoing, researchers at WSU and UW have found that Coho salmon face additional modern environmental challenges. Coho salmon have evolved to take advantage of their environmental conditions by migrating to smaller streams during the late fall when rainfall has increased the water supply. However, this inclination has put Coho salmon at increased risk of harm as urban roadways runoff. Runoff mixed with tire dust washes downstream causing salmon mortality even at small doses (Spromberg et al., 2016). Over-water roadways such as the First Avenue Bridge increase the risk of tire dust entering our waterways.

Next Stop: Site #10

Distance: 1.3 miles

Time: 21-minute walk / 9-minute bike

Site 10: Water-Formed Landscape

West Marginal Way Southwest & Southwest Front Street

Figure 57. West Marginal Way Southwest & Southwest Front Street (Photo by author)

Site Description:

This is the first site on the west side of the Duwamish River. While we are near the river, it is no longer visible. The Duwamish Greenway Trail will take us across the western side of the Duwamish River to the Spokane Street Bridge. West Marginal Way is an industrial landscape. Painting, plumbing, shipping, and many more industries line the edges of this roadway. The major industries in Seattle converge here, just as this river was once a place where multiple waters, people, and more-than-human communities met.

Site Selection:

Before settlers arrived at the Duwamish, water shaped this valley. Today the landscape is dictated by the roadways. The contrast between a roadway landscape and the original curves of a river landscape shows how much the land and water have changed over time.

The following six stops follow the Duwamish Greenway Trail. This benefits those participating in walking the Contour Project because the trail is well-marked, has minimal grade change, protected from vehicle traffic, and is easy to navigate.

Figure 58. Black River with farmhouse in the distance, ca. 1899
(Museum of History & Industry Collection, MOHAI, 1988.33.286)

Historic Photograph:

To enforce the contrast between the roadway and the water landscape, I chose a photograph of the unaltered shoreline during Seattle's early colonial period. With limited available photographs of unaltered sections of the Duwamish River, I used an image of the Black River, which would have looked similar to this portion of the Duwamish River, to represent this watershed information.

Figure 59. Contour Project Site #10 Sticker
(Illustration by author)

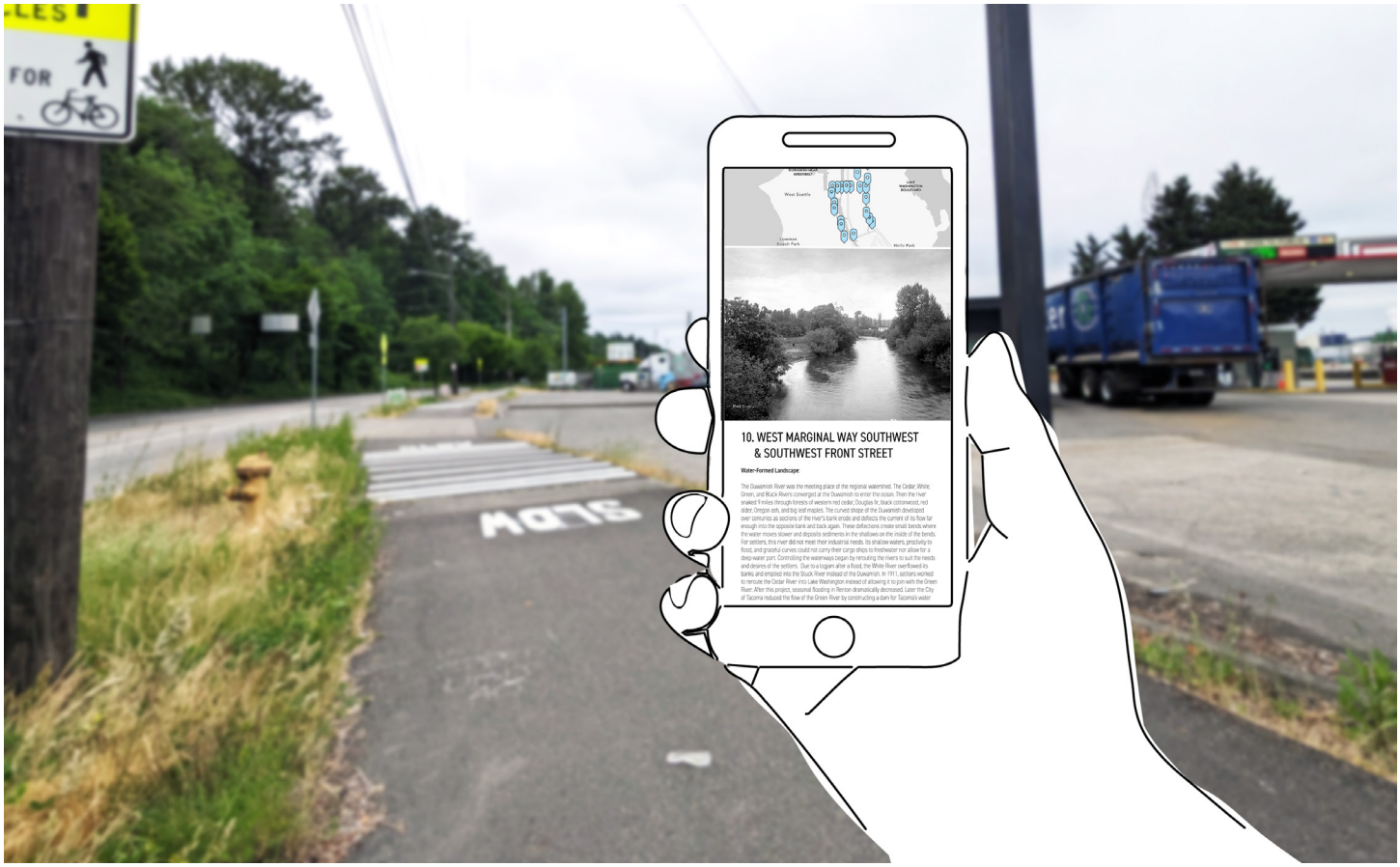


Figure 60. Site #10 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Water-Formed Landscape:

The Duwamish River was the meeting place of the regional watershed. The Cedar, White, Green, and Black Rivers converged at the Duwamish to enter the ocean. Then the river snaked 9 miles through forests of western red cedar, Douglas fir, black cottonwood, red alder, Oregon ash, and big leaf maples. The curved shape of the Duwamish developed over centuries as sections of the river's bank erode and deflects the current of its flow far enough into the opposite bank and back again. These deflections create small bends where the water moves slower and deposits sediments in the shallows on the inside of the bends. For settlers, this river did not meet their industrial needs. Its shallow waters, proclivity to flood, and graceful curves could not carry their cargo ships to freshwater nor allow for a deep-water port. Controlling the waterways began by rerouting the rivers to suit the needs and desires of the settlers. Due to a logjam after a flood, the White River overflowed its banks and emptied into the Stuck River instead of the Duwamish. In 1911, settlers worked to reroute the Cedar River into Lake Washington instead of allowing it to join with the Green River. After this project, seasonal flooding in Renton dramatically decreased. Later the City of Tacoma reduced the flow of the Green River by constructing a dam for Tacoma's water supply. The final engineering feat was the loss of the Black River, severing the Duwamish River from Lake Washington (Cummings, 2020).

Next Stop: Site #11

Distance: 0.5 miles

Time: 11-minute walk / 3-minute bike

Site 11: Living Sewer

4th Avenue South & South Michigan Street

Figure 61. West Marginal Way Southwest & Southwest Front Street (Photo by author)

Site Description:

On the left is West Marginal Way roadway and to the east are lines of industrial buildings and stacks of shipping containers. Although this section is still part of the Duwamish Greenway Trail, there are not many trees to shade the path and buffer noise from the roadway.

Site Selection:

Directly east of this site is the location of one of Seattle's combined sewer overflow pipes. Urban spaces create a significant amount of waste. In Seattle, this waste isn't deposited in some unknown river or landscape but flows into Seattle's only river. We stand a few hundred feet from this outflow site. Noting our proximity to this pipe makes visible a concealed landscape element.

The route runs along the southern portion of the Duwamish Greenway Trail. This trail is wider than a traditional sidewalk allowing pedestrians and cyclists to navigate off the roadway. Pedestrian and cyclist safety was a huge concern when designing this route. Including the Duwamish Greenway Trail created the most protected path on this side of the river.

Figure 62. Pipe discharging sewage into the Duwamish River at Diagonal Way, ca. 1938
(Museum of History & Industry Collection , 1983.10.10091)

Historic Photograph:

While we cannot see the combined sewer overflow site, this photograph shows how this pipe looked in 1938 when untreated wastewater flowed into the Duwamish River. I included this photo to show that combined sewer overflow sites are not new to Seattle's history. Settlers used the Duwamish River as a repository for waste throughout settler alterations to this landscape.

Figure 63. Contour Project Site #11 Sticker
(Illustration by author)

Figure 64. Site #11 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Living Sewer:

Rivers are seen as a solution for removing waste from urban environments. The flow of water takes waste products downstream away from settled areas. But this solution only works if the amount of waste does not impede ecological needs. In the early 1900s, Seattle decided to mix stormwater and wastewater. During high rainfall events, this causes raw sewage to overflow into the Duwamish River where they hoped it would dissipate into Puget Sound. However, as Seattle's population grew and families moved to the suburbs after WWII, the river became overwhelmed by sewage. A March 1958 ballot measure would have created a Municipality of Metropolitan Seattle with broad authority to address sewage disposal, water-quality improvement, public transit, and comprehensive planning. In 1940, the City of Seattle built the first sewage treatment plant on the Duwamish. While these upgrades have improved water quality, sewage continues to enter the Duwamish at combined sewage overflow (CSO) sites. Sewage, stormwater, and industrial waste overflow into the Duwamish during intense rainstorms. One of these outflow areas is just east of this stop, at the end of the Duwamish (Klingle, 2009).

Next Stop: Site #12

Distance: 0.5 miles

Time: 10-minute walk / 2-minute bike

Site 12: Seattle Spirit

5658 West Marginal Way Southwest

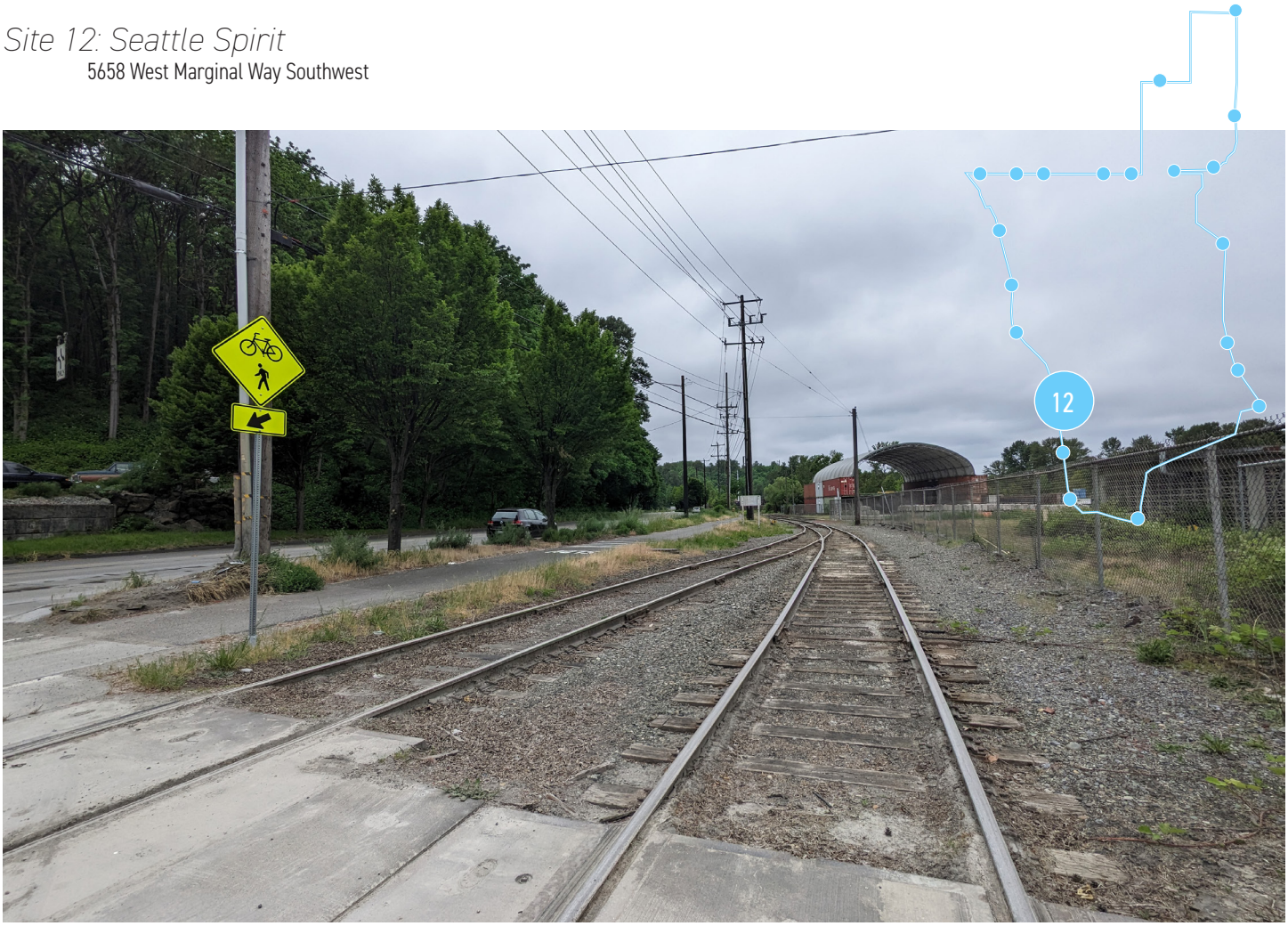


Figure 65. 5658 West Marginal Way Southwest
(Photo by author)

Site Description:

Lines of stacked shipping containers obscure the view of the Duwamish River outside the Duwamish Shipyard. Between the Shipyard and the sidewalk runs the railway line. Along this section of the pathway, no vegetation separates the Duwamish Greenway Trail from the five lanes of commercial and industrial traffic.

Site Selection:

I chose this site to share the story of the Seattle Spirit and the railroad industry because it was a place where it is easy for a pedestrian to interact with the railroad, as the rail runs right next to the Duwamish Trail without any barriers separating people from the tracks. This portion of the Duwamish Greenway Trail protects pedestrians and cyclists from the 30-mph roadway.

In addition, the modern landscape almost perfectly matches the historical photograph, which I will describe in more detail in the next section.

Figure 66. West Marginal Way and Southwest. Oregon St., ca. 1925
(University of Washington Libraries, Special Collections, SMR14)

Historic Photograph:

The similarity between this 1925 photograph and the current conditions on the west side of the Duwamish River are remarkable. Similar elements such as the railroad and the streetscape show that not much has changed in the 100 years. I chose this photograph because it was taken within a half mile of where we stand and shows that the industrial and mobility priorities of 1925 are still visible today.

Figure 67. Contour Project Site #12 Sticker
(Illustration by author)

Figure 68. Site #12 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Seattle Spirit:

There are many similarities along this stretch of the Duwamish Greenway trail in this 1925 photograph and today. In reaction to Northern Pacific's 1873 decision to locate its western terminus in Tacoma rather than in Seattle, Seattleites founded the Seattle &Walla Walla Railroad to bring food and coal from the east to the west. The railroad established what became known as the "Seattle Spirit" when, in the effort to turn Seattle into the hoped-for metropolis, the founding partners of the Seattle &Walla Walla Railroad Company rolled up their sleeves to grade and lay the first railroad track across the tide flats (Klingle 2009). Residents all over Seattle converged on the Duwamish to grade the land and lay those first tracks. This track received a permit in 1912 and ran from Seattle to Burien. Investors hoped the railroad would increase property values in neighborhoods like White Center and Highland Park.

Next Stop: Site #13

Distance: 0.4 miles

Time: 7-minute walk / 2-minute bike

Site 13: Advocacy

West Marginal Way Southwest & Puget Way Southwest

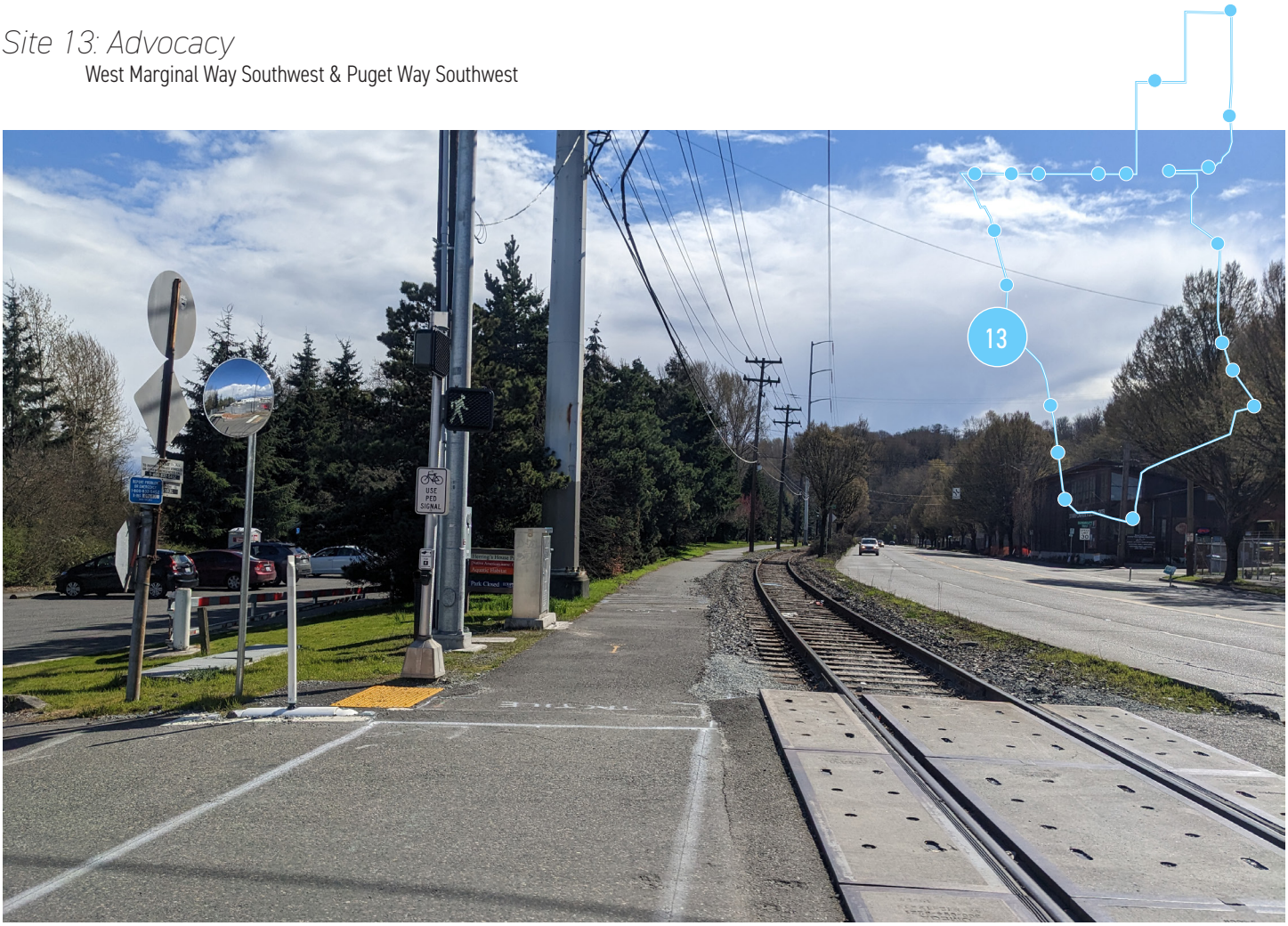


Figure 69. West Marginal Way Southwest & Puget Way Southwest (Photo by author)

Site Description:

This section of the Duwamish Greenway Trail is beautiful. Just to the west of Herring's House Park, a generously planted green strip with the railroad track separates pedestrians from the roadway. To the east, a beautiful park with a mix of large trees, riparian vegetation, and historical information might entice curious visitors.

Site Selection:

I chose this section of the Duwamish River Greenway to tell the story of ecological advocacy on the river. Advocacy by the Duwamish Tribe and other environmental groups saved Herring's House Park from redevelopment to a port. This is the first park that we have come across on this side of the Duwamish River, and it is a place where people can stop and take a break along this tour route.

Figure 70. Climate March, ca. 2017
(University of Washington Libraries, Special Collections, 2017)

Photograph:

Without a photograph of the construction of Herring's House Park, I looked toward other photographed moments of environmental advocacy. The image used for this page comes from the 2017 Climate March in Seattle. Nationally, thousands of people assembled on that day to demand action on environmental and climate issues. While this image is separate from the Duwamish, it represents a larger environmental advocacy trend in Seattle.

Figure 71. Contour Project Site #13 Sticker
(Illustration by author)

Figure 72. Site #13 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Advocacy:

Estuaries are where salt and freshwater combine. Within estuaries, different ecological communities form unique plants and animals adapted to these protected brackish waters. Today less than 15% of the river's original tidal wetlands remain. Community groups are hoping to change this. The Duwamish Tribe, Duwamish Alive Coalition, and Puget Soundkeepers are just a few community organizations involved with re-establishing and protecting the remaining ecosystems. They replant native plant communities, clean up trash, create opportunities for traditional practices, and report on areas of illegal contamination.

If you're interested in getting involved, links to these organizations are located at the end of this project.

Next Stop: Site #14

Distance: 0.2 miles

Time: 4-minute walk / 1-minute bike

Site 14: Indigenous City

West Marginal Way Southwest & Southwest Hudson Street

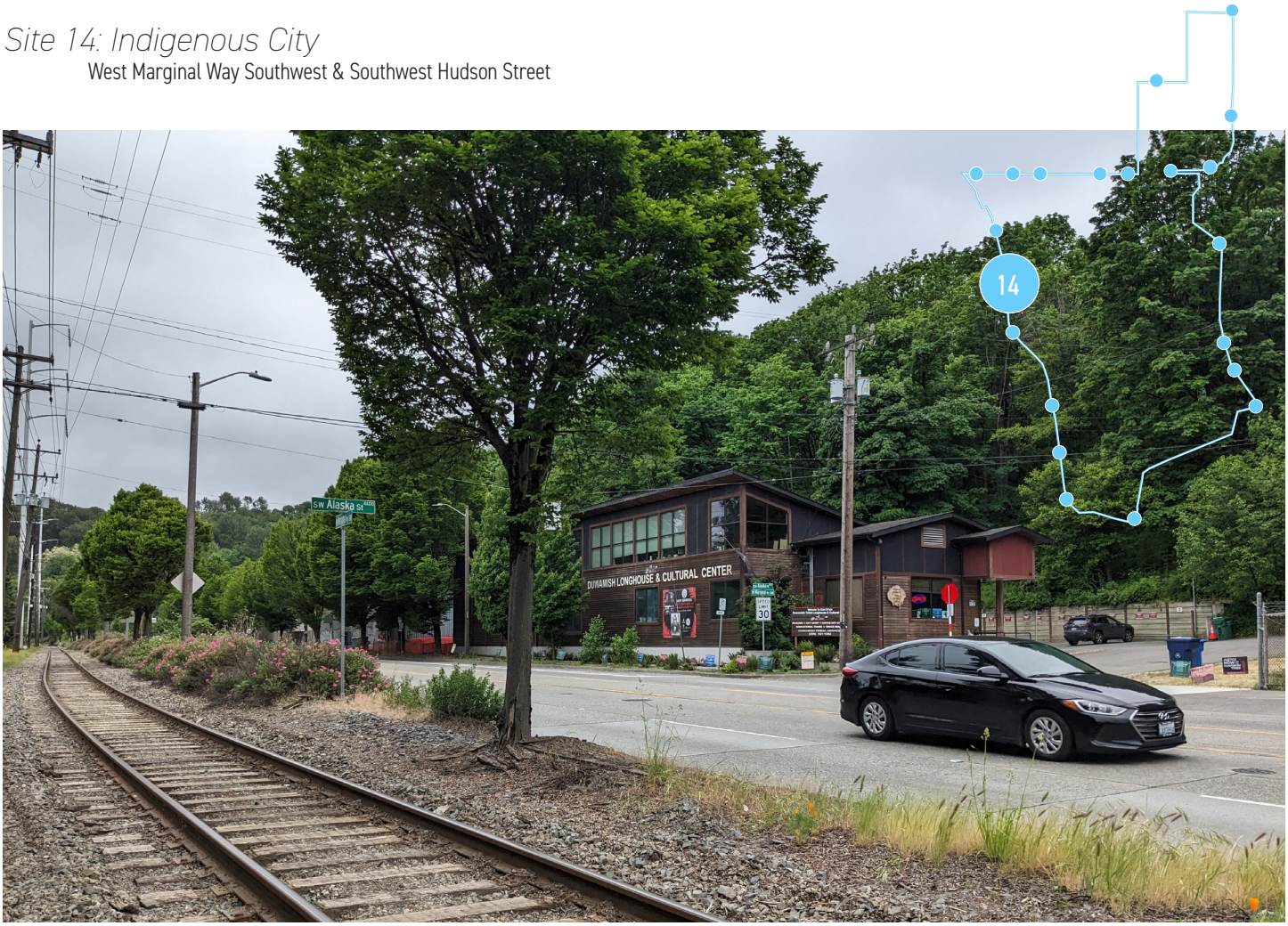


Figure 73. West Marginal Way Southwest & Southwest Hudson Street (Photo by author)

Site Description:

This is our last tour stop along the Herring's House Park, and we would be amiss to not pause at this northern corner. Herring's house park to the east, on our west is the Duwamish Longhouse and Cultural Center. This beautiful building breaks up the industrial landscape along this trail. Again, this portion of the trail is beautifully landscaped and feels sheltered from the busy roadway.

Site Selection:

This site has particular significance to this project, both historically and today. Herring's House Park, the last curve in the Duwamish Waterway contains both narratives of indigenous tragedy and resilience. This curve remembers the ancient village of Basket Hat, a once-thriving indigenous community. The curve also housed an indigenous couple who ended up starving to death in the 1920s after the river had become industrialized. This landscape and the histories of this bend are preserved by the efforts of today's indigenous people. This site shows why it is important to commemorate landscape history – because they tell complex stories of our home. It became evident throughout my research that indigenous histories in Seattle are spoken in the past tense. They often tell the story of vanished people, but the story I wanted to bring forward was about an existing community that continues to play a role on the Duwamish River. This is why I positioned this site across the street from the Duwamish Longhouse and Cultural Center – a physical landmark of the continuing Duwamish Tribe.

Figure 74. Duwamish Tribal Members Canoing, ca. 2013
(Duwamish Tribe, n.d.)

Photograph:

This photograph taken just a few years ago, shows members of the Duwamish tribe rowing in a canoe. Selecting a modern photograph was intentional. It was important for this section to use a modern photograph to push against the narrative of the vanishing race. Historic photography of indigenous people was often taken by a settler colonial group who often choreographed these moments to represent their own ideas of indigeneity. Preservation through photographs, collection of indigenous items, and theft of indigenous lives are an insidious narrative throughout the United States. And while stories represented in historical photographs are important to tell, they are better told by the members of the Duwamish Tribe.

Figure 75. Contour Project Site #14 Sticker
(Illustration by author)

Figure 76. Site #14 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Indigenous City:

The building to the left is the Duwamish Longhouse and Cultural Center. Herring's House Park on the right is on the site of the last unaltered curve of the Duwamish. This is the site of an ancient indigenous community called Basket Hat. This was once the site of a thriving community (Thrush, 2007). However, the passage of Ordinance 5 in 1865 forced all indigenous people to leave the city in the evenings (Seattle Weekly Gazette, 1865). For a time, the site was lost, however, in 1975, the Port of Seattle attempted to build a new terminal at this spot. A bulldozer both exposed and crushed the midden of the ancient village. A midden is a historic dumping site. At this Duwamish River site, the shells and fish bone made up the majority of the midden. It was only after the advocacy work of members of the Duwamish tribe, that some of the remnants of the village was preserved. Take a moment to explore the park and read the information in the park (Cummings, 2020).

Next Stop: Site #16

Distance: 0.5 miles

Time: 10-minute walk / 3-minute bike

Site 15: Shorebird

4260 West Marginal Way Southwest

Figure 77. 4260 West Marginal Way Southwest (Photo by author)

Site Description:

At the entrance to the T-105 park road, this site invites travelers to investigate this natural area. The park itself contains a small stream and the remnants of the historic mud flat. Across the river, we can see Harbor Island and the far shore of the Duwamish and the large Cementfabrik building looms on the opposite side of the shore. While this tour location is meant to discuss the more-than-human elements of the river, this site makes clear that these natural areas are nestled in between industry and commerce.

Site Selection:

QR code stickers will be located at two places along this tour, one at the entrance to the park and the other in the park at the water. Along the roadway, this QR code is positioned for visitors to see upon entering the park as a pedestrian or cyclist. The sticker will be located on a post near the park sign.

I chose this location because it was a good location for individuals to take a break during this tour. If visitors travel down the pathway toward the water they can rest under the covered structure, picnic tables, grassy field, and benches make this site a beautiful moment to take a break. I chose this location because it is one of the few places along this tour where I have seen many native birds that would have thrived in the delta ecosystem 150 years ago. On multiple occasions, I have seen Sandpipers darting across the mud foraging for food. My hope is when individuals visit this site and read about Sandpipers, they might get the opportunity to see one while they are in the park.

15

Figure 78. Sandpiper
(Manuel, 2020)

Photograph:

This particular site stands as one of the few remaining habitats for sandpipers along the Duwamish River today. To enhance the visitor's experience, I have deliberately selected an up-close image of a sandpiper for this site. By featuring this detailed image, I aim to provide tour participants with a clear visual reference, enabling them to recognize and appreciate the presence of sandpipers if they encounter them at this location.

Figure 79. Contour Project Site #14 Sticker
(Illustration by author)

Figure 80. Site #15 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Shorebirds:

Delta ecosystems are especially important for migrating birds. Easy to identify with their narrow bill and long legs, sandpipers have a remarkable range of bill sizes adapted to their various ecological niches. In the 1850s, various species of Sandpipers might dart across the tideflats eating insects, worms, crustaceans, and other invertebrates. Only small segments of habitat exist along the Duwamish today. The Spotted Sandpiper, (Actitis macularius) nests within 300 feet of water under the leaves of nearby shrubs and grasses (King County, n.d.). Without access to water, mud, and plants, these species cannot thrive in the Duwamish. From here, explore Toolalt Village Park and Shoreline Habitat Terminal (formerly Terminal 105 Park). To the south of the pier, there remains a strip of tidelands where occasionally one can find sandpipers.

Next Stop: Site #16

Distance: 0.5 miles

Time: 10-minute walk / 3-minute bike

Site 16: Industrial Landscape

SW Spokane Street Bridge

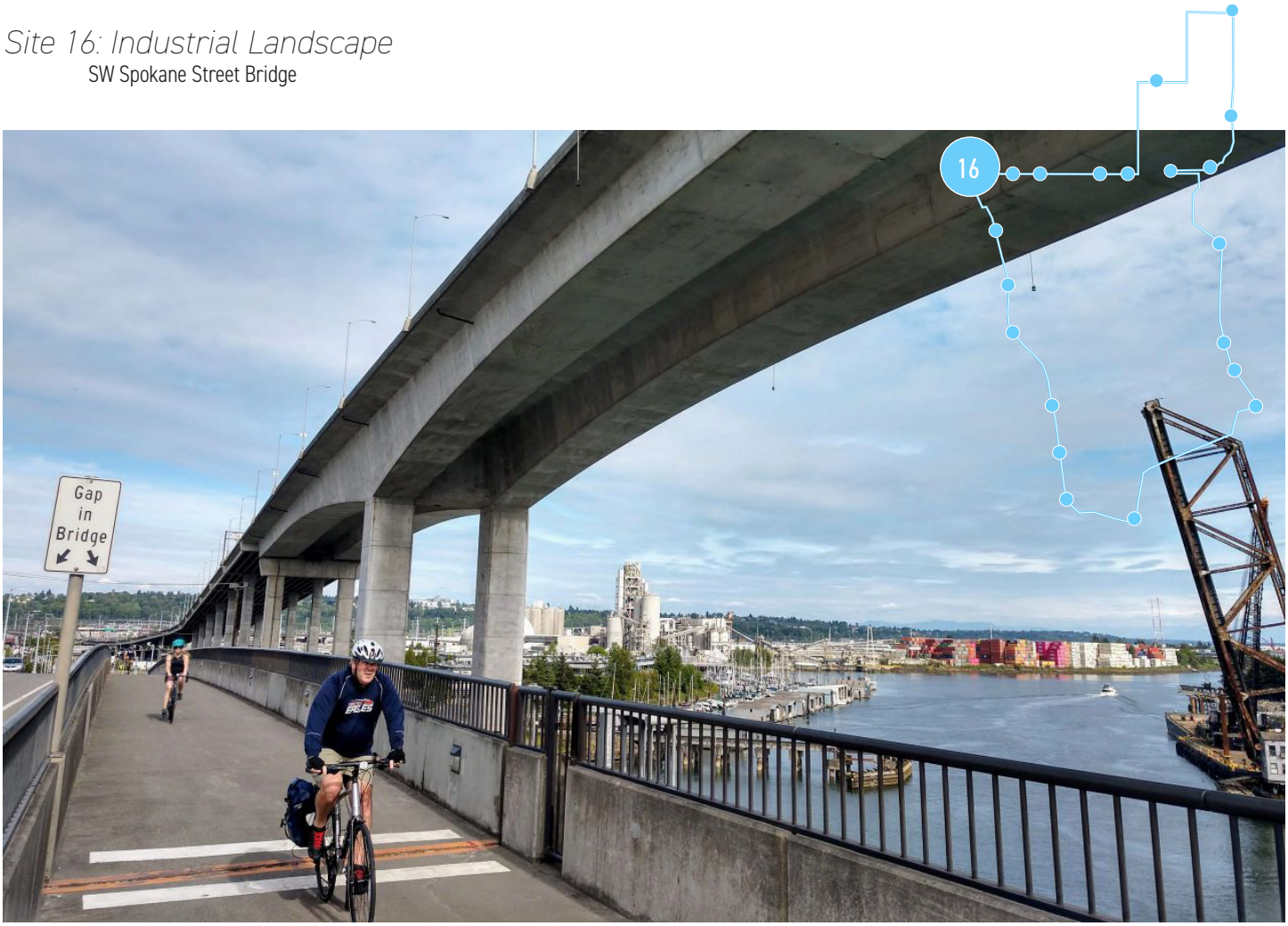


Figure 81. SW Spokane Street Bridge
(Photo by author)

Site Description:

To get to the next site, we climbed the hill to the center of the Spokane Street Bridge. At the highest point on the bridge, we get our first glimpse of the trajectory of our tour. Like the 1st Avenue Bridge, the view south of this site reinforces the sense that this landscape is meant for industrial purposes. We can see Terminal 105 Park as well as the curve that makes up Herring's House Park.

Site Selection:

The protected pedestrian and bike path across this roadway makes this an especially attractive location for placing a QR code. The pedestrian crossing is wide enough to accommodate two cyclists passing and a person standing by the railing. This creates the opportunity for individuals to stop for a moment and appreciate the view while feeling safely removed from traffic.

I chose this site because of its spectacular view down the Duwamish River. Few sites have enough elevation to look across the entire tour site, so this location provides a pay-off moment for those who have continued through the tour. The scale of this industrial landscape historically and today is the main feature I hope my viewers take from this historic photograph.

Secondly, to the view, this site mirrored an archival photograph of the original Spokane Street Bridge to the south. Like other sites along this tour, the remarkable visual similarity between the past and present tells a story of a landscape unaltered by changing local values. More on this in the next section.

Figure 82. Aerial of Duwamish River and Spokane St. Bridge ca, 1938
(PEMCO Webster & Stevens Collection, Museum of History & Industry, Seattle; All Rights Reserved, 1938)

Historic Photograph:

I chose this site specifically because of the similarity between this historic photograph and the existing conditions today. The original Spokane Street Bridge is visible in this historic photograph, and today we stand on the new Spokane Street Bridge and look south toward this historic bridge. The similarity shows a continuity in the industrial history of the Duwamish. While contemporary opinions of industrialization are more varied, the landscape continues to reflect decisions made over a hundred years ago.

Figure 83. Contour Project Site #16 Sticker
(Illustration by author)

Figure 84. Site #16 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Industrial Landscape:

As part of Eugene Semple's plan, the Duwamish needed to be dredged and diked to deepen and straighten the waterway allowing ships to dock upriver and creating new land for industrialization. The transformation of the river into the Duwamish Waterway officially began in 1913. Two dredges, Anaconda and Python, dug into the riverbed and expelled sand, mud, and living organisms buried in the mud onto the flats. By 1897 the dredges excavated 3,000 ft of the Duwamish to a depth of 35ft creating 75 acres of new land. However, with larger ships, the canal required to be dredged again. By 1920, the waterway reached a depth of 50 ft and extended 4 1/2 miles south (Williams, 2017). Beginning in the north and moving south, acres of new land transformed into industry. Industries included cargo handling, marine construction, boat manufacturing, food processing, and fabrication workshops. These industries contributed to the persistent pollution that plagues the Duwamish today (Cummings, 2020).

Next Stop: Site #17

Distance: 0.3 miles

Time: 6-minute walk / 2-minute bike

Site 17: Underwater Meadows

Southwest Spokane Street & 11th Avenue Southwest

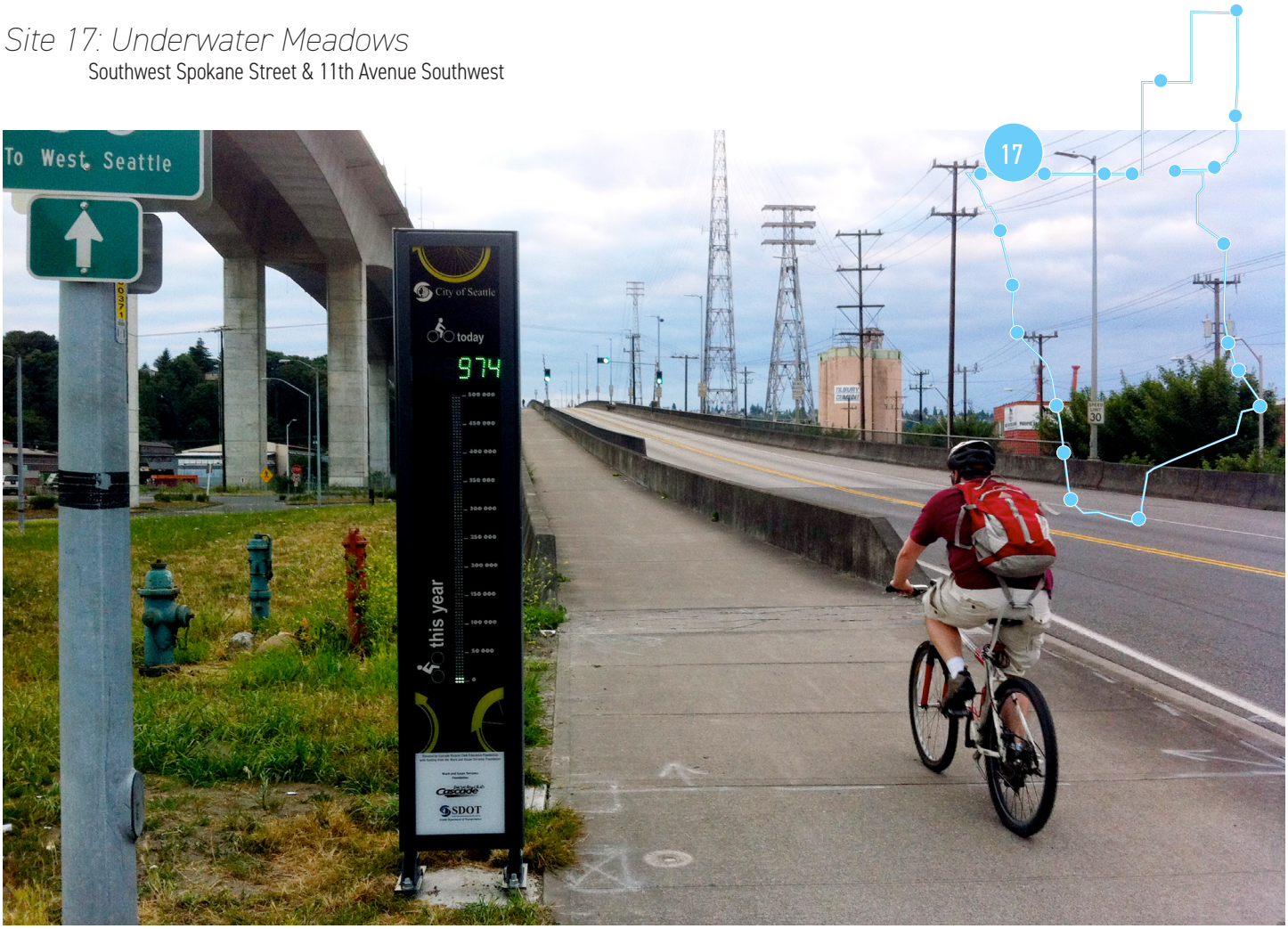


Figure 85. Southwest Spokane Street & 11th Avenue Southwest (Photo by author)

Site Description:

On Harbor Island, at the base of the Spokane Street Bridge, the viewer stands in the shadow of the West Seattle Bridge and at the industrial intersection between the island and West Seattle. This location is highly trafficked by both pedestrians and cyclists because it is the main pedestrian path to West Seattle.

Site Selection:

Pedestrian safety dictated this northern route for the trail because if the route does not feel safe people will not participate in this trip. This portion of Harbor Island has a separate bicycle and pedestrian pathway creating a safe environment for non-vehicular traffic. The sticker is located at the traffic light where pedestrians and cyclists wait to cross SW Spokane Street. I have placed a sticker at the traffic signal here because it is easy to see, and pedestrians will have time to scan the QR code before they cross the street.

Figure 86. Eelgrass (Zostera marina)
(Thormar, 2021)

Photograph:

Underneath the surface of the water, eelgrass remains a vital and often unseen component of the nearshore ecosystem. Recognizing its importance, I have chosen to include a contemporary photograph of eelgrass to visually represent its significance to the Duwamish Delta.

Eelgrass plays a crucial role in maintaining the health and balance of the nearshore environment. It provides habitat, shelter, and food for a diverse array of marine organisms, including fish, invertebrates, and waterfowl. By showcasing a contemporary photograph of eelgrass, we can help bring this overlooked character to the forefront of our narrative.

Figure 87. Contour Project Site #17 Sticker
(Illustration by author)

Figure 88. Site #17 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Underwater Meadows:

Eelgrass (Zostera marina) buffer currents, dampen waves, fix carbon via photosynthesis, and create habitat for young fish and invertebrates, such as juvenile salmon, to find prey (Kennedy et al., 2018). Today, eelgrass meadows are one of the most at-risk ecosystems. Generally, coastal development, nutrient runoff from agriculture, stormwater, and rising ocean temperatures causes the most harm to these meadow systems. Due to eelgrass's dependence on clear, clean water for photosynthesis, it functions as an early indicator species for the health of an ecosystem (EurekaAlert, n.d.). As a result of sewage, stormwater, and a lack of riparian habitat to hold sediments, the Duwamish waters are opaque. Eelgrass cannot survive under these conditions. Fragments of the ecosystem remain intact around the edges of West Seattle and Magnolia, but none are at the mouth of the Duwamish.

Next Stop: Site #18

Distance: 0.2 miles

Time: 5-minute walk / 1-minute bike

Site 18: Salmon as Landscapers

West Seattle Bridge Trail Fishing Dock

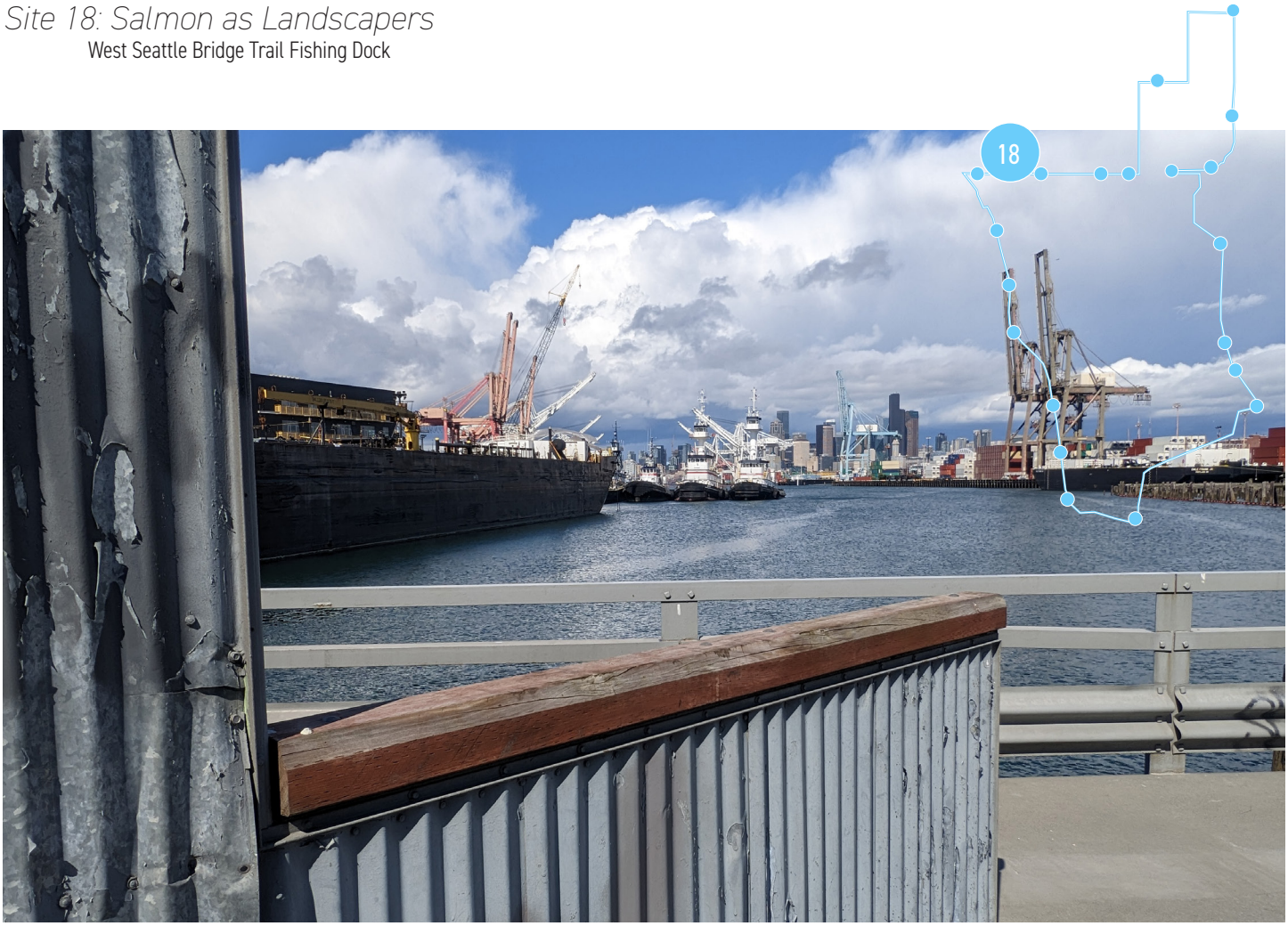


Figure 89. West Seattle Bridge Trail Fishing Dock
(Photo by author)

Site Description:

The SW Spokane Street Fishing Dock is a lesser-known gem of a park. This modest park contains both a structure to protect from the rain, benches, and a beautiful view northward down the industrial edges of the east waterway of the Duwamish. Frequently, you can watch large ocean-going vessels being fixed or cleaned at the multiple ports on the waterway. Despite the pollution levels, during salmon season, the ledge of this park is full of people fishing.

Site Selection:

I chose this site as another opportunity for visitors to rest during this tour in an area separated from the roadway. The benches face north towards the eastern waterway and one can see the towers of downtown Seattle in the distance. The small park is separated from the busy roadway and feels like a small oasis in this industrial area.

Salmon are the subject of this QR code, as a result, it felt fitting that this fishing location be a site for placing this QR code. During salmon migration season in the late summer and fall, the railing of this park is full of diverse fisher people. Proximity to the subject matter of this code makes this location particularly impactful.

In addition, I chose this area because 150 years ago this would have been the place where the alluvial fan of the Duwamish Delta would have emerged. This original landscape shifted between water and land multiple times throughout the day. But today, the separation between land and water has become more distinct. Harbor Island has replaced the delta ecosystem.

Figure 90. Sockeye Salmon
(Kent Reporter, 2017)

Photograph:

I deliberately selected a contemporary image of salmon in the Duwamish River as a representation of their significance within the ecosystem, even though they may not be readily visible from this bridge. Despite their invisibility, salmon play a crucial role in the river's ecosystem. They are emblematic of the intricate web of life that exists within the Duwamish River, contributing to its ecological balance and serving as indicators of its overall health. This image brings attention to an unseen community of the Duwamish River.

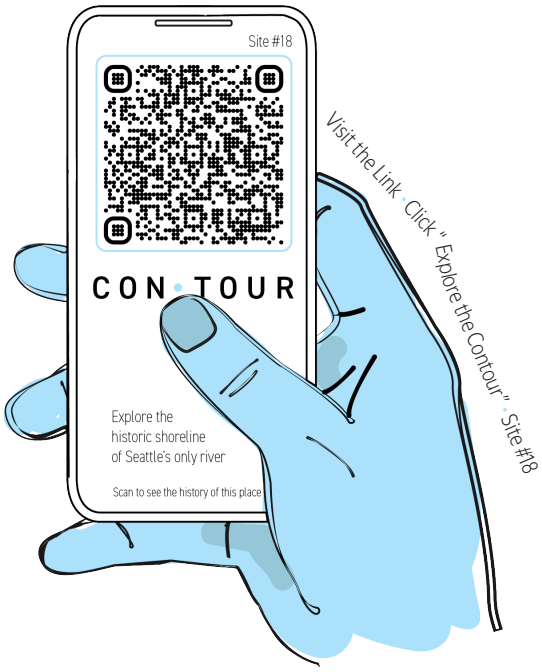


Figure 91. Contour Project Site #18 Sticker
(Illustration by author)

Figure 92. Site #18 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Salmon as Landscape Formers:

From this bridge to the Duwamish River estuary, salmon could slowly adjust from saltwater to fresh through the osmoregulation process (City of Seattle, 2001). Osmoregulation is a complex process where salmon adjust the levels of salt and water within their bodies (CIAA, 2022). The carcasses of dead salmon provide nutrients to the forests where they spawn (Feddern, 2019). But before dying, spawning salmon played an influential role in carving the shape of the Duwamish Delta. When salmon spawn, they wiggle into the loose gravel at the bottom of stream beds. This process kicks up the dust from the stream bed. The current catches this dust carrying it downstream where it lands along the broad tideflat. Spawning rivers are specifically known for their spectacular alluvial fans, a result of millions of salmon over centuries migrating upstream. Alluvial fans are the triangle-shaped accumulation of sediments that fans outwards from a concentrated source of sediments. The spawning salmon's final act of stirring up dust, performed by generations of salmon, supports returning populations. These alluvial fans create critical rivets where returning salmon can go through osmoregulation before proceeding upstream (Love and Stallman, 2018). But the transformation of the Duwamish River to the Duwamish Waterway required a deep and straight river. Dredges, steam shovels, hydraulic cannons, and all manner of machines ripped through this salmonscape to industrialize the river.

Next Stop: Site #19

Distance: 0.2 miles

Time: 4-minute walk / 1-minute bike

Site 19: Razor Clams

910 West Seattle Bridge Trail

Figure 93. 910 West Seattle Bridge Trail
(Photo by author)

Site Description:

At this portion of the West Seattle Bridge Trail, the visitor is shadowed from the sky by the overhead roadways. These upper-level roadways distinctly separate the spaces designated for pedestrians below and the automobiles above. Beneath the protective shade of these bridges, the trail meanders through a greenspace of ivy and concrete. This is one of my favorite portions of the trail because of the way that the multi-modal trail winds between the landscape of ivy and concrete support columns.

Site Selection:

This rumbling and echo from the roadways create the sensation of being below the automobile world above. I wanted to leverage this sensation on this site for the location of my information on razor clams. Razor clams, spending the majority of their lives buried beneath the sandy substrate, possess a perception of their surroundings that is perhaps akin to how we humans perceive the passing of large industrial trucks overhead. By aligning this sensation with the presence of razor clam information, I aimed to create a meaningful connection between the visitor and the clam.

This site holds historical significance as it once served as a highly productive area for clam foraging. Imagining the expanse of the mudflat that once occupied this landscape, teeming with thousands of clams, now replaced by an intricate network of cement columns and roadways, evokes a sense of reflection on the profound changes that have shaped the area.

Figure 94. Digging Razor Clam
(National Geographic, 2012)

Photograph:

Few historic photographs exist of razor clams in the Duwamish Delta. Of the few photographs available, most were clams caught and photographed against a measuring tape. This type of picture removes clams from their context. Instead, I chose a contemporary image of a razor clam digging into the sand. Although most sandy areas along the Duwamish are inaccessible, clams continue to persist and remain an important part of the Duwamish ecosystem.

Figure 95. Contour Project Site #19 Sticker
(Illustration by author)

Figure 96. Site #19 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Razor Clams:

The historic tideflats under our feet supported abundant habitat for clams. High in protein and various vitamins, clams are an important food staple for multiple different species and indigenous communities. Razor clams (Ensis directus) can dig up to 1 cm per second. They dig by closing their shell suddenly, turning the mud surrounding them into quicksand. For this reason, razor clams are considered micro sediment engineers.

When the Denny Party arrived at Alki Point, they were ill-equipped to survive their first winter. Indigenous people gave them food and showed them how to dig for clams. This early pioneer family may not have survived their first winter without clams (Cummings, 2020). The Duwamish Dela created an environment hospitable to clams because of its large expanses of soft sand and abundant clam foods such as algae, zooplankton, and phytoplankton. Razor clams intake water-borne particles through an intake siphon to eat. Absorbing these particles clears the water for other near-shore plants like eelgrass. Today, there are few patches of mud remaining for clams to survive. For those that do, when they open their siphons, they intake toxic chemicals with their food. As a result, Duwamish razor clams are poisonous (City of Seattle, 2001). Once one of nature's most abundant local food sources, clams have become forgotten members of the ecosystem.

Next Stop: Site #20

Distance: 0.5 miles

Time: 10-minute walk / 5-minute bike

Site 20: Railroad & Mobility

Colorado Avenue South & South Spokane Street

Figure 97. Colorado Avenue South & South Spokane Street (Photo by author)

Site Description:

A double-lane railroad crossing bisects South Spokane Street. Above us is the Spokane Street Viaduct. We can hear the boom of cars crossing the contraction joints on the roadway above. This site, with a multi-modal path, two major arterials, and a train track, emphasizes the importance of mobility at this site.

Site Selection:

At this point during the tour, pedestrians will come across the largest pedestrian-level railroad crossing. This crossing serves as a tangible connection between the physical environment and the rich history of the railroad industry. This view provides a clear sightline for pedestrians in both the north and south directions, allowing them to observe the railroad lines and the surrounding industrial landscape. While it may not be conventionally perceived as beautiful, this site holds a unique allure with its dramatic industrial aesthetic. The viaduct frames the railroad crossing, sightline for pedestrians north and south around the railroad line. While not considered traditionally beautiful from a landscape perspective, this site has a type of intrigue.

Figure 98. Beacon Hill and First Hill from Tideflats, Seattle, ca. 1904
(University of Washington Libraries, Special Collections, A. Curtis 04252, 1904)

Historic Photograph:

This 1904 photograph, taken from a high vantage point, shows the network of early mobility infrastructure in the Duwamish tideflat. We notice a railroad line in the background, a roadway winding between electric line supports, and decomposing pilings that once held train tracks or roadways in neat lines. This photograph shows multiple modes of transportation in varying stages of use. The train cars show a railroad fully utilized, while the decomposing piling displays an abandoned route.

Figure 99. Contour Project Site #20 Sticker
(Illustration by author)

Figure 100. Site #20 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

Railroad & Mobility:

Water, above all other resources, defined Seattle's early success. For centuries, shipping goods and people was the most efficient means of travel for both indigenous communities and settlers. This all changed with the railroad. The railroad overtook water routes because of its speed and ability to move large numbers of people and goods. However, Seattle's hilly topography and inundated tideflats did not meet the needs of a railroad that relied on flat and straight pathways. The city of Seattle gave Seattle & Walla Walla Railroad the first railroad permit to skirt the edges of the Duwamish River - the flattest topography in the city. This railroad intended to connect Seattle and Walla Walla; bringing people and food from eastern Washington and coal from New Castle to Seattle for shipping. The Seattle & Walla Walla Railroad Company regraded 22 acres of land from Seattle to New Castle (Williams, 2017). This was the first major change to the Duwamish tideflats. Today, mobility infrastructure dominates the landscape. The modern Industrial District specializes in moving people and goods through the region and world from the port along the waterfront, Boeing airfield to our south, Interstate-5 to the east, railroads crisscrossing this area, and a grid of roadways.

Next Stop: Site #21

Distance: 0.7 miles

Time: 15-minute walk / 4-minute bike

Site 21: New Land, New Housing

South Lander Street & 3rd Avenue South

Figure 101. South Lander Street & 3rd Avenue South
(Photo by author)

Site Description:

On top of the Lander Street Bridge, we can see the Seattle skyline and stadiums to the north. To the west, we can see the 1912 historic Sears building, now Starbucks headquarters, and the shipping cranes that frame the river. The railroad runs below.

Site Selection:

A 10-foot wide multi-modal trail runs across the length of this bridge. A concrete barrier separates the pedestrian traffic from the roadway, further enforcing a sense of security. Commonly, you see people enjoying the view during sunset. The extra moment pedestrians spend on this bridge shows a perceived level of comfort.

The bridge experiences high pedestrian traffic because it connects the bars and restaurants in SODO with the light rail and sports stadiums north. On game day, this bridge becomes crowded with sports fans moving between the bars and the stadiums. This highly trafficked area makes this space ideal for placing a QR code.

The site of this bridge also has historical significance. A few blocks north of this bridge was the site of Seattle's Hooverville. I wanted to place this information on this bridge so modern viewers can imagine that historical encampment.

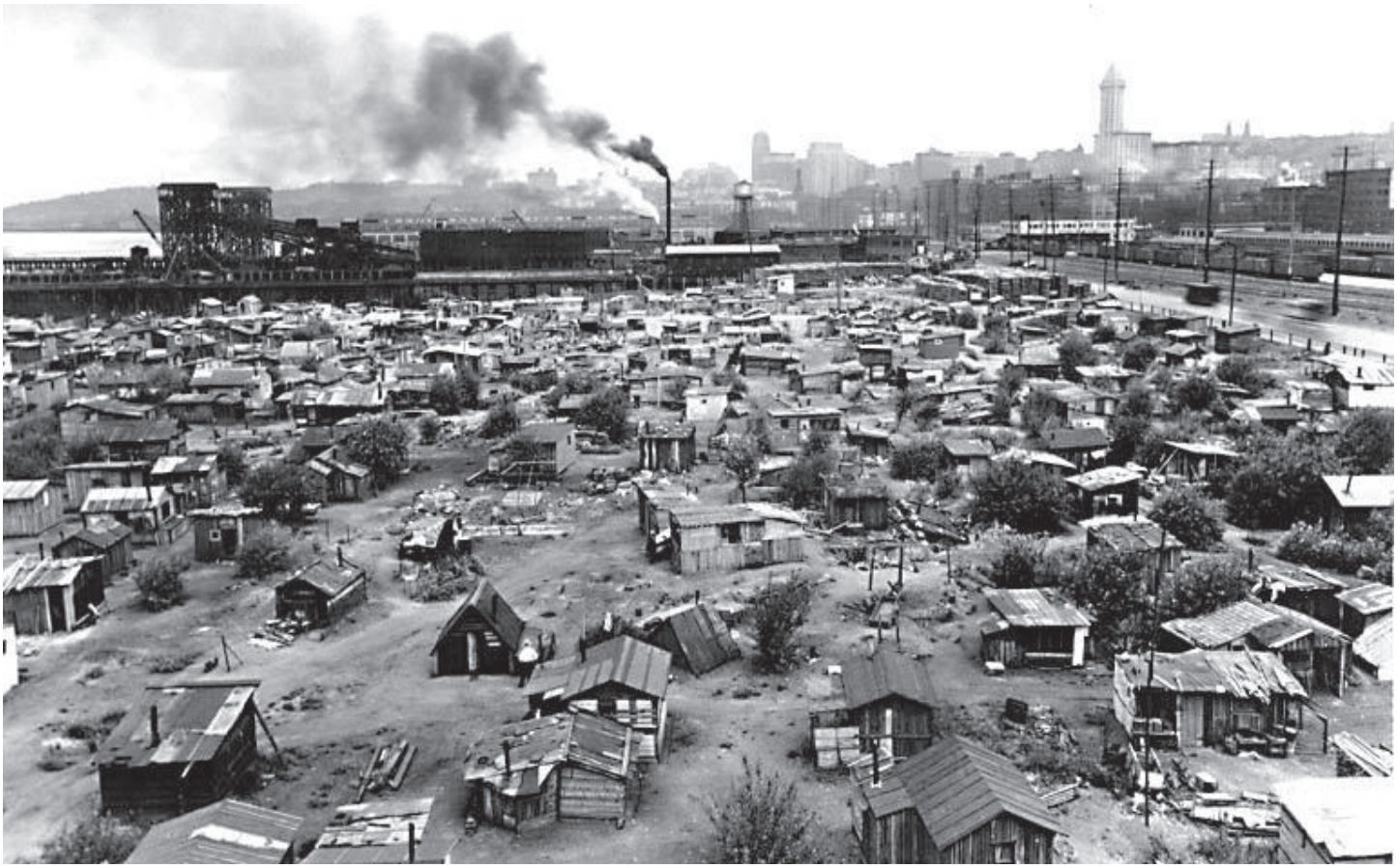


Figure 102. Seattle's Hooverville at the foot of S. Atlantic St, ca. 1937
(University of Washington Libraries, Special Collections, UW2129, 1937)

Historic Photograph:

This 1937 photograph of Seattle's Historic Hooverville shows a similar angle to where we stand on the Lander Street Bridge. To the north, we see the skyline of downtown Seattle. Both in the historic photograph and today, we can see the faint outline of the Smith Tower connecting this space through time.

Figure 103. Contour Project Site #21 Sticker
(Illustration by author)

Figure 104. Site #21 Collage with Details from the Contour Project (Illustration by author)

Information from the Contour Project

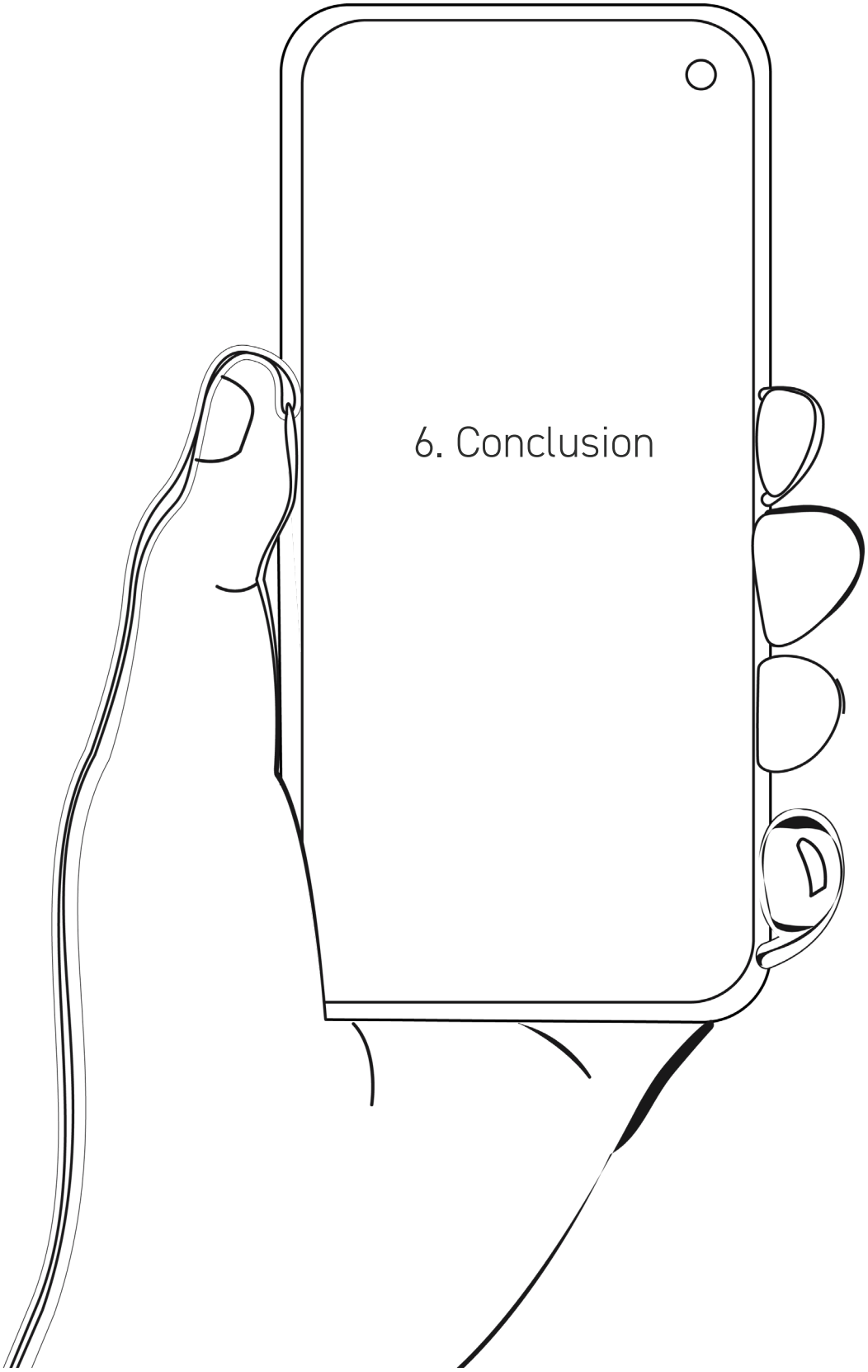
New Land, New Housing:

Homelessness and the establishment of tent encampments have played a notable role in the history of Seattle. These informal settlements historically emerged on lands characterized by inherent hazards, such as flood-prone areas or locations deemed of low value. In the context of Seattle's history, there were industrial plants dedicated to the creation of new fill in the vicinity of our present position. However, during the challenging period of the Great Depression, when the American economy experienced a significant downturn, this newly created land remained vacant. It was during this time that the availability of this new land opened up housing opportunities for impoverished and minority residents in Seattle (Klingle, 2009). Amidst the hardships of the Depression era, these residents established what became known as Seattle's Hooverville. Situated just one block north of our present location, this neighborhood encompassed approximately nine acres of newly reclaimed and dry land. A census conducted in March 1934 recorded the presence of 632 men and 7 women within the community. The diverse population included 292 foreign-born Caucasians, 186 Caucasians born in the United States, 120 Filipinos, 29 African Americans, 3 Costa Ricans, 2 Mexicans, 4 indigenous individuals, and 1 Chilean (Demirel, 2009). However, following the conclusion of the Depression, city officials cleared the camp to make way for industrial and port expansion.

Next Stop: Site #1

Distance: 0.9 miles

Time: 18-minute walk / 6-minute bike



6. Conclusion

Emerging Themes

Three themes emerge from walking this tour. 1) an overall decline in biodiversity, 2) a transformation of a multi-use landscape into a landscape dominated by mobility and industry, and 3) a shift from the undulating topography of a delta to a reconstructed flat landscape. Each theme offers insight into the profound changes that have shaped the Duwamish River:

Decline in Biodiversity: The Duwamish River has experienced a notable decline in biodiversity as it has undergone transformations over time. Once a flourishing ecological system, it has transitioned from a vibrant landscape of diverse habitats including Douglas fir forests, sedge-filled wetlands, mud flats, and riparian vegetation; to an agricultural environment dominated by the hop industry, cattle, and hog farms; and ultimately transformed into an industrial environment. The once-diverse habitats, brimming with diverse flora and fauna, have gradually yielded to the industrialized landscape dominated by concrete and asphalt we witness today.

Single-Use Landscape: The Duwamish River, once shaped by indigenous communities and early settlements where people lived, worked, and found sustenance in the Duwamish Delta. As settlers remade the landscape for industry, the main purpose of the landscape shifted to a singular use. While pockets of residential area remain, industry remains its primary purpose. Despite this industrial dominance, Georgetown and South Park remain culturally diverse and residential neighborhoods that hold a special place within Seattle.

Topographic Transformation: Another significant theme encompasses the evolution of the Duwamish River's topography. The landscape of the Duwamish River Delta was a landscape formed by water. The deposition and erosion of both tidal waters from the north and freshwater from the south created the valley and delta. From an area defined by the movement of water, today the water has been channeled and hidden from view. Once characterized by diverse topographic features and varying water levels, the landscape has morphed into a uniform terrain. The once-rich topographic features that once added diversity and character to the area have been replaced by a flattened expanse, erasing the subtle nuances and contours of the past.

Within these three interwoven themes of cultural, biological, and topographic change, a central concept emerges — a narrative of the loss of diversity, albeit in different forms. The transformation of the Duwamish River has resulted in a reduction of diversity in landscape form, as the natural features have become replaced by industrial infrastructure. The changing land use has reduced the diversity of human occupants, with marginalized communities experiencing displacement and a diminishing presence. Furthermore, the transformation of the topography has contributed to a loss of variation and distinctiveness in the physical landscape. These three themes converge at the overall loss of diversity in this landscape since settlement.

The Experience

Within each individual site, a unique story unfolds, shedding light on the profound transformations that have shaped both human and more-than-human communities. These stories weave together to create a rich and intricate narrative of the landscape. However, it is through the exploration of multiple sites that the audience begins to witness the interplay of these narratives, unveiling an overlapping and interconnected tale of place.

It is important to acknowledge that this project, like any landscape history endeavor, inherently carries limitations. Only a select number of narratives can be brought forward, leaving countless untold stories behind. Yet, the true essence of a landscape lies not only in the documented narratives but also in the layers of personal and social experiences that have shaped it. That "... meaning resides in and evolves with the layers of personal and social experience.... Thus, opening landscapes begins with understanding the site as an intersection of layers of stories connected to other stories" (Pottegier and Purinton, 1998, p. 189) By recognizing each site as an intersection of diverse stories interwoven with other stories, we begin to open the landscape, unveiling its multifaceted nature.

The lived experiences of the audience members, their unique encounters during this tour, and the inherent stories embedded within each site contribute to expanding the potential meanings beyond the confines of

Figure 105. Comparison Images of the Duwamish River, ca 1922 and 2021 (Burke Museum, 1922) (Tom Reese, n.d.)

this project. As I witnessed friends, classmates, family, and even strangers engage with the project, I was pleasantly surprised by the profound impact certain stories had on them and how their personal narratives became intertwined with this endeavor. These layers of engagement enrich the project, adding depth and breadth to its significance.

Places for Improvement

User Testing

At the conclusion of this thesis, I have reflected on some of the challenges and continuing ways this thesis can be improved. One of the primary ways I could improve upon this project is through testing this project with the general public before full deployment. While I tested the accessibility of this project to select groups, I believe that this project would benefit from multiple different user trials over an extended period of time. In these user trials, I would develop a condensed version of this tour by choosing a set of four stops in a condensed area. From here, I could interview participants in-person about their perception of the project and collect data through Esri to find trends.

Coordination with Community Groups

In addition to user testing, I believe this project could be improved by outreach to community groups involved with the Duwamish. One benefit of this would be that I could better understand their work and represent their interests in the project. The Duwamish Tribe, Duwamish Alive Coalition, and the Puget Soundkeepers are among some of the community groups I have identified who I would have liked to have contacted. Their feedback on the information provided could provide specificity to this project.

Custom Web Platform

I chose to utilize the Esri platform StoryMaps for this project due to its powerful interface, compatibility with both phones and computers, and its ability to transform ArcMaps into an online platform. StoryMaps has proven to be an excellent tool for presenting information effectively. However, to take this project to the next level, the next evolution would involve creating a custom website specifically tailored for an optimal user experience. By building a website from scratch, I would have greater control over the design and layout, allowing for the inclusion of different pages such as a project home page separate from the individual stories accessible through the QR code. This modification would enhance the visual experience for users and minimize the amount of scrolling required. Additionally, while I can geolocate each stop within the mapping software, it would be even more powerful to integrate the platform with location services on smartphones. This would enable seamless navigation from one stop to another, further enhancing the user experience. Implementing these changes to the platform would greatly improve legibility and user-friendliness, ensuring that users can easily engage with the content and navigate through the project's stories.

Application to Other Contexts

Through the process of developing this thesis, I found that one of the most promising elements of this project is its potential application to other landscapes that lack legibility. Thematically, the transformation of landscapes through industrialization has formed and fragmented human and more-than-human communities is a relevant storytelling lens in American cities. We can use this same lens to analyze other mobility infrastructure systems that have required large landscape alterations. Within Seattle, I looked into applying this project to Interstate-5, the Lake Washington Ship Canal, the Burke Gilman Trail, or the light rail system. With more time, the development of a template or a set of standards accessible to anyone that could facilitate similar on-site histories would be a powerful tool for other designers and landscape historians.

Reflection

I initially conceived this project during the stay-at-home order amidst the pandemic. Beginning as a personal endeavor, this project began to develop into my thesis and incorporate the broader Seattle community. With this project, I set out to achieve four primary goals: encouraging

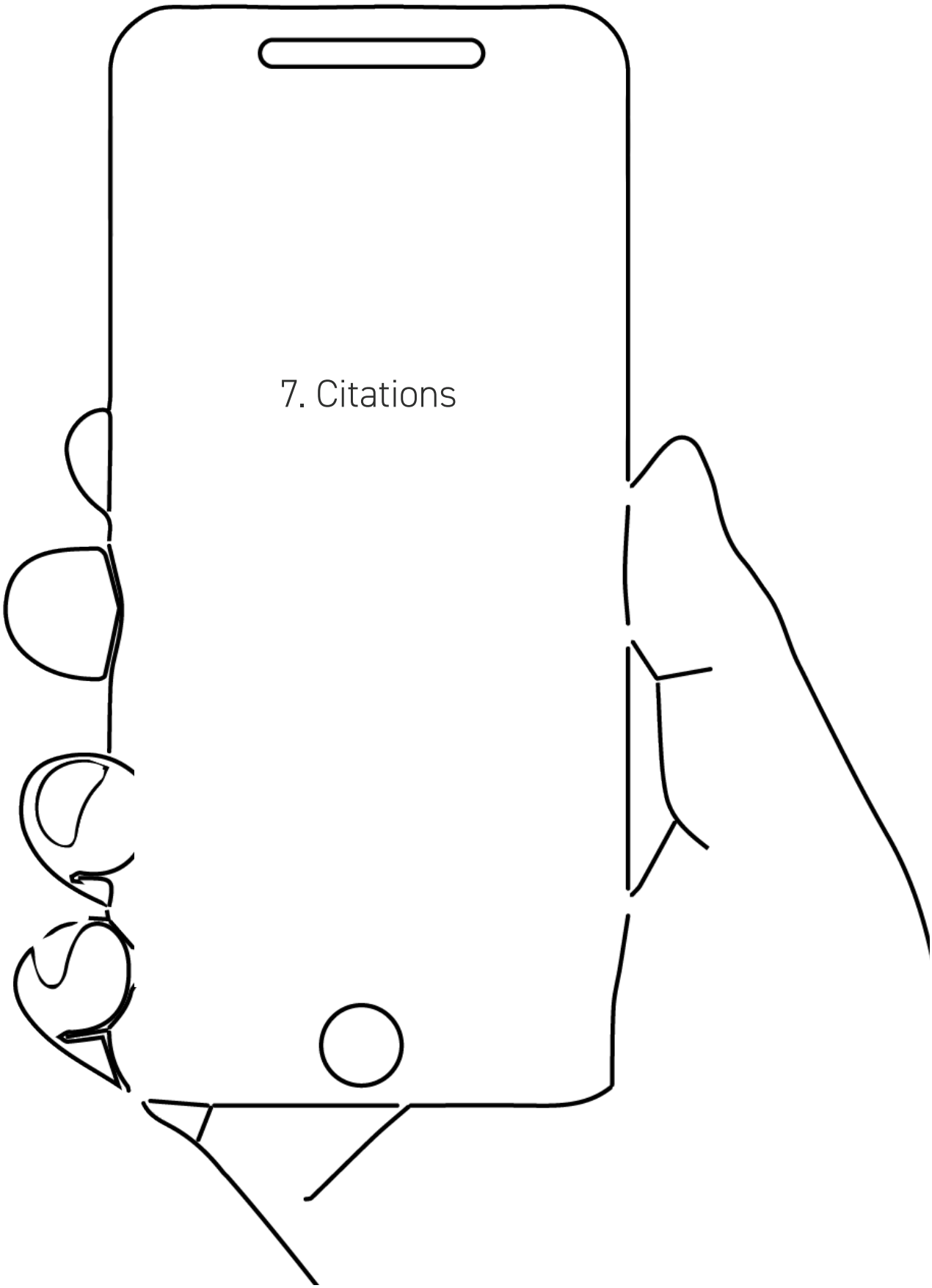
people to explore their urban surroundings, shedding light on the history of Seattle, creating moments of reflection within the city, and fostering a deeper connection between individuals and their environment.

On a personal level, this project has provided me with invaluable insights beyond what I could have anticipated. I have had the opportunity to embark on my own tour multiple times, and with each walk, I have discovered something new and intriguing. For instance, I stumbled upon the original outline of the Duwamish River, traced by the curving River Street, or the time I hurriedly crossed an onramp to the 1st Avenue Bridge, only to discover the last remaining tidal marsh along the Duwamish River nestled within the cloverleaf of 2nd Avenue Southwest. Most of my discoveries never made it into the tour but have deeply impacted my appreciation for my home. The exploration and discovery process has provided me with a deep connection to the history and essence of Seattle. While this project may reach its end, its impact on my personal perspective will endure.

In May, the Contour Project received a grant from the City of Seattle SmART fund, which will enable me to print and distribute stickers along with educational fliers at public businesses near these sites. These stickers are intended to be affixed to the surface of publicly owned infrastructure projects, serving as a way to engage and inform the community. However, before proceeding, I am currently undergoing the approval process to obtain permission for placing these stickers on City of Seattle property.

If my request is approved, this project will become publicly accessible for a duration of fifteen months, from June 2023 to October 2024. During this period, individuals will have the opportunity to encounter and interact with the stickers, fostering a deeper connection to the city and its history. I am grateful for the support provided by the City of Seattle and my thesis committee Manish Chalana and Lynne Manzo at the University of Washington. I am very excited to share this project with the community.

7. Citations



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