

RUNNERS' WORLD

Trail Infrastructure for Navigating Extreme Urban Freeway Conditions

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I thank my peers and professors for ensuring that I loved graduate school.

PREFACE

My interest in the connections between infrastructure and architecture began my first studio of graduate school. In that studio I was asked to design a school of transportation. I decided to make it a school of human powered transportation and engage it with the Burke Gilman trail in the neighborhood of Ballard.

My interest in the freeway began with a canoe trip on Union Bay that took me under the never connected off ramps of the SR-520 bridge at the Washington Arboretum. There was a practice kayak slalom strung between the columns. Teens used one of the ramps and a giant diving platform. Our kayak skimmed underneath the belly of the freeway itself. I was struck by the juxtaposition of natural and infrastructural and the activation of the space between through outdoor activity.

I became interested in running at the age of 13. I ran cross-country and track through high school. I ran with a club team in college and joined a group of avid marathon runners in Austin, Texas. For two years, most of which were during my graduate studies, I worked at a running gear store training large groups of adult runners for races ranging from 5k to marathon. I have always had my community of runners.

CONTENTS

ACKNOWLEDGMENTS	iii
PREFACE.....	iv
FIGURES.....	vi
INTRODUCTION	1
SCOPE.....	
World of the Freeway.....	5
World of the Body.....	13
World of the City.....	19
Runners' World.....	23
METHODOLOGY.....	29
URBAN ANALYSIS.....	
Trail System.....	31
Neighborhood Focus.....	42
PROGRAM + SITES.....	46
DESIGN.....	64
CONCLUSION.....	87
BIBLIOGRAPHY.....	92

	FIGURES	pg.
figure 1: Conceptual images of freeways.....		3
figure 2: Freeway Infrastructure.....		4
figure 3: 1961 aerial image of I-5 construction in Seattle.....		5
figure 4: Photograph of a physical model		6
figure 5: Iconic landscape of the open road.....		7
figure 6: Highway 1 on the coast.....		7
figure 7: 520 floating bridge.....		8
figure 8: I-90 Entering Seattle.....		8
figure 9: General Motors Pavilion at the 1939 World's Fair.....		9
figure 10: Conditions on the I-5 Corridor in Seattle.....		11
figure 11: Broken ends map.....		12
figure 12: Connections diagram.....		13
figure 13: Allegheny riverfront		14
figure 14: Mopac freeway bridge in Austin, Texas.....		15
figure 15: Maxwan designed, Dutch "Orgware".....		17
figure 16: I-5 Colonnade Park.....		18
figure 17: View from Lakeview overpass.....		18
figure 18: Mamihara Bridge by Jun Aoki in Japan		20
figure 19: Gran Via de les Corts Catalanes, and the A19 Highway.....		21
figure 20: Federal Highway Administration diagram - energy harnessing road.....		21
figure 21: View from the bottom of the Harrison pedestrian stair.....		22
figure 22: Runner's World magazine covers.....		23
figure 23: High five during the 2012 Seattle Marathon.....		24
figure 24: Seattle training group on Interlaken Blvd.....		24
figure 25: Mud run, costume run, color run with running tutus.....		26
figure 26: Local ultra runner Hal Koerner.....		27
figure 27: Ultra runner's pit crew.....		28
figure 28: An ultra runner's pacer.....		28
figure 29: Regional running destinations map.....		32

figure 30: Running on the roads I-90 Tunnel.....	33
figure 31: Seattle Marathon on I-90.....	33
figure 32: This map shows existing central trail conditions.....	34
figure 33: I-5 Spine	35
figure 34: Focus sites	36
figure 35: The Seattle Marathon route.....	37
figure 36: The Portage Bay Loop.....	38
figure 37: The Inner Loop.....	38
figure 38: Lake Union or Cheshiahud Loop.....	39
figure 39: The Arboretum.....	39
figure 40: The Lunch Loop.....	40
figure 41: 10 mile city loop.....	40
figure 42: This map shows bike connections.....	41
figure 43: This map shows bus connections.....	41
figure 44: Easlake analysis map.....	44
figure 45: The program diagram.....	46
figure 46: Program sizes diagram.....	47
figure 47: Rouge Running.....	51
figure 48: Trail restroom on Lady Bird Lake In Austin, Texas.....	52
figure 48: Outdoor recreation area in Copenhagen.....	53
figure 49: maps and image of the first site on the spine trail.....	54
figure 50: maps and image of the second site on the spine trail.....	55
figure 51: maps and image of the third site on the spine trail.....	56
figure 52: maps and image of the first focus site.....	57
figure 53: maps and image of the fifth site on the spine trail.....	58
figure 54: maps and image of the sixth site on the spine trail.....	59
figure 55: maps and image of the seventh site on the spine trail.....	60
figure 56: maps and image of the second focus site.....	61
figure 57: maps and image of the ninth site on the spine trail.....	62
figure 58: maps and image of the tenth site on the spine trail.....	63

figure 59: System concept diagram.....	64
figure 60: Tent, billboard, refuge - tectonic inspiration.....	65
figure 61: The kit of parts for the deployable module.....	66
figure 62: Clearsorber™ material in application.....	67
figure 63: A module with enclosure hanging below the freeway.....	68
figure 64: Enclosure, sign and railing.....	69
figure 65: Enclosure, sign and railing.....	70
figure 66: Partial enclosure, sign and roof.....	71
figure 67: Roof and railing.....	72
figure 68: Just railing.....	73
figure 69: North site section - kiosk.....	74
figure 70: Kiosk Plan.....	74
figure 71: Retaining wall attachment	75
figure 72: Running kiosk at night.....	76
figure 73: North Section - Rest Stop.....	77
figure 74: Rest Stop Plan.....	77
figure 75: Bridge attachment.....	78
figure 76: Running rest stop at night.....	79
figure 77: Running station lower plan.....	80
figure 78: Running station upper plan.....	81
figure 79: Attachment for suspension framework under the freeway.....	82
figure 80: Assembled suspension framework under the freeway.....	83
figure 81: Running station under the freeway at night.....	84
figure 82: South section perspective of the running station.....	85
figure 83: View and a Zoomba class on the I-5 Express Trail.....	86
figure 84: Physical Model of the kiosk.....	89
figure 85: Physical Model of the rest stop.....	89
figure 86: Physical Model of the station.....	89
figure 87: Micro-scale model of the Seattle I-5 corridor with site models each exploration.....	90
figure 88: Micro-scale model of the Seattle I-5 corridor.....	91

INTRODUCTION

And I can't wait to get on the road again.

On the road again

Goin' places that I've never been.

Seein' things that I may never see again...

-Willie Nelson

Exponential growth of the world population and the growing environmental crises has put higher and higher demands on land and infrastructural systems. In order to optimize efficiency of urban space, infrastructure should be designed for more than just single function. The freeway cuts through a city, physically dividing neighborhoods, leaving broken ends where it severs ties. Instead of cutting these networks, this arterial connector should join with other infrastructural systems to engage with the cultural and environmental conditions it passes by.

This thesis analyzes how infrastructure and architecture can integrate to better accommodate the moving body in the growing city. The networks below the freeway and the landscapes divided by the neglect of attention from the scale of freeway design are explored in this thesis through the network of pedestrian trails along the freeway, focusing on runners as exemplars of city navigators.

During training, runners find hidden paths to traverse from side A to side B of the freeway. This runners' map of the city is utilized in this thesis to explore the occupation that is possible in leftover spaces of the highway infrastructure.

A series of sites located along the trail system interface with the different spatial conditions and neighborhood networks along the freeway to provide a variety of connections and amenities for pedestrians at different scales. By exploring the possibilities of its formal functions and unique spatial conditions of the freeway, the architecture can better respond to the rapid densification of the city .

PROBLEM STATEMENT

At the basest of levels, the engineering of freeway infrastructure focuses on the efficient conveyance of vehicular traffic at the highest speed possible. Freeway design is also, however, a product of movement, considering the landscape and creating vistas as it passes through. The landscape of a city, however, is too complex for the massive scale of the freeway to effectively respond to all of its minute facets. Because of this, the extensive amounts of land devoted to highway infrastructure are largely underutilized. This underutilization is becoming more and more apparent as the development and density of cities increases and the value of space rises. As the freeway cuts through the dense fabric of the city, it creates a landscape accessible by a wide range of social networks. It is experienced from above and below, from the car and by the pedestrian, heightening the potential of its spaces.

This thesis seeks to investigate and integrate the landscape of highway infrastructure and the city to create social spaces. The first examination is of the freeway network from above, identifying the overwhelming physical presence of highway infrastructure in the landscape of the city, the powerful role of the road as cultural symbol in United States, and the contention between ecological concerns and the value engineering of vehicular transportation. This research

helps to determine where there are opportunities to enhance the performance of freeway infrastructure through layered programming and architectural intervention.

The second focus of research examines on the networks that weave along the freeway and the landscapes divided by the neglect of attention from the scale of freeway design. This will be explored through the network of pedestrian trails along the freeway, focusing on runners as exemplars of city navigators. The runners' map of the city is utilized in this thesis to explore the occupation that is possible in leftover spaces of the highway infrastructure.

The runners' experience of these spaces is somewhere in between the formal and the accidental. They occupy road sometimes a more controlled way like a typical pedestrian would, but their desire for unique experiences or challenges of distance and topography can inspire unsanctioned use of informal spaces. The runner is able to weave in and out of the system established by the larger engineered network of transportation and the local one of city streets, alleys, and trails.



figure 1: Conceptual images of futuristic freeways



figure 2: Freeway Infrastructure including SR 520 in Seattle

SCOPE

Motion generated by transport infrastructure affects the perception of the surrounding landscape.

-Kelly Shannon + Marcel Smets

WORLD OF THE FREEWAY (VIEW FROM ABOVE)

Conceptual images of future cities often show a complex mass of overlapping, elevated roadways. (figure 1) The reality in many cities is not much different. (figure 2) In Seattle, the sheer scale of infrastructure creates a dense, incomprehensible layering of space. In order to build Interstate 5 in 1957, a two block wide swath of land all the way through the city had to be cleared, (figure 3) As noted in Kelly Shannon and Marcel Smets book, *The Landscape of Contemporary Infrastructure*, “The territorial dimension of infrastructure – its sheer bigness and muscularity – categorically ensures it is visually impressive within the landscape, [however], while establishing a connection, it produces a rupture,” (Shannon 52). As visible from aerial views (figure 1) the interruption of the urban fabric allows for a high capacity, continuous passage for vehicles through the landscape.



figure 3: 1961 aerial image of I-5 construction in Seattle

This is not to say that the utilitarian goals of the freeway mandate that they are devoid of higher design strategies. The model of the I-5 corridor in figure 4 shows how the freeway hugs the curves of the landscape. The United States Federal Highway Administration held biennial design awards for excellence in highway design from 1996 through 2010 in order to, “encourage excellence in the design of highway-related facilities and to recognize projects that contribute effectively to a more pleasing highway experience,” (USDOT). Much has been written on freeway design and aesthetics. In collaboration with Kevin Lynch and John Myer, urban designer Donald Appleyard wrote an entire book called *View from the Road* that examines the highway as a potential work of art, orchestrating movement through the landscape and the city. In this book, the aesthetics of the road experience are examined not only as an amenity, but as a necessity for driver orientation and attention.

The road is held as romantic, as a work of engineering and as an artful experience, as a means to conquer the landscape and uniquely experience it. For travelers, some stretches of road are seen as destinations, earning designations of National Scenic Byways and All-American Roads. (figure 5) California’s coastal Highway 1, (figure 6) an example of the latter, compliments the scale of the ocean and cliff face landscape. It is not only considered a destination for drivers, but also for runners, hosting the Big Sur International Marathon, one of the most popular destination marathons in the world.

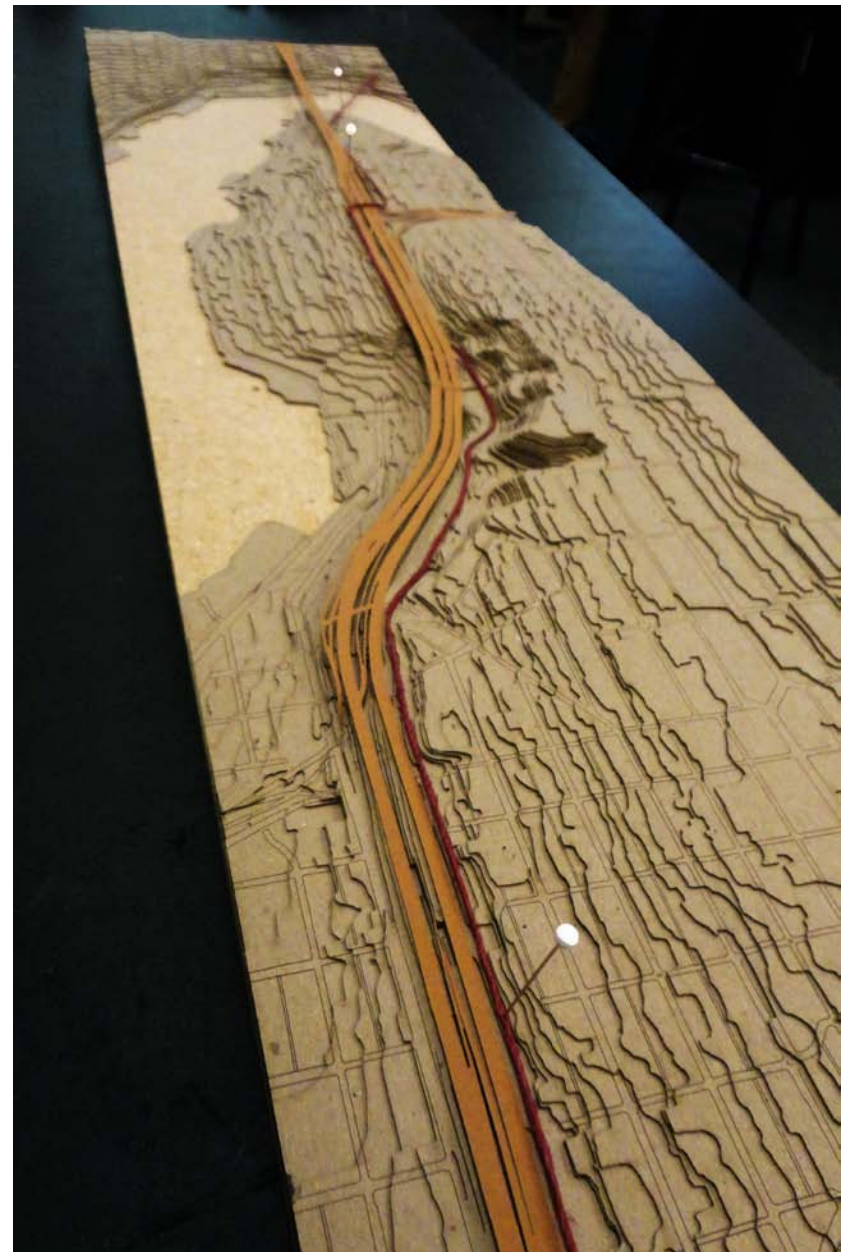


figure 4: Photograph of a physical model with the freeway in orange and proposed trail design in red



figure 5: Iconic landscape of the open road



figure 6: Highway 1 on the coast

The image of the road as territory can be traced back to the history of the wild west and settler's desire to conquer nature. The scale of the freeway infrastructure tames and minimize the enormous scale of the landscape. Drivers are allowed to physically cut through mountains, pass over rivers, and capture framed views of the landscape. Songs like Roger Miller's King of the Road, depict the traveler as an individual conqueror in control of his own destiny. A Seattle example of the road taking over the landscape is State Route 520, a feat of engineering, designed to float in order to tame the cross span of Lake Washington. (figure 7)

The scale and mass of the freeway, in part a product of its purpose as a conveyor of vehicles, has also endowed it with a monumental appearance that is prevalent in the cultural memory of the United States. The General Motors Pavilion at the 1939 World's Fair in New York borrowed this aesthetic, replicating the monumentality of the overpass. (figure 9) Fairgoers were tunneled into its giant form on overlapping ramps the size of two lane roads. As Donald Appleyard notes, "one of the strongest visual sensations is a relation of scale between an observer and a large environment, a feeling of adequacy when confronted by a vast space," (Appleyard 13). This sense of mastery is provided by the personal control of speed within the large environment along the freeway. This is evidenced by frequent appearance in countless car commercials with speedy shots of vehicles on mountain cliffs and canyon edges. The entry into Seattle is quite dramatic with an elevated, sweeping view of the downtown. (figure 8)

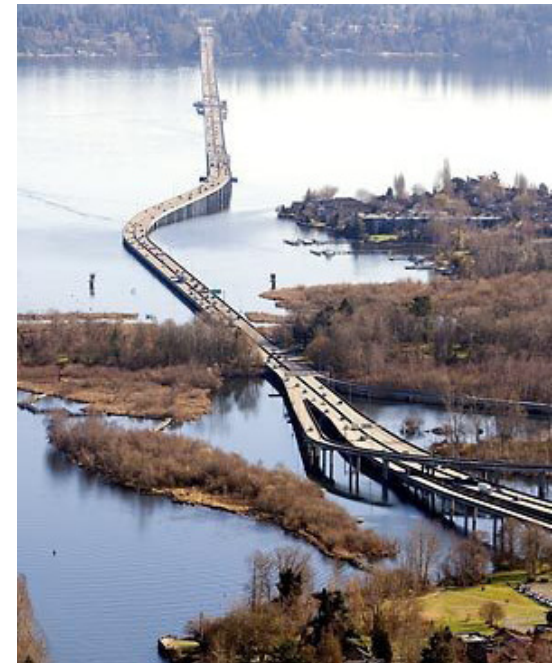


figure 7: 520 floating bridge and its close interaction with the landscape of the Washington Arboretum

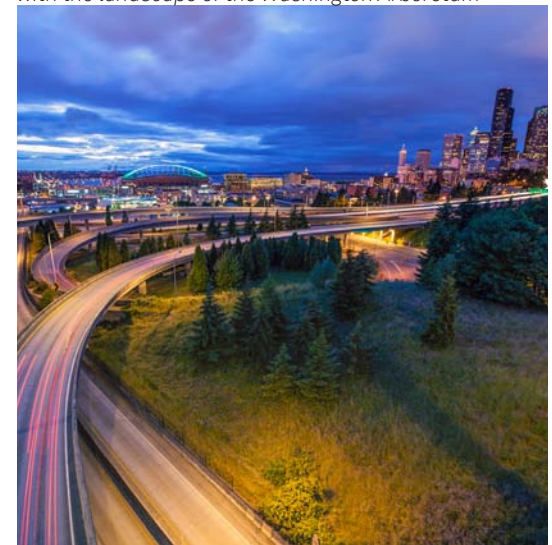


figure 8: I-90 Entering Seattle from the south east



figure 9: General Motors Pavilion at the 1939 World's Fair in New York

The issue of scale produced by the juxtaposition of engineering and nature becomes more disjointed when the freeway cuts through the city. The massive scale of landscape that infrastructure typically creates and inhabits, does not translate well to the fine grained complexities of the city. The simple curves the freeway takes through landforms and waterways cannot as cleanly traverse the intricate networks of streets and complex assemblies of built form. Several of the conditions in Seattle along I-5 are shown in figure 10.

As Christopher Alexander notes in *A City is Not a Tree*, “The city is a receptacle for life. If the receptacle severs the overlap of the strands of life within it... it will be like a bowl full of razor blades on edge, ready to cut up whatever is entrusted to it,” (Alexander 166). The intricate intersections and various layers of the city cannot be simply diagrammed and ordered and separated into objects. This makes it difficult to design a freeway that cuts through this “overlap” without creating a multitude of broken ends in the urban fabric.

The problems of these “broken ends” are due in large part to a lack of transition between infrastructural scale and neighborhood scale. Where the freeway cuts through streets dead end or become alleyways running along the edge of the freeway, serving as forgotten buffers. The map in figure 11 shows the alleys and dead ends along the I-5 corridor.

As Rem Koolhaas theorizes in *The Contemporary City*, it is not the design of the architecture and infrastructure that is the issue, the problem is rather the lack of attention that is given to leftover spaces and networks between the infrastructure and nodes of social activity. The freeway may be able to twist and turn, rise above and dip below in response to larger landscape views, but its maximum performance for quick transport of traffic requires a standardization and scale that limit its ability to provide for spaces between. These left over spaces become opportunities for intervention. This thesis will explore how these sites might mediate between the scale of infrastructure and the scale of the human body.



figure 10: Conditions on the I-5 Corridor in Seattle

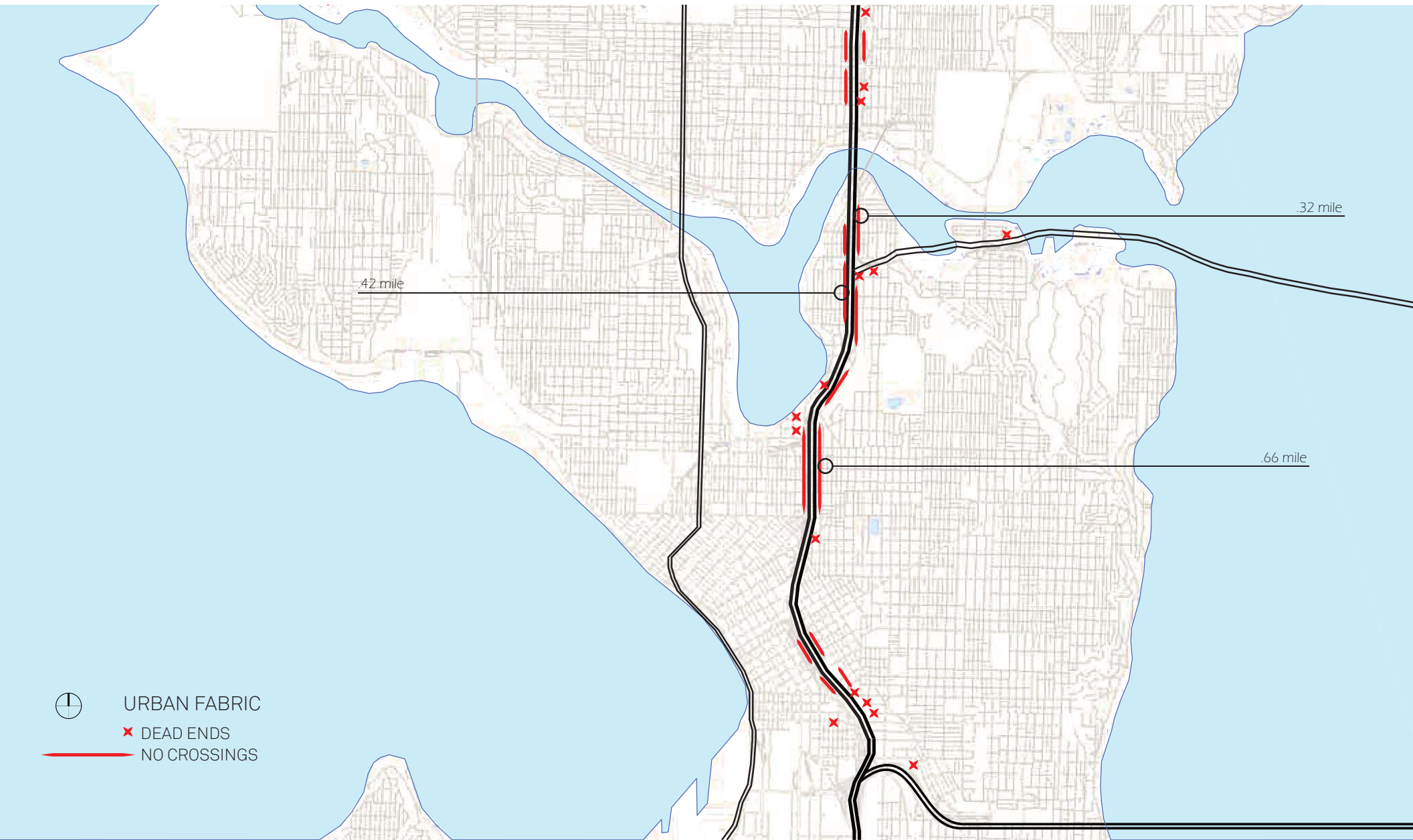


figure 11: Broken pieces of the urban fabric on the I-5 Corridor

WORLD OF THE BODY (VIEW FROM BELOW)

Although it cuts through the city, seemingly ignoring the small scale details of the urban fabric, the freeway, in fact, inserts itself as an additional layer within this context. Transportation networks consist of linear paths and connector nodes that shape landscapes into parcels of varying scale and topography. In this thesis, the term landscape a conceptual area of the city and surroundings that can be defined by physical boundaries and personal experience. The structure of transportation can aid in the overall composition of the urban landscape, helping to define otherwise continuous space into distinct, neighborhoods and districts with paths between them.

The typical approach to integrating the freeway layer into the rest of the transportation system is to find individual points to cross over or under it. The issue with this approach is that it sets up a directional conflict that is overpowered by the speed and movement of the freeway. These spaces of crossing become odd bridges and tunnels that are constantly fighting the presence of the highway. These should instead be thought of as key transition points between the grid of the city and the flow of the freeway. With this approach, the freeway can become part of a comprehensive and legible system of mobility for the city. (figure 12)

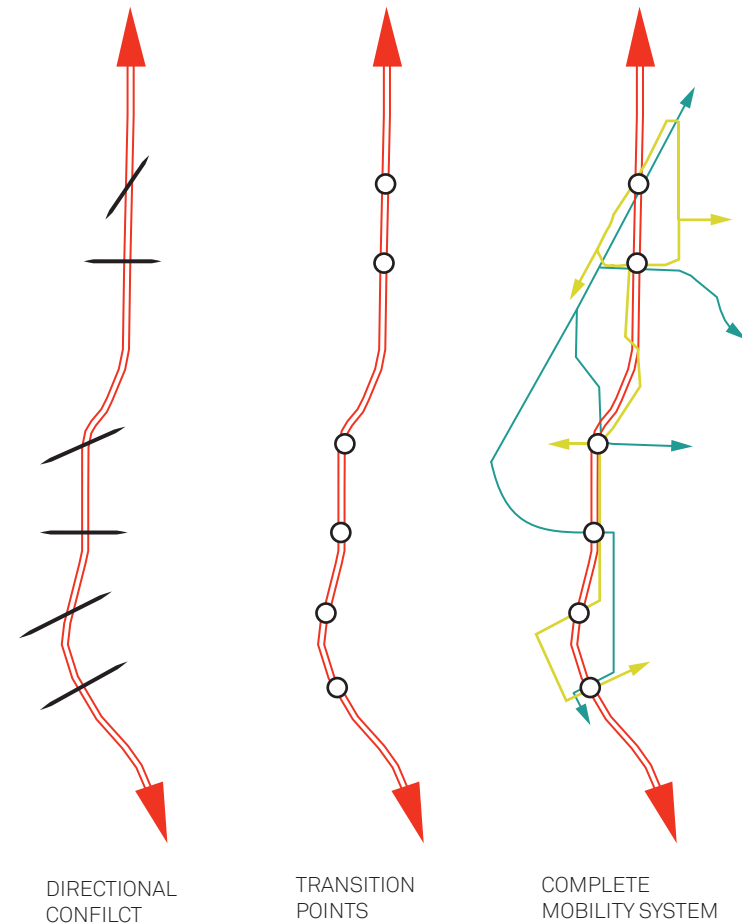


figure 12: Connections diagram

One of example of the integration of freeway and city is in Pittsburgh on the Allegheny Riverfront. This project layered park space, a walking path, and the city grid with the highway to create a riverfront space that connected to the commercial development on the opposite side of the highway. This design did not attempt to cover or ignore the highway, but instead incorporate it into the overall plan. (figure 13)

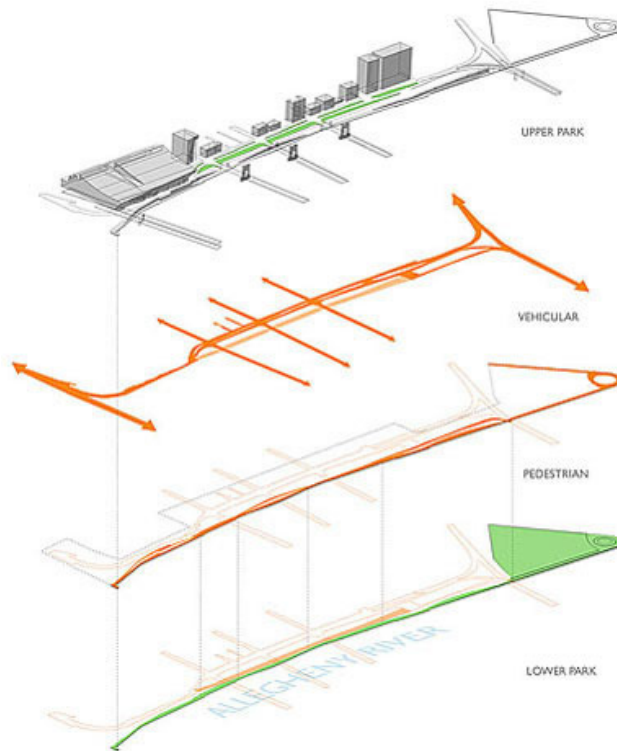


figure 13: Linkages through crossings - Allegheny riverfront

Another example is the Butler Trail around Lady Bird Lake in Austin, Texas. This trail integrates the bridges crossing the water into the trail system making different length loops from bridge to bridge. One of these bridges is for the Mopac freeway. Underneath the freeway is a pedestrian bridge, a stretching area, a restroom, and a major parking area for the trail. This trail is extremely popular for running, walking, and biking, as well as other outdoor activities. (figure 14)

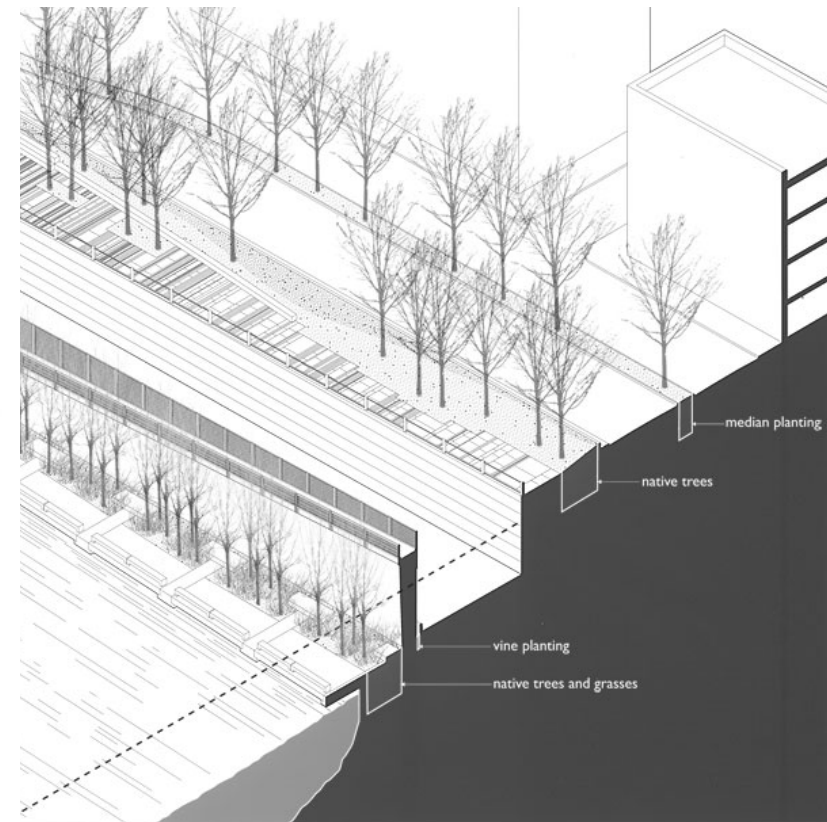




figure 14: Different activities around the Mopac freeway bridge in Austin, Texas

...landscapes are only rarely encountered by lone individuals, other people are usually present and the encounter is part of a social activity

(Sell 78)

The analysis of navigation on the street will help assess how the act of navigating the city on the freeway corresponds with the overall organization of movement between districts and nodes. The running network of trails in the central core, especially those that travel along the freeway have been examined to explore this scale. As runners frequently cross the boundaries between neighborhoods they are navigators of the broken ends of paths at the edges of freeways. The runner as urban commuter has the potential to mitigate the environmental and societal issues of high speed vehicular transit.

Running, thus, can be seen as a way to create a cohesive mental map created by a sequence of experiences of the landscape through movement. This process of mapping can be analyzed according to the categories of human interactions with nature described in *With People in Mind*. Their categories of *coherence*, *complexity*, *legibility*, and *mystery* can also be compared to Kevin Lynch's analysis of perception of the city as Paths, Edges, Districts, Nodes, and Landmarks (ref. Gifford 33). The first two establish the coherence of the map. Districts and nodes add comprehension to the map. Landmarks give legibility to the city and potentially establish a sense of mystery.

In *With People in Mind*, coherence is described as the ordering and organization of distinct regions and textures. On the city scale, this

overall, two-dimensional view provides an understanding of streets and transit connections for a basic understanding of how to move through a natural space or a city and connect with different areas or neighborhoods. This perception of the landscape as a whole occurs also in the motion experienced through transportation infrastructure. Coherence can also be achieved an understanding of one's particular place in this larger context. For runners, a measured distance on path to follow may be enough. Establishing a coherent picture by moving along a hierarchy of paths helps them to shape a mental map of the city.

Comprehension of a city, however, requires the ability to use the established physical framework of the map to layer more complex information about areas. Within the city, this can also include starting points close to where people live, routes through parks, view destinations and stopping points for water or restrooms. While complexity can enliven the comprehension of a place too much can result in a lack of understanding of the city as a coherent network. Signage, path identifiers, and a coherent architectural language for infrastructural systems can aid in this. In Utrecht, for example, Maxwan Architects developed the "Orgware" bridges that provided a set of recognizable identifiers while incorporating some visual variety. (figure 15)



figure 15: Maxwan designed, Dutch "Orgware"

Without variety of experiences and opportunities to explore, the city and paths within it can become monotonous. As Appleyard states, “the roadside should be a fascinating book to read on the run,” (Appleyard). The final categories in *With People in Mind of legibility and mystery*, go beyond a basic understanding of space to a deeper appreciation of it. The distinctiveness of signage and path can contribute to a sense of place, ownership and place attachment. They serve as orientation markers that strongly contribute to a legibility of space.

At the same time, a sense of mystery is also essential. Mystery can be discovered in the spaces and between its levels that are similar to the experiences of the moss covered pedestrian stairs all over Seattle. The promise of hidden wonders offer escape from the prescribed path of travel. Discoveries like I-5 Colonnade Park under the freeway (figure 16) or Lakeview overpass above the freeway (figure 17) and others, provide powerful moments where the body can inhabit the massive scale of the infrastructure.



figure 16: I-5 Colonnade Park

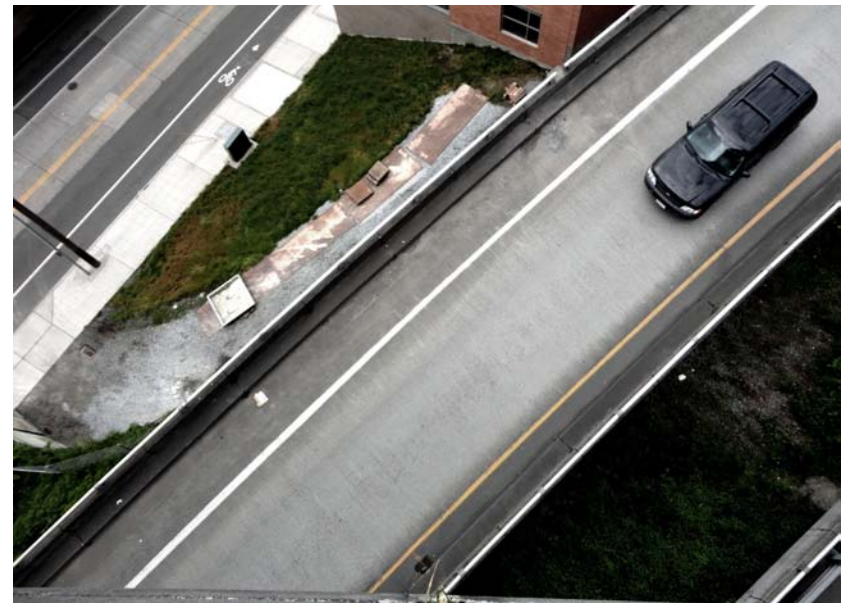


figure 17: View from Lakeview overpass

LANDSCAPE IN THE CITY (VIEW FROM WITHIN)

Ernest Sternberg compares the city network to the forest ecosystem and states that by treating it as a series of individual elements, “we risk subverting the many hydrological, botanical, and wildlife interrelationships that cross parcel boundaries.” Human experience of the city is rarely limited to one building’s property line or even to a set of buildings. Each individual travels through the city scape, interacting with and depending upon other individuals, each with different web of connections, as they move from place to place. Users of a space that are enabled to engaging healthier lifestyles may continue engage in those habits when they are not directly interacting with that space.

Infrastructural projects can be discussed in a similar manner. The ecological and environmental effects of a project rarely remain contained within the footprint of the project, yet by focusing on the intense needs for the maximization of efficiency and speed, freeway design often neglects to adequately respond to its environmental impacts. By engaging with the systems of the city, this infrastructure could potentially be a strong positive environmental influence instead of a detriment to the neighborhoods it cuts through. The freeway infrastructure’s exaggerated scale and engineering has the potential to provide both technical and social support for the city.

Due to the weak attention of freeway design with respect to the urban environment, however, Seattle residents have felt contention between freeways and healthy neighborhoods and as a result have fought against them beginning in 1968. Margret Tunks, author of *Seattle Citizens Against Freeways*, and other political activists worked to greatly reduced the amount of freeway infrastructure that was built in the 1970’s including an additional north-south connector and an additional bridge across Lake Washington. Her goal was to see that transportation planning was done in respect to land use planning and that it involved, “a study of all the alternative choices of transportation for a certain desired system or corridor,” (Tunks 33). Perhaps by designing the freeway in conjunction with land use, ecological strategies and other modes of transportation, the romance of it can be somewhat reconciled with the demands of contemporary issues in the city.

In this thesis, infrastructure is utilized to strengthen an existing network of urban trails by creating a distinct definition of place in relationship to the mass of movement and space that is the freeway. The crossings, paths, and nodes establish process of daily engagement, potentially inspiring ownership of the design through group events and social interactions. The aggregation of activity that crosses through a variety of neighborhoods has the potential to engage with local businesses and community groups to

strengthening social networks for future use of the system. These paths emphasize the variety of experiences and relationships to the freeway as they traverse the city. Nodes serve as meeting and entry points along the trail providing amenities to users.

There several infrastructural designs that can provide a foundation for examining the potentiality of this sort of design process. Infrastructure can serve as a public gallery of movement, if it must “focus on the connection between functional spaces or on the circulation within the connection space itself.” xx One example of this in the book is the *Mamihara Bridge* by Jun Aoki in Japan where “Aoki superseded the notion of the bridge as *connector* to bridge as *civic place*.” The modern and distinctive bridge was inspired by the design language of bridges in the region, connecting in to the vernacular culture. It includes a pedestrian bridge underneath the vehicular one with holes for fishing and enough space to allow for movement and gathering at once. This creates a communal space that also ties into the economics and food source of the area as well as two modes of movement. (figure 18)

Arriola & Fiol, architects in Barcelona, Spain combined the neighborhood paths and the freeway by creating a megastructure that also included housing and parks, the city boulevard, the Gran Via de les Corts Catalanes, and the A19 Highway. (figure 19) This



figure 18: Mamihara Bridge by Jun Aoki in Japan

idea of considering the highway as “megastructure,” is defined by Shannon and Smets as something that is “constituted by several independent systems that can expand or contract with no disturbance to the others,” (Shannon 84), serving as a flexible framework that supports the shifting functions of the urban network. This would incorporate other systems into the primary infrastructure as needed and allow it to better serve its urban context.

Other approaches for a “megastructure” could incorporate environmental systems and energy infrastructure. One very technical example of engagement with a complete system is a strategy that is being attempted in Israel to harness the power of movement vibrations with generators placed beneath the upper layer of asphalt on a highway. (figure 20). Another example could be utilizing sound absorptive and air filtering materials in the design of the freeway to deal with the environmental issues it creates. Plants and landscape design could also be incorporated to deal with the toxic fumes emitted by traffic.

These approaches grant the ability to experience the highway infrastructure at a more intimate scale. The physical and mental impact of this ability must be addressed. Mental fatigue is common in the fast paced and complex environment of the city. In their discussion of the perception of landscape through infrastructure,



figure 19: Gran Via de les Corts Catalanes, and the A19 Highway.

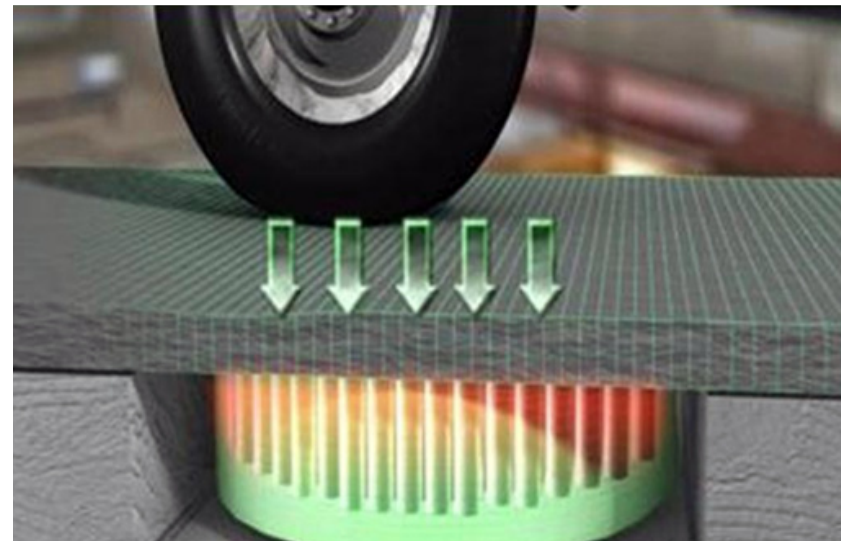


figure 20: Federal Highway Administration diagram - energy harnessing road

Shannon and Smets note that,

In today's era of a shrinking world and ever more time-space compression, the control of outside interferences indeed needs to be balanced with a visual orientation that highlights the navigability of the system and the specificity of the landscape.

(Shannon 125).

In order to find relief from mental fatigue, then, there must be restorative settings that connect urban system to the landscape. By taking advantage of the clear visible path of the freeway and a sense of movement and flow, the urban spaces around the freeway can provide a break in the density of the city. The connection to the urban context frames the sequential views, giving them the potential to become a human built, restorative landscape. By blurring the edges between infrastructure and nature, a sense of place can be achieved that enables mobility and provides refuge. In this kind of restorative landscape, views created through systems of trails that weave within the highway path provide connection and moments for pause.



figure 21: View from the bottom of the Harrison pedestrian stair on the Melrose trail. The space made by the freeway allows for light and view that doesn't reach the denser areas of the city.

RUNNERS' WORLD

*Afoot and light-hearted I take to the open road,
Healthy, free, the world before me,
The long brown path before me leading wherever I choose.*

-Walt Whitman

What is the runner's world? For one, it is a magazine. It is entitled *Runner's World* with the apostrophe strongly before the s, focusing on individuality and strength of the runner. The heroes depicted on this magazines cover are always very fit, scantily clad individuals that are either standing, stretching or running while smiling or looking intense. (figure 22) They have already conquered the landscape, it lies at their feet behind their bulging calves. Sometimes they have completely run off the landscape to a plane devoid of any restrictions to their powers as an individual.

Although this placeless space is just a creation of marketing and Photoshop, it does have an actual realization in the runner's world. Haruki Murakami, runner and author of *What I Talk About When I Talk About Running*, actually has a description for this plane of self-involvement that one sometimes reaches on a run. His description promotes the solo run describing his experience of running as follows:

*All I do is keep on running in my own cozy, homemade void, my own nostalgic silence.
And this is a pretty wonderful thing. No matter what anybody else says.*



figure 22: Runner's World magazine covers

This experience of the “void” is a powerful for runners, but it is not the only important one. There is also a shared experience and understanding between runners. This thesis is interested in that feeling of community among runners; the runners’ world with the apostrophe strongly after the s, focusing on the experience of support and community.

What is the runners’ world? On an ethereal level, it is an esoteric comprehension of what it means to love the pain and struggle of running. Actually, one of Runner’s World’s writers, Richard O’Brein, describes this commune through shared understanding:

Running is not, as it so often seems, only about what you did in your last race or about how many miles you ran last week. It is, in a much more important way, about community, about appreciating all the miles run by other runners, too.

This community has tangible realizations as well. Runners will nod or even wave to other runners as they pass them on the streets, especially in extreme conditions like the pre-dawn hours or inclement weather. There are also a set of informal running routes in most cities that most runners will be mutually aware of as good places to run. These destinations in Seattle were mentioned in an earlier section.

Races, of course, are the most visible realizations of the running community. Runners take over the roads in mass occupation that can last for hours depending on the length of the race. In figure 23, two strangers high five, communing in the joy and pain of the marathon. The race creates bonds outside of race day as well. The long training runs are often done in groups (figure 24) and stories of the race are shared afterwards. These training groups range in formality from a pair of friends, to a city club, to a coached program.



figure 23: Two strangers commune with a high five during the 2012 Seattle Marathon

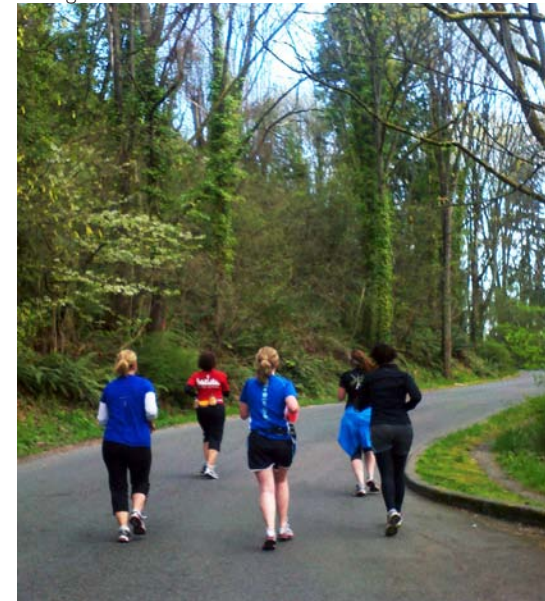


figure 24: Seattle training group on Interlaken Blvd.

Who is the runners' world? First of all it is a growing group of people. The USA Track & Field Foundation (USATF) keeps detailed accounts of running events in the United States every year. In the year 2000, only 2.1 percent of the US population participated in recorded running events. In 2012, approximately 15.5 people participated in running events, making this group 4.9 percent of the population. That is a 2.3 times increase in percentage over the last twelve years. Although this is a national statistic, looking at the amount of events in the state of Washington shows the popularity of the sport. There are approximately 300 road events per year. That is more than 6 events per week not counting any trail races. These numbers do not account all of the runners that do not participate in these recorded running events.

The American Time Use Survey done by the Bureau of Labor Statistics examines what sport and exercise activities people do in their free time. During the study period from 2003-2006, running was in the top five sporting activities with 7.1 percent of the population participating in it on an average day. That is more than the current percentage of people participating in running events. If this number follows the trends, then it has increased since 2006 as there has been an increase in people exercising in general. According to a study done by Healthy People, a national government effort that researches health trends and sets goals for the health of the

nation, people participating in exercise in general is increasing. The percentage of adults participating in 150 + minutes of moderate exercise or 75+ minutes of vigorous exercise in one week increased from 43.5 percent in 2008 to almost 50 percent last year. In the Outdoor Industry Association's 2013 Outdoor Participation Report, running, jogging, and trail running boasted 53.2 million participants in 2012, or 19 percent of the US population. If this number is correct, the percentage of people running in general increased 2.7 times in 6 years.

This increase in participation is diversifying the field of runners. The heroes discussed earlier are not the only conquerors of trail. There are now people running in actual hero costumes (figure 25). There is a whole new community of "fun runners." New types of runs have been steadily growing in number and popularity over the past few years. These include costume runs, team runs, mud runs, women only runs, and color runs. Several of these runs are untimed and encourage participants to cross the finish line together with their friends. All of these runs inspire themed running apparel including costumes and tutus.

According to the USATF 2012 end of year report, 2 million people participated in these types of events last year. That is 13 percent of the 15.5 million that participated in all running events in 2012. One of the most recent trends is the color run, a typically

MUD RUN



COSTUME RUN



COLOR RUN



figure 25: From left - team mud run, costume run, color run with running tutus

untimed, approximately 5 kilometer distance event where runners are showered with colored powder like it is the Hindu festival Holi, (figure xx). Although this is a national trend, it is definitely present in Seattle. There are four of these types of races, The Color Run, Color Me Rad, Color Vibe, and Color in Motion, in the Seattle-Tacoma area.

At the other end of the spectrum is the community of trail runners and of ultra runners, those running races of 50 kilometers to 100 miles and more, typically on trails. This community a piece of a larger Seattle culture of outdoor extreme sporting that is inspired by the city's proximity to the mountains. The Outdoor Industry Association's 2010 Special Report on Trail Running notes the Pacific region of the United States as containing 18.8 percent of all the trail runners the largest population of trail runners by region by almost double. In 2012 in the month of November alone, there were 7 trail events just in the Seattle area. Scott Jurek, winner of seven Western States 100 mile race, moved to the Seattle region in order to train on the mountains, (Jurek 81). Seattle boasts several other successful ultra runners including North Face sponsored Hal Koerner, who at age 37 has run 122 trail ultra-marathons over the last 14 years ranging in distance from 26.2 miles to 122 miles.

This may seem much like the group of heroes shown on the covers of Runner's World magazine. They do in fact have their own magazine. Although its many of its covers show images much like



figure 26: Local ultra runner sponsored by the North Face, Hal Koerner, conquers mountains

this one of Hal Koerner (figure 26), an individual conquering the trail, they are much more about the landscape than the Runner's World images and sometimes even show groups of runners struggling up a challenging slope together (figure 27). Because the conditions are so extreme, trail runners almost automatically commune when sharing the experience of a particular race course.

There is even more to this community than individual strength or even the shared challenges. The extreme conditions and physical and mental demands of ultra-marathons require an entire support team, (figure xx). This crew of people is the ultra runner's trail family that helps them through injury, dehydration, and mental road blocks. Many ultra-marathon races have specific places where 'pacers' can join the runner. Often these pacers are friends or coaches, but they can also be volunteers that may run a marathon distance or more with the person racing in order to help them reach the finish line. (figure 28)

Where do the ultra runners and the fun runners meet? Although the ultra runners typically race on the trails, most of their training runs are done on the road. According to the Outdoor Industry Association's study, the average trail runner only got out on the trails about 32 times a year. So these although these two communities may not run side by side, they meet on the city streets.



figure 27: Ultra runner's pit crew helps her with an injury, perhaps to get her back running



figure 28: An ultra runner's pacer may run a marathon distance or more just to support the racer

METHODOLOGY

*The will to win means nothing
if you haven't the will to prepare.*

– Juma Ikangaa, 1989 NYC Marathon winner

The design process began by defining the runners' network of movement in the city and proposing a master plan for the centralized trail. The freeway was examined as a key feature due to its large effect on the urban core. The goal of this investigation was to question the freeway as an element that simply maximizes vehicular transportation by incorporating response to the small scale urban connections of neighborhoods. Instead of ignoring or attempting to erase the flow of the freeway, architecture should compliment it as a vital piece of a coherent transportation system and comprehensive experience of the city.

As the goal of the intervention is to strengthen the public network of movement, the design is intended as a civic space. In order to determine the network in the central area, the focus is on the I-5 corridor. This allows for analysis of a piece of the city that currently limits connections east to west between the neighborhood trails and

creates poorly defined spaces for the pedestrian or cyclist. It is also centrally located and passes through several of the most dense and fastest growing neighborhoods in Seattle, allowing for analysis of a large variety of neighborhood connections.

The intention of the design is to encourage long-term of the urban trail network for the purpose evolving public utilization of the freeway infrastructure. It is beyond a designer's ability foresee the community use and adoption an isolated design beforehand. The proposal, therefore, will include different scales of intervention for potential aggregation of programming along the trail network over time.

This temporal programming is important to address as some of the neighborhoods within the district are undergoing significant change. One of these developing neighborhoods is the Eastlake

neighborhood as its population grew almost 20% from 2000 to 2010. This area will continue to densify as a lot of the single family housing is being converted to multi-family and almost the entire neighborhood is zoned for low rise development. This long, narrow neighborhood, limited by both the I-5 freeway and lake union, is already lacking east to west connections. With growth, the need for public connections will inevitably increase, making it a vital area to develop the access network across the freeway.

The investigation includes the design of a modular system for deploying program along the trail at key connection points. The scale of module application will depend on crossings, paths, and nodes. The design will provide crossing points that work with the flow of the I-5 freeway system to connect integrated public spaces on both sides. Paths will be more clearly defined for comfortable navigation of the city.

The architecture defines the nodes along the existing path where aggregation of activity can occur. The design will respond to an examination of existing public use in order to inspire growth of use and development of nodes over time. Case studies of existing urban trail systems are used to suggest a phasing projection for the growth and development of the urban trail network in Seattle where it interacts with the freeway.

The program elements and scales are determined by examining the needs of the body for healthy exertion as it navigates the city. Each function of the process are ascribed to a different program element in order to easily distribute amenities like showers and restrooms along a path of movement. These amenities respond to the immediate needs of the body to support the athlete in the city. The nodes will also respond to the larger community to inspire group engagement with health in the city.

Precedents of urban infrastructure design inform not only the design of the nodes as programmatic and scaled elements, but also as a system of elements with a shared language. The tectonics of the project were designed with the runner in mind, exploring the language of speed. They also are intended to create a series of elements with shared characteristics that visually communicate the network of urban pedestrian trails to the city.

URBAN ANALYSIS

The long and winding road

That leads to your door

Will never disappear

I've seen that road before

It always leads me here

Lead me to your door

-The Beatles

Seattle is home to a number of running destinations that serve as good meeting spaces in and around Seattle. These are areas that Seattle runners may drive for social interaction, measured distance, views or natural experience. These destinations, Greenlake Park, Seward Park, Discovery Park, the Seattle Arboretum, and Cougar and Tiger Mountains, define the wide range of fitness culture in Seattle and provide opportunities for collective, yet personalized, experiences for running. (figure 29)

As mentioned in the previous section, Seattle's culture of outdoor sporting is due in part to its proximity to the mountains. Located less than 30 minutes driving from Seattle, the trails at Cougar and Tiger Mountain offer easy access to a level of intensity and individualism that is not found on city streets. Steep climbs and rugged terrain fulfill the desire for challenge and competition, particularly within

the ultra running community. Discovery Park is almost as remote as the mountains and serves as a "gateway" trail to the trail running scene. It provides short distance running trails but could be connected to trails leading downtown and along the ship canal.

The loop at Greenlake is the most active social destination for fun runners as it has the most amenities for exercising and is closer to the urban core. There is a loop trail with mile markers for measured daily distances and multiple bathrooms. The whole loop is about 3 miles in length, making it an excellent location for 5k races. It is closely associated with two local running stores that host events, and is relatively easy to access for larger weekend races. The trail, however, is isolated from most other running routes, with weakly defined connectors to Ravenna Park to the east and to Woodland Park to the west and almost no connection to the trails to the south.

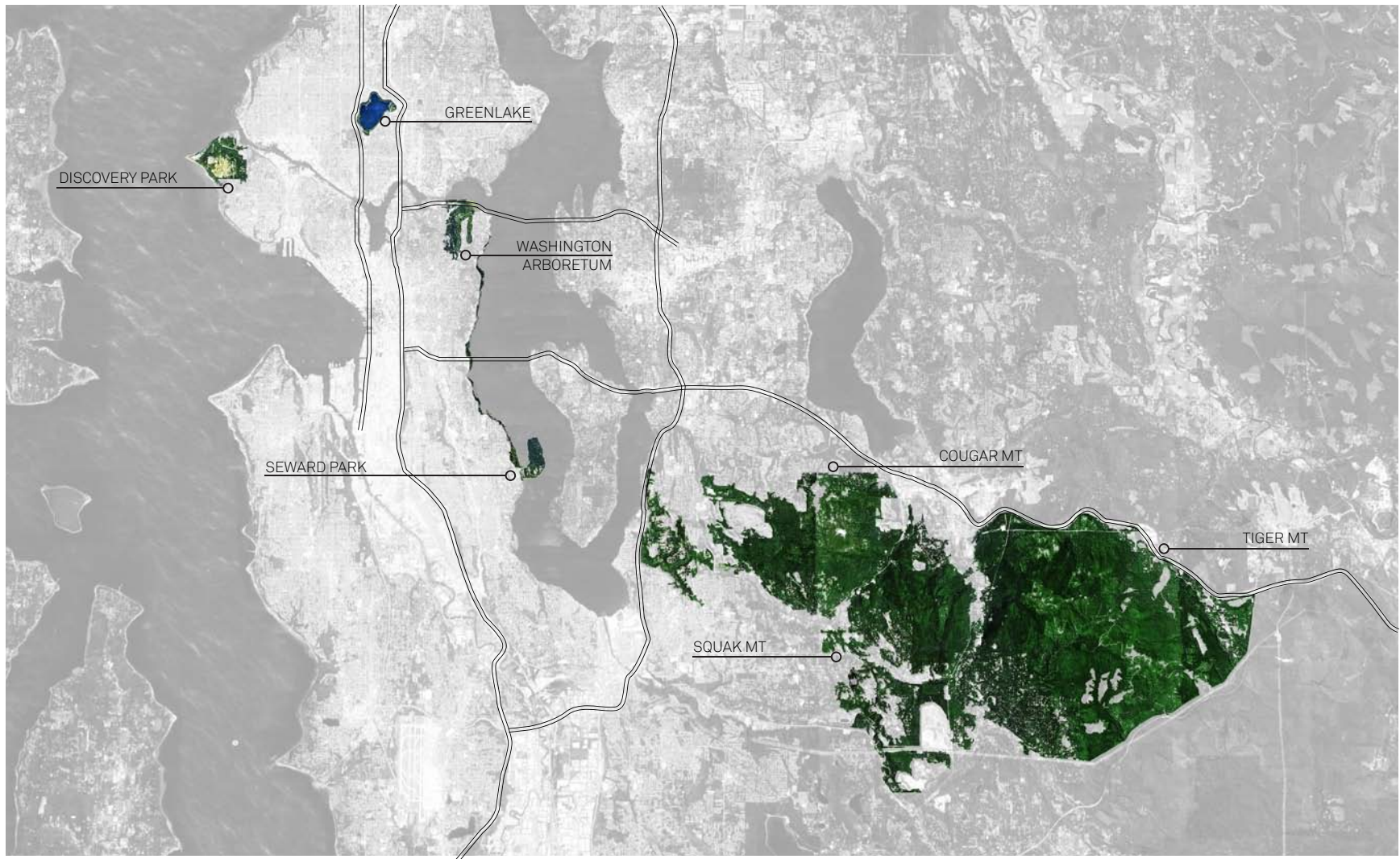


figure 29: The highlighted areas are places runners might drive to for a run. The closest of these is at least a 5 mile round trip from the downtown. A centralized running destination would provide something accessible by foot from downtown and serve as a connector between the other city destinations for longer distances.

Seward Park caters fairly evenly to both the fun and the far runners. It can be classified as a social loop that measures about 2.5 miles. A short loop on the interior of the park is easily added to allow for 5k races to be hosted here. As a peninsula, the park has spectacular views across Lake Washington and to Mount Rainier. Although many of the trails are paved, the park gives the impression of a natural environment as it is heavily wooded with old growth forest. Even though it is located in far south Seattle, this park is connected to the city trail system via the Lake Washington trail, making it a prime turn around destination for long training runs, especially as it is incorporated into both the Seattle and Rock 'n' Roll Marathon routes. It is however, the end of the trail, not a connection point.

The Arboretum is similar to Seward park in that it is also heavily wooded, creating a more natural urban running experience. Although the connection is not clearly defined, runs through the Arboretum are often linked to the Lake Washington trail as that link is a part of the Seattle Marathon. The Arboretum trails can easily link a run through the park to the waterfront and to Interlaken Boulevard but these links are not clear as the trails crisscross the park.

Although there are these great running destinations, what is lacking is a network connecting them to the urban core and to each other. Figures 30 and 31 show the connection from downtown to one of the city's most beautiful running locations, Lake Washington. Seattle's streets could better facilitate the meeting of the running communities, particularly in the densest areas of the city.

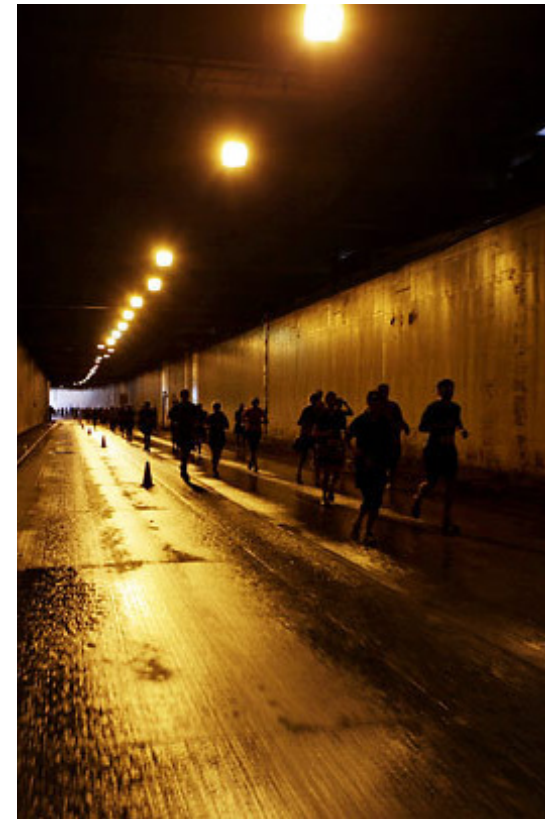


figure 30: Running on the roads I-90 Tunnel



figure 31: Seattle Marathon on I-90

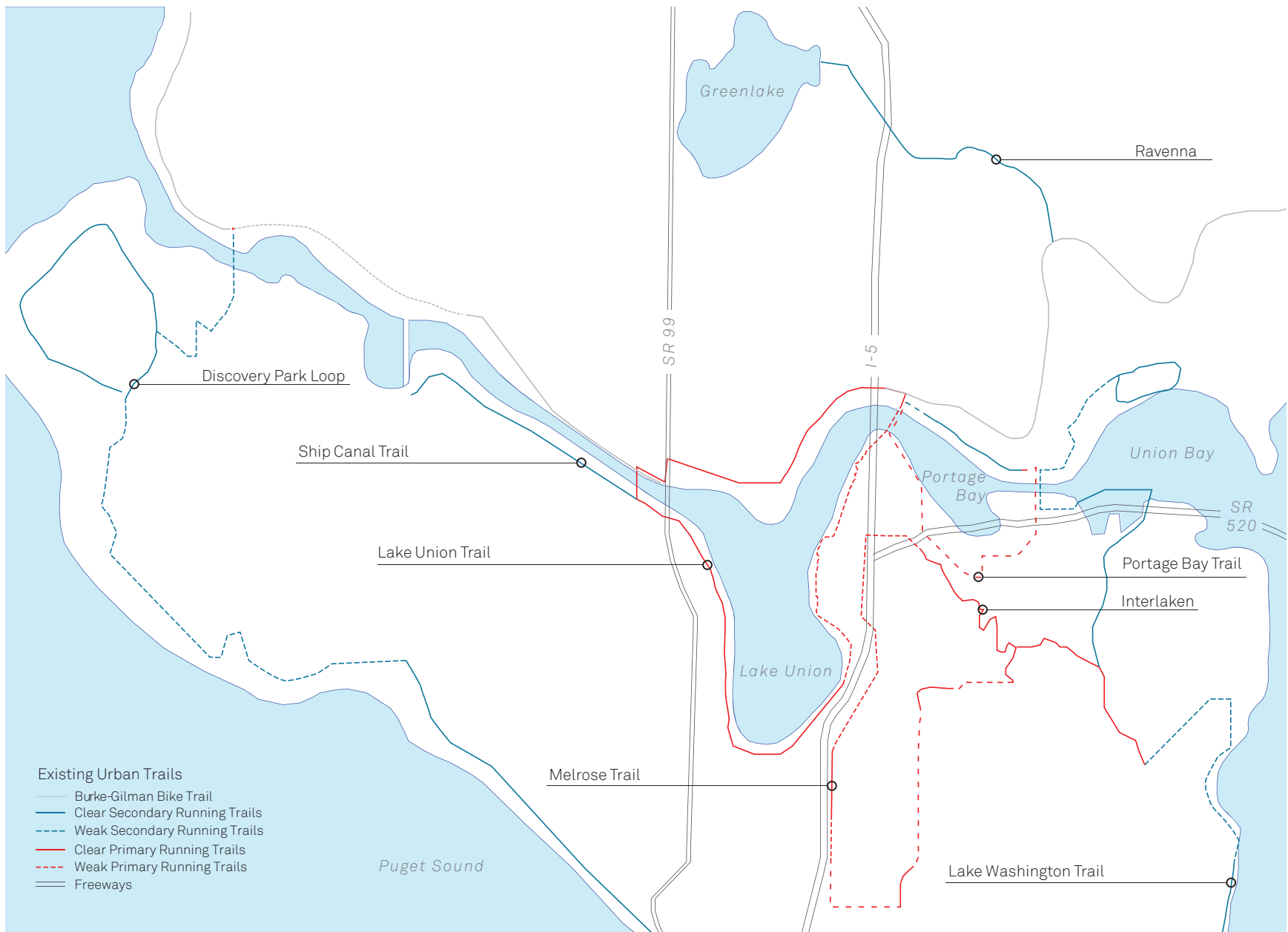


figure 32: This map shows existing central trail conditions. The weak running trails are ones that are frequently used, but poorly defined. Narrow sidewalks and difficult road crossings make these trails somewhat unpleasant to run on, especially when there is car traffic. Note that many of these weak trails run along the freeway and connect to clearly defined trails

The centrally located running trails of the city are shown in figure 32. They include the Cheshiahud Lake Union Loop Trail, the Portage Bay Loop Trail, and the Interlaken Trail to Melrose Trail connector that serves as part of the Seattle Marathon Route. Although very frequently used, the everyday, neighborhood access running trails are lacking a few of the positive qualities of the destination running routes. Established as an official trail by the city of Seattle in 2008, the Lake Union Loop is the most clearly linked marked. As it was created during the economic down turn, however, it still remains largely weak along the sections that were not already developed, particularly along Fairview Avenue in the Eastlake neighborhood. Even though it passes within blocks of the Melrose and Interlaken Trail connector route, it is isolated from it.

The connector route itself is weak as well, in part due to its lack of response to the massive scale of the freeway. The Portage Bay loop is the weakest of the trails, but it could serve as a valuable amenity connecting the University of Washington to the waterfront and connecting the Lake Union Loop to the Arboretum.

The convergence of these trails along the I-5 corridor between the Eastlake and Capitol Hill neighborhoods provides the opportunity to strengthen them as a network instead of simply individual running trails. Figure 33 shows the proposed central spine of infrastructure for the trail system. This will provide a support for a variety of urban trail trails in high density neighborhoods to allow for easier access and a more recognizable social network for outdoor activity. The varied experiences of the trails as they weave across the freeway and through the landscape have the potential to accommodate the challenge and excitement of destination running in the dense urban setting.

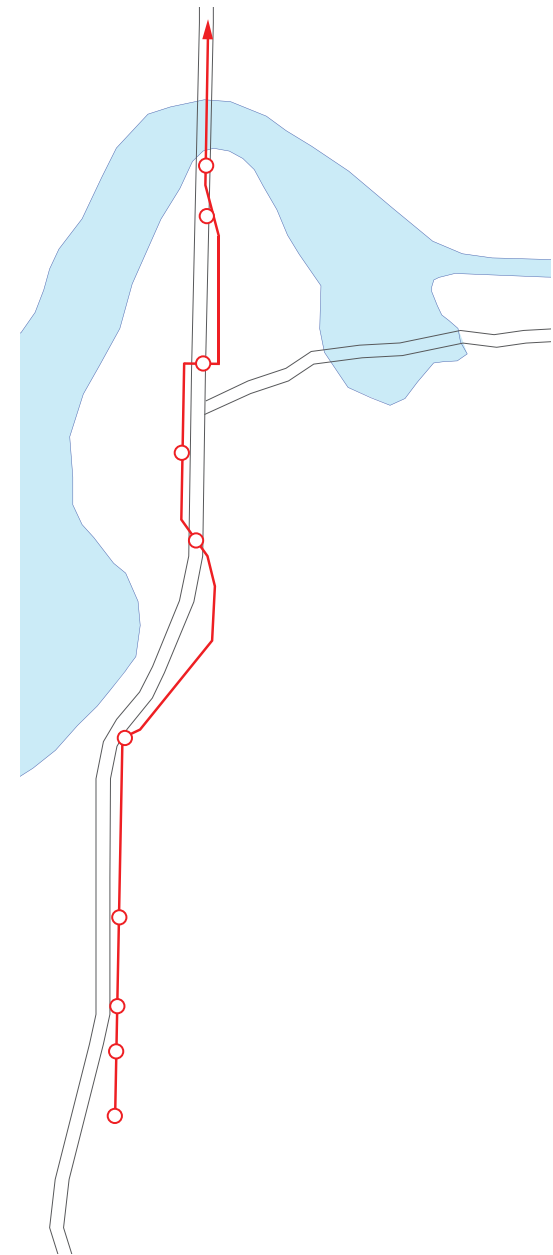


figure 33: I-5 Spine - centralizing the trail infrastructure along a central spine provides a recognizable route that will always be in use as well as providing connections for a variety of loops

FOCUS SITES

The three sites located on the map (figure XX) are investigated in the Design chapter as exemplars of different trail conditions and intervention scales. The selection of these sites is detailed in the Program + Sites chapter. They are shown on the maps on the following pages for reference.

The southernmost site is located at Melrose and the pedestrian stair to Harrison. This small module is on a retaining wall beside the freeway and serves as an overlook. The next site at Roanoke bridge is already a water stop location for the Seattle Marathon. This rest stop is a set of modules for a larger gathering space. The final site is located at intersection of Eastlake and Harvard underneath the freeway. The amount of space and connection to the ground allows for a larger intervention. The intervention serves as a transfer station connecting to bus and bike routes as well as a proposed trolley line.

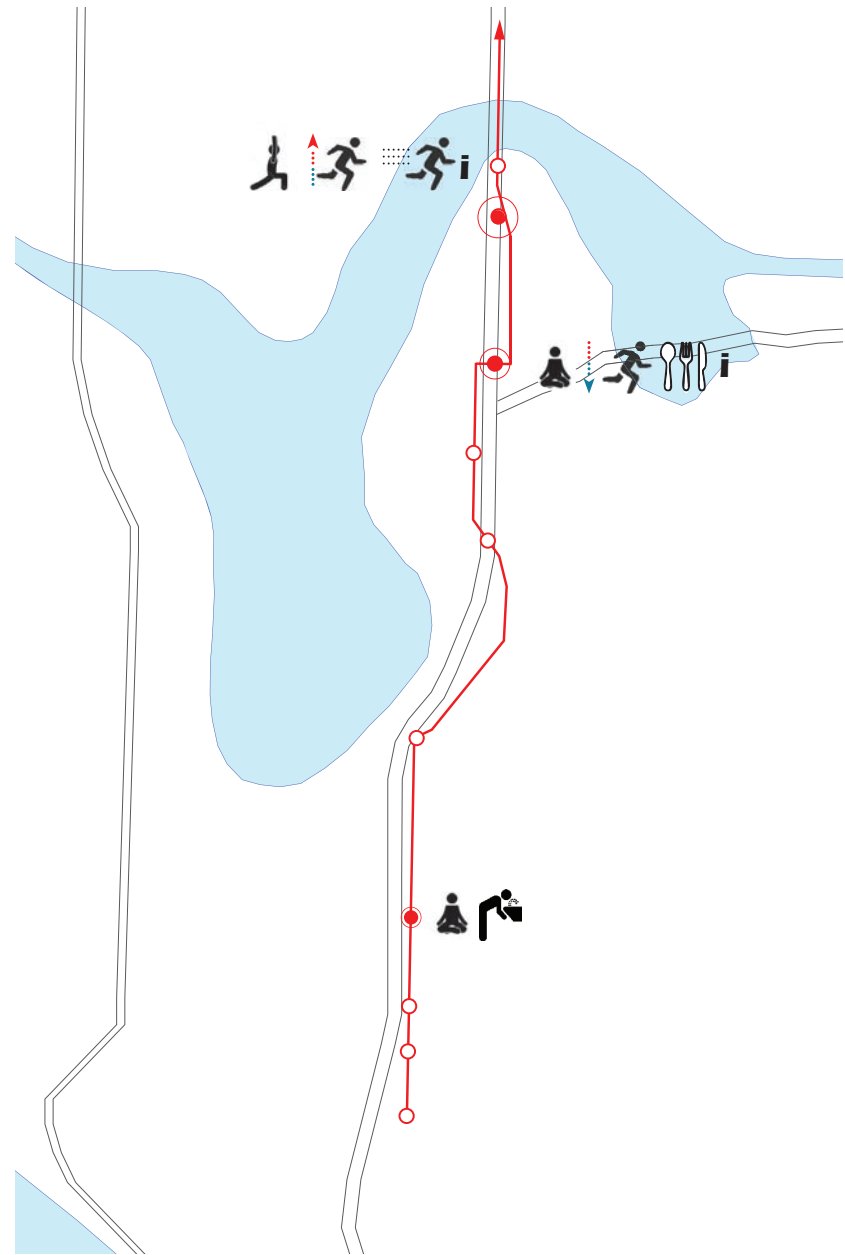


figure 34: Focus sites - the three sites highlighted above are explored in more detail for this thesis. Each site has a different physical relationship to the freeway and each is appropriate for a different scale of intervention.

URBAN TRAILS

The maps in figures 35 - 41 show a variety of proposed urban loops base on existing running trends that utilize portions of the proposed infrastructure spine trail. Figure 35 shows where the existing Seattle Marathon route crosses the central trail. This portion of the trail is already heavily used by training groups during the season preceding the marathon. Although races are typically run on the roads to accommodate the much higher load of runners, unique experiences are important for attracting running tourism for these large events. This portion of the trail is also near the end of the race, so runners are more spread out and could potentially utilize the trail infrastructure. The Roanoke intervention is designed to allow space for the water station to be set up.

The maps on the following pages show loops varying in distance and difficulty from short and flat to long and hilly. These routes directly connect at least ten neighborhoods to the central spine.

All sites were analyzed in terms of transit and bike connections as well. Figures 42 and 43 show those connections along the central spine.

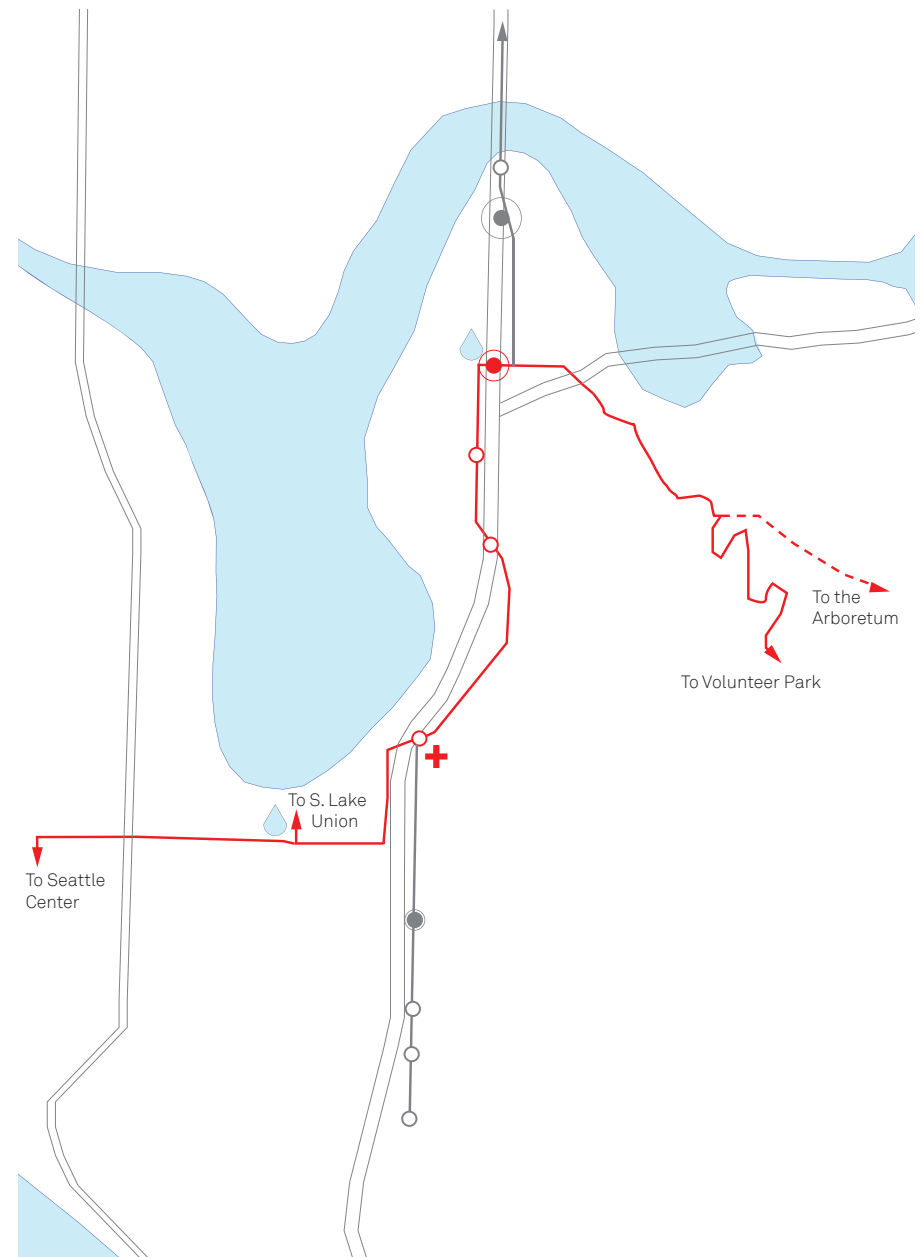


figure 35: The Seattle Marathon route crosses the freeway, utilizing a large portion of the proposed trail spine. One of the interventions supports an existing water stop on the race route.

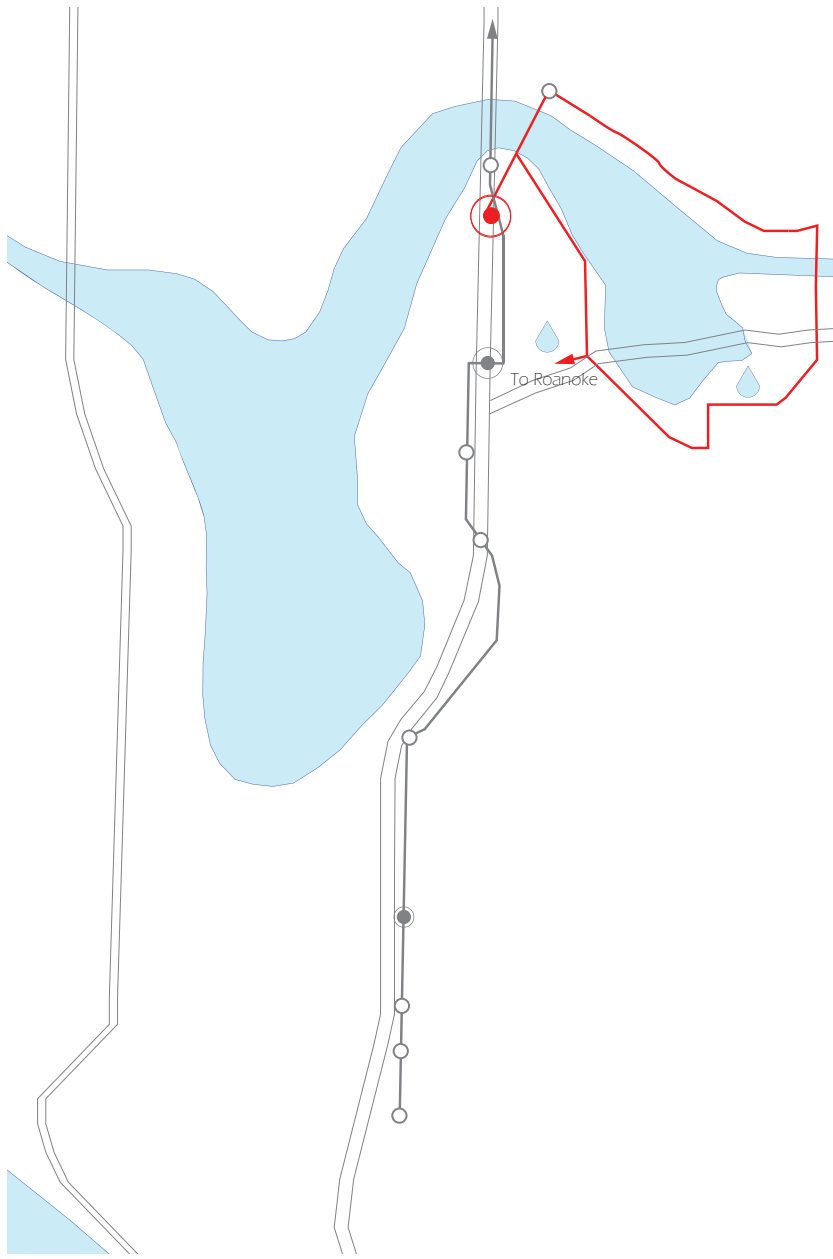


figure 36: The Portage Bay Loop is a short, flat 5k route could start and end at the north station

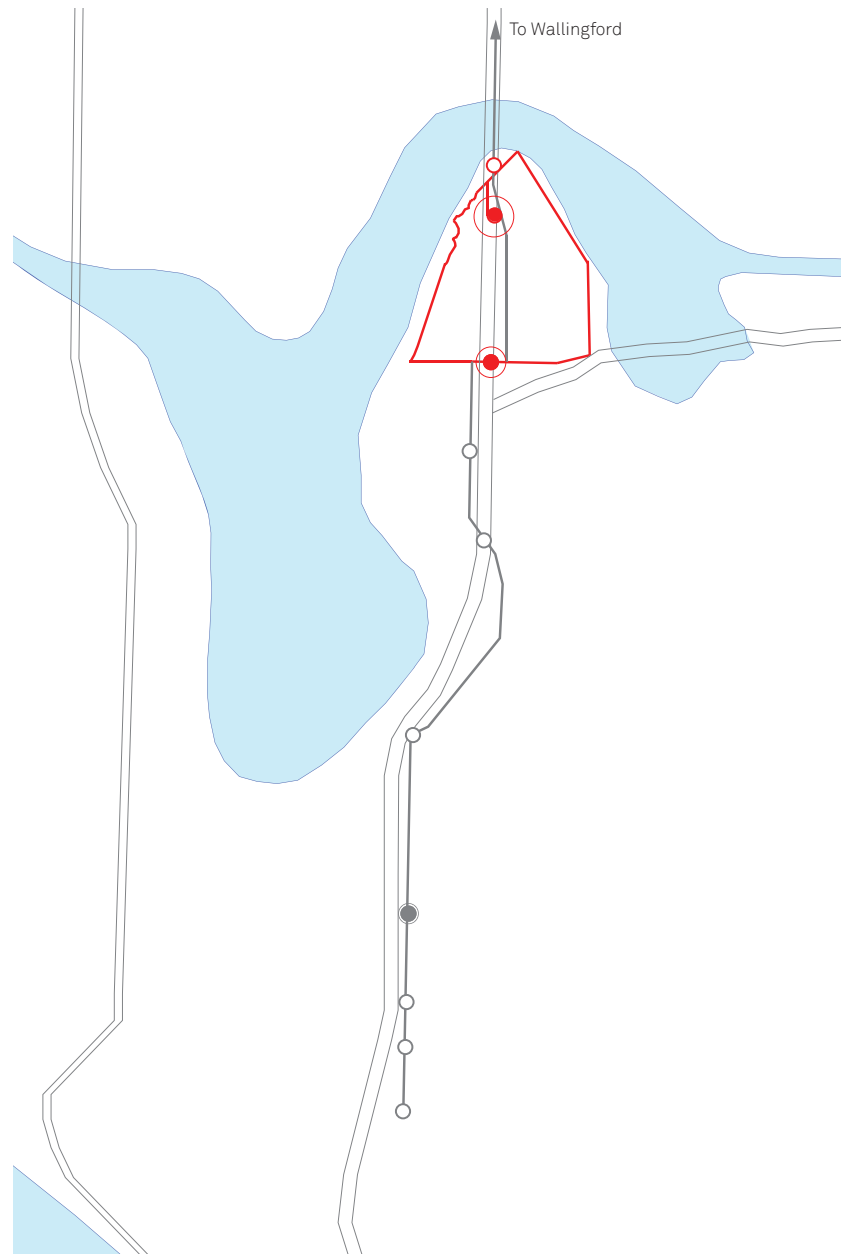


figure 37: The Inner Loop, a short, hilly route would be good for training groups meeting at the north station

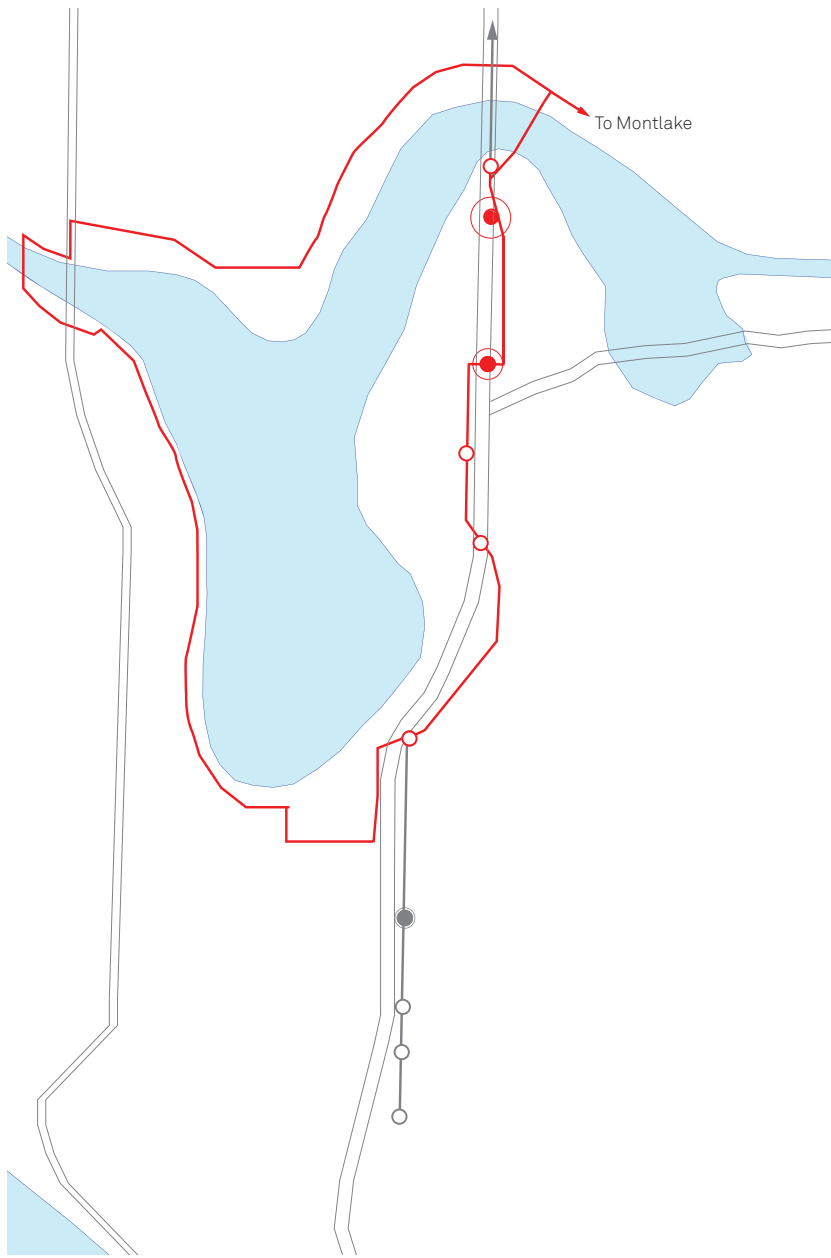


figure 38: Lake Union or Cheshiahud Loop is an existing, longer flat loop with some signage. Much of it, however, is weakly defined. Rerouting the eastern side of the loop to connect with the spine would strengthen the entire loop.

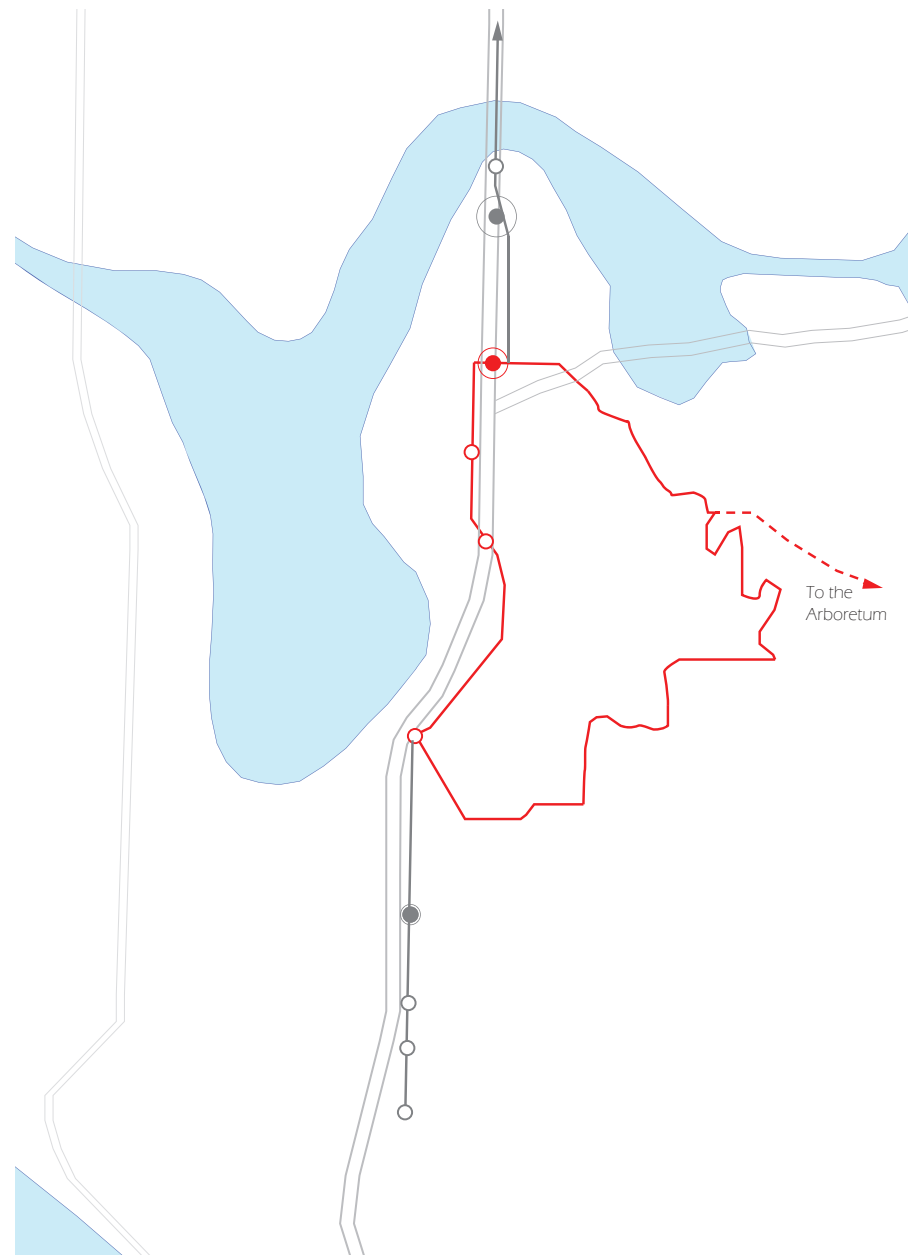


figure 39: The Arboretum is one of the most trail like roads in the city center. Linking this trail to Volunteer Park and the central spine creates a longer, hilly route.



figure 40: The Lunch Loop is a quick run that could be done during a lunch break downtown. Shower facilities located on the spine make for a clean walk back to work down the hill.

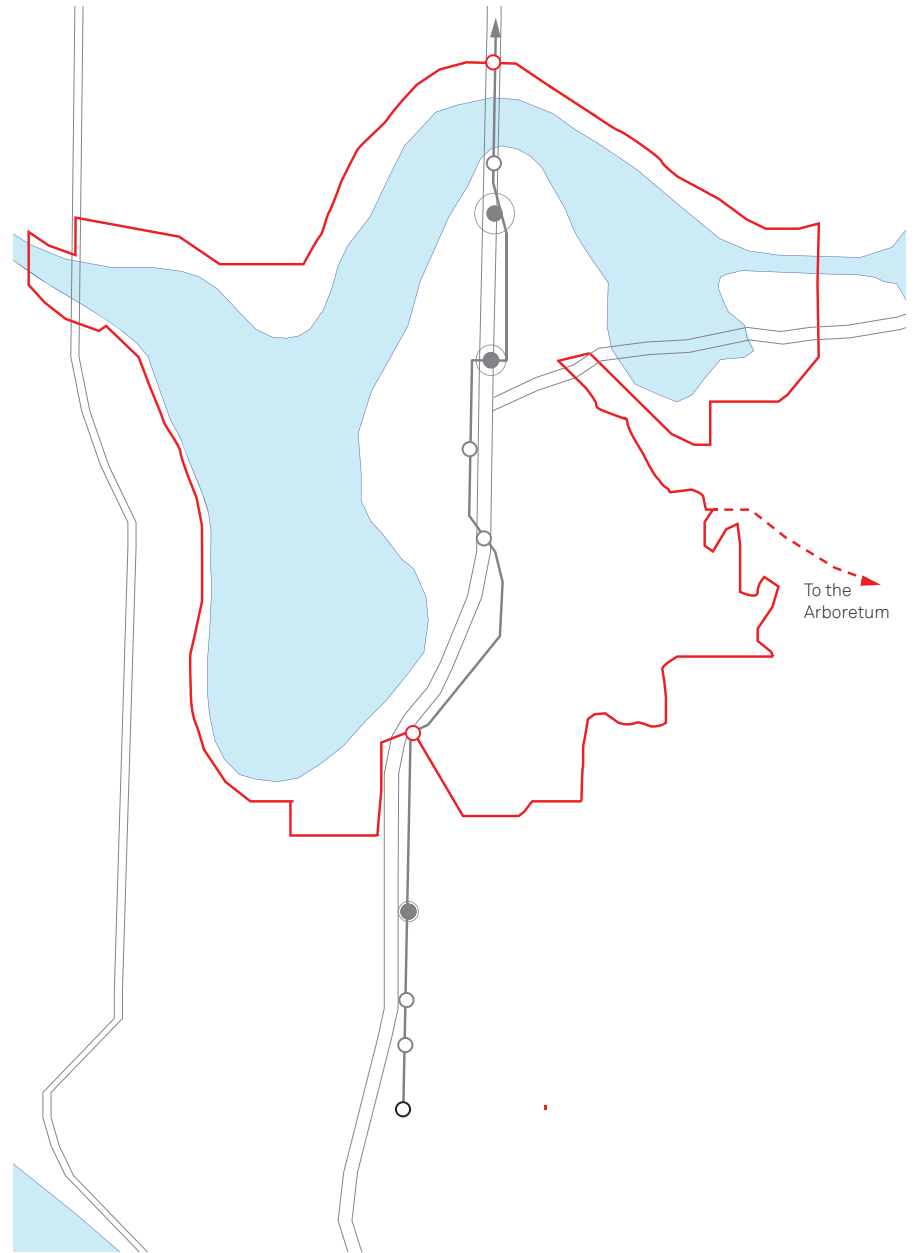


figure 41: Even a longer loop like this 10 mile one can make use of the infrastructure of the spine. Water stops at these key crossing points make the route much more amenable to training.

figure 42: This map shows bike connections. The entire spine is also a part of the bicycle master plan and the blue lines show routes that come from it. The blue circles show major bike transfers.

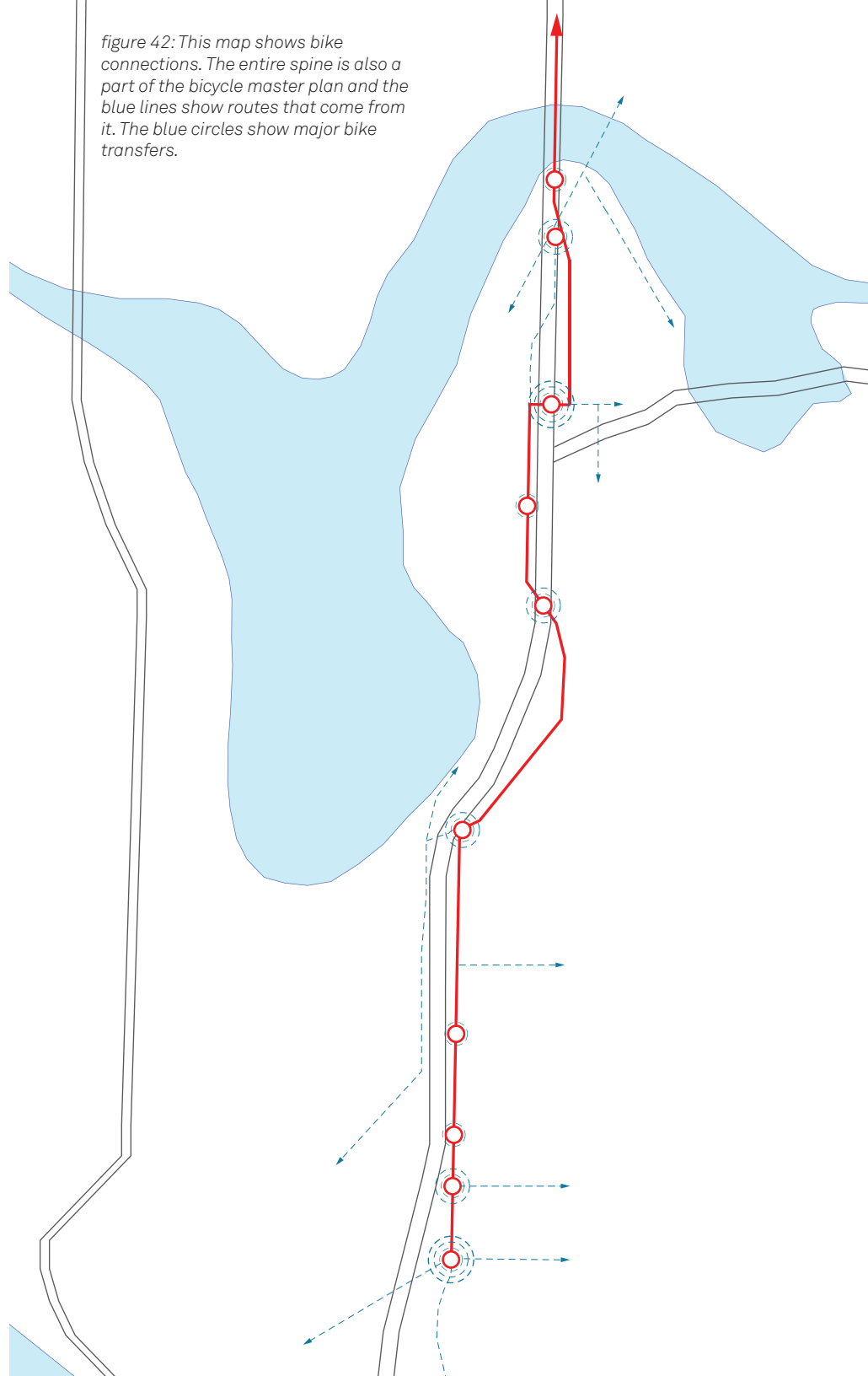
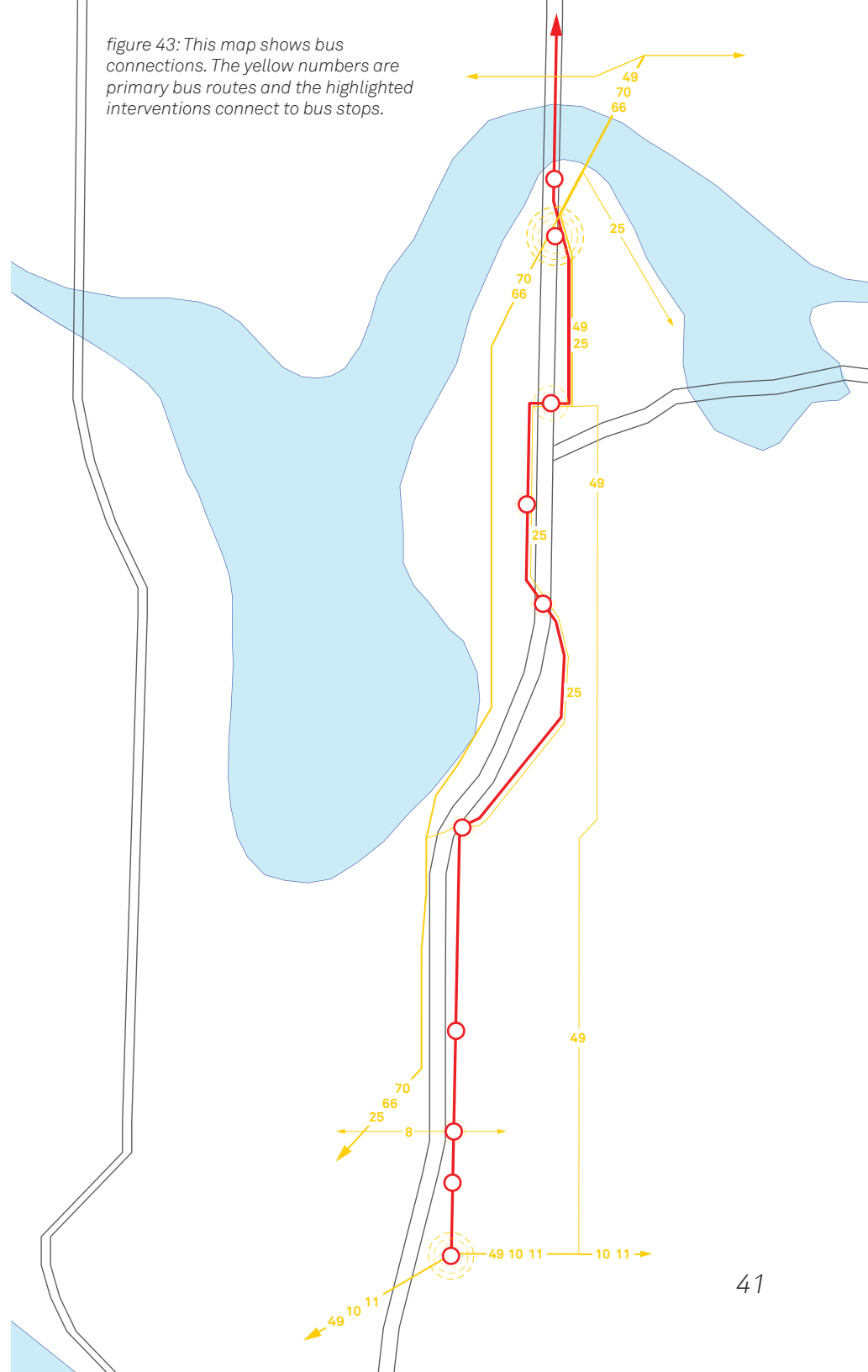


figure 43: This map shows bus connections. The yellow numbers are primary bus routes and the highlighted interventions connect to bus stops.



NEIGHBORHOOD FOCUS

The Eastlake neighborhood is located at the junction of two major interstates and the connection between Lake Union and Portage Bay. It is also a neighborhood link between the University District and Downtown Seattle. It is also the neighborhood with the most growth potential along the proposed spine. This neighborhood is located at the convergence of people, transit, and water giving it a unique mix of building types, land use, and identity. Characterized by a large number of houseboats and high levels of land use mix, The core of Eastlake fits in a quarter mile radius from intersection of East Lynn Street and Eastlake Avenue. Natural boundaries are provided to the north and west by Lake Union and to the east and south by the turns of the I-5 corridor. It is the neighborhood that would most benefit from the proposed trail spine.

HISTORY

Eastlake has a history as a transit oriented neighborhood as it developed as a streetcar suburb to downtown Seattle. In 1908, two streetcars ran through the neighborhood, one, northeast on Eastlake and the other, north-northwest on 10th Ave and Harvard. There was concentration of development in the south end of the neighborhood near the transit lines. Even though very little was constructed along

the waterfront at this time, the extension of lot lines onto Lake Union set the ground for future waterfront development. Maps from the 1920's call out the Campfire Girl's houseboat and show a few other waterfront structures. Former Red Avenue running along the water expanded into Fairview Avenue North, reflecting the growing waterfront development.

By the 1960's the waterfront was completely lined with houseboats and marinas. At this time, there was a drastic change in the urban fabric of Eastlake. A full block width along the west side of the neighborhood was removed in preparation for the I-5 corridor, cutting off the Eastlake area from Capitol Hill. Land was also cleared to the west of I-5 to build an interchange with state route 520.

LAND USE

Eastlake contains a variety of land use and property values at varying densities. Beyond the natural boundaries of Lake Union and I-5, the heavy sloping topography of the neighborhood further segregates this neighborhood from the rest of the city. The slope also makes traversing the neighborhood difficult as the landscape at top of the slope varies dramatically from that at the bottom there is not a natural flow to the waterfront.

The building typologies in this area are quite varied. Although it began as a traditional residential area, seclusion of the neighborhood between I-5 and the waterfront lead to many shifts in land uses over time. The heavy transit activity along Eastlake Ave has created a central commercial core that relies upon the bus lines and includes bars, restaurants, cafes, but no grocery store. The noise and physical presence of I-5 has forced the west edge to cater to lower income residents and creating a diversity of incomes in the area.

Many of the larger and older single family houses have been converted into multiple units, especially along the I-5 corridor. Several older, large multi-family apartment buildings and office buildings are scattered throughout the area. New development fills in the cracks, primarily with row house style multifamily housing. The central neighborhood commercial corridor includes quite a bit of mixed use development and higher densities. The potential for densifying the entire neighborhood is great as many of the areas zoned for larger multifamily construction are still just multi-unit, formerly single family homes.

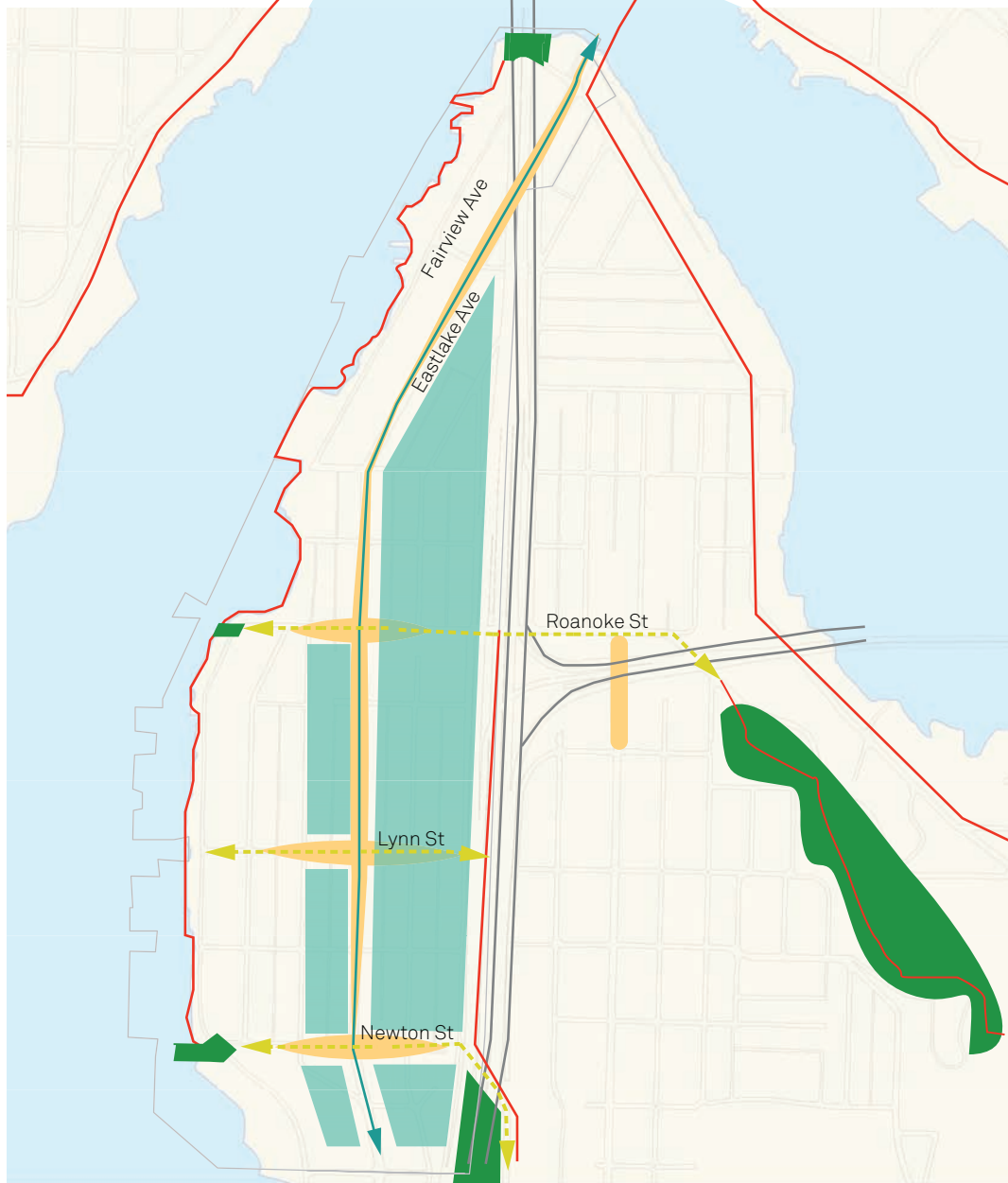
There are a number of small pocket parks along Eastlake's shoreline to ensure boating access. The one larger park at the center of the neighborhood, removed from the urban trails, is the only park with any facilities. Fairview, the current route for the Lake Union Trail,

runs along the waterfront and is frequently used, but very weakly defined, serving as an al. Almost any time of day, runners can be seen on that road. It is also a designated bike route, but as the condition of the road is poor, Eastlake Avenue is more frequently used. Eastlake Avenue serves as a major bus and bike arterial. Commercial destinations have developed along that road as a result.

These good transit connections in the neighborhood are really just passing through, leaving the neighborhood lacking in community. This is due in part to the long, narrow form of the area. Eastlake Avenue serves as a major bus and bike arterial. As small commercial core has developed along that road as a result, but it could be supported by more community development along it.

NEIGHBORHOOD POTENTIALS

Although Eastlake's isolation has allowed it to provide for an interesting assortment of building types including house boats and the like, it has no real identity or sense of overall neighborhood community. The neighborhood needs connections between the existing nodes within the neighborhood and Capitol Hill. This can be achieved by providing stronger east to west connections along Newton, Lynn, and Roanoke streets. The intervention located at Newton Street could serve as a spur connection at the I-5 Colonnade



Neighborhood Analysis

-  Streetcar Connection
-  East-West Connection
-  Existing Trail
-  Existing Park
-  Commercial
-  Multi-Family

figure 44: Easlake is zoned mostly multi-family, but a lot of the existing building stock is still single family. There is a lot of potential for growth in the coming years. The parks are small and there will be a need for outdoor public space.

Park linking it to the Terry Pettus Waterfront Lookout Park. A new east to west connection on Lynn Street starting from the intervention at I-5 that breaks up the long length of wall would strengthen the core of the neighborhood. A stronger Roanoke connection provided by the bridge intervention could strengthen old running routes and create new ones by linking the Interlaken trails via Delmar to the Lake Union Trail and the Roanoke Street Mini Park.

Although there is already a popular trail around Lake Union, the portion through Eastlake is somewhat unpleasant as it runs along the alley-like Fairview Avenue. This could be linked to the larger trail system by connecting the loop to the central spine. The mixed use and commercial development along Eastlake Avenue needs to be supported by more than the bus lines that run along that street. This means letting the commercial street seep into the neighborhood from Eastlake to the edges, especially along the strong east to west corridors in order to bleed across I-5 and connect to the trail spine. The potential density of the area could also support a the trail system, keeping it very active even after dark. Most of the area could greatly increase in density as many of the buildings in the multi-family zones are old housing stock.

To strengthen the overall sense of community in Eastlake, there must be an increase in identity for the area. There are a few public

art pieces on Eastlake, but nothing very distinctive to give the neighborhood a sense of public pride. A notable entry point created by the station at the north end of the district will call attention to the South Passage Point Park and the beginning of the spine trail. Entry points along the east side and at the south end will help build identity and coherence for the neighborhood.

PROGRAM

Some trails are happy ones,

Others are blue.

It's the way you ride the trail that counts,

Here's a happy one for you.

-Dale Evans

Sites for the aggregation of the trail programming are assessed for variety of spatial experience, variety of interaction with the freeway and the city, views and light, connections to existing trails, connections to transit and density, and connections to existing businesses and amenities. This will determine potentials of each site through a matrix of characteristics. It will also determine the scale of intervention that is appropriate for each location. All of these sites will be placed along a navigable path with regular, recognizable markers.

The program is also designed with the technical layout of a race course in mind with measured distances and check points. By connecting and strengthening existing trails, different distance opportunities will be available from starting points. Maps and signage will inform the runner of potential connection loops to provide distances from 3 miles to 20 miles. There will also be varied

figure 45: The program is designed around the needs of the body as it travels through the city on a run.

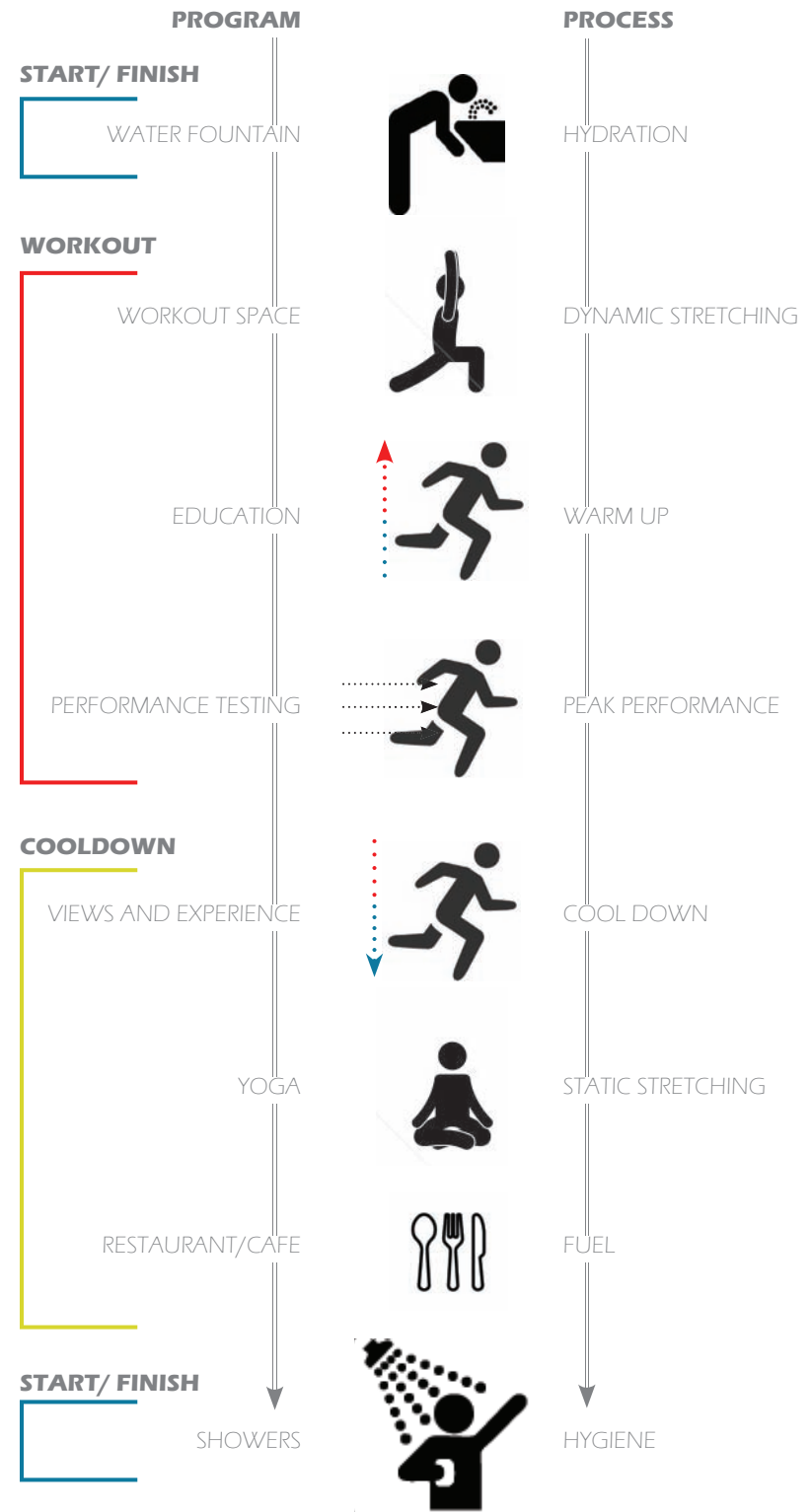




figure 46: The program is distributed along the trail in the above scales of intervention as appropriate to each site. This distribution is determined by connections to amenities at the site as well as distances between amenities along the trail.

degrees of difficulty indicated with elevation gain and pedestrian staircases noted. By creating a unified route, the trail system will attempt to capture the energy and momentum of a race course, provide spaces for large gatherings, identifiable shared challenges, and opportunities to appreciate the views and experience of the run.

The program will also respond to bodily needs of the moving runner in the process of exercise. Each node along the path serves as a transition point for entry and exit to serve the different neighborhoods the system travels through. Each of these small interventions will serve as a beacon for the trail, provide basic amenities for hydration and hygiene, and include a public lavatory. Medium sized cool down areas will accommodate some outdoor exercise infrastructural space and potentially have small vending areas for nutritional fueling. These will serve as meeting spaces and small group workout areas providing a place of reflection and refuge along the trail.

The large intervention will serve the whole community in terms of healthy lifestyle education and training for development of exercise performance. This facility will provide training and testing for all levels of fitness in order to promote health in the city for both elite athletes and those just beginning a exercise. The large community facility will have a variety of activity and meeting spaces for flexible

use somewhat like the Mountaineers Seattle Program Center in the Sandpoint neighborhood.

PRECEDENTS

The following projects detailed in figures 47-49 are examples of different scales of fitness programming. Rouge Running is a running retail and training group head quarters. Their newest facilities incorporate exercise rooms for gym partners, a smoothie bar, and several sports medicine professionals. The Carlsberg park in Copenhagen is an example of a series of mid-sized recreation spaces complimented by small interior programs including dance studios and cafes. The Trail Restroom in Austin, Texas by Miró Rivera is an outstanding example of an urban trail rest stop that maximizes design and space. The 70 square foot facility includes an outdoor shower and water fountain and enclosed, handicapped accessible restroom with commode, urinal, sink and bench that is naturally ventilated and daylit.

SMALL SCALE: START+FINISH STATIONS

The program for these spaces will be simple, serving the city travelers' basic needs of hydration and hygiene. The structures will range from 50 to 600 square feet depending on the amount of

bathroom stalls and indoor versus outdoor shower stations. It will be important for these stations to be visible beacons for the trail that signal entry and connection to the trail system. Ideally these will be close to residential neighborhood entry points for everyday access and will need lighting and safety amenities. The program goals for the site to be developed as a pilot project includes:

- Handicapped accessible restroom with commode, urinal, sink and bench ~50 ft²
- Drinking fountain ~5 ft²
- Outdoor shower ~15 ft²
- Passive daylighting and ventilation

MEDIUM SCALE: COOL DOWN STATIONS

The program for these spaces will accommodate an area for cool down, stretching and refueling. These spaces will range from 500 to 5000 square feet depending on the group size it is intended to accommodate and whether it includes a restaurant or just nutrition vending. These structures will serve as points of refuge and refreshment along the trail system. It will be important for them to include maps and signage detailing the different route options and provide locations of light and safety. Ideally, these spots will have access to public transit for those meeting groups or departing

from the cool down stations. The program goals for the site that is developed as a pilot project includes:

- Padded stretching area for group yoga, tai chi, etc. ~1000 ft²
- Informal fitness space ~1500 ft²
- View Platform ~500 ft²
- Small food kiosk, seating + nutrition vending ~500 ft²
- Drinking fountain ~5 ft²

EXTRA LARGE SCALE: EDUCATION AND TESTING FACILITY

Total square footage with outdoor covered area~17,000

Additional outdoor spaces ~7500

3 levels site approx. size 14,000 ft²

The program of this facility will provide a more fixed and permanent location for gathering on the trail. The program will aid in healthy life style development, and help athletes of all skill levels reach peak performance. It will perform as both an interior facility for education, training, and testing, and an outdoor amenity for the urban trail system. This space will be approximately 70,000 square feet of indoor program and another 20,000 of outdoor programming. It will be vital for the building to have access to public transit and

easily serve multiple neighborhoods. The design will provide a center that enhances the connections between different neighborhood trail systems and serves as a beacon for healthy living that is highly visible from the freeway and the trails. The indoor program includes the following components and support space:

EXERCISE FACILITIES

- Check-in and Administration ~700 ft²
 - Front desk + waiting area ~150 ft²
 - Facility director ~150 ft²
- Offices for fitness program scheduling, marketing, event coordination ~250 ft²
- Instructor prep space ~150 ft²
- Storage ~ 2000 ft²

FITNESS EDUCATION

- Offices ~1200 ft²
Personal Trainers, Fitness Director, Exercise Physiologist, Health Education Instructors
- Training Groups ~1700 ft²
Classrooms ~1250 ft²
Training office and assessment ~450 ft²
- Presentation Hall ~2600 ft²
- Showers + Locker rooms ~2500 ft²

SUPPORT SPACE

- Mechanical ~1400 ft²
- Public Bathrooms ~250 ft²
- Storage and Circulation ~2450 ft²

The outdoor space serves both the public and the users of the facility and includes:

OUTDOOR GARDENS

- Medicinal and Herb Garden ~500 ft²
- Edible Garden ~1500 ft²
- Greenhouse + Tool storage ~500 ft²
- Module Green Space ~2000 ft²
- Bicycle parking and storage ~500 ft²
- Outdoor Exercise and Play ~2500 ft²



figure 47: Training group outside Rouge Running



ROUGE RUNNING
Austin, Texas
Large - 7500 sqft
Footprint - 50 ft x 150 ft

Program includes:

- Retail
- Large gathering
- Wellness Center
- Sun Deck
- Smoothie Bar
- Workout rooms
- Exercise classrooms

STATION PRECEDENT



figure 48: Trail restroom on Lady Bird Lake In Austin, Texas



TRAIL RESTROOM

Austin, Texas

Architects: Miró Rivera

Small - 70 sqft

Program includes:

- Handicapped accessible restroom with commode, urinal, sink and bench
- Drinking fountain
- Outdoor shower
- Passive daylighting and ventilation

KIOSK PRECEDENT



figure 48: Outdoor recreation area in Copenhagen



CALRSBURG
Copenhagen, DK
Architects: Unknown
Medium - approx 5000 sqft
combined

Program includes:

- Outdoor informal fitness/play elements
- Indoor cafe with outdoor seating
- Adjoining indoor dance studios
- Indoor football court for the homeless

COOLDOWN PRECEDENT

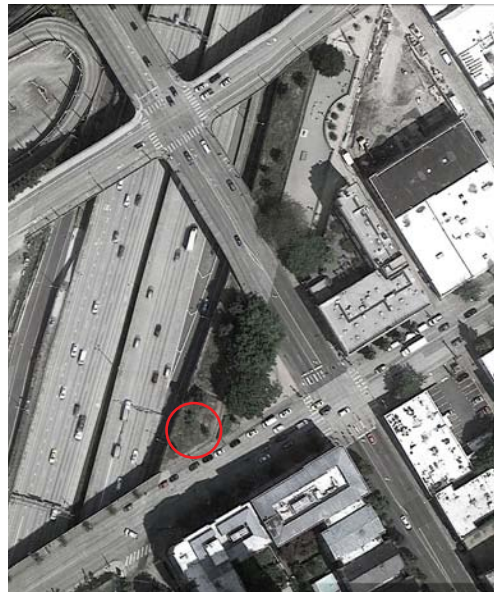
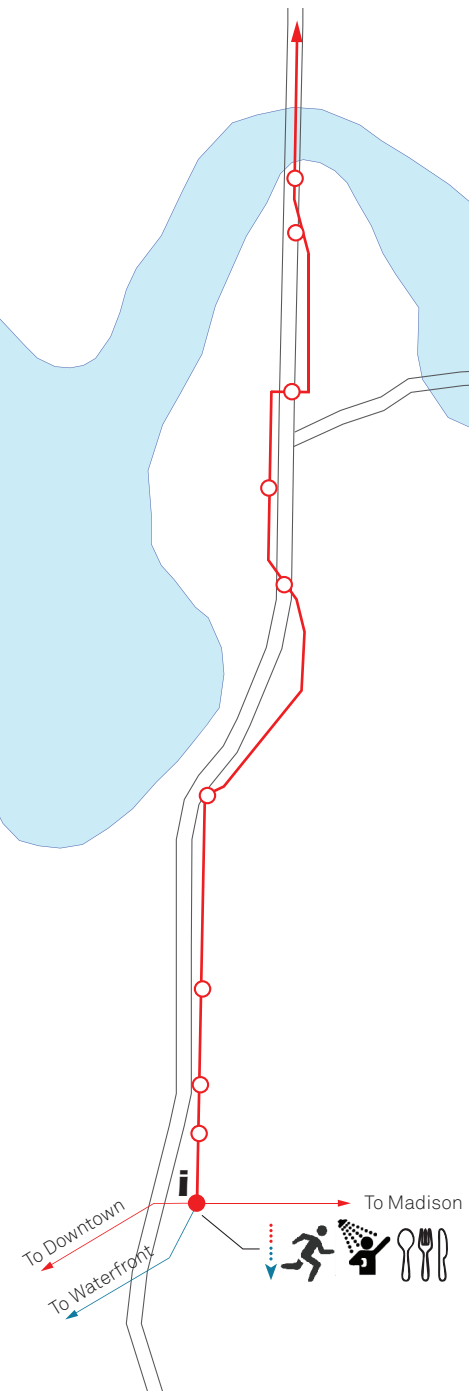


figure 49: maps and image of the first site on the spine trail starting from the south end

The focused freeway analysis will cover the sites for program distribution along the continuous path beginning at Seattle's Freeway Park and ending at the small lookout park at Portage Bay the north end of the Eastlake neighborhood as it converges on the potential connections of several centrally located running trails.

STATION

Downtown Hub

- Weak Trail Connection
- Visibility
- Access to transit
- Serves Downtown, Capitol Hill, and First Hill
- Urban Experience
- City View
- Large Space
- Unsheltered

This site has open views of the freeway and city and is the most urban stretch connecting Downtown, Capitol Hill and First Hill. There are large swaths of land bordering the freeway and several of the roads span it in this area. This is a strong link to pedestrian and bus networks, but currently provides little opportunity for refuge and nature. A site in this location links the existing Freeway Park to the urban trail system, opening up that secluded area to larger network and extending pedestrian access south.

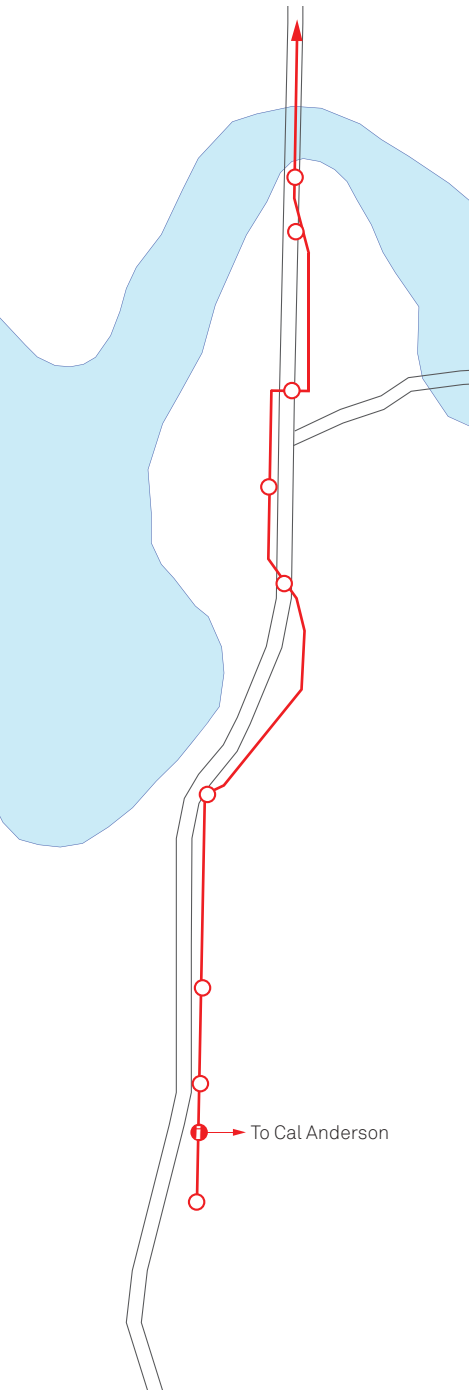


figure 50: maps and image of the second site on the spine trail starting from the south end

SIGN

Pike-Pine Connector

- Very limited space
- Excellent landscape and city view
- Downtown Capitol Hill
- Access to transit
- Urban Experience
- Somewhat sheltered space

This site is similar to the previous one, but has a stronger connection to the commercial areas of Capitol Hill it is important to have lots of signage in this area as this is part of the trail with the most crossings and potential transfer points.

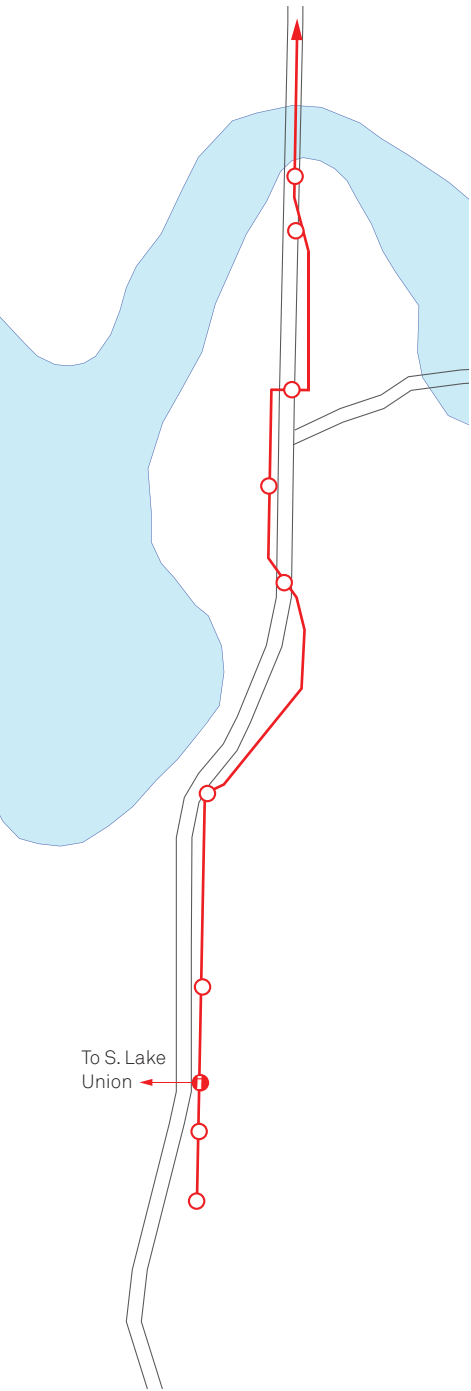


figure 51: maps and image of the third site on the spine trail starting from the south end

SIGN

South Lake Union to Capitol Hill

- Very limited space
- Beginning of defined urban trail
- Capitol Hill + South Lake Union
- High Density
- Urban Experience
- Somewhat sheltered space

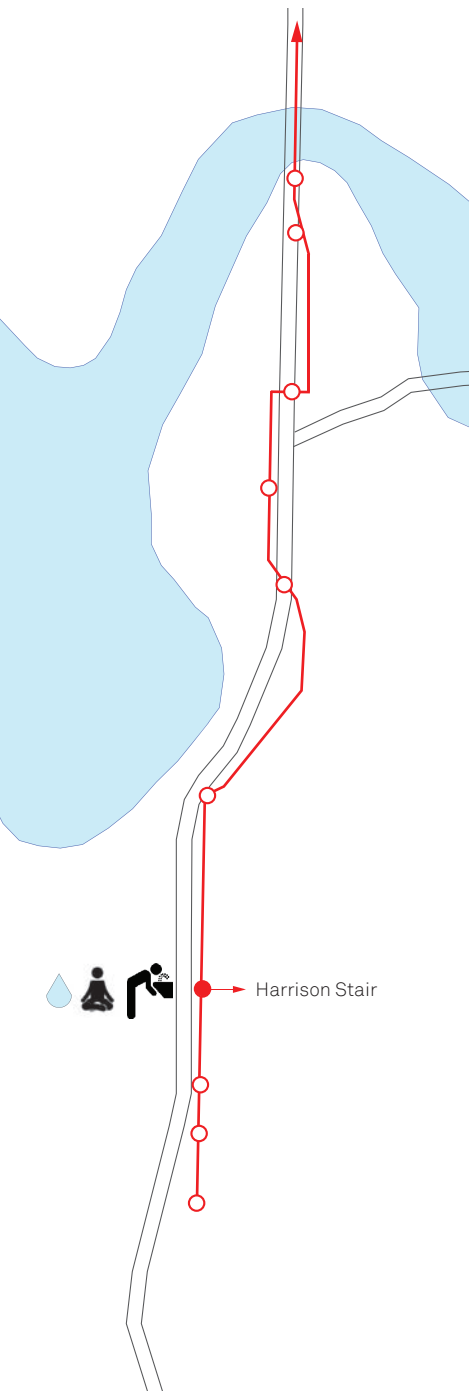


figure 52: maps and image of the fourth site on the spine trail starting from the south end. This is also the first focus site explored in more detail in the design chapter

KIOSK

I-5 Alley

- Very limited space
- Beginning of defined urban trail
- Excellent landscape and city view
- Capitol Hill
- No access to transit
- Urban Experience
- Somewhat sheltered space
-

This location is the site first of the interventions explored in more detail. This section of the trail is elevated above the freeway, reducing noise while maintaining the relationship of directional movement flow. There are excellent views of the city that emphasize the natural landscape of rolling hills, water, and mountains. This is currently the most defined portion of the urban running trail in this area with a few signs and some portions off of the roads. It provides little space for intervention, however, as development closely borders the path to the east and the topography slopes dramatically to the east and west.



REST STOP

Loop Connector

- Some space
- Exit of defined urban trail
- Excellent landscape and city view
- Capitol Hill, Eastlake, South Lake Union
- Limited access to transit
- Urban Experience

This location has an excellent view across Lake Union. There is opportunity for increased signage and for east to west connection at this Lakeview Boulevard to Belmont Avenue crossing. This site also serves as a first aid station for the Seattle Marathon Route.



figure 53: maps and image of the fifth site on the spine trail starting from the south end.

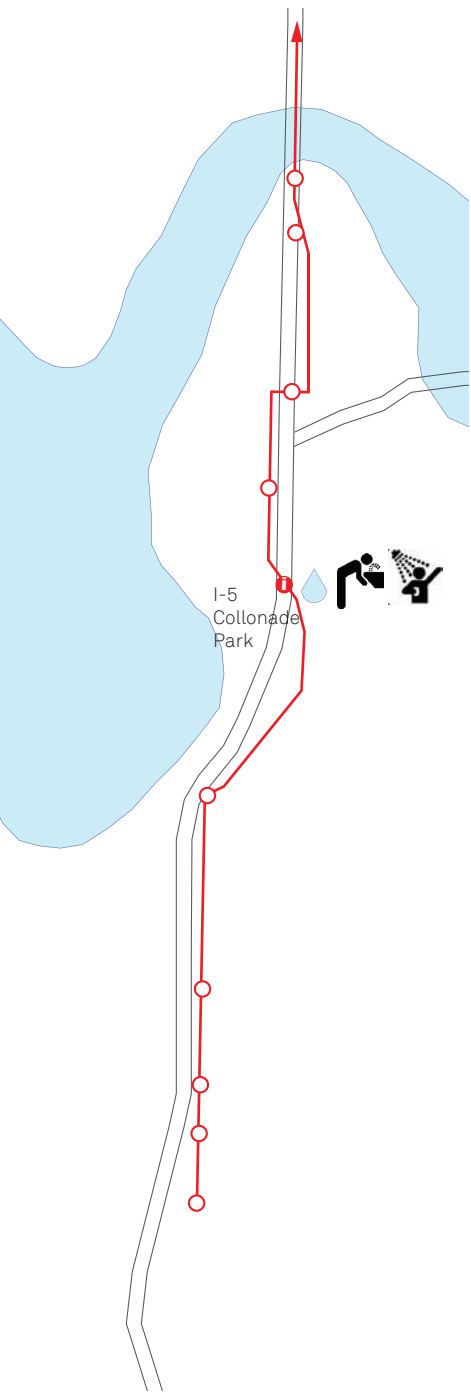


figure 54: maps and image of the sixth site on the spine trail starting from the south end. This is also the site of the existing I-5 Colonnade Park

KIOSK

I-5 Colonnade Park

- Lots of Space
- Unique landscape experience
- Capitol Hill, Eastlake
- No access to transit
- Urban Park
- Sheltered space

This portion of the trail are heavily dominated by the presence of I-5. The approach is sheltered as the trail pulls off into the neighborhood for a half a mile before coming to the I-5 Colonnade Mountain Bike Park and crossing beneath the lanes of the freeway. The massive scale of the infrastructure becomes apparent here as the path weaves through the columns supporting the freeway and cars above. An intervention here could capitalize on the scale of the space and better link the isolated, primarily single use bike park to the surrounding neighborhoods.

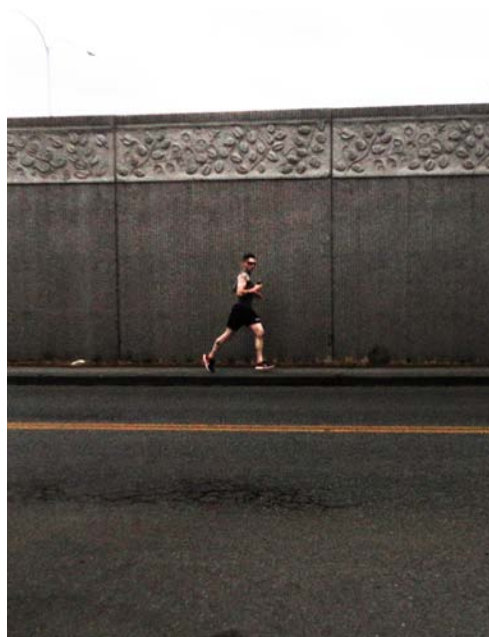
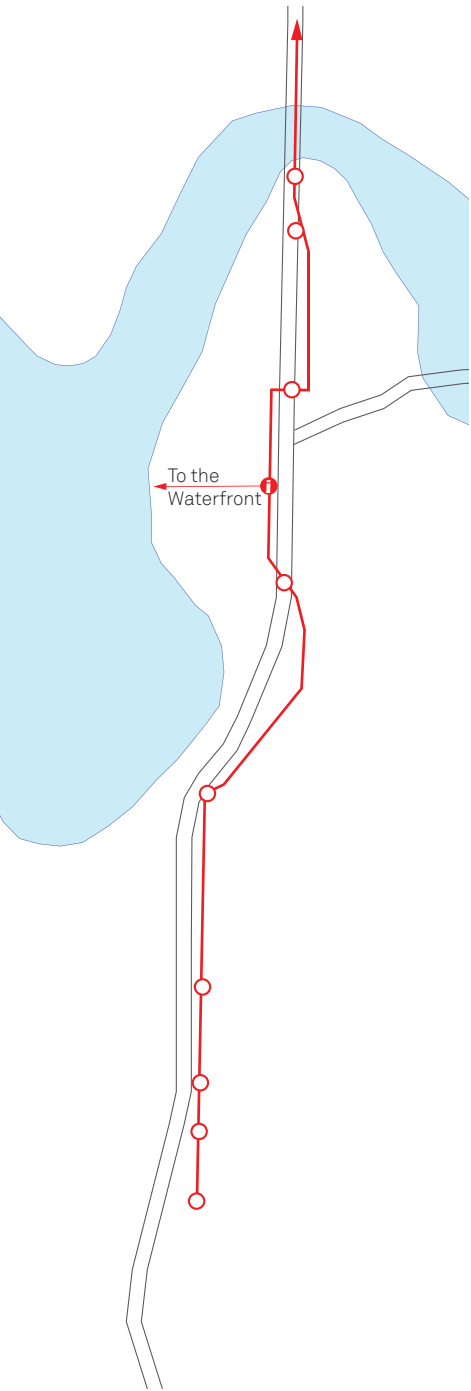


figure 55: maps and image of the seventh site on the spine trail starting from the south end.

SIGN

Eastlake Wall

- Very Limited Space
- Unique landscape experience
- Eastlake
- Connection to Eastlake commercial core
- Limited access to transit
- Neighborhood Improvement
- Exposed space
-

This site next is along the sound barrier wall that marks the eastern border of the Eastlake neighborhood. Any intervention would likely improve the harsh wasteland created by this large wall that dominates the east side of Boylston Avenue. Although there is little land here with only six feet of sidewalk between the wall and Boylston, there is an opportunity to break the wall and attach modules to it.

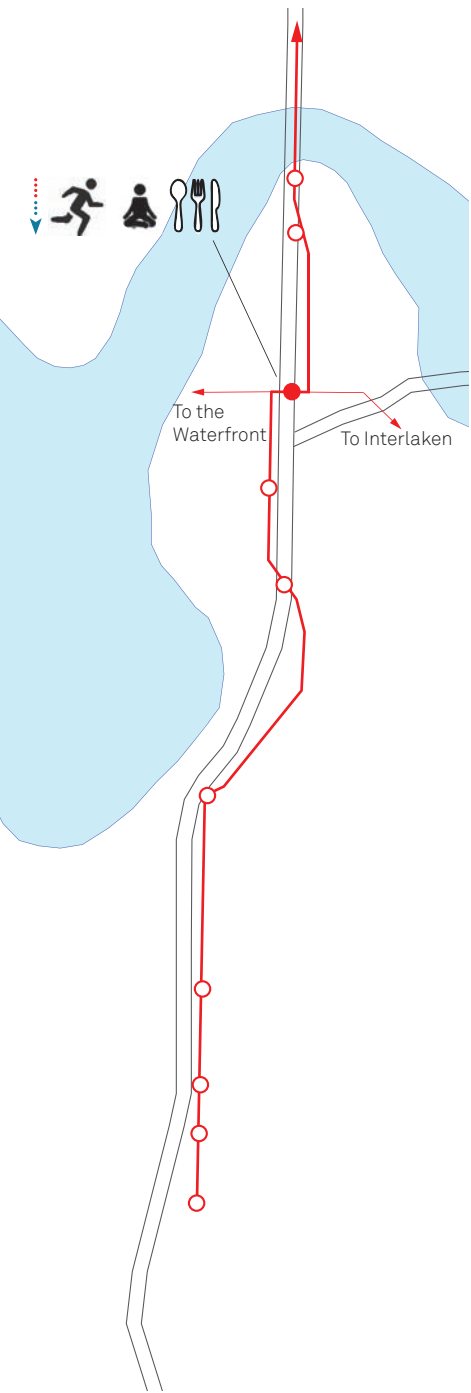


figure 56: maps and image of the eighth site on the spine trail starting from the south end. This is also the second focus site explored in more detail in the design chapter

REST STOP

Loop Connector

- Large space to program over freeway
- Missing link between Interlaken Trail and Lake Union Trail
- Near increasing density
- Access to transit
- Unsheltered
- Limited View
- Serves Eastlake, U District, and Capitol Hill
- Residential

This stretch of the trail bridges above the freeway at Roanoke.

Developing program as a bridge at the freeway here encourages

greater east to west connection from Interlaken trail to the Eastlake

neighborhood and the waterfront. This location also accommodates

a water stop on the Seattle Marathon Route.

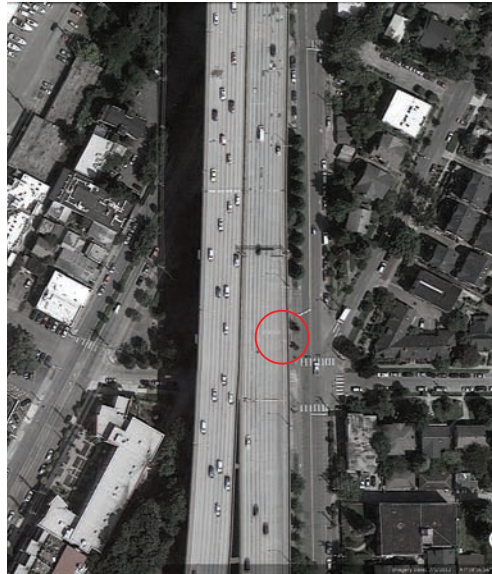
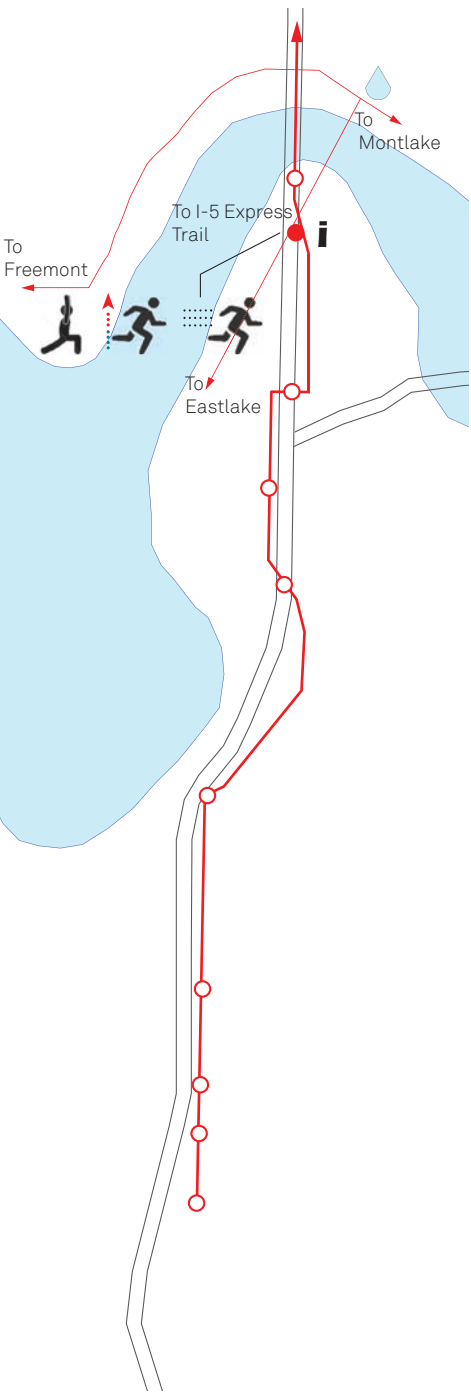


figure 57: maps and image of the ninth site on the spine trail starting from the south end. This is also the third focus site explored in more detail in the design chapter

STATION

North Hub

- Large space under freeway
- Missing link to Capitol Hill
- Primary Bike Trail
- Access to transit
- Sheltered
- Lower level no view
- Serves Eastlake, U District, and Capitol Hill
- Residential to commercial connector

The final stretch of the freeway trail slopes dramatically down to the waterfront, creating large vertical spaces as the infrastructure departs from the ground crosses the water. The existing urban trails here are very poor quality, missing opportunities to be a more connected and serve as active public space. The area is instead cut off by a large, mostly empty parking lot between the columns of I-5. The bike trail and transit connections pass by awkward spaces under the freeway often inhabited by transients and urban campers. The strong public transit and cycling corridor on Eastlake can easily link directly into the spine trail at this site.

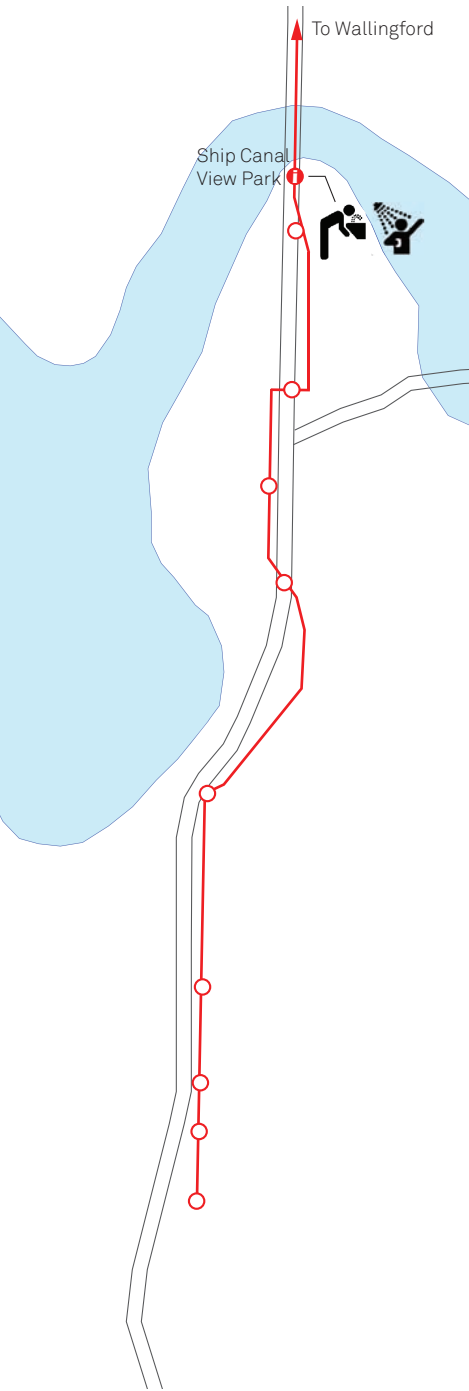


figure 58: maps and image of the tenth site on the spine trail starting from the south end.

KIOSK

I-5 Express Trail

- Strong connector to the north
- Landscape View at the water
- Serves Eastlake, U District, Wallingford and Capitol Hill
- Commercial + Residential
- Access to transit

There is a long forgotten view point park at the north end of the Eastlake neighborhood on the ship canal. The express lanes provide an opportunity to create a new view point park above the water while providing an express trail to Wallingford and the U District.

DESIGN

Your quality of experience is based not on standards such as time or ranking, but on finally awakening to an awareness of the fluidity within action itself.

-Haruki Murakami



SYSTEM

The design response begins with a the kit of parts of a deployable module for installing program along the trail system. The base connector would be installed all along the central spine trail and incorporate lighting to serve as a trail marker day and night. Modules can be attached to these base pieces over time to create spaces for stretching, shelter, and gathering.

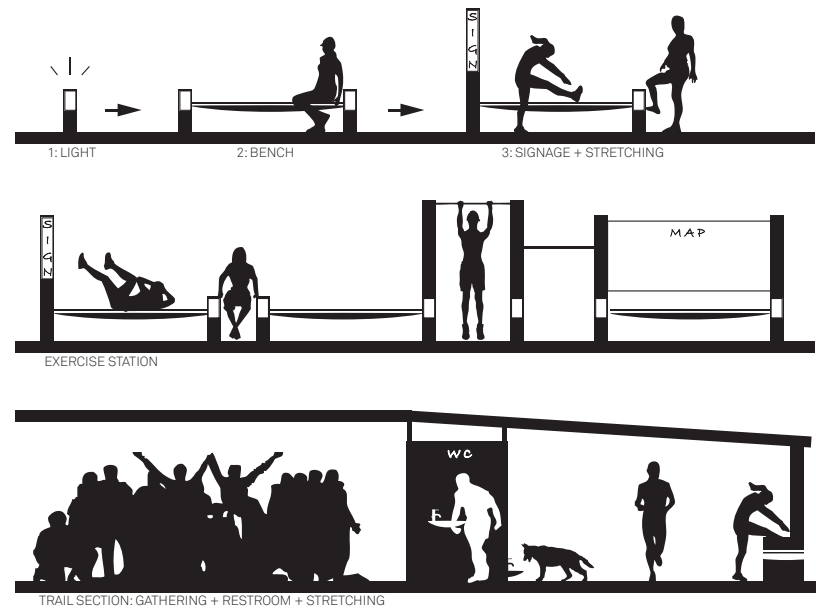


figure 59: System concept diagram

TECTONICS

The deployable module combines the lightweight tectonics of race tent, the refuge of cabin enclosure and the branding opportunities of billboard to serve as shelter and beacon. As noted in *The Landscape of Contemporary Infrastructure*:

Evocative infrastructure makes the traveler aware of the passage either by setting up sequential spatial events or by drawing attention to the landscapes and places crossed. To go beyond the fugitive impression and address a civic quality, the routes must construct a spatial sequence by simulating an understanding of the landscape's construction or by engendering contemplation of its natural or architectural splendor.

The goal of the tectonic language is to provide a recognizable set of event spaces to draw the of the runner to places of respite. The mode of attaching these tent like modules like billboard above and below the freeway is intended to capture the attention of the both the traveller on the road and the traveller on the trail, uniting their understanding of the civic quality of the complete transit system.

The reference to billboard is not intended as a literal use of the modules as advertising billboards, but rather promotion for the trail system, healthy living, and human powered transit. The modular nature of the installations could accommodate rotating art installations that ascribed to a set of regulations appropriate for these kiosks that hang over the freeway.



figure 60: Tent, billboard, refuge - tectonic inspiration

MODULES

The deployable module combines the lightweight tectonics of race tent, the refuge of cabin enclosure and the branding opportunities of billboard to serve as shelter and beacon.

The rubberized surface is present in all the modules and is the surface of the path. Although not used in the United States very frequently in outdoor application, the surface is used prevalently in spaces of outdoor recreation in Europe. The softness of the surface makes running easier on the body and inspires active use of spaces.

The tension structure speaks to the deployability of the system of running architecture in general. Every race has a finish line party complete with white tents that comes and goes quickly, but creates a community space at the end of a challenge.

The enclosure piece differs depending on module application. There might not be any enclosure, or there might just be a roof and a railing. The base material for the enclosure pieces is wood composite. This keeps the material light and durable while giving the enclosure a warmer feeling akin to the cabin. For the larger interventions that need more conditioned enclosure, the walls could be layered with fiberglass panels for sound and weather insulation.

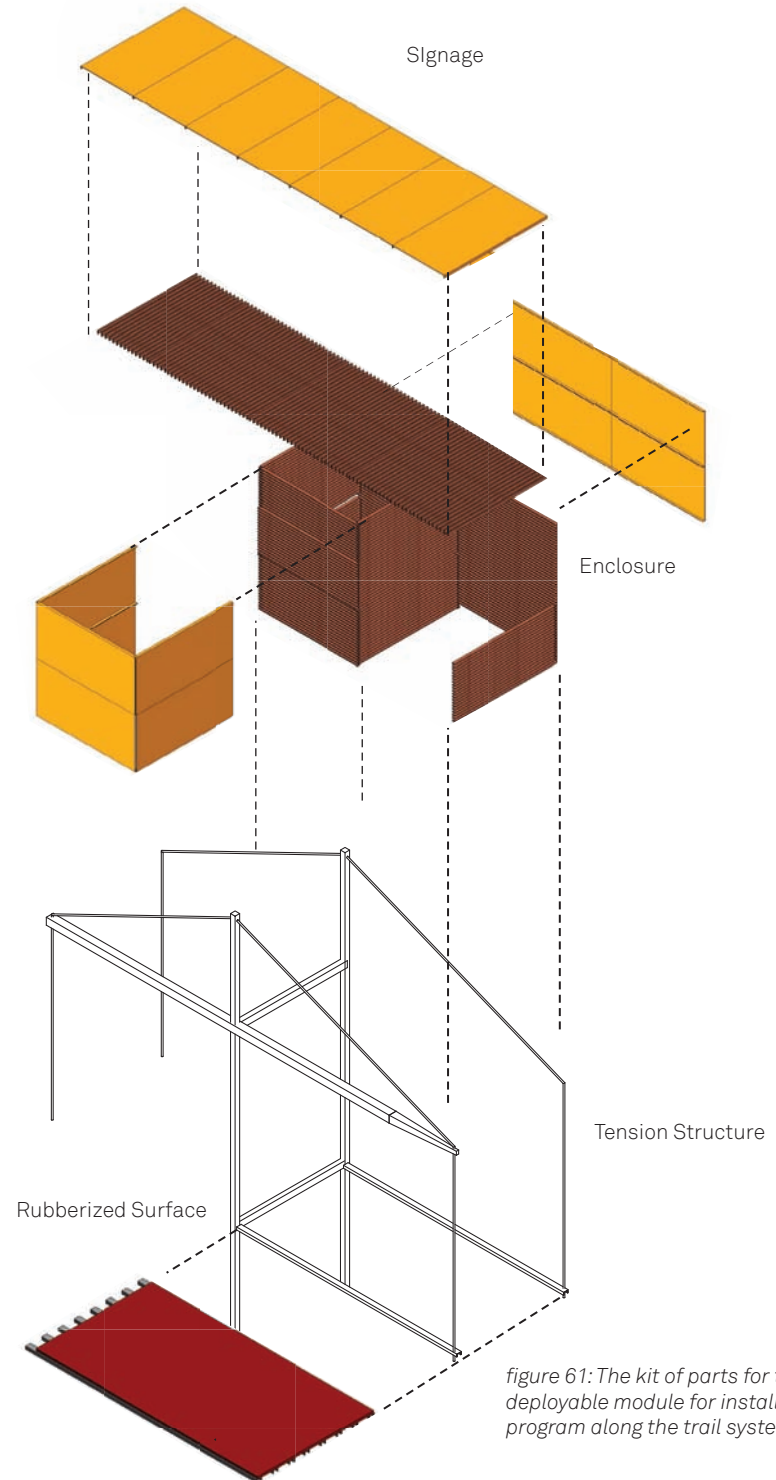


figure 61: The kit of parts for the deployable module for installing program along the trail system.

The signage piece also provides a level of insulation and enclosure. For a stiffer sign, translucent Kalwall would be printed on to allow for light to pass through.

For more flexible applications, like at the Freeway express trail, layers of foil fabric will be used. When two layers of the foil are appropriately spaced, they are able to provide sound absorption that would be necessary in these loud spaces on the freeway. A product provided by RPG, Clearsorber™ (figure 62) states that the foil provides sound absorption because:

The microperforated panel, when spaced from a transparent or non-transparent reflective surface, offers high viscous losses when air passes through the surface. The Clearsorber™ is inherently damped and does not require porous absorption in the cavity between the Clearsorber™ and the reflecting wall behind it.

This essentially means that a sheet of the perforated Clearsorber paired with a non perforated fabric or foil sheet will essential capture the sound waves in a cavity between them that is 30 mm in depth.

This would allow for the signage piece of the module to remain light weight and transparent while protecting the enclosed spaces and the surrounding neighborhood from sound pollution from the freeway.



figure 62: Clearsorber™ material in application

APPLICATION

Variations in enclosure and attachment provide a variety of uses while maintaining a recognizable structural language. Each application of the module differs based on the site conditions but limits differences to maintain deployability,

Figure 63 shows a module that is attached to a framework hanging under the freeway. This would be an application where Clearisorber™ is used.

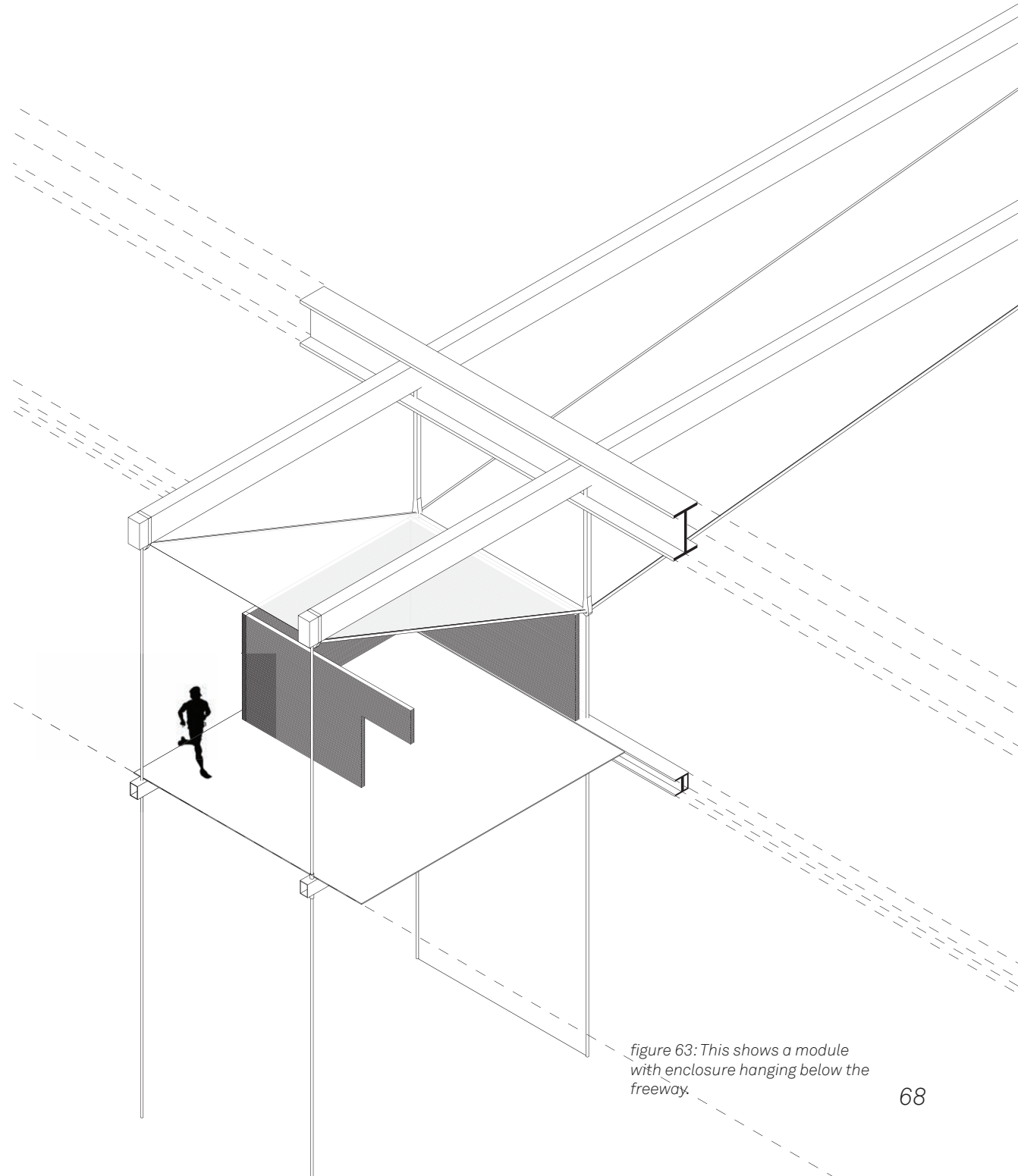


figure 63: This shows a module with enclosure hanging below the freeway.

VIEW + ENCLOSURE

The next few pages show a variety of applications for modules hanging above the freeway. This one shows an overlook space with a railing and a fully enclosed space with signage application and a solid roof.

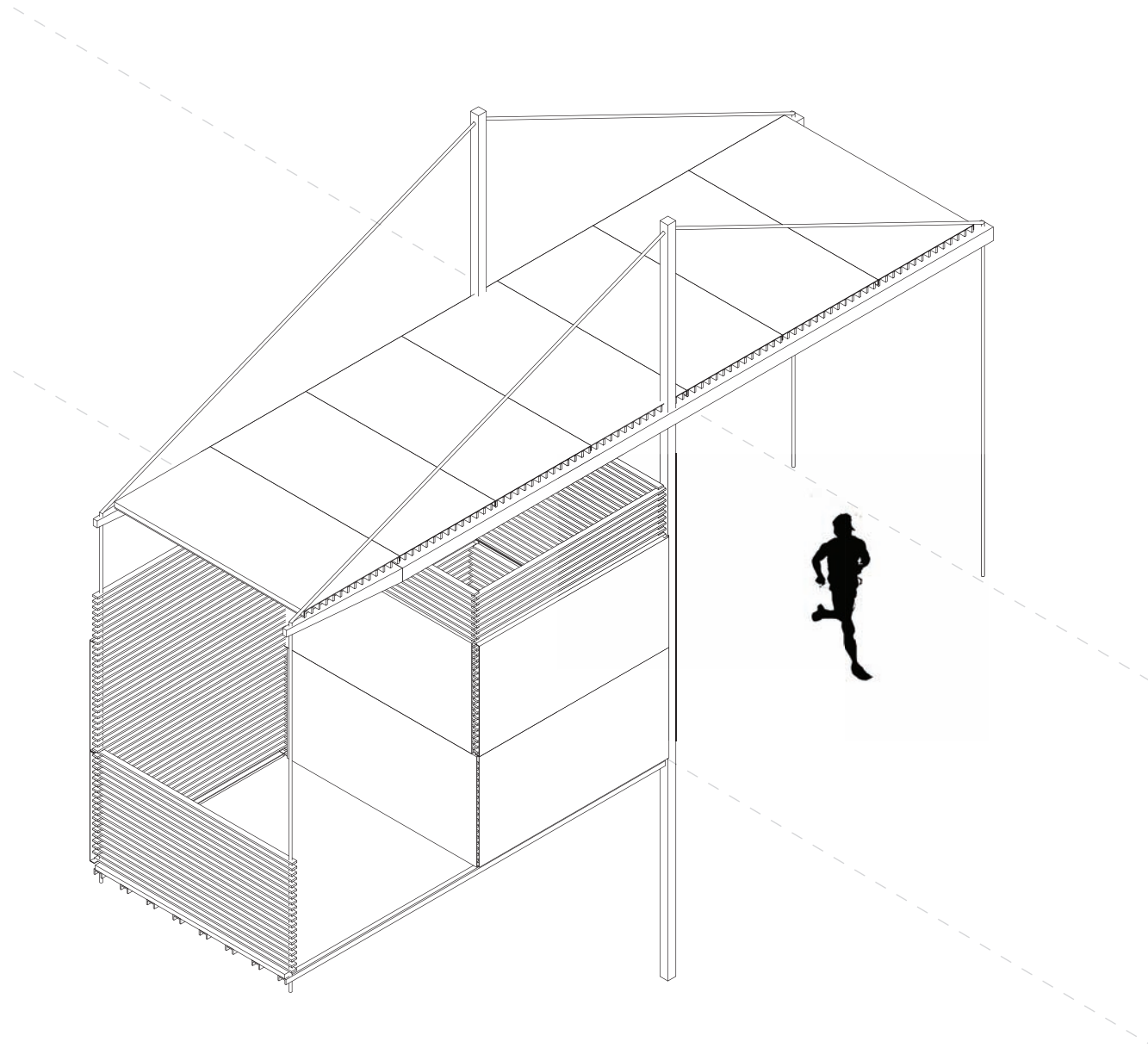


figure 64: Enclosure, sign and railing.

PATH + ENCLOSURE

This variation shows an expanded path space and full enclosure.

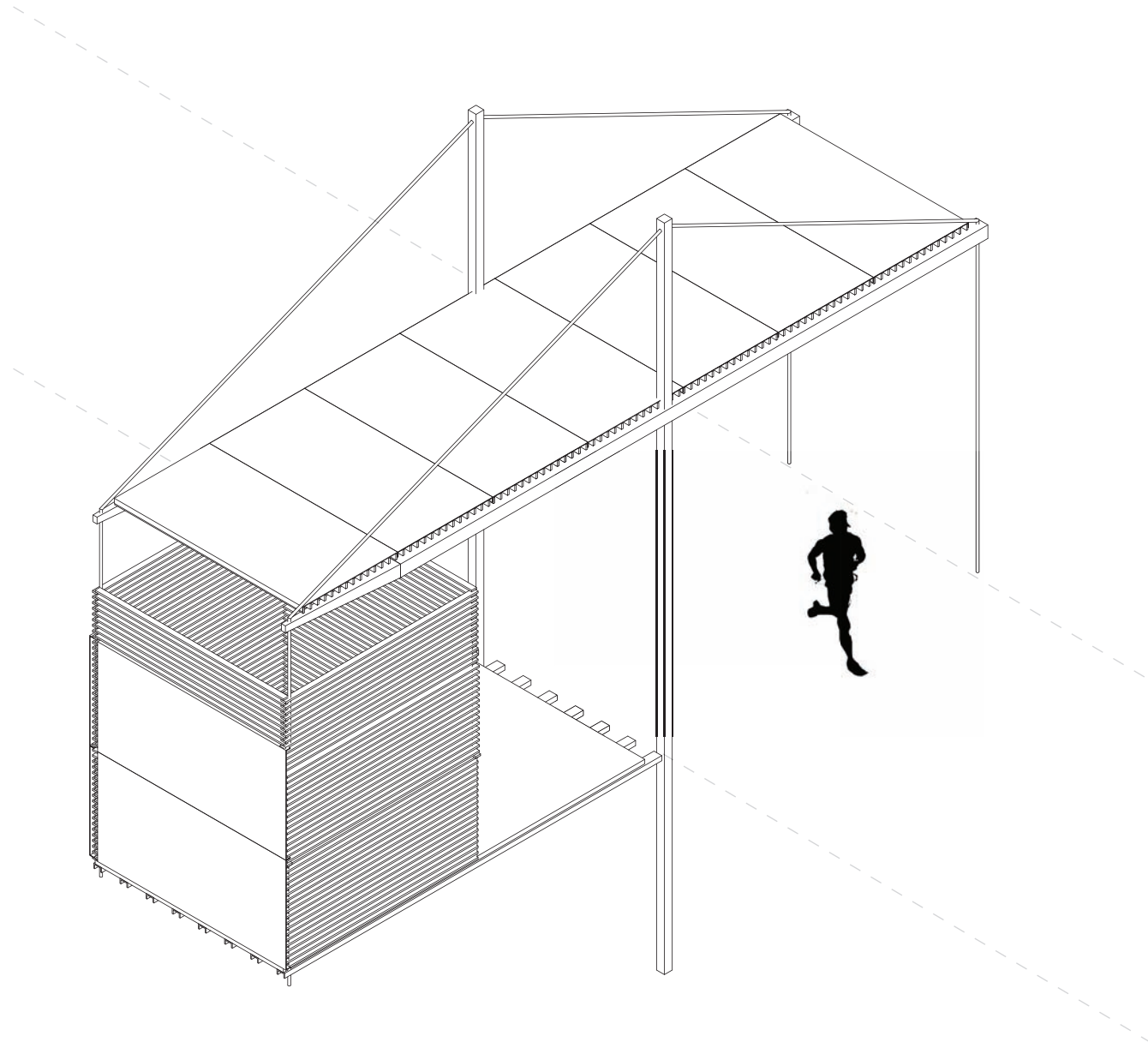


figure 65: Enclosure, sign and railing.

PATH AND PARTIAL ENCLOSURE

This application shows an expanded path and partial enclosure for a more flexible space or to create larger spaces when joining multiple modules together.

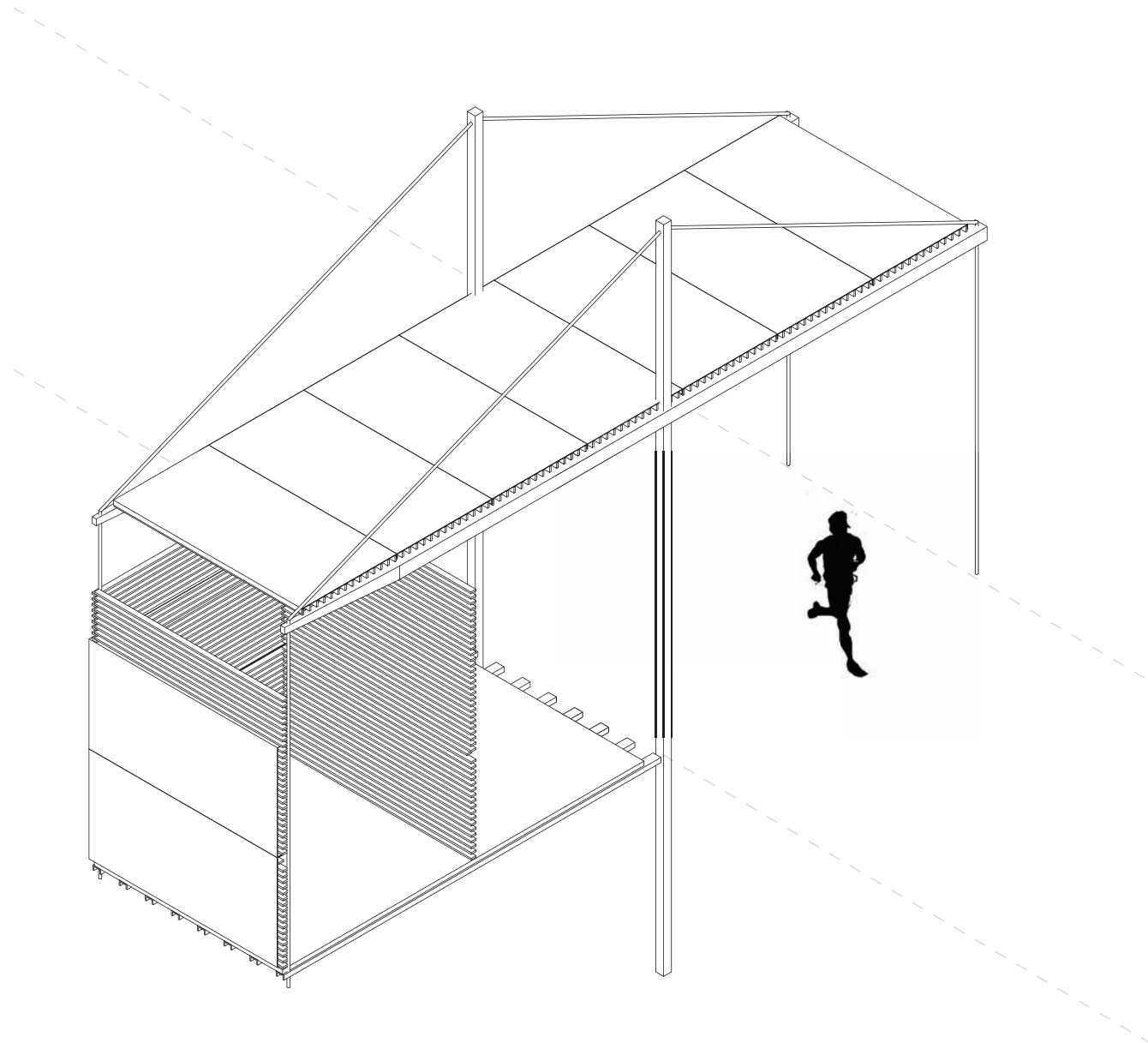


figure 66: Partial enclosure, sign and roof

ROOF + RAILING

Some applications would not require enclosure. This one has a roof and a railing. It could serve as a quick shelter from the rain and a view point.

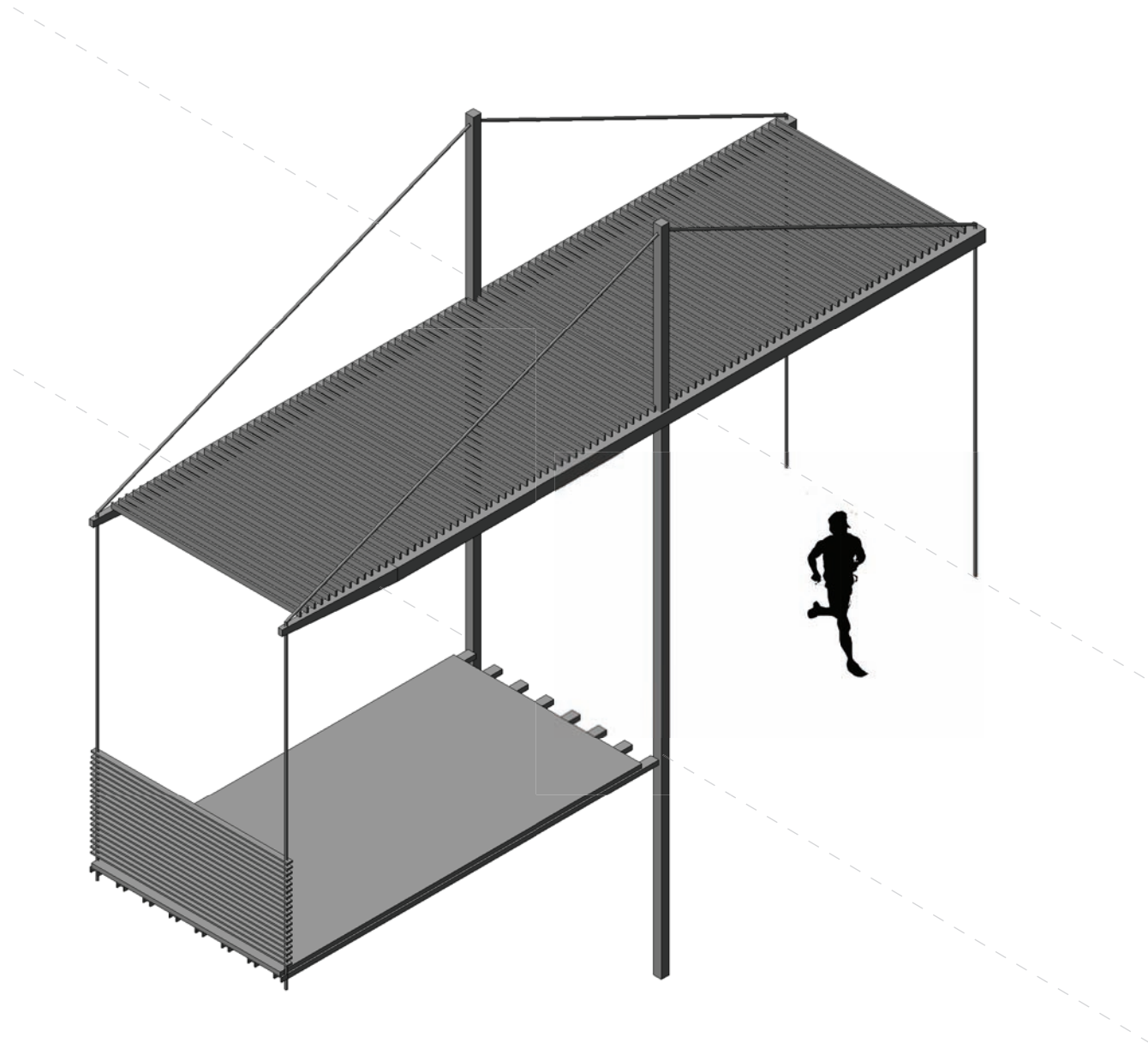


figure 67: Roof and railing.

RAILING + STRETCHING

All modules would not necessarily need roofs. This module provides space for stretching and is a beacon on the path.

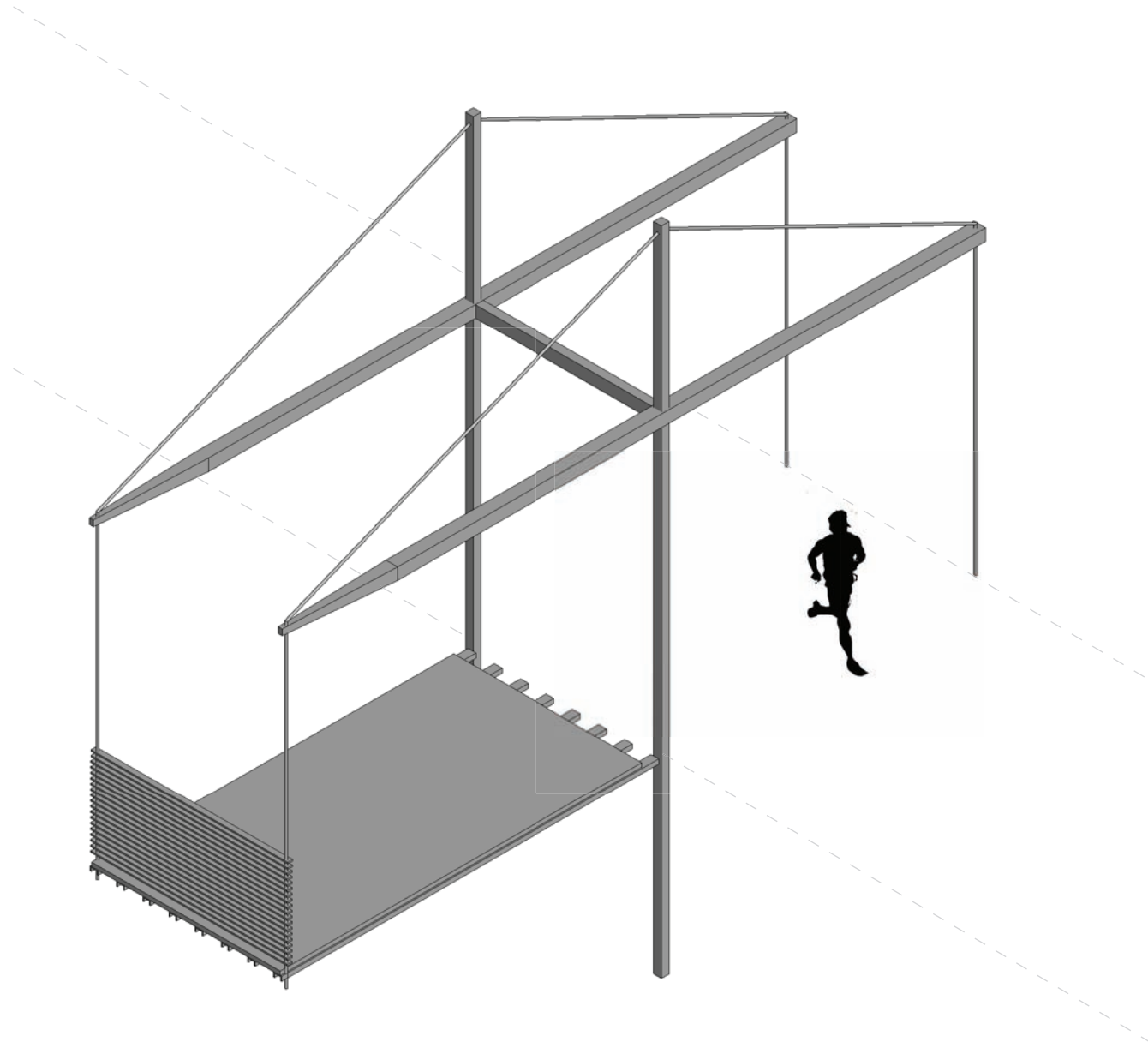


figure 68: Just railing

KIOSK

The smallest of the interventions is located at Melrose and the pedestrian stair to Harrison. This small module serves as an overlook and a restroom kiosk.

This location is a terrific spot to watch the sunset. Benches attached to the module base can serve as spots for stretching as well as places for viewing the city.

The module could serve to activate the currently sparse stair site as a place to run up and down the hill for training.



figure 69: North site section - kiosk

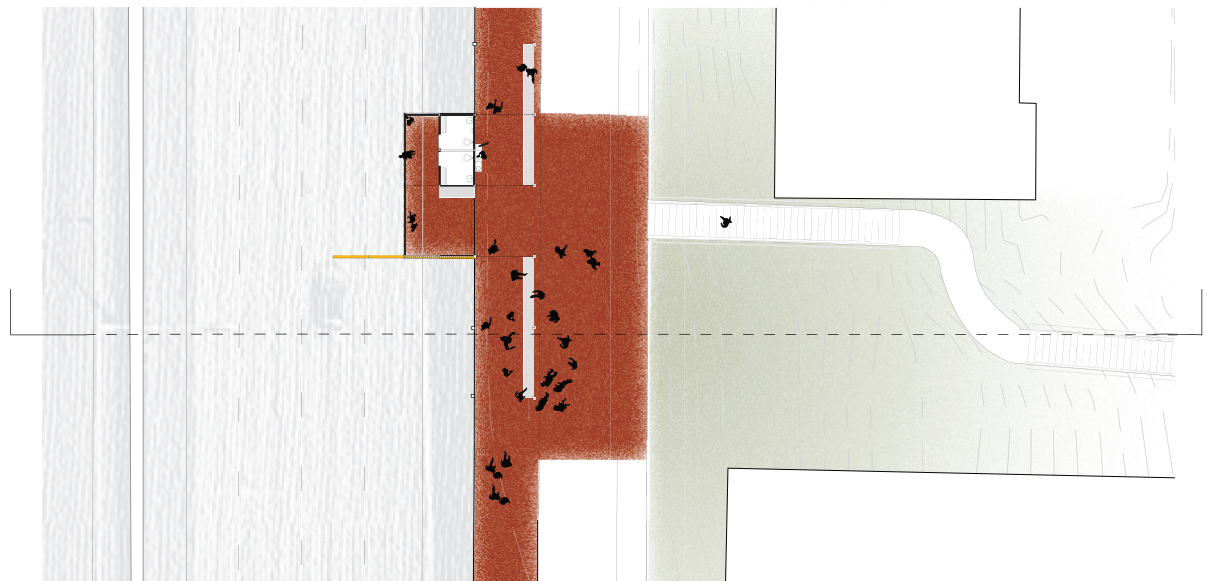


figure 70: Kiosk Plan

ATTACHMENT - RETAINING WALL

This intervention utilizes deep piles to tie back the tension members. Attachments at the face of the retaining wall allow for addition of modules as needed. This attachment will be used for any retaining wall site with appropriate soil for deep piles.

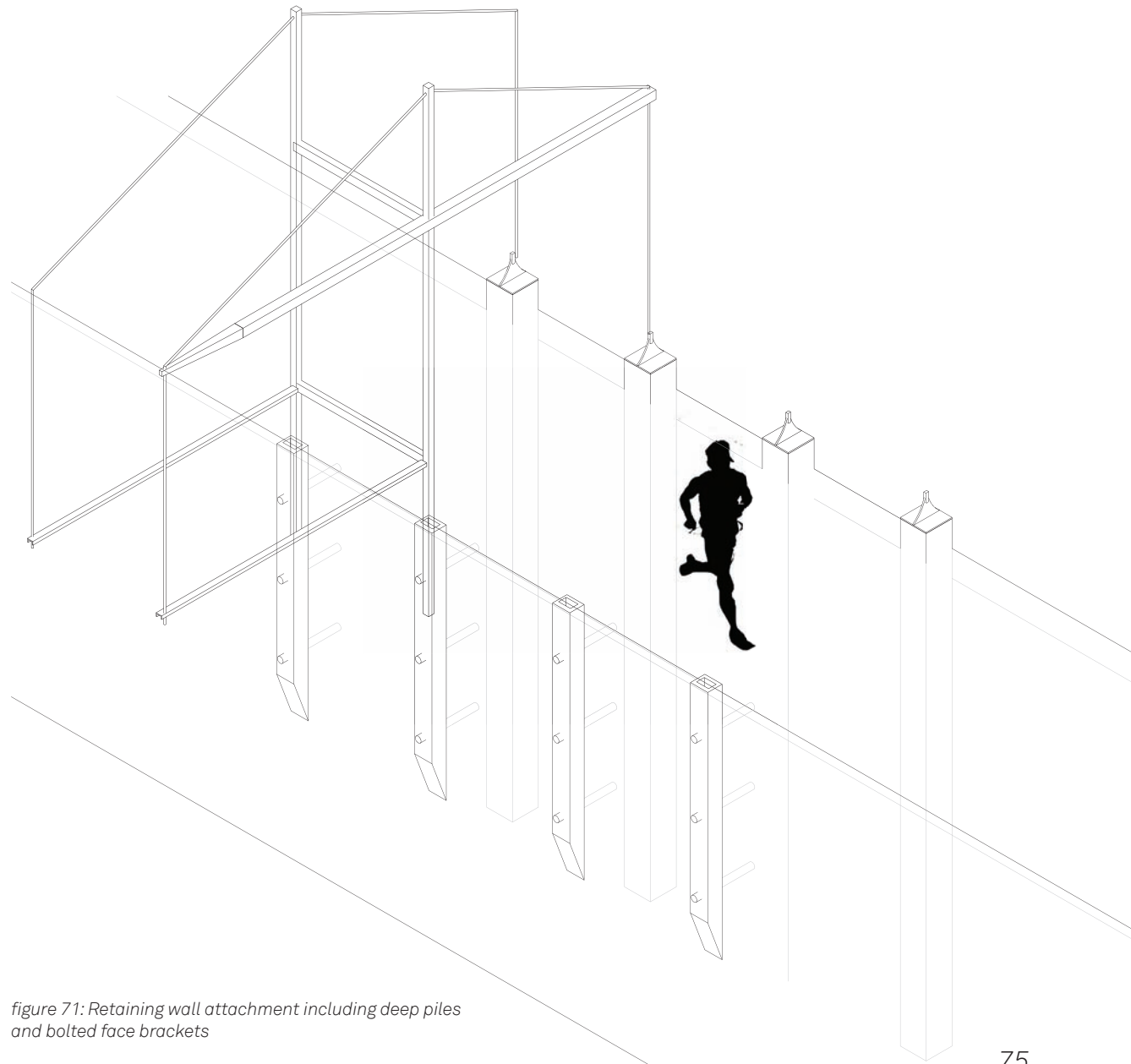


figure 71: Retaining wall attachment including deep piles and bolted face brackets

figure 72: Following page - running kiosk at night



REST STOP

Site two is located at the Roanoke bridge and is already a water stop location for the Seattle Marathon. This set of modules includes a bathroom, a small exercise studio that could also serve as a meeting hut, a nutrition kiosk and two gathering spaces. One of the spaces would be used for the juice bar customers and for nutrition bar vending machines. The other space would be stepped to provide a

barrier to the freeway and more variety to the exercise space options. The open spaces could also be used to set up the water stop for the Seattle Marathon and provide a place to sit for spectators of the race.

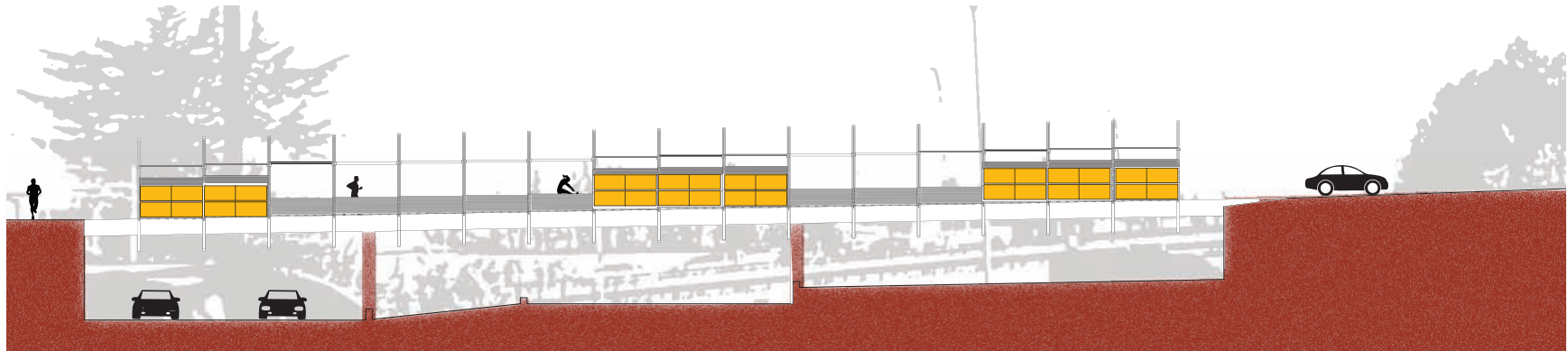


figure 73: North Section - Rest Stop

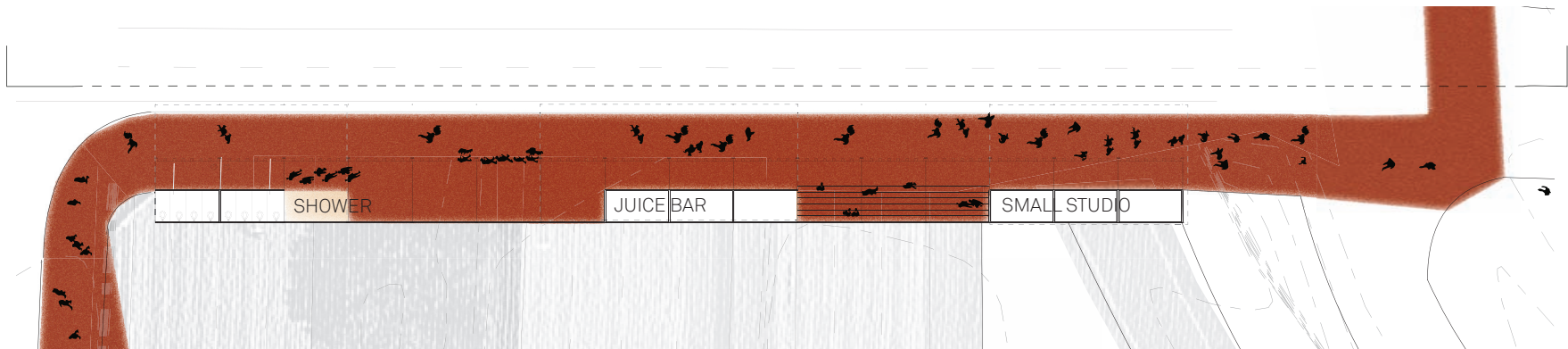


figure 74: Rest stop plan during a race

ATTACHMENT - BRIDGE

This intervention utilizes similar attachments as the retaining wall but also needs the brackets shown to the right. The long span and the lack of soil for deep piles requires extra support. The brackets compress against the existing concrete support walls of the bridge.

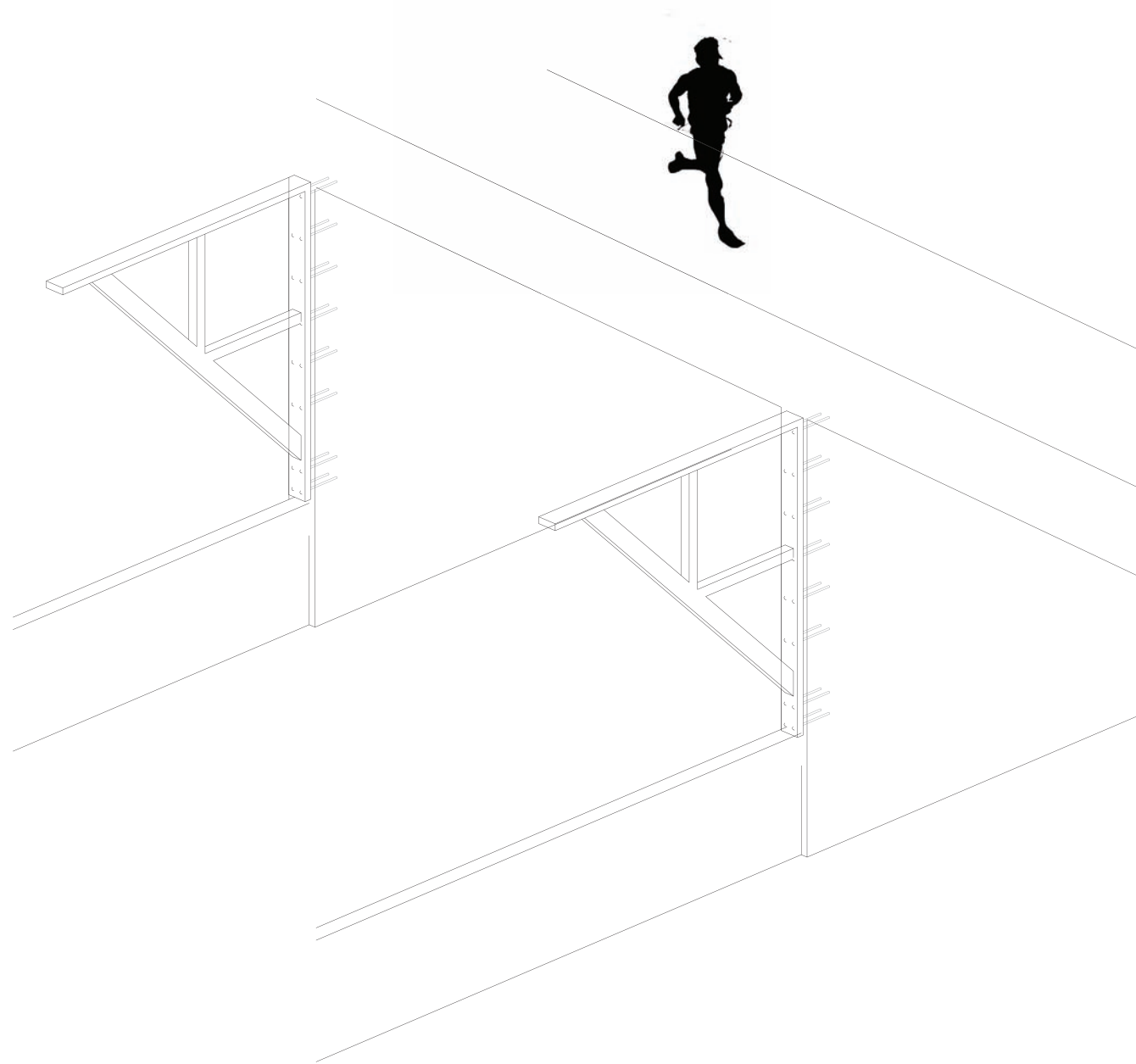


figure 75: Bridge attachment - large angle brackets at existing bridge walls

figure 76: Following page - running rest stop at night



STATION

Site three is located at the intersection of Eastlake and Harvard. The space under the freeway and connection to the ground allows for a larger intervention. The building serves as a training center, one wing targeting those new to exercise, the other wing targeting advanced athletes. The space between serves as a major gathering space along the trail.

The ground level provides connection to the ground for more secure spaces like the cafe, training offices and locker rooms.

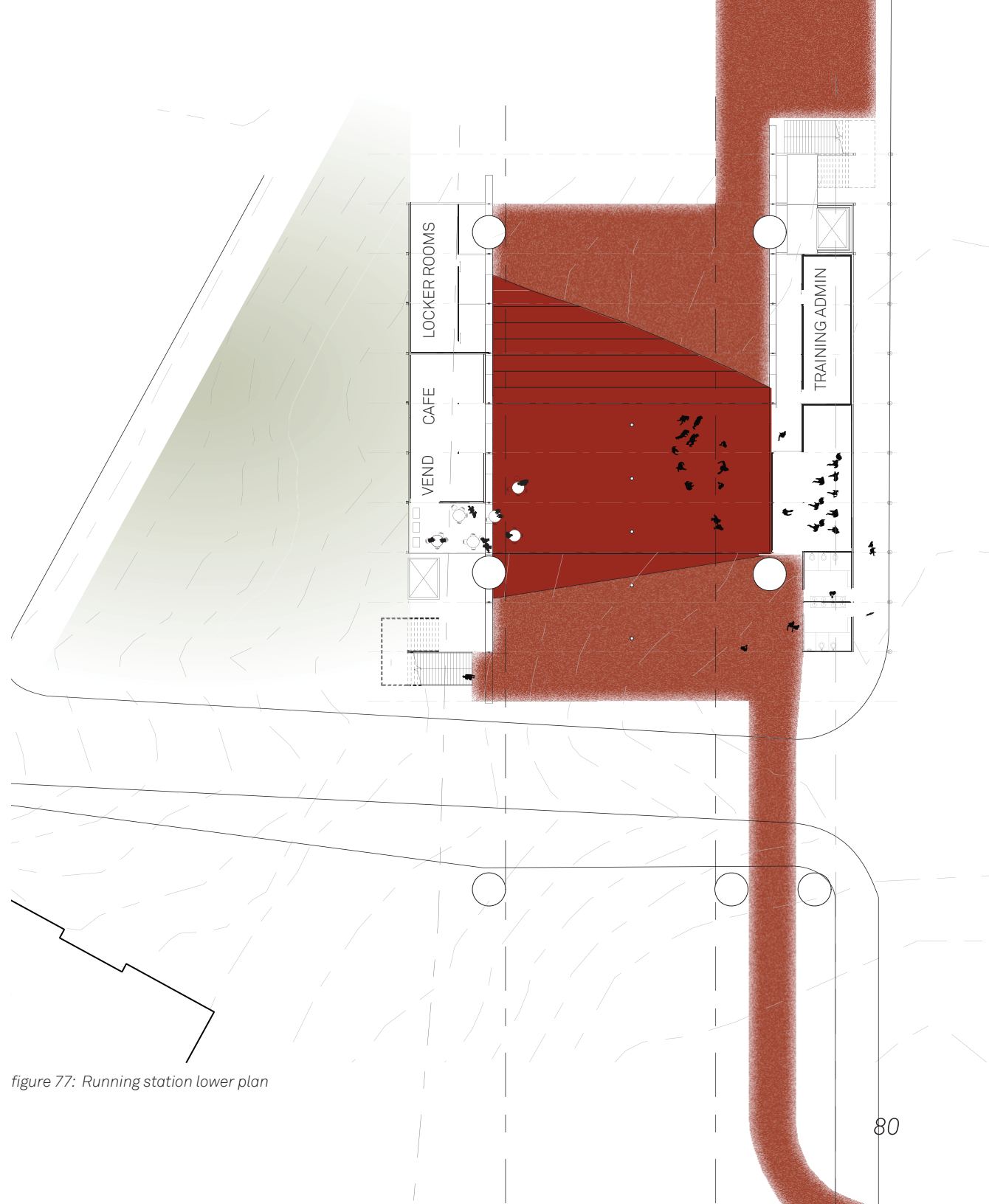


figure 77: Running station lower plan

I-5 EXPRESS TRAIL

After a structural framework is installed, The upper level is more flexible. The attachment would include a rubber sleeve around the column of the freeway to reduce the transfer of vibrations from the traffic. This would then be fitted with a large steel gasket and beams to span between the columns. (figures xx-xx) After this framework is in place, modules can be installed as need.

Most of these module will make up the extension to the I-5 Express trail at the express lane level of the freeway. The program for these spaces would need to accommodate the noise of the freeway. Classrooms for high powered exercise like Zoomba and Crossfit could benefit from the view offered at this level. In the Rouge Running precedent there were several gym classes that moved into their space as the condo tenants above the large gym had complained about the noise.

Other enclosed spaces could facilitate meeting huts and informal exercise studios.

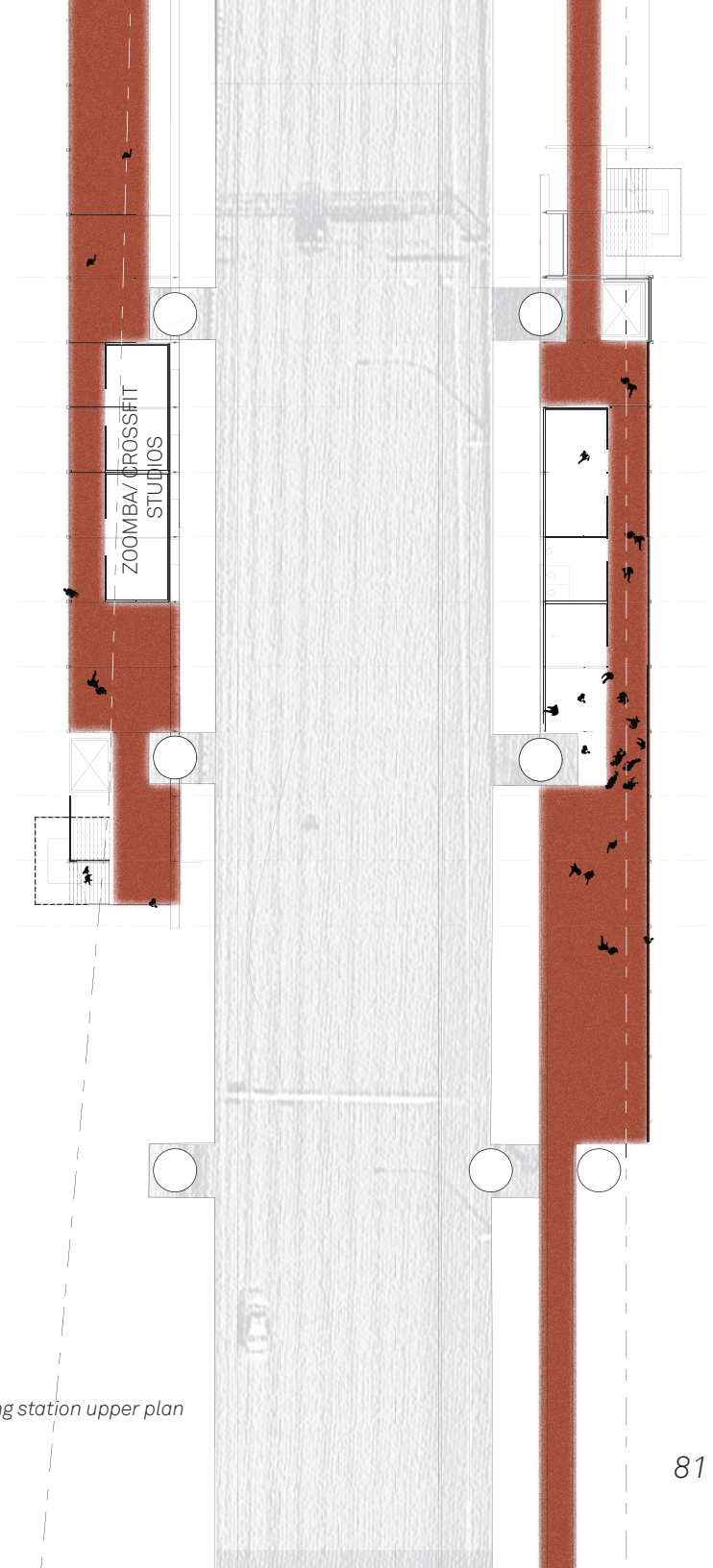


figure 78: Running station upper plan

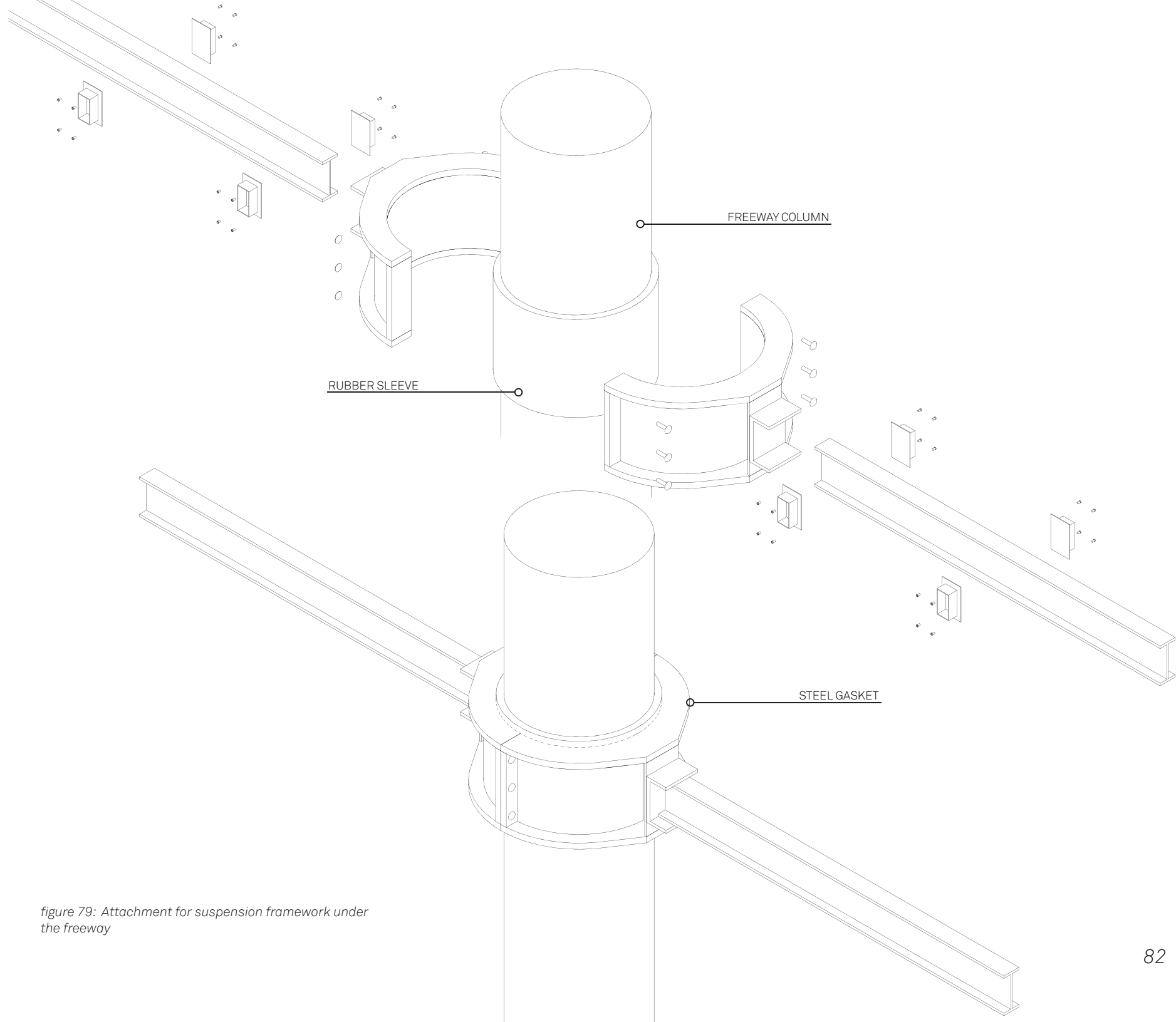
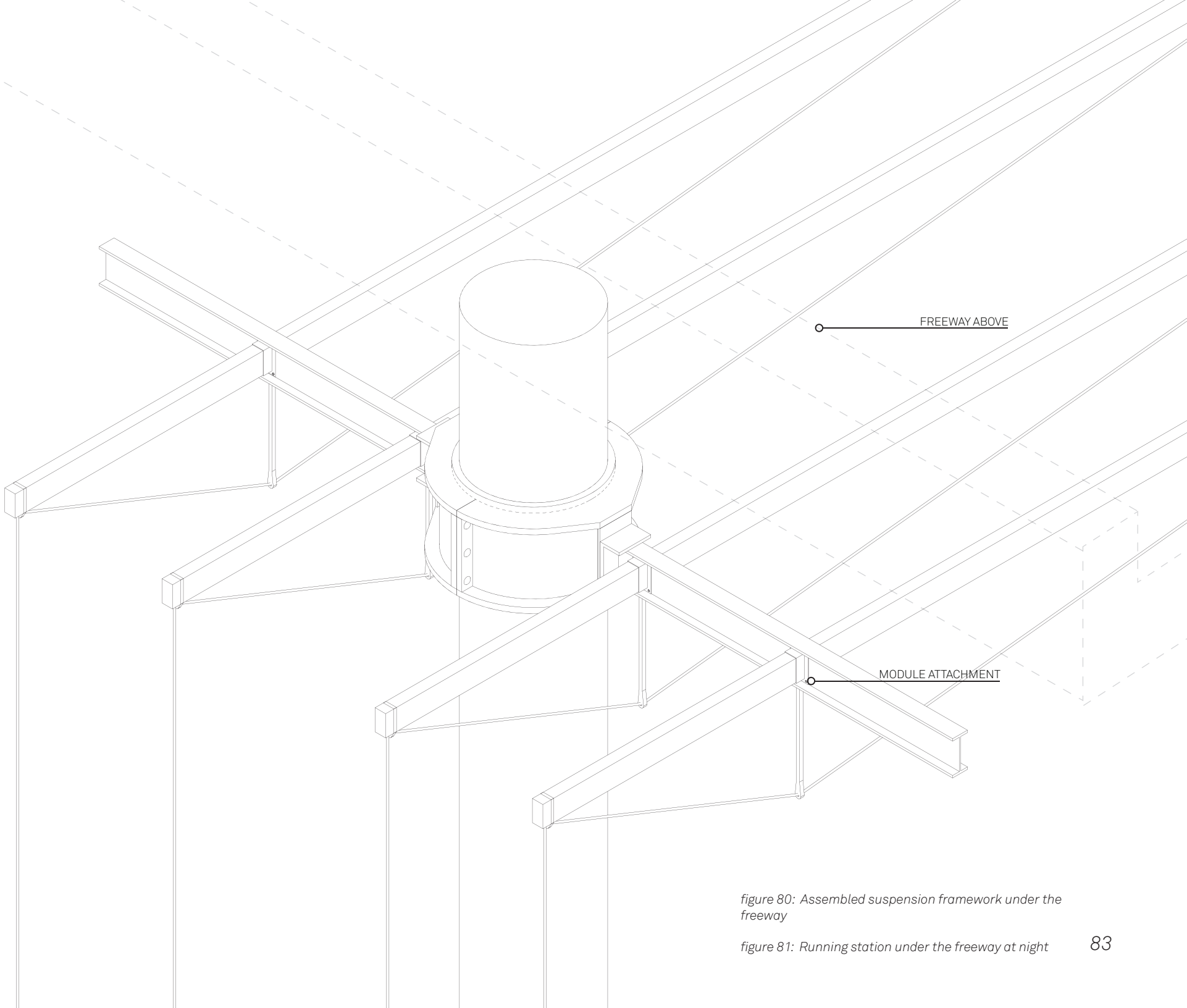


figure 79: Attachment for suspension framework under the freeway



FREEWAY ABOVE

MODULE ATTACHMENT

figure 80: Assembled suspension framework under the freeway

figure 81: Running station under the freeway at night



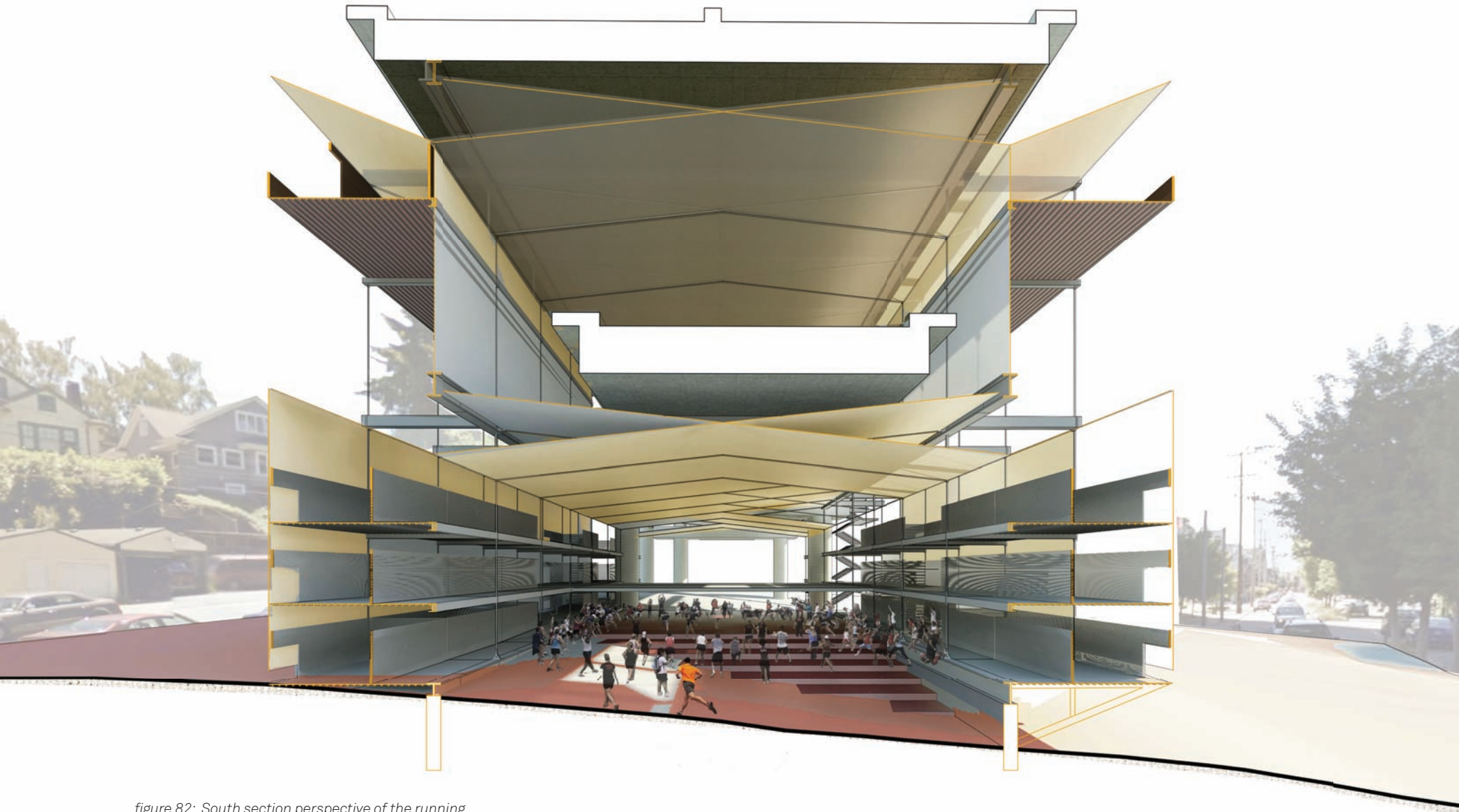


figure 82: South section perspective of the running station



figure 83: View and a Zoomba class on the I-5 Express Trail

CONCLUSIONS

Not all those who wander are lost...

- J. R. R. Tolkien

This thesis explores architecture as infrastructure for public space. The practice of architecture has long sought to compliment, create, and enhance public space. As noted in *The Landscape of Contemporary Infrastructure*, “Infrastructure, by its very nature, expands the public real beyond the boundaries of a single space,” (Smets 184). Transportation infrastructure is perhaps the most expansive piece of public space as it serves as the network between communities. . Although freeway infrastructure is a large piece of this network, the insular nature of vehicular transportation limits its functionality as social space. Its massive presence and singular use leave a rift in the existing urban fabric leaving many opportunities for intervention.

This thesis occupies the edges of that rift and provides a network of connections along it to form legible system of mobility while creating new public spaces in previous dead ends and freeway alleys. By examining the moving body of the runner as human powered transportation, the architecture along the trail serves as an additional layer of infrastructural support on the massive investment of space and resources that is the freeway. The recognizable language and visibility of the architecture is important for creating an identifiable

system that promotes its own use.

While this thesis addresses the need for social connection along and across the freeway in Seattle, there is more to be explored. The health of the environment within the spaces along the freeway remains in question. While the use of sound absorptive materials and the addition of plants as air filtration are proposed, more research is needed regarding carbon emissions and high decibel sound pollution of the freeway.

Another environmental concern is the rise in emissions and demand on existing transportation infrastructure caused by steadily increasing population and density of cities. Alternatives to vehicular transit must be addressed to adequately respond to this issue. The proposed modular system supports a network of human powered transportation, but it impacts only the Seattle city center. With further development, this system would expand beyond the urban core to establish city to city connections. At all scales, the architecture of the system can serve as a beacon of respite and community for the traveling body.



figure 84: Physical Model of the kiosk

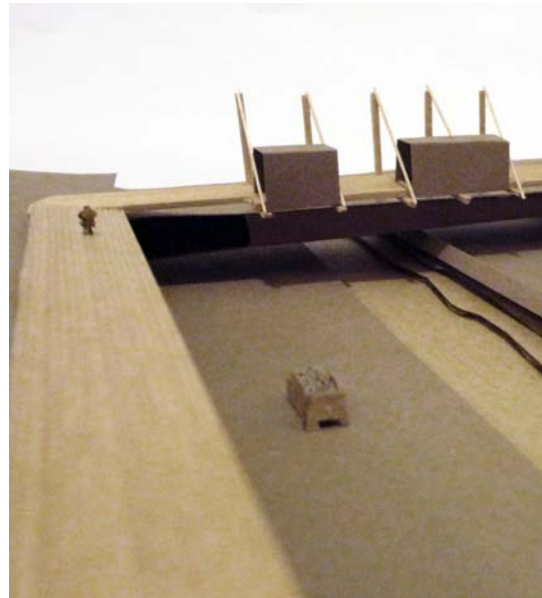


figure 85: Physical Model of the rest stop

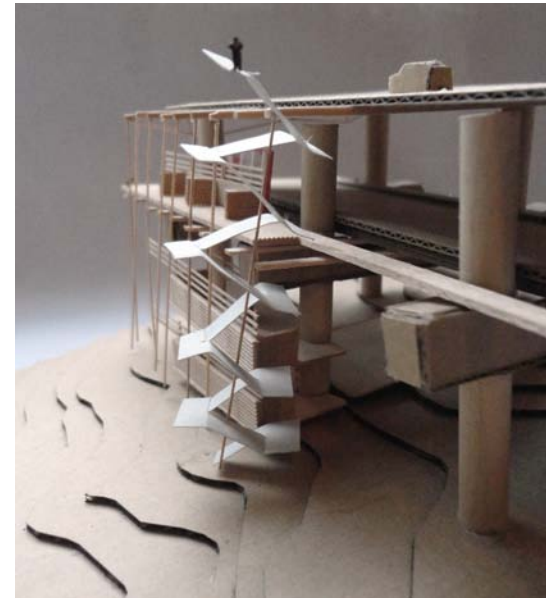


figure 86: Physical Model of the station

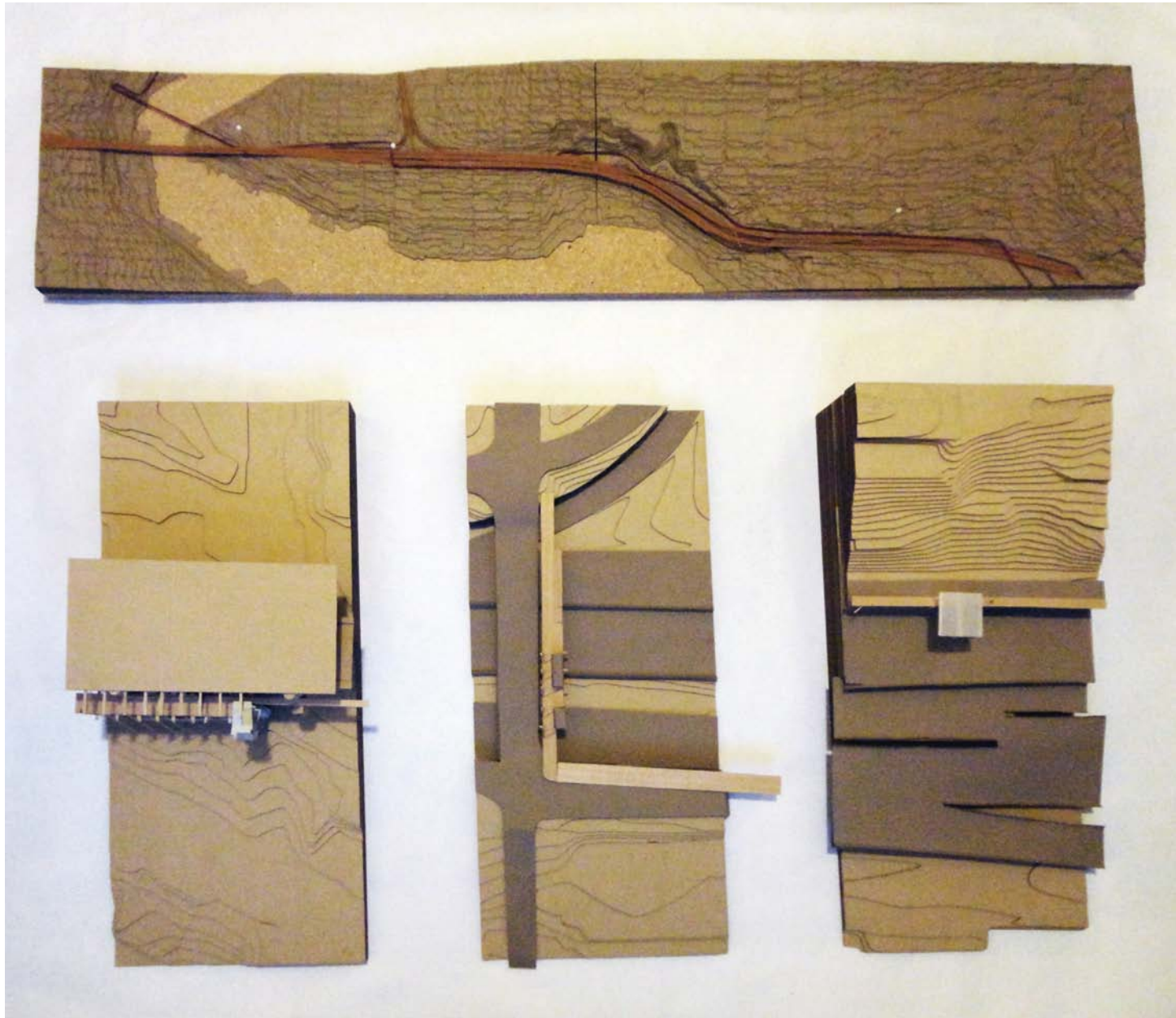


figure 87: Micro-scale model of the Seattle I-5 corridor with sites and trail marked. Physical models of each exploration site arranged from north to south



figure 88: Micro-scale model of the Seattle I-5 corridor showing the freeway in orange and the trail in red.

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figure 7: Siegel, Mike. 520 floating bridge. *Seattle Times*. 23 July 2008.

figure 8: Sorensen, Dan. *Seattle and Interstate 5 from the 12 Avenue Bridge*. <http://www.dansorensenphotography.com/>

figure 9: Courtesy Albert Kahn Family of Companies General Motors Pavilion at the 1939 World's Fair. *Enchanting Reality*. HUMANITIES. January/February 2011, Volume 32, Number 1

figure 13: Allegheny riverfront. Michael van Valkenburgh. <http://mvvain.com>

figure 15: Maxwan designed, Dutch "Orgware", *The Landscape of Contemporary Infrastructure*

figure 18: Mamihara Bridge by Jun Aoki in Japan. *The Landscape of Contemporary Infrastructure*

figure 19: Gran Via de les Corts Catalanes, and the A19 Highway. *The Landscape of Contemporary Infrastructure*

figure 20: Federal Highway Administration diagram - energy harnessing road, <http://fhwa.dot.gov/>

figure 23: Trujillo, Joshua. High five during the 2012 Seattle Marathon. *Seattle Pi*

figure 26: Hal Koerner. Anecdotes from the Trail. <http://anecdotesfromthetrail.blogspot.com>

figure 27: Ultra runner's pit crew. <http://newstimes.com>

figure 28: An ultra runner's pacer <http://newstimes.com>

figure 31: Trujillo, Joshua. Seattle Marathon on I-90. *Seattle Pi*

figure 47: Rouge Running. http://about_rougue_rougerundown.files.wordpress.com

figure 48: Public Conveniences - Miro Rivera Architects Trail Restroom. <http://eyecandy-webcandy.blogspot.com>, 29 October 2009

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