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Station Experience Design Guidelines

Sound Transit | 2022

Preface

Figure i for Preface - Cyclists waiting to board LINK light rail

The Station Experience Design Guidelines provides direction for Link light rail station and station environment design to support transit passengers on their journey. The standards and guidance provided distill lessons learned from previous Link light rail designs including the station surroundings. It streamlines requirements for future extensions for passenger experience consistency, design efficiency and supportive station environments. While this document does not attempt to identify all detailed requirements for light rail design, references to other documents for further information and direction are provided.

Sponsored by Russ Arnold, Chief Passenger Experience Officer, this standards project began in 2019 with an interdepartmental working group from multiple Sound Transit departments including Passenger Experience, Planning Environmental and Project Development (PEPD), Design Engineering and Construction Management (DECM), Operations and Portfolio Services Office (PSO).

Here the Passenger Experience Goals are clearly defined, station design requirements and guidance provide the elements to support the passenger journey, and frameworks are provided for the station environment including station access, contextual integration, and equitable transit oriented development.

This manual has been reviewed through a value analysis workshop to assess whether the Passenger Experience Goals can be met in an even more cost-effective way. Costs have been assessed from a total cost of ownership standpoint with lessons learned from previous and in-progress Sound Transit light rail extensions. Different options have been compared and balanced with Passenger Experience Goals. This document has incorporated the value analysis recommendations to provide guidance for future Link light rail extensions including increasing standardization for a consistent passenger experience, efficiency, and affordability.

This document is a new addition to the Sound Transit standards. While the passenger experience requirements herein describe Link light rail, the principles are to be applied to all Sound Transit modes of transportation.

Table of Contents

01 Introduction

Figure i for 1.0 - Passengers wait to board the train at University Street Station

1.0 Introduction

As Sound Transit expands transit systems to support a growing region, the agency must do so in a cost-effective manner which connects people to where they need to go. This primer on Link Light Rail design from the passenger perspective is critical to success. The document provides an overview with guidance and requirements for passenger experience, station design and the station environment.

ST staff from multiple departments have come together to document these standards in order to provide robust guidance for the expanding system. The information herein has been coordinated with designated representatives from Passenger Experience, Planning Environmental and Project Development, Design Engineering and Construction Management, Operations and the Portfolio Services Office with input from multiple Subject Matter Experts from around the agency. The team has taken the approach of clearly defining the passenger experience to simplify the design of the stations and identify access and station area planning approaches.

The audience for this document is anyone interested in learning about Link Light Rail as well as stakeholders, design consultants and design-build teams. This document is a required standard for future Link Light Rail extensions including Tacoma Dome, West Seattle and Ballard, Everett and future Extensions.

1.1 Mission and Vision

Sound Transit's Mission

Connecting more people to more places to make life better and create equitable opportunities for all.

The agency's Vision

Enthusiastically transforming the map of Central Puget Sound. Making our transit service as iconic to our region as the Space Needle, Mount Rainier and ferries.

In order to meet the Mission and Vision, Sound Transit adopted six core values:

COLLABORATION

We share each other's successes and challenges, and invite involvement of all toward achievement of common goals. We are one agency; no single department defines our business.

PASSENGER FOCUS

We always start with our passengers' needs and work back from there. They are the focus of everything we do.

INCLUSION AND RESPECT

We foster a culture where everyone is treated fairly and where diverse perspectives are welcomed and every voice is heard.

SAFETY

We ensure the safest transit trip and work environment for every passenger, employee and contractor, each and every day.

INTEGRITY

We build trust by keeping commitments and taking ownership—demonstrating honesty, accountability and transparency throughout.

QUALITY

As stewards of public resources, we do our best work every single day and take great pride in the efficient, sustainable and equitable delivery of our services and projects.

While this document integrates all of these values, Passenger Focus is defined and highlighted. Passengers are the ultimate focus of everything we do. They are the reason we are expanding transit services for the region. We must support their needs in order to achieve our mission.

Figure i for 1.1 - Passengers exiting at Angle Lake Station

1.2 Document Purpose

This document has the primary purpose of describing the passenger experience requirements and subsequent station design and station environment elements to support that experience.

Chapter 2 clearly describes the Passenger Experience Goals for a simple, seamless and intuitive journey to connect people to where they need and want to go. By describing these expectations, capital project teams can more easily provide designs which support a positive passenger experience with fewer course corrections on the process. It also details the “persona workshops” that design teams can use to help guide early planning decisions.

Chapter 3 provides direction and guidance through a series of design principles to help attain the Passenger Experience Goals. Station elements from the entry to the platform provide the setting and cues for the passengers to get to where they need to go and a protective reasonably comfortable place for them to wait. Because maintainability is crucial to providing a good passenger experience, information is provided for back-of-house spaces and maintenance access.

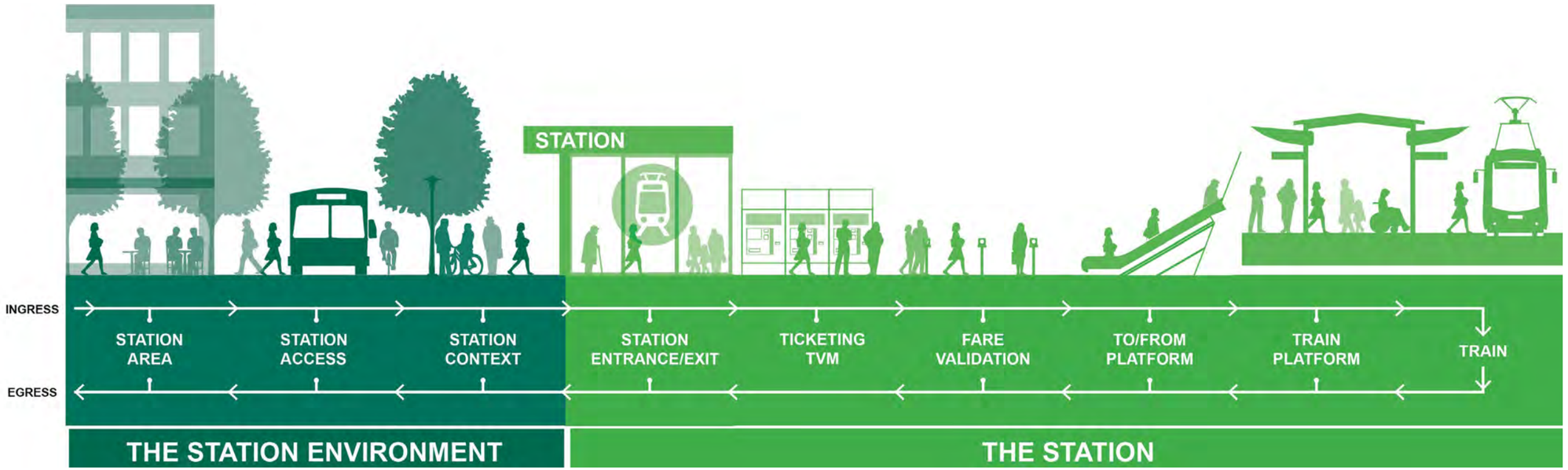
Chapter 4 lays out a framework for stations to integrate into various station environments throughout the system. A typology matrix of land use and station access types helps to target the guidance for the different station settings. Transit oriented development is an integral part to many station environments and best practices are provided.

Chapter 5 contains an evaluation checklist to analyze how proposals are meeting the requirements and guidance provided in previous chapters It can be tailored for various project types.

1.3 How to Use This Document

This document provides overall information and direction to consultants and design-build teams working on Sound Transit Link Light Rail projects as well as Authorities Having Jurisdiction and others who might interact with those projects.

The guidelines and requirements set forth in this document are required for the Link Light Rail Extension governed by this manual. These guidelines are further reinforced through Link design requirements provided in other Sound Transit documents such as the Design Criteria Manual. Chapter 5 includes an evaluation checklist of the requirements which should be submitted by the project team to Sound Transit at specified project milestones and is a companion to the Design Criteria Manual requirements and Sound Transit’s Standard and Directive Drawings. The guidelines allow teams to balance design priorities and receive credit for meeting more of the Passenger Experience Goals with the design which may be used in design-build procurements for higher rating of the design.



02 Passenger Experience

Figure i for 2.0 - Passengers deboarding on the Link light rail platform

2.0 Passenger Experience

Sound Transit fosters a positive passenger experience by starting with the passengers' needs and working back from there. The passengers are the focus of everything we do.

Putting the passenger experience at the core of strategy and decision making ensures Sound Transit will plan, deliver and operate a world class transportation system that connects more people to more places to make life better and create equitable opportunities for all. To achieve this, Sound Transit must be a passenger-centric organization; passionately advocating for outcomes at every decision point that will create an experience that is not only safe and reliable, but simple, seamless, intuitive, resilient and, ultimately, enjoyable. Sound Transit endeavors to provide a passenger-focused experience beginning with its planning and design process through construction, opening day, and continuing on with daily service. At each step we perform critical checks, measured through the lens of the passenger, to ensure that we are on target.

2.1 Passenger Experience

Introduction

The passenger experience can broadly be defined as the impressions made and emotions felt by passengers over the course of the passenger journey. Some of the wide variety of impressions and emotions are impacted directly by the transit system, some are not.

There can be a sense of adventure and accomplishment when navigating to a new part of a city, a feeling of ordered productivity when commuting to work with the ability to check email or read a newspaper, or a sense of elation when meeting up with friends and family and embarking on a journey together.

Sometimes, there's a sense of relief for having made it to the train platform and having a moment of pause from the rush of life's everyday activity.

At other times there could be feelings of boredom, perhaps tempered by curiosity while waiting for the train, causing one to look at one's surroundings more in depth.

Any of these impressions and emotions during a journey can be overwhelmed when expectations of the journey aren't met because of unpleasant surroundings, difficulties navigating the station, or the system not functioning as it should. The Passenger Experience Division within Sound Transit has developed two sets of goals, one service-related and one design-related, and has developed different metrics though passenger surveys and persona workshops to measure performance in attaining these goals.

We will deliver a transit experience that is dependable, safe, clean and available with informed riders; while striving to create an experience that is simple, seamless and intuitive for our riders.

–THE VISION STATEMENT FOR SOUND TRANSIT'S PASSENGER EXPERIENCE DIVISION

This chapter focuses on Sound Transit's approach to two sets of goals. First, the Fundamental Service Goals are used to assess the performance in meeting passenger expectations around dependability, safety, cleanliness, availability, and capability of keeping passengers informed. Second, the Experiential Goals for the Passenger Journey which are simple, seamless, intuitive, and resilient, are utilized to evaluate passengers' impressions and emotions of their journey over the course of their trip from end to end. This chapter also addresses metrics for studying progress towards meeting these sets of goals. Station Design (Chapter 3) and Station Environments (Chapter 4) have additional sets of related guidance and metrics which serve to further reinforce these two basic sets of goals and are summarized in the Evaluation Matrix (Chapter 5).

At its core, the "passenger experience" is a fundamental relationship between passenger expectations and agency execution, through the impact of multiple touchpoints. This manual focuses on the agency's intent, delivered through design, to ensure the experience aligns with passenger expectations. Often transit agencies evaluate success in terms of operational metrics, which do not always put the passenger first.

"Matching industry standard does not mean we are meeting our passenger standards/expectations."

–RUSS ARNOLD, CHIEF PASSENGER EXPERIENCE AND INNOVATION OFFICER, SOUND TRANSIT.

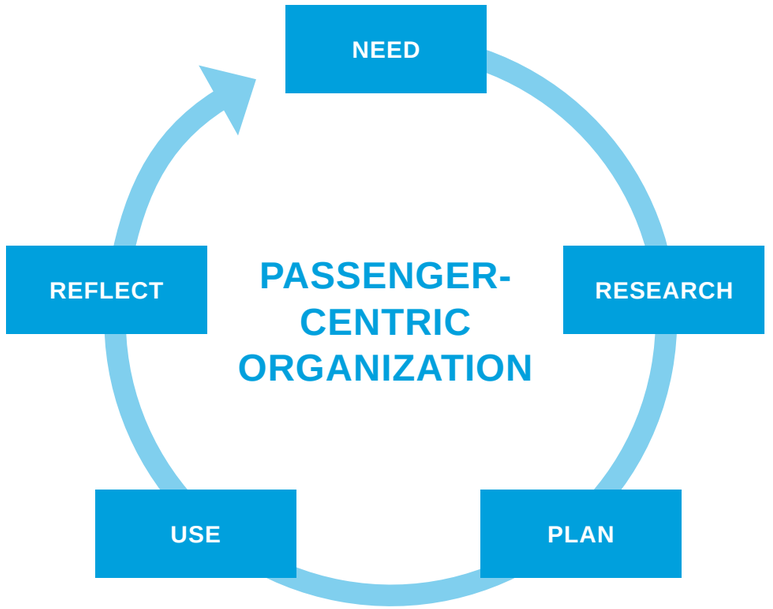


Figure i for 2.1 - This diagram represents the cycle a passenger goes through to plan, execute, and evaluate a journey on the Link system

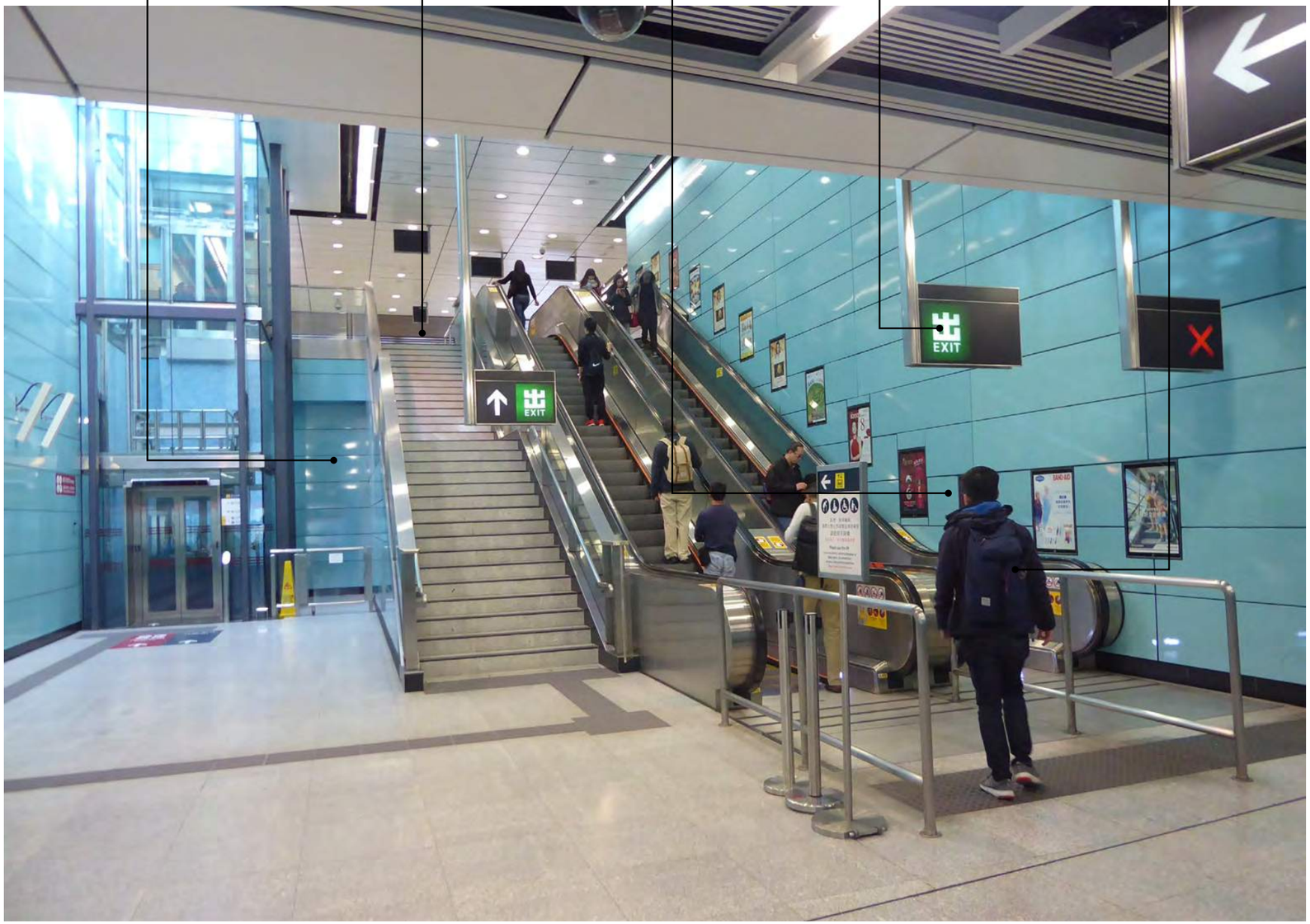


Figure ii for 2.1.1 - As illustrated in this example, by first meeting the direct needs of passengers through the Fundamental Service Goals, the overall quality of the design can then be addressed with the Experiential Goals for the Passenger Journey

2.1.1

The Fundamental Service Goals

The five Fundamental Service Goals, also referred to as "foundational service performance categories", identified by Sound Transit set the foundation that is required to deliver a positive experience. When one of these five dimensions is not met it increases the likelihood of a passenger having a negative experience while utilizing the Sound Transit system. Sound Transit specifically measures these categories as a means of evaluating Sound Transit's effectiveness at delivering passengers' expectations and are defined below:

» **Dependable** - Passengers should expect service to pick them up and drop them off within a consistent window that allows them to have a reasonable ability to plan their lives free from a pervasive sense of uncertainty.

» **Safe** - Passengers should be confident with the current operational condition of the Sound Transit fleet and station facilities. Passengers should also expect an experience free from discrimination, harassment, violence, or the threat of violence.

» **Available** - During normal operations, passengers should have access to their preferred Sound Transit mode including reasonable assistance under the ADA to ensure they can complete their journey. Emergencies, power outages, or maintenance issues may close facilities or alter functionality.

» **Clean** - Passengers should expect service and facilities that are free of excessive trash, graffiti, or vandalism with all fixtures in good working order.

» **Informed** - Passengers should expect rapid notification of service disruptions, awareness of upcoming changes to service, and easy access to schedules and information about their ride.

Sound Transit actively collects data, analyzes, and reports out on these metrics to determine agency performance and identify insights that could lead to improvement. Research tools used by Sound Transit includes peer reviews, researching industry best practice, user-centered design, and public survey work such as the annual Passenger Experience Survey and monthly surveys to Sound Transit's Sounding Board (volunteers from within Sound Transit's service area interested in improving the rider experience, open to anyone who responds to the Passenger Experience Survey). These tools are available to project teams through the Passenger Experience's Research Program. This research-based approach of making service decisions based on data reflects Sound Transit's efforts to use metrics as a tool to reach its goals.

It is imperative that planners, architects, engineers, and designers think about the Five Fundamental Service Goals to positively influence the design during project development and design phases. Waiting until a station opens and service begins is too late and could require costly, time-consuming, disruptive retrofits.

2.1.2

Experiential Goals for the Passenger Journey

Imagine a well-designed station that requires minimal signage to navigate due to how intuitive the station circulation and architecture are, even for a first-time rider. As one arrives on the station platform, one notices the stairs are adjacent to the escalator, maintaining a consolidated regular or alternative path for vertical circulation in case of an outage. There are clear sightlines from one decision point to the next, and people can see up the stairs and escalator to an upper mezzanine from the platform. The space is clean, and one barely notices the cleaning activities because the equipment is stored below a space under the stairs, leaving clear space for passenger path of travel. Passengers have easy access through the station with the full complement of circulation options available within their sightlines, so no stopping or crowding occurs. With the confidence of moving in the right direction, people can interact with each other, notice the artwork floating above the escalator, and be curious about their surroundings. From the mezzanine, passengers feel immediately informed, since they can easily understand the circulation options to the available exits (and how busy those options are) at a quick glance and make decisions with minimal thought. The experience is so seamless that even the first-time rider will walk into the plaza with open, positive mindset, feeling that they are on the correct path towards their destination.

By first meeting passenger expectations around the Fundamental Service Goals, the table is set to address the Experiential Goals for the Passenger Journey. Providing a "simple, seamless, intuitive, and resilient" journey will create a positive experience for passengers. As the design progresses, additional Station Design Principles (3.2) will come into play to help further reinforce these goals:

SIMPLE

Passengers should experience a journey through Sound Transit's stations and vehicles that is sequential and eliminates unnecessary complexity, by providing consistent passenger touchpoints in a consistent and expected order. The experience should be uncomplicated and easily completed (see Universal Design Principles in Appendix B).

SEAMLESS

Passengers should experience a journey that is smooth, continuous, and free from barriers from the beginning to the end of their travel experience. Removing barriers through thoughtful design and operations in terms of physical barriers, as well as touchpoint barriers due to ability and need, should be considered to ensure convenient connections to amenities and easy transfers between modes (see Universal Design Principles in Appendix B).

INTUITIVE

Passengers should be able to instinctively travel through their journey without cumbersome steps and should experience a logical journey with minimal decision points that is easy to learn. Passengers should understand their options at a quick glance, and not be overwhelmed

RESILIENT

Passengers should experience a journey that is responsive to anticipated or evolving operating conditions while upholding a simple, seamless, and intuitive passenger experience. A passenger's journey should have flexibility and redundancy built into the system so that in the event of a planned or unplanned service disruption, they can continue their trip.

During early design phases, Sound Transit "measures" passenger feelings by using design reviews, persona simulations and journey mapping of space to evaluate how well the design is meeting these Experiential Goals.

Figure i for 2.1.2 - Seamless. Easy and intuitive transfers between modes

Figure ii for 2.1.2 - Simple and Intuitive. The experience should be uncomplicated and easily completed.

Simulating personas, discussed in section 2.2, facilitates an examination of station design and helps catch confusing layouts or problems before significant resources are invested, requiring costly retrofits. Journey mapping, discussed in section 2.3, is a particularly helpful tool for identifying service gaps and the impacts of how customer touchpoints are designed for passengers. A journey map is a visual interpretation of the overall story from an individual's perspective of their relationship with a service and the brand, over time and across touchpoints. Often a journey map takes the form of a flow chart that identifies all the points along a passenger's journey to illuminate pain points, generate and analyze ways to solve passenger problems, and improve on or maintain the moments where Sound Transit already excels. The Link journey map will be discussed in more detail in section 2.3.

Sound Transit also makes systematic decisions about station siting (section 4.2) to improve access to support future development goals which works to further enhance these Experiential Goals for the Passenger Journey. The Station Design Principles (section 3.2) provide specific guidance and more detailed implementation strategies as the station design develops. Finally, Sound Transit works to promote equitable development in station areas through its balanced approach in the Transit-Oriented Development program (4.2.7). All of these efforts contribute to the overall passenger experience from the station area to the platform, and all of these efforts have their own additional internal metrics for success. As planners, designers, architects and engineers for Sound Transit, the design team is empowered to positively influence these four Experiential Passenger Goals through project development and design. Program changes, design iterations, change orders and value management/engineering decisions must be analyzed thoroughly for continued adherence to these goals.

A good passenger experience will reinforce a positive relationship between the passenger and mass transit service and encourage passengers to share their positive impressions with friends and family; if the experience is negative, people are less likely to ride again and are more likely to discourage others from riding. Passenger experience can be influenced positively by designing and delivering a passenger-focused, high-quality and safe service.

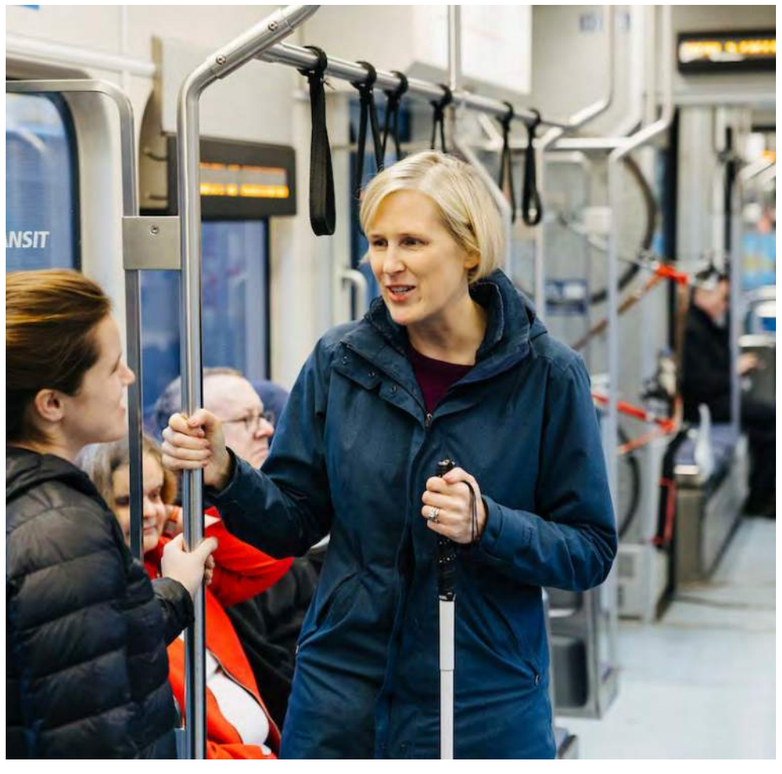


Figure iii for 2.1.2 - Resilient. Flexibility for meeting each passenger's needs

Figure iv for 2.1.2 - The design team should consider how passengers experience stations at different times of the day.

Here is another example:

Imagine, a passenger routinely commutes by taking a Community Transit bus to Link at Lynnwood City Center Station. Their friend invites them to join them at a WNBA basketball game. They do not regularly take transit from home on the weekends but are excited to try it now that Link is open and runs from Lynnwood to UW near the arena. They check the Community Transit trip planning app and use a bus that drops them off at Lynnwood City Center in time to walk across the plaza to the station and catch Link, which also shows up on their trip planning app. Pathways from the bus loop to the station are clear and direct. They only have to cross one lane of slow traffic to connect to the Link station. There is a feeling of safety and conviviality close to the station as people walk along the sidewalks to and from nearby development. Digital signage at the station is clearly visible from the entry and confirms the arrival of Link, allowing everyone to relax and look forward to meeting their friends. They take Link to the Seattle Center Station and follow signs to walk to Climate Pledge Arena. For the return trip they backtrack and use their Sound Transit trip planning app to figure out when to catch Link to arrive in time for their bus home. While waiting for the bus, they are sheltered from a misty rain and pause to look at the glow of illuminated artwork in the distance.

2.1.3

How It All Works Together

Through recurring evaluations of performance in meeting our goals, Sound Transit works to meet passenger expectations and compare performance to industry standards. By additionally evaluating designs for Sound Transit's capital projects in terms of its Experiential Goals for the Passenger Journey, Sound Transit can deliver a comprehensive, inclusive approach in early design phases.

These goals remain constant as design teams delve into station siting and fostering equitable development (section 4.2) and station form (section 3.1), thinking about how to connect passengers to the station's immediate context. As the design develops additional guidance and evaluation metrics are provided. The Station Design Principles (section 3.2)ays out an approach focused the passenger experience within the station while the Access and Approach Design Guidelines (section 4.3) focuses on passenger connections to other modes of transit outside the station. Public Realm and Plazas (4.4) dives into that critical threshold for passengers to become pedestrians and link to other parts of the broader station area to the station seamlessly.

All of these efforts contribute to the overall passenger experience, and they each have their own internal metrics for success. By monitoring these metrics and exceeding the expectations of passengers with designs that serve their diverse array of needs, Sound Transit can positively influence the emotions of riders, enabling them to feel calm, confident, and safe during their entire journey.

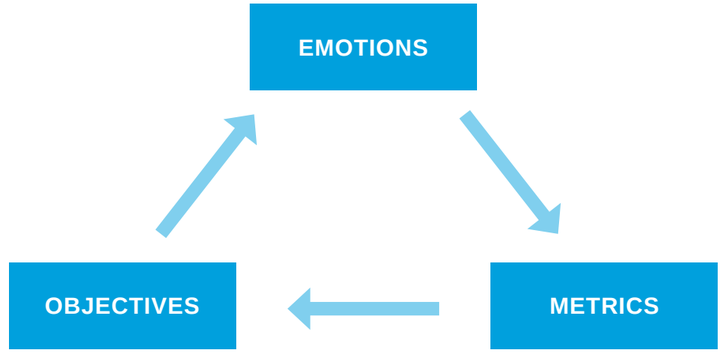


Figure i for 2.1.3 - Constant performance assessment to meet tangible passenger expectations and compare to industry standards

Sound Transit is committed to delivering a passenger-centric service that meets passenger-based metrics. Operational excellence alone does not guarantee a positive passenger experience, or deepening relationship, between passengers and Sound Transit. Sound Transit must also work hard to understand what matters to passengers and meet those demands and needs through design excellence.

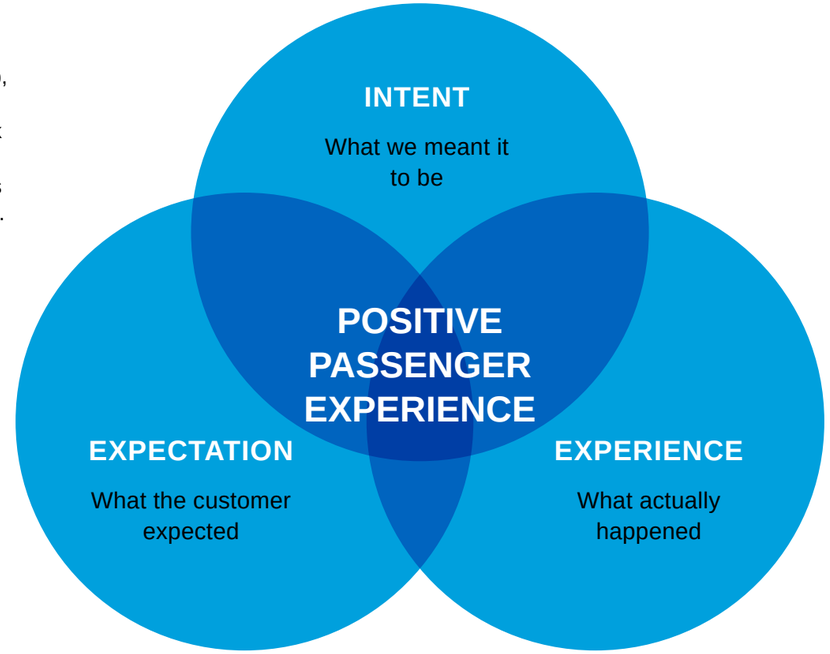


Figure ii for 2.1.3 - A customer experience is a fundamental relationship between customer expectations and company execution through the impact of multiple touchpoints

2.2 Passengers—The Focus

Introduction

Sound Transit's vision is a simple, seamless, and intuitive transit experience that has built in resiliency. Sound Transit believes that passengers from all walks of life will benefit by having their needs put at the forefront during planning and design.

The following sections will introduce the passenger-focused practice of persona work at Sound Transit. This practice provides deeper insight and understanding of the various personas and the characteristics of the riders who use the system. Role playing of personas during design aims to surface passenger experience considerations which can be used for design refinement.

This persona work should be considered at a very early stage of conceptual design, ideally at 5% design but no later than 10%, in order to capture the most value, before the project footprint is established in the environmental process. Important decisions can be made early in the project which positively affect the passenger experience and which can avoid changes later in design.

Figure i for 2.2 - The passengers and their needs are at the forefront of the experience

2.2.1

Universal Design at Sound Transit

Universal design is the design of buildings, products or environments to make them accessible to all people, regardless of age, ability, language skills, or other factors.

In conjunction with a working group of architects, product designers, engineers, and environmental design researchers, architect Ronald Mace led an effort at North Carolina State University to define a set of principles for Universal Design. They are:

- equitable use
- flexibility in use
- simple and intuitive use
- tolerance for error
- low physical effort, and size
- space for approach and use

The American Public Transportation Association has interpreted these for transit agencies with their Transit Universal Design Guidelines . See Appendix B for a more in-depth look at these principles.

At Sound Transit, Universal Design has been interpreted to mean the design of stations and station environments should be understood and usable to the greatest extent possible by all people regardless of their age, size, primary language, or ability. Often design favors the majority or meeting code minimums.

Universal Design is a method for evaluating the quality and robustness of Sound Transit's design, improving the passenger experience for all. It goes beyond ADA requirements and challenges designers to go further to think about equity, simplicity, and usability for users with diverse abilities, which in turn improves station accessibility for all. Not only do people with diverse abilities benefit from Universal Design, but so do people who may have temporary needs (such as an injury that requires crutches), or conditional needs (such as having a stroller or large luggage) that impact their mobility. Universal Design benefits everyone.

In designing for universality, the designer must contemplate the particular set of experiences of individuals that use the transit system. Sound Transit Personas, which are explained in the following section, are a method to accomplish this, and create use cases to test the robustness of the design.

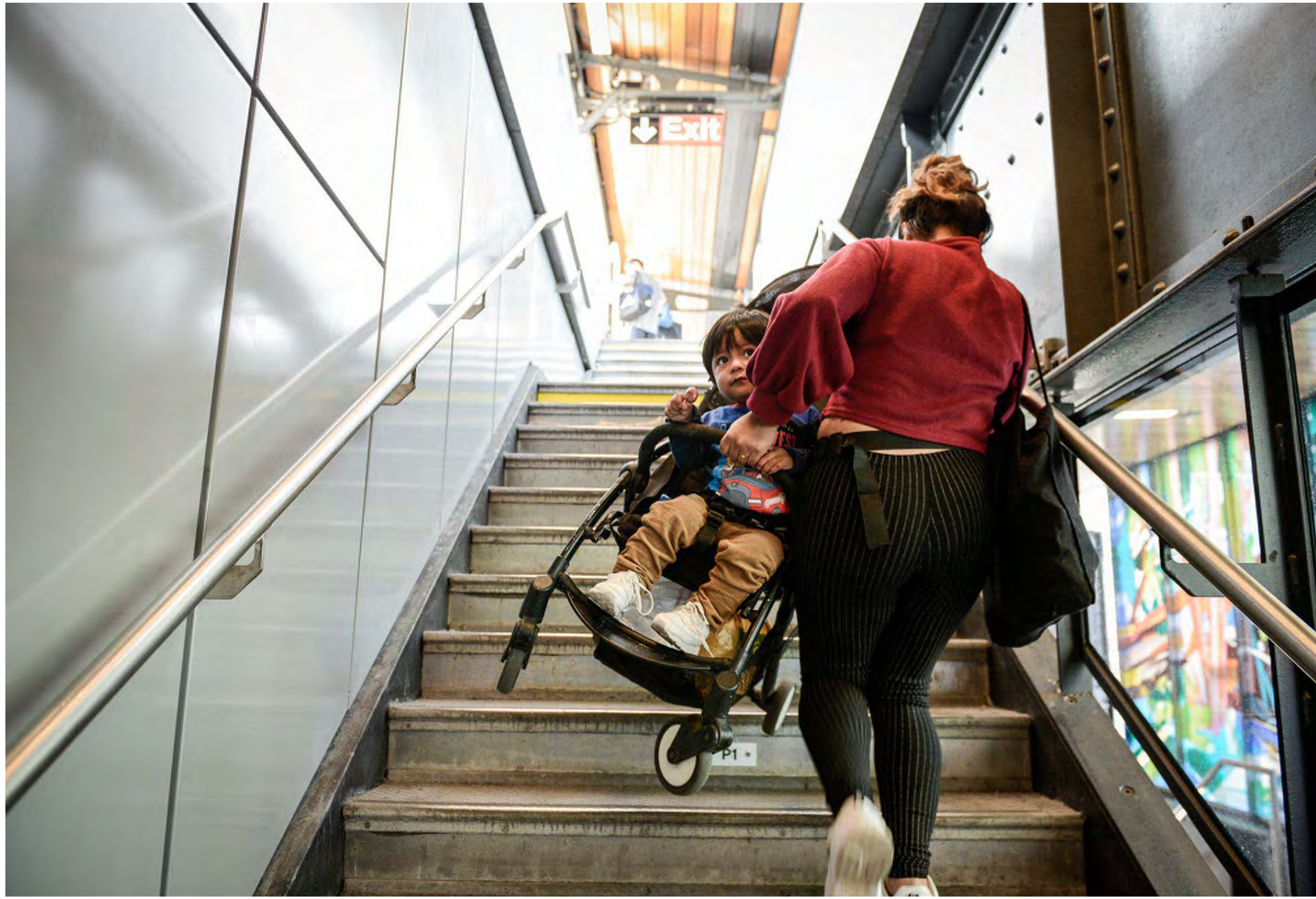


Figure i for 2.2.1 - Universal Design and the persona role-playing exercise go beyond simply meeting ADA requirements to think about the everyday experiences of passengers with additional needs.

2.2.2

The Persona Exercise Explained

Sound Transit has been learning about the passengers it carries within the Link light rail systems and the resulting observations can be organized under these two categories:

A. **How frequently the passenger travels on the system**

B. **Different characteristics based on various degree of ability and need**

Often, Sound Transit passengers (aka “personas”) are a combination of the frequency traits and characteristics below, resulting in a wide range of abilities and needs to be considered when designing the Sound Transit system.

A

Passenger Frequency—How frequently do they ride

How familiar passengers are with the Link light rail system could depend on how often they ride the system. A well thought-out universally designed system will help passengers learn to ride the transportation system, even to a point where it will become second nature to them. This is the result Sound Transit would like to see. However, there are always First-time Riders, Occasional Riders and Regular Riders riding on the system at any given time and their needs are not the same.

A.i

Regular Passengers

» They could be commuters to work or school, or have a similar daily routine, and can be very familiar with specific stations on their routine.

» They are familiar with the system and can move quickly with a minimum of guidance.

» Same regular travel pattern with occasional “trip chaining” like getting groceries along the way.

» They may be accustomed to peak crowding.

» They may connect from or to other modes of transportation on their journey.

» They appreciate and rely on a timely journey every day.

A.ii

Occasional Passengers

» They move easily with great reliance on signs for guidance.

» They could be riders for entertainment purposes, such as shopping or attending a special event (like a festival, theater performance, sporting event or running a marathon)

» Higher percentage observed during weekend and event.

» They may experience concentrated crowding (for example, all riding in a packed train to UW station for a marathon that starts at 7 am in the morning).

A.iii

First-time Passengers

» They may be from out of the Puget Sound Region, visiting for the first time and riding on the system. Some may be riding the system and connecting to/from intrastate or international transportation facilities such as the airport, cruise ship terminal, interstate train station (such as Amtrak), and/or interstate bus station (such as Bolt Bus and Greyhound).

» They may be from the Puget Sound Region but riding to attend a new school, or for a new job.

» They use signage and ticket vending machine and sometimes it could be challenging.

» They may be unaccustomed to and potentially unnerved by peak crowding

» Design of stations should consider first-time users

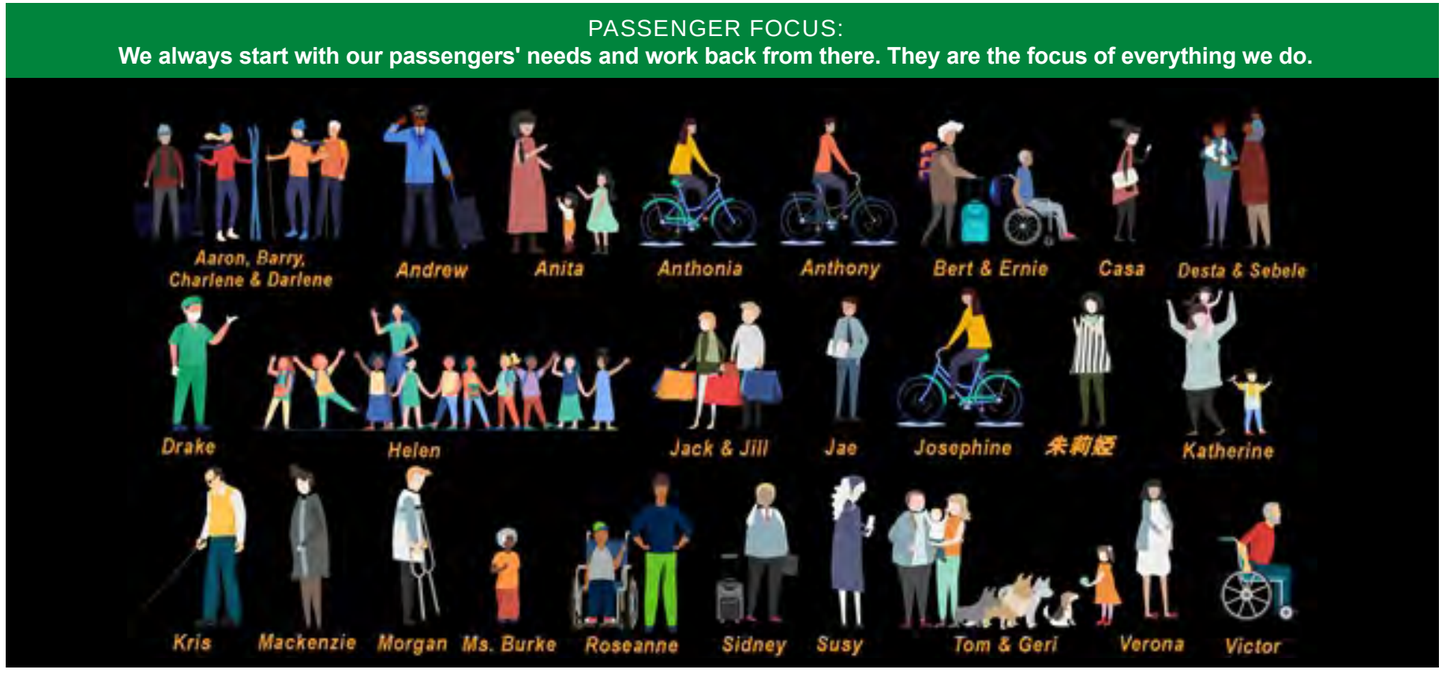


Figure i for 2.2.2 - Passenger personas

B

Passenger Characteristics - Riders with various ability and needs

The following is a list of characteristics of passengers representing a wide range of ability, as observed by Sound Transit. Note that a persona can have multiple abilities. The intent of the list below is to assist the designer to understand the everyday needs of passenger while traveling on a public transportation system.

B.i

Passengers with Limited English Proficiency (LEP riders)

» They use station features, such as color and art on the platform, and icons, such as universal symbols, to navigate and determine what station they are at and when to deboard the train.

» Some even go on a scouting trip to practice their rides.

» They will be affected more than other riders when there is a service disruption.

B.ii

Passengers who are tourists

» They could be new to the area and unfamiliar with landmarks that would normally be used to orient a traveler along a typical journey.

» Some tourists are familiar with riding transit in other countries. They will look for color and similar symbols that they encounter on other transit systems.

» They will likely be traveling with belongings, such as luggage.

B.iii

Passengers traveling with family and/or children with strollers

» Most seen riding during the weekend.

» They could be traveling with a stroller for a small child or twins.1 They will use elevators.

» They make frequent stops along their path to adjust to the family needs, such as grabbing a bottle or snack for children, or repacking their belongings.

» They could be looking for restrooms along their journey.

» They tend to travel at a slower speed and take their time along the journey.

B.iv

Passengers traveling with belongings

- Most seen traveling with luggage and carrying bicycles, and micro-mobility devices such as skateboards, etc.
- They are encouraged to use elevator instead of escalators.
- They need space to maneuver around static objects along the journey and navigate around crowds.
- They need space to store their belongings without blocking other passengers along the journey.
- They tend to pause at all decision points (such as fare validation) to look for storage, maneuvering space, etc.

B.v[1]

Passengers who are women[1]

- More women make multiple trips (7 or more) per day than men
- They may make shorter trips than men, which is potentially driven by workforce participation rates, location of employment opportunities, and taking household–serving trips that tend to be more localized.
- They are more likely to trip-chain, or make stops along the way to other destinations
- They are more likely to travel mid-day, when transit service may be reduced.

B.vi

Passengers who are women and pregnant

- They may need more space and typically have high concerns for personal space.
- They may need access to restrooms.
- They may need more time and need access to vertical conveyances depending on the trimester.
- They may need places to sit and rest.

B.vii

Passengers who are senior

- They may have varied cognitive ability based on age.
- There is a different fare structure for seniors, which can add to confusion about rules for riding or paying.
- Depending on their physical ability, they may need more time to board and deboard the Link Light Rail vehicle and may need access to vertical conveyances in the station.
- Visual ability may vary, and they may appreciate larger visual information.
- They may have hearing impairment, and be traveling with an assistive devise, such as a walker or cane.

B.viii

Passengers who are youth

- They have varying cognitive ability based on age.
- They sometime have passes provided by school and are unaware of how to use them at first.
- There is a different fare structure for Youth, which can add to confusion about rules for riding.
- There could be security concern for younger-age passengers traveling alone.

B.ix

Passengers who are technology literate

- They seem to be engaged with their phones all the time.
- They prefer mobile payment
- They tend to rely on technology and prefer to use apps to ride Link and to navigate stations, such as chatbots, rider alert notifications, trip planners, etc.

B.x

Passengers who are technology illiterate

- They depend on signage and maps and other information posted at stations on how to ride.

B.xi

Passengers with mobility assistance devices

- Most notable are passengers with walking disabilities who rely on devices such as a wheelchair, scooter, walker, crutches and cane. Walking disabilities can also be temporary, such as caused by injury, and traveling on Link light rail during a rehabilitation period.
- They need space and can take time for their travel.
- They rely on vertical conveyances, and trips can be highly disrupted when vertical conveyance equipment is out of service, especially when there is no redundant equipment nearby.

B.xii

Passengers with hearing impairment

- They will not be able to follow any audible cues.
- Rules or service warnings need to be delivered visually for them to understand.
- They may have challenges communicating with other passengers or asking Sound Transit staff questions.

B.xiii

Passengers with visual impairment[2]

- They will not be able to follow visual cues.
- Rules or service warnings need to be delivered audibly for them to understand, or designed with features that are recognizable by touch, sound, light and smell.
- They will have trouble with conflicting and confusing pedestrian movements and can be lost when their regular routing is disrupted due to abnormal operation, such as single tracking or vertical conveyance outages.
- Passenger with colorblindness will have difficulty in differentiating colors, commonly between green and red, and occasionally blue.

B.xiv

Passengers with speech impairment

- They will have challenges communicating with other passengers or asking Sound Transit employees questions.
- They possibly need more time when communicating.

Figure i for 2.2.2.B.iv - Passengers with luggage

Figure i for 2.2.2.B.ix - Passengers who are technology literate

[1] Understanding how women travel – LA Metro (http://libraryarchives.metro.net/DB_Attachments/2019-0294/UnderstandingHowWomenTravel_FullReport_FINAL.pdf)

[2] Architect goes blind, says he's actually gotten better at his job, https://www.cbsnews.com/news/architect-chris-downey-goes-blind-says-hes-actually-gotten-better-at-his-job-60-minutes-2019-08-11/

B.xv

Passengers with service animals

» Their service animals can be confused about the rules.

» Other passengers around the animals may not feel comfortable.

» Animal can get lost or get confused or disoriented, and may create a safety hazard for themselves or other passengers in the car or on the platform.

B.xvi

Passengers with pets[1]

» Same as passengers with service animals.

» As of the time of the publication, and according to the Rules and etiquette on Sound Transit website, “Pets may ride if they are carried in small containers.” See Passengers traveling with belongings for more information.

B.xvii

Passengers who are below or above average height or above average weight[2]

» Standard amenity design may not be fully functional for them, such as TVM or elevator button height, hand holds on vehicles, and standard seat widths

B.xviii

Passengers with cognitive disabilities

» They may have difficulty with orientation, concentration, judgement, problem-solving skills and coping skills.[3]

» They may also have compromised short-term memory, and may lack the ability to seek and act on directions, to process information, and to communicate their needs.[3]

B.xix

Passengers traveling in large groups

» Most commonly found in teacher-lead group of students on a field trip

» They occupy more space and may travel at a slower pace.

Figure i for 2.2.2.B.iii - Passengers with children and strollers

Figure ii for 2.2.2.B.iv - Passengers with bicycles

[1] Link to current Rules and etiquette when riding with Sound Transit, see https://www.soundtransit.org/ride-with-us/know-before-you-go/rules-etiquette.

[2] Why design should include everyone – Sinead Burke https://www.youtube.com/watch?v=RD_SLJG7oi8

[3] Transit Universal Design Guidelines – Principles and Best Practices for Implementing Universal Design in Transit – APTA (July 28, 2020) https://www.apta.com/wp-content/uploads/APTA-SUDS-UD-GL-010-20.pdf

2.2.3

Applying Role Playing in Design

Sound Transit has initiated a passenger-centric approach to station design that includes passenger touchpoints along a rider’s journey with Sound Transit.

Sound Transit has adopted a Passenger Experience Workshop practice for projects from project development phase to final design. The workshop is a passenger journey mapping exercise, where the design team and Sound Transit staff walk through the entire Sound Transit journey with different types of passengers (aka personas), analyzing each passenger touchpoint along the way, such as: walking into the station entrance, transferring within the Link light rail system, to exiting the station. This series of touchpoints is shown as a diagram called a Passenger Journey Sequence on Link and is essentially a flow chart outlining the steps required by passengers to navigate Sound Transit’s Link light rail system (refer to Figure i for 2.3.1). Using these tools enables the design team to fine-tune the design for a better passenger experience as the design advances. Additionally, performing this work early in Conceptual Design, allows for changes to be incorporated with minimal cost and impact, yielding the most value. The first Persona Workshops should ideally occur at 5% design, and no later than 10% design.

Fictional characters are assembled with various characteristics from Section 2.1.3 to create “personas”. The journey describing how these characters are traveling on the Link light rail system is provided for Sound Transit employees and design consultant professionals to role play over the conceptual layout of the station design in various small teams composted of diverse cross-functional subject matter experts. Team members are charged with giving feedback in service not to their discipline, but to the passenger persona assigned to them. Through small team discussion during the role play, team members focus on the emotions of the passengers as they role play through the journey of navigating the design of the station assigned to them for analysis. The small team discussion then focuses on the negative emotions caused during the journey of their persona within the station, and documents their observations of the cause of those negative emotions at each relevant touch point, then they look for considerations/recommendations on the design layout that could revert those negative emotions into positive emotions.

In addition to project development, this Persona Journey Mapping Exercise can also help inform passenger considerations through the life of the design, such as final design and value management workshops. This exercise has since been applied to inform transit service planning and can further be applied to vehicle procurement, operating procedures, and even Sound Transit policies concerning passenger experience.

For more information on how to plan, organize and facilitate a passenger experience workshop, please coordinate with Passenger Experience Department.

2.3 Passenger Journey on Link

Introduction

The passenger journey sequence on Link is a step-by-step journey taken by passengers when coming into, navigating through, and leaving a station. Even though passengers may not recognize the steps in this sequence, they are subconsciously going through it. However, passengers will notice if the sequence is different or interrupted. Designing stations to follow the sequence of this step-by-step journey will provide the passengers a consistent experience when riding the system, no matter if it is their daily routine to a frequently travelled station or adventuring to a new station for the first time. Passenger-focused station design will help passengers learn this step-by-step journey sequence, and it will become second nature. This breaks down barriers when traveling throughout the entire Link light rail system and brings confidence, as Sound Transit connects more passenger to more places. This also contributes to a simple (due to the same sequence, no matter if it is an elevated station, at-grade or tunnel station), seamless (breaking down learning barriers) and intuitive (easy to learn) riding experience.

The following sections further describe the passenger experience during normal Link light rail operation, as well as during planned and unplanned disruptions (also see the Tables in Appendix F). It is the intent of this manual to provide this information to the designers so that passenger experience during these other operating scenarios can be considered in the design. When considered in design, accommodating passenger needs during both planned and unplanned scenarios enables resiliency among passengers.

Figure i for 2.3 - Striving for a simple, seamless, and intuitive riding experience

2.3.1

Passenger Journey Sequence

A journey is an act of traveling from one place to another. The beginning of the travel is called the “Origin” and the end of the travel is called the “Destination”. For example, a passenger travels from home to work. Home is the “origin” and Work is the “destination”. For the return trip from work to home, Work is now the “origin” and Home is now the “destination”. To complete these journeys, Link light rail can be a form of transportation that this passenger uses to ride between their origin and destination.

Figure A shows the step-by-step sequence that a passenger will encounter when riding on Link light rail from their origin to destination. Note that the step-by-step journey sequence will differ based on different modes of mass public transportation.

Link Step-By-Step Sequence:

Step 1

» A passenger will travel through the origin station environment to get to the Station Entrance.

Step 2 through 6

» The passenger will then encounter the various elements of the “Origin Station,” including “Station Entrance”, “Unpaid Area”, “Fare Validation”, “To platform” and “At platform”.

Step 7

» The passenger will then board the train.

Step 8 through 10

» If the journey requires a transfer, the passenger will encounter the “Transfer Station” that includes “At Platform”, transfer “To Platform” of their connecting train, and “At Platform” of their connecting train.

Step 11

» The passenger will then board the train and if their journey requires a transfer, then the passenger will encounter another “Transfer Station”. See Step 8 through 10.

Step 12 through 16

» If the passenger arrives at their destination, then the passenger will encounter the “Destination Station” that includes "At Platform", “Exit Platform”, “Fare Validation”, "At Platform", “Unpaid Area”, and “Station Exit”.

Step 17

» The passenger will then leave the “Destination Station” and encounter the “Station Environment” to continue to their destination.

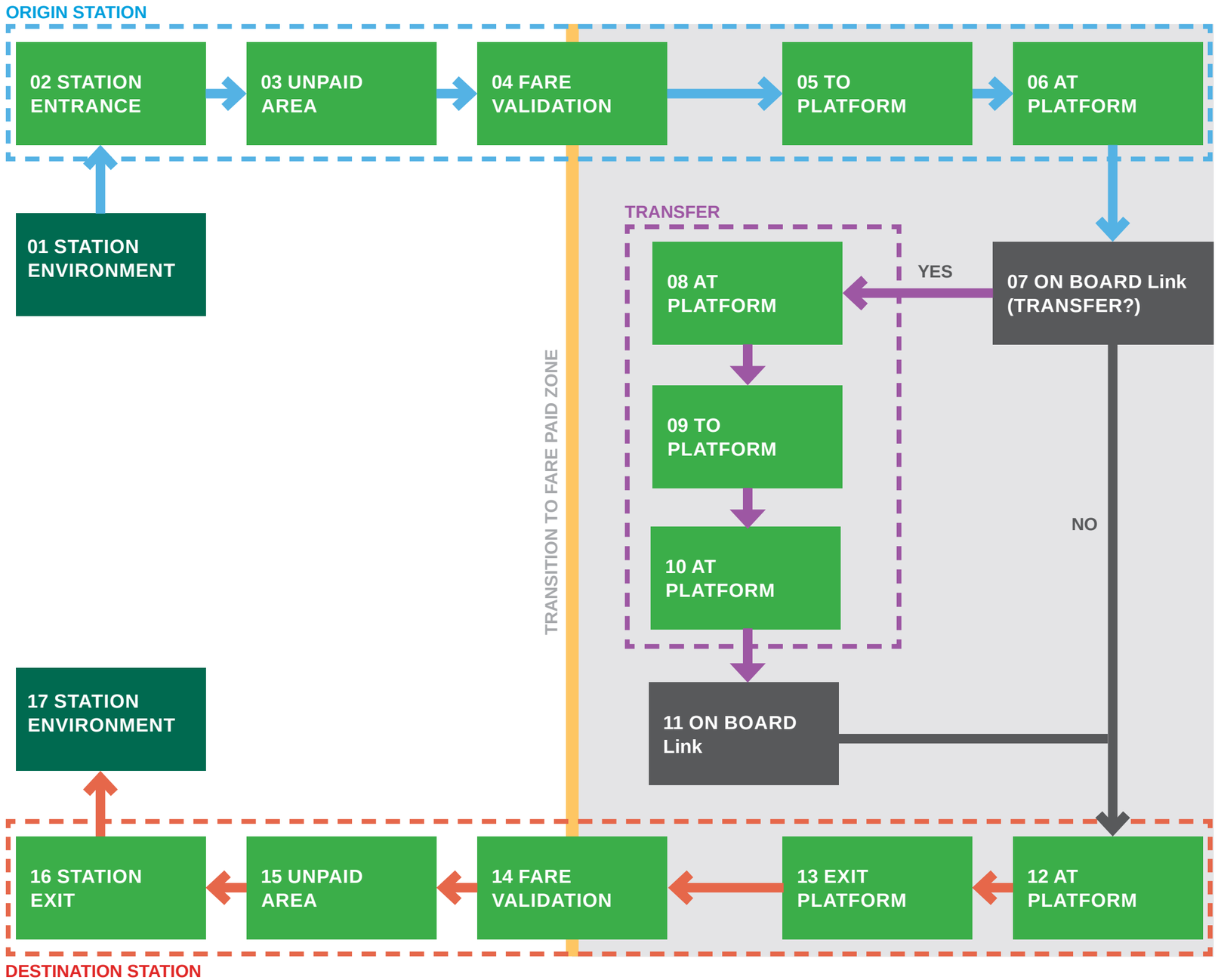


Figure i for 2.3.1 - Sound Transit's Passenger Sequence on Link

2.3.2

The Concept of Passenger Flow

2.3.1 describes the sequence of the passenger journey. The passenger movement can also be analyzed as the concept of flow, similar to how water flows. If the inflow of water exceeds the pipe capacity or pump in the system, water will start to back up from the constraint. Similarly, if the demand of the passenger exceeds the design capacity of the station, or the capacity of the Link light rail vehicle and its frequency, the passenger will start to back up from the point where the constrained capacity occurs.

Figure i for 2.3.2 - Passenger flow at Capitol Hill Station

A

Level of Service and Surge Conditions

Chapter 10 of the Transit Capacity and Quality of Service Manual (TCQSM) (Third Edition 2013) reviews the concept of Station Capacity Level of Service, which is derived from the Highway Capacity Manual (HCM) (Sixth Edition 2020). It is a useful means of evaluating the capacity and comfort of an active pedestrian space.[1] The Level of Service (LOS) measure is based on the proximity of passengers in walkways and queuing areas. For walkways, the Level of Service ranges from free flowing (Level of Service A) to mobility severely restricted (Level of Service F). For queuing areas, the Level of Service ranges from free circulating through the queuing area (Level of Service A) to virtually all persons within the queue standing shoulder to shoulder (Level of Service F). Comfort for passengers ranges from the most comfortable in Level of Service A to feeling high discomfort in Level of Service F.

Sound Transit station design capacity is determined by passenger demand volumes under weekday peak-period conditions. During the environmental documentation process, Sound Transit aims to balance sizing the station elements for peak-period condition using the design year ridership forecast based on maintaining a desirable Level of Service C for passengers, as well as meeting the requirement for emergency evacuation situations to the applicable municipal codes.

Passenger flows and appropriate Levels of Service under other planned and unplanned operating scenarios, such as during service disruptions and special events, shall also be taken into consideration during the planning and design of the station.

Some passengers during typical peak may be willing to tolerate a greater degree of crowding than occasional transit passengers, if such crowding is typical.[2] Sound Transit has also observed tolerance for a greater degree of crowding during special events. Under these operating scenarios where passenger flows are drastically increased for relatively short periods of time, the individual passenger would likely be more tolerant experiencing Level of Service D or E comfort. In some situations, interventions (such as metering) could help maintain a more desirable and comfortable Level of Service.

The TCQSM also suggests adequate queuing area for escalators to be based on an average passenger space of 5 square foot per person, which suggests that passengers may be more tolerant of Level of Service D[3] comfort during this situation.

[1] *TCQSM Chapter 10, Page 10 - 13*

[2] *Per Passenger Flows in Underground Railway Station Platform by Mineta Transportation Institute - page 18.*

[3] *TCQSM Exhibit 10 - 32 in Chapter 10 Station Capacities - Station Elements and Their Capacities*

Passenger Level of Service

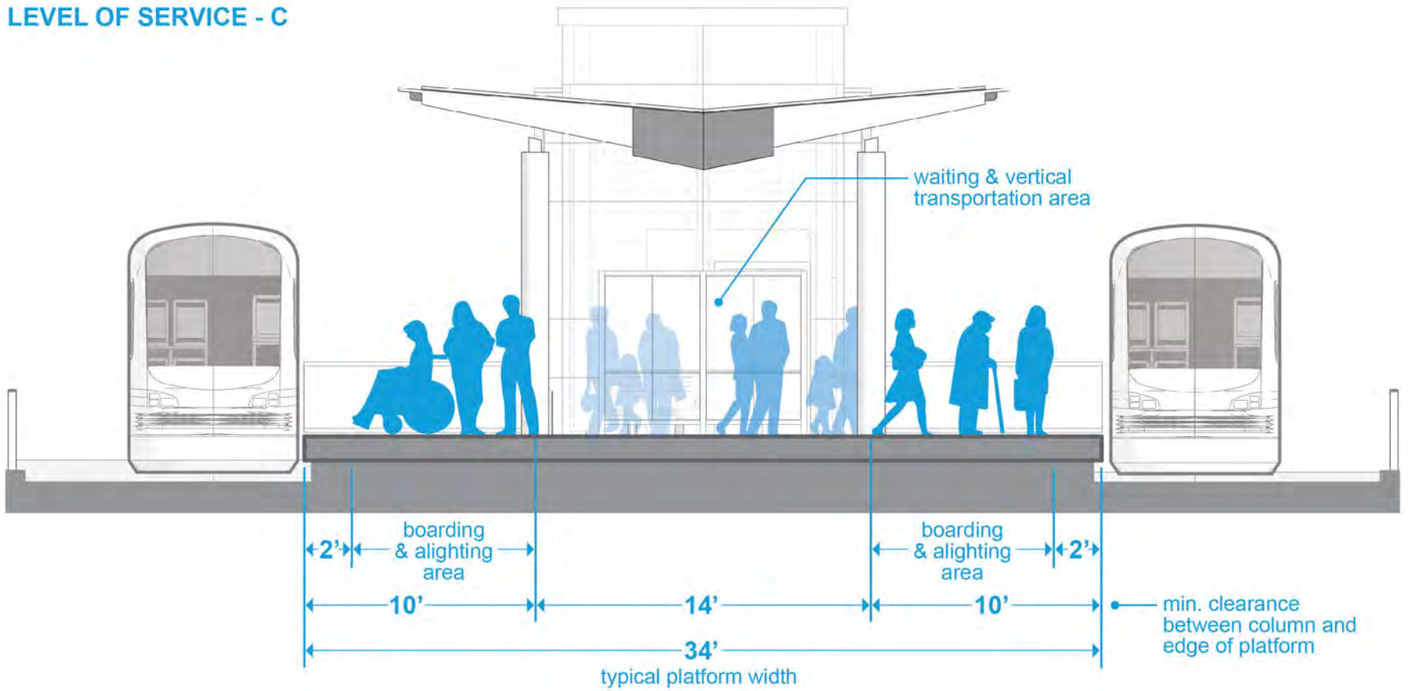


Figure i for 2.3.2.A - Station design targeting Passenger Level of Service C

	A	B	C	D	E	F
WALKWAY	Free walking speeds, few conflicts	Free walking speeds, some conflicts	Free speeds, minor conflicts for cross movements	Walking speed and passing is restricted	Walking speeds and passing only possible by shuffling	Walking speeds are severely restricted, unavoidable conflicts
QUEUING	Standing and free circulation without disturbing others	Standing and partially restricted circulation to avoid disturbing others	Standing and restricted circulation with some disturbance	Standing with touching and restricted circulation	Standing with uncomfortable physical contact	All persons standing in direct physical contact

Figure ii for 2.3.2.A - Passenger Level of Service descriptions

B

Elements of Passenger Flow within a Station

Overall capacity is only as great as the most constrained element. Passenger flow breaks down when pedestrian crowding becomes too dense, resulting in restricted and uncomfortable movement. Therefore, especially for high-capacity and transfer stations, it is important to understand the constrained element within the station. The goal during design development is to appropriately size these elements as a system, allowing for operational flexibility to facilitate comfortable and efficient passenger movements to the extent feasible under normal operation and other potential planned and unplanned operating scenarios. Bi-directional flow provides passenger convenience and choices. Accommodating demand while optimizing the efficiency of the facility will yield the highest capacity. Providing resiliency to demand and event-driven surges and maintaining a reasonable quality of service during planned and unplanned scenarios such as delays, partial system closures, and station maintenance.

Within the station, the following elements work together as a system to facilitate passenger movements:

- Station Entrance/Exit
- Ticketing Vending Machine
- Fare Validation Threshold
- Horizontal circulation (such as corridors or walkways)
- Vertical circulation (such as stairs, escalators and elevators)
- Elevator lobby (especially for elevator only station access)
- Platform circulation and queuing area storage
- Train doors of Link light rail vehicle (note that capacity is only available for passenger to walk through the door, when the train door is open)
- Available capacity on Link light rail vehicles for passenger to board

In highly complex stations, with unpredictable flows caused by nearby special events, simulation models can be used to further assess passenger movement and interactions (including various passenger types) to inform the design of the station, as well as strategy when managing a surge demand of passenger flows. Consideration shall be given to methods for managing passenger flow in the station environment to ensure comfortable Levels of Service within the station and larger system.

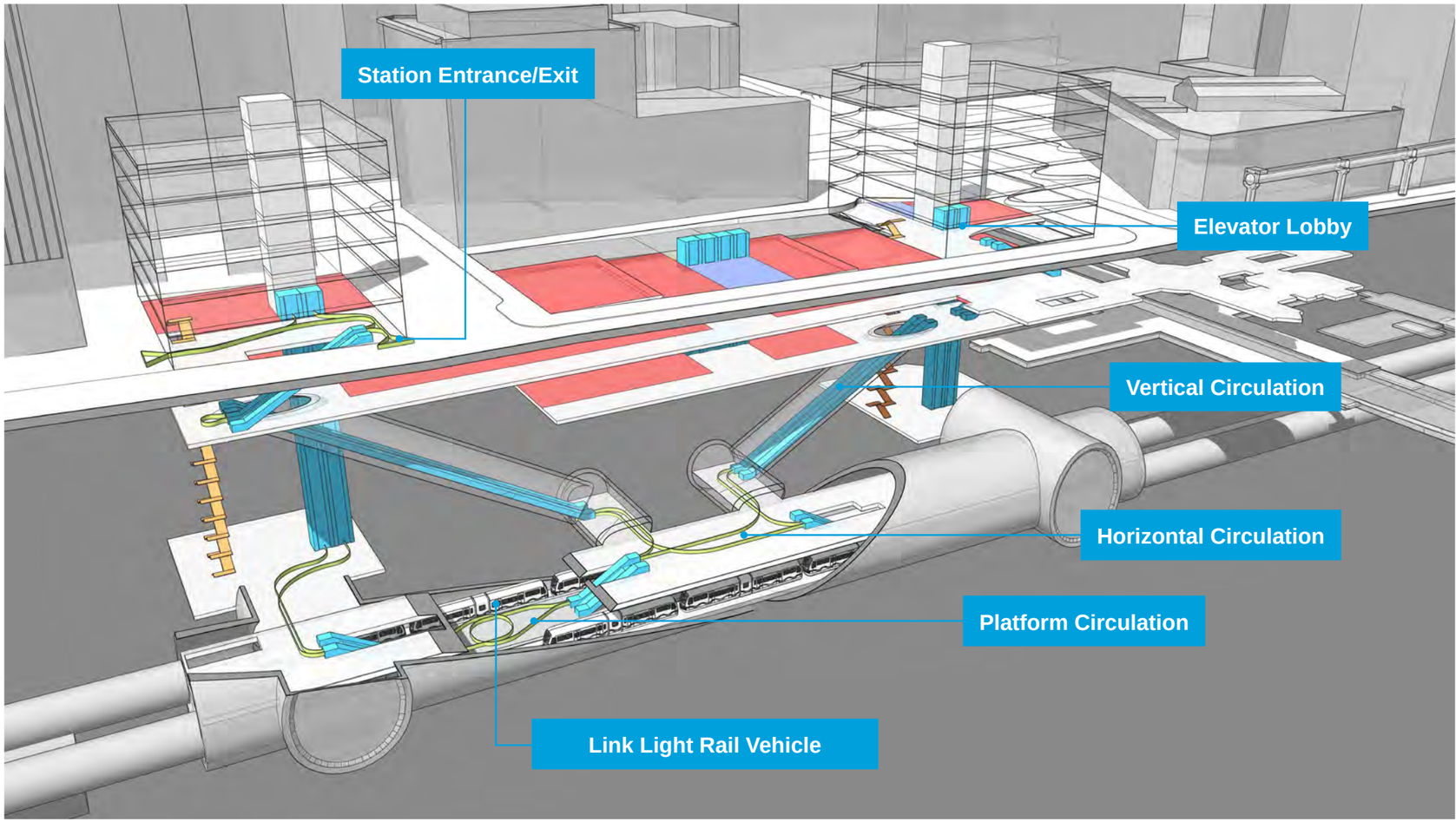


Figure i for 2.3.2.B - 3D section highlighting the elements of passenger flow within a station.

Figure i for 2.3.3 - A passenger purchasing a ticket at a TVM

2.3.3

Passenger Decision Points and Wayfinding

A

Decisions Passengers must make while riding Link

A “decision point” is a place or point in time along the passenger journey where a passenger must make a choice, often crucial to the navigation of Sound Transit’s stations. Decision points occur at each of the steps listed above in the journey sequence. To aid in decision making, the sequence of decision points should be consistent throughout the system for each of the three station typologies in Chapter 3 and station environments in Chapter 4. This will create a passenger journey that is consistent across the network and promotes intuitive navigation, as it requires passengers to make the same decisions in the same consistent and sequential manner at each station.

B

Passenger Wayfinding

Wayfinding encompasses all the ways passengers orient themselves in physical space and navigate from place to place. Signage (Section 3.2.2) is one tool for wayfinding but it should not be the only, or even the primary, tool. By logically orchestrating the passenger journey sequence and passenger flow through the careful placement of decision points, and ensuring clear sight lines between them, the journey becomes intuitive.

C

How design can simplify the decisions that a Passenger needs to make

Designing the layouts of stations and station environments in a consistent sequence will simplify decision points for passengers. To aid in decision making, station layouts should provide clear direction, sight lines, space, and safe path of travel for optimal passenger flow between journey steps and accompanying decision points (see Station Design Principles in section 3.2). From the station entrance to the platform, the journey should be seamless, the spatial layout enabling intuitive passenger navigation, providing cues for movement rather than forcing a reliance on signage.

2.3.4

Planned and Unplanned Scenarios on the Passenger Journey

This section further defines the basic function of each step in the passenger sequence and describes the passenger experience and relevant decisions passengers must make on a journey sequence when riding Link light rail.

A

Normal Operation

» From the transit provider's perspective, normal operation means the operation between the startup phase and shut down phase for day-to-day function of the transit system. From the passenger's perspective, normal operation starts at the opening of the station, with first light rail train available for passengers to board, and the closing of the station aligns with the last light rail train for passenger to de-board. (See Appendix F.1 for a Table of the desired passenger reactions.)

B

Normal Daily Shutdown

Normal daily shutdown is the nightly period when the transit system is not open for passenger use. While passengers may be aware of the operating hours of the Link light rail system, there could be some passengers who are not aware, such as travelers who arrive after midnight at Seattle Tacoma International Airport. They may experience the station when it is closed for passenger use. While they would be unable to use the system, it is still a touch point with passengers, so this experience shall also be considered in the design. (See Appendix F.2 for a Table of the desired passenger reactions.)

C

Planned and Unplanned Scenarios

Besides day-to-day operation, a passenger may experience planned or unplanned disruptions when riding the Link light rail system. The intent of this section is to describe the passenger experience during these scenarios so designers can focus on considering this passenger experience and incorporate resiliency in the design. The design should enable a passenger experience that remains simple, seamless, and intuitive enough for passengers to react swiftly and confidently in the event of a planned or unplanned scenario.

C.i

Passenger Surge

Passenger surge refers to a sudden rise of passenger volume along any portion of the journey sequence. Passenger surge exceeding the design capacity of the system will create congestion along a passenger's journey. An example of a typical surge is when passengers deboard Link light rail at the same time and exit the station platform via the vertical circulation.

For passenger surge from a planned event and to prioritize safety and access to the Link light rail systems, Sound Transit may expand the use of passenger flow management strategies. **Figure i** shows that the Link light rail system, Station Design and Station Environment are all inter-related and that at the center of it is passenger flow management.

The most common planned passenger surge is an event, such as a planned sold-out sport event or concert at a venue located within the station environment of the station. Ahead of the event, Sound Transit will coordinate transit service with the venue, event organizer, local jurisdiction and other transportation agencies. If the anticipated passenger surge volume exceeds the capacity of the Link light rail system, Sound Transit will plan and deploy passenger flow management strategies at stations, such as:

» Metering at the entrance to vertical circulation or at station entrance.

» Entrances may be restricted to allow for a safer and smoother passenger flow. For example, one-way circulation through the station may be established.

» Elderly and mobility impaired passenger may be given priority for elevators.

» Able bodied passengers will be encouraged to use stairs.

The goal of passenger flow management is to achieve the balance between managing passenger flow outside the station (within the station environment) and maintaining safe and efficient operations within the Station, as shown in the figure below.

Passengers can also experience unplanned passenger surge. Unplanned passenger surge can be a result of an adverse weather event, an incident on the system, or a sudden closure of a major freeway or arterial where light rail is the preferred (and sometimes only) choice of transportation mode.

(See Appendix F.3.1 for a Table of the desired passenger reactions.)

Why passenger flow management?

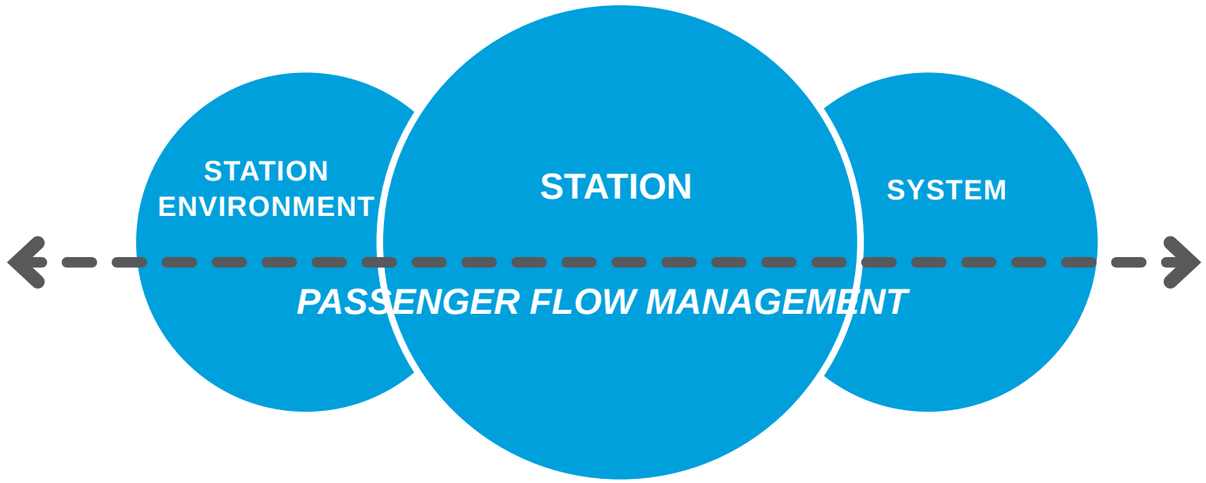


Figure i for 2.3.4.C.i - The Link light rail system, Station Design and Station Environment are all inter-related and at the center is Passenger Flow Management.

Achieving Balance

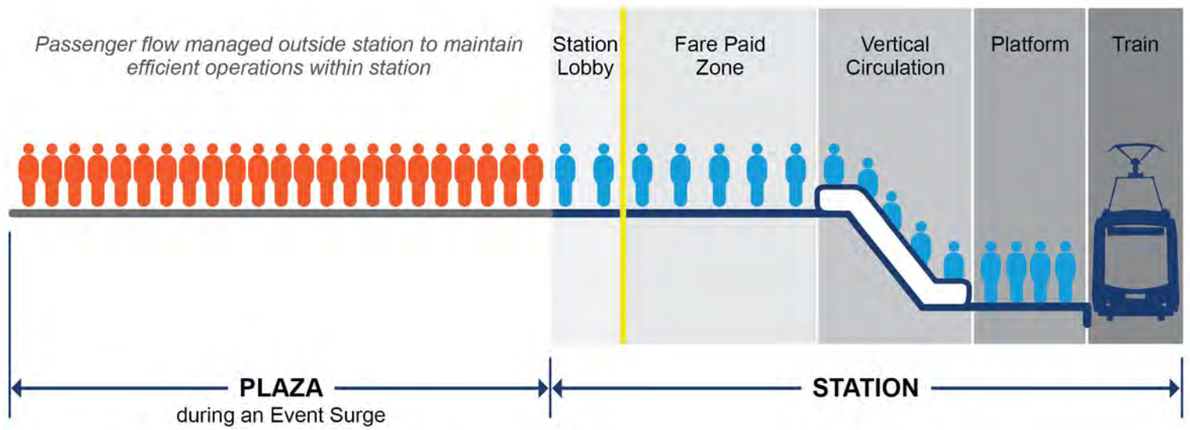


Figure ii for 2.3.4.C.i - Passenger Surges at Event Stations can be managed outside of the station entrance

C.ii

Single Tracking

Single Tracking refers to when only one of the double two-way tracks is available for operation, forcing operations in both directions to use a single track. The two-way Link light rail traffic will need to take turns traveling on the available track. The section of tracks utilized for single tracking are between two crossovers. As a result, train frequency will be reduced and passengers going in both directions will use the same platform. This creates yet another experience for passengers.

Planned single tracking operation can occur to facilitate trackside maintenance activities or for construction of future system expansion.

Unplanned single tracking operation can occur when a train breaks down or when the train track is blocked by an incident on the trackway.

(See Appendix F.3.2 for a Table of the desired passenger reactions.)

C.iii

Disruption of Service (with Light Rail Service Substitution)

Disruption of Link Light Rail service occurs when a section of tracks that serves both directions of travel is out of service, and Light Rail operations cannot be maintained at the stations within this section of shutdown tracks.

Typical planned disruption of Link light rail service occurs to facilitate trackside maintenance activities or for construction of future expansion connections. Due to stations and track being closed a substitute Link light rail service will be planned, usually in the form of shuttle buses, to provide transportation along the route of the closed stations and serve the gap between the nearest operating stations on both ends.

Unplanned disruption of Link light rail service can occur when both tracks are blocked due to incidents. This could lead to a section of tracks not being able to be in service between two crossovers. Link light rail service will not be able to provide at the stations within the section of tracks that are not in service. Given that this is unplanned, Link light rail service will be disrupted and a substitute service, such as shuttle buses called “Link Shuttle”, will take time to be established. Passengers will need to seek an alternative form of transportation to complete their journeys and will be looking for information to help complete their trip and make alternate mode transfers.

(See Appendix F.3.3 for a Table of the desired passenger reactions.)

C.iv

Station Closure

Station closure is when a particular station is closed and not available for passengers to enter, board and deboard the train at that particular station.

Planned station closure is rare; however it can occur due to major overhaul of maintenance activities as the transit system ages. A Link light rail substitute service can be provided during planned station closure to provide the connecting service for passengers between the closest station at each end of the portion of the route that is closed.

Unplanned station closure can be caused by an incident within a station, a localized power outage, and even station equipment malfunctioning. Link light rail service can still operate through the closed station, treating it as a “pass-thru station”, without passengers boarding and deboarding at the station. If Link light rail service cannot operate through the closed Link light rail station, this will result in an unplanned disruption of Link light rail service.

(See Appendix F.3.4 for a Table of the desired passenger reactions.)

C.v

Elevator and Escalator Outage

Escalators and elevators are machines that transport passenger from one level to another level within a station. It is a mode of transportation just like the Link light rail vehicle. These machines can at times be out of service.

Planned escalator and elevator closures typically occur during maintenance or replacement of these machines. It will create a disruption for passengers who depends on these machines for their journey. An alternative re-route will be provided for these passengers.

Unplanned escalator and elevator closure typically occurs when the machine is malfunctioning, a safety switch is triggered, or when an incident occurs that damages the machine and causes it to be inoperable. Passenger will need to look for alternative ways to travel from one level to another level of the station to complete their journeys and will look for information to assist them.

If vertical conveyance is out of service, passengers should not be forced to go to another station in order to enter or exit the Link light rail system. Designs must include redundant vertical circulation (See Chapter 3). Passengers should not be forced to cross the trackway in order to access a station’s redundant vertical circulation.

(See Appendix F.3.5 for a Table of the desired passenger reactions.)

Figure i for 2.3.4.C.v - A variety of passengers depend upon functioning elevators at stations to meet their daily needs.

2.3.5

Scenario Planning and the Passenger Expectation Management Plan

A station design that considers the normal, planned and unplanned operating scenarios will help bring a consistent journey experience for passengers, as well as ensure resiliency. During project development, which is conceptual engineering to preliminary engineering, the design team shall collaborate with the Passenger Experience Department to schedule workshops to consider the passenger experience during normal, planned and unplanned operating scenarios. The goal is for these passenger experience considerations to inform the preliminary design. Design teams must document design features that support the passenger experience requirements outlined in this manual and track their incorporation into the design (see Chapter 5). In the event that the desired passenger experience cannot be achieved through the design solution or design features change, a “Passenger Expectation Management Plan” shall be prepared for the completion of Preliminary Engineering to document the various non-design mitigations (such as signage, operating procedure) that are needed to support the passenger journey through these scenarios. This plan shall be developed collaboratively between the project team and Passenger Experience Department. If documented and tracked design features change during Final Design and Construction, the Passenger Expectation Management Plan shall be updated with the agreed outcome.

Figure i for 2.3.5 - Every level of the passenger experience at the core of strategy and decision-making

Figure ii for 2.3.5 - The goal is to connect more people to make life better and create equitable opportunities for all

Figure iii for 2.3.5 - Aspiring to plan, deliver, and operate a world-class transportation system

2.4 Passenger Focus Challenge

In conclusion, Sound Transit challenges design teams, both internal (Sound Transit employee) and external (contract consultant), to be passenger-focused and act as stewards of Sound Transit's passenger experience. As a project progresses from its conception, through all stages of design to construction and operation, the actions and decisions of Sound Transit planners, architects, engineers, designers, consultants and employees determine the passenger experience within Sound Transit's system. The project team must put the passenger experience at the core of each decision as design progresses, to ensure Sound Transit will plan, deliver and operate a system whose design meets the needs of its riders, where design intent aligns with passenger expectations. The guidelines, metrics, and tools are explored in the remaining chapters, as well as in other criteria documents referenced throughout, including the Passenger Experience Management Plan.

Sound Transit requires the design professional community to go beyond the Design Criteria Manual by meeting the guidelines in this manual and obtaining a higher degree of design excellence. By putting thought into the each of the design elements, meeting the Fundamental Service Goals will be more easily accomplished. By strategizing about how to optimize for meeting the Experiential Goals of the Passenger Journey, overall design decision-making will be balanced in favor of what is best for the passenger.

Being a passenger-centric organization requires everyone to take ownership and action, sympathy to and awareness of Sound Transit's diverse passenger needs, and thoughtful design intervention by the design professionals. The design professional community plays a direct role in ensuring Sound Transit delivers a passenger-focused experience and, in doing so, ensures Sound Transit is a passenger-centric organization and living out its mission.

Figure i for 2.4 - Dynamic signage informing passengers waiting

03 Station Design

Figure i for 3.0 - Capitol Hill Station

3.0 Station Design

Stations provide the crucial interface between a station environment and the Link light rail system and to the network of other stations within the Central Puget Sound region. The guidelines within this chapter serve to reinforce both the Service Goals (section 2.1.1) and the Passenger Goals (section 2.1.2). Focusing on these sets of goals from the arrival at a light rail station plaza or other urban threshold through the station to the platform and the reverse journey to exit the station will help create priorities, manage design trade-offs, and enable faster decision-making for design teams.

The first three Passenger Goals are to provide a simple, seamless, and intuitive passenger journey. These terms are used synonymously with “intuitive passenger wayfinding” throughout this chapter to describe a passenger’s ability to navigate comfortably without reading signs. Signage provides a secondary backup system to sightlines and spatial legibility.

As described in section 2.2 Passenger – the Focus, the arrival at the station is experienced differently by everyday users, occasional users, first-time riders, people traveling in groups or with other family members, those with different navigational abilities and needs, or some combination of this list. The station design must serve them all.

Examples of different station types have been laid out (section 3.1) to help the design team understand the preferred direction of future stations, encompassing lessons learned from previous stations. Section 3.2 addresses the first three Passenger Goals (simple seamless, intuitive) through the Station Design Principles. Section 3.3 covers the station elements to which those principles are applied. Section 3.4 focuses on the fourth Passenger Goal of creating resiliency in both the passenger journey and within the station itself.

3.1 Station Types

Role of Station Form

Sound Transit explores alternatives for the station form and its integration with the existing and future urban context during the early planning phases (see Section 4.2) with the goal of creating separated-grade stations and guideways to ensure safety and reliability by eliminating at-grade crossings where possible. The resulting Sound Transit station types are:

- Elevated Stations - tracks and platforms are lifted above ground level
- Below-Grade Stations –platform is located underground
- At-Grade Stations - platform is accessed at ground level, while the crossings are above- or below-grade.

Each type has its own opportunities and challenges. Passengers can spot an elevated guideway and up-lit canopy of an elevated station from a distance. Below-grade stations can have entryways integrated into buildings and the treatment of tunnel walls becomes a focus of ensuring passenger comfort while underground. At-grade stations will have either bridge or tunnel crossings to connections across the tracks which presents a different opportunity for architectural expression. The station type is determined by Sound Transit and is selected based on location, surrounding neighborhoods, feasibility studies, site conditions, operational costs, and construction costs.

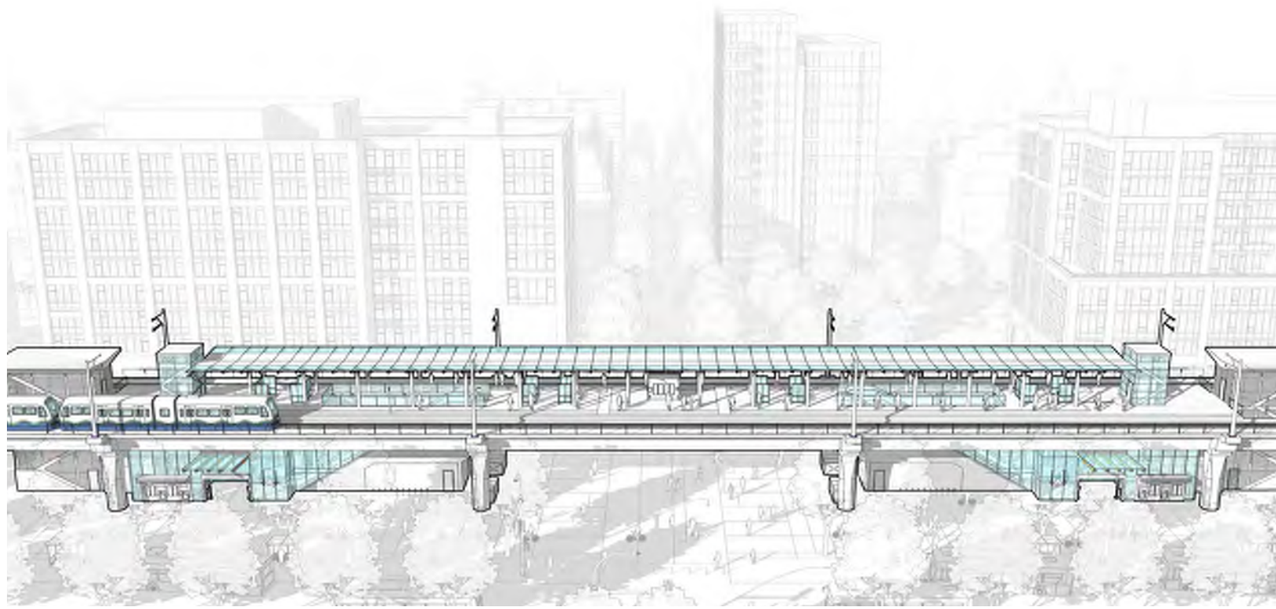


Figure i for 3.1 - Symmetrical elevated station

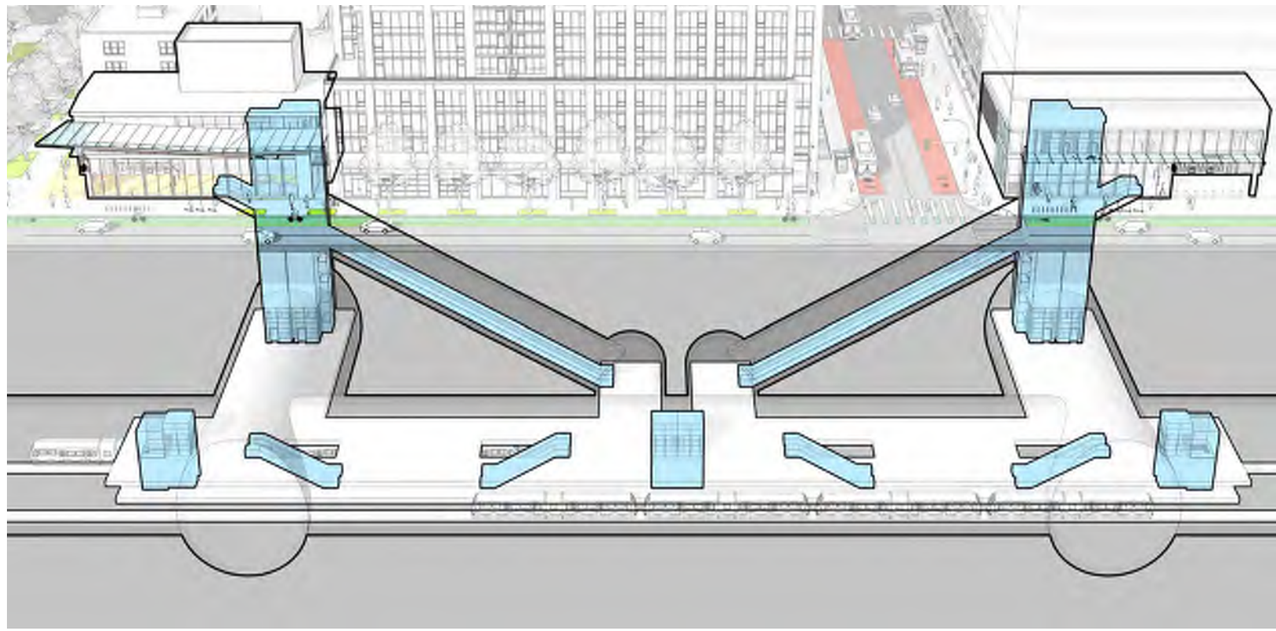


Figure ii for 3.1 - Vertical circulation optional layout at a below-grade station

3.1.1

Elevated stations

Elevated stations are the most common station type throughout the Sound Transit Link system and with their elevated platforms and canopies are highly visible from the public realm.

At ground level they have distinct entrances leading either into a head houses or to vertical circulation to a lobby at a concourse level. Access configurations will differ depending on the site conditions, number of Required Entrances (see sections 3.3.5 and 4.2.2) and projected passenger access patterns. It is preferable to consolidate the elevators at one entrance to enhance accessibility.

At elevated stations, the concrete structure has a significant impact on the pedestrian experience and surrounding neighborhood, especially in Emergent Station areas. The design team must coordinate the locations of the overhead guideway, platform, bents, and supporting columns to enhance the station's presence and minimize impacts to sightlines and passenger flow. See the requirements for concrete detailing in the Material section 3.3.1.

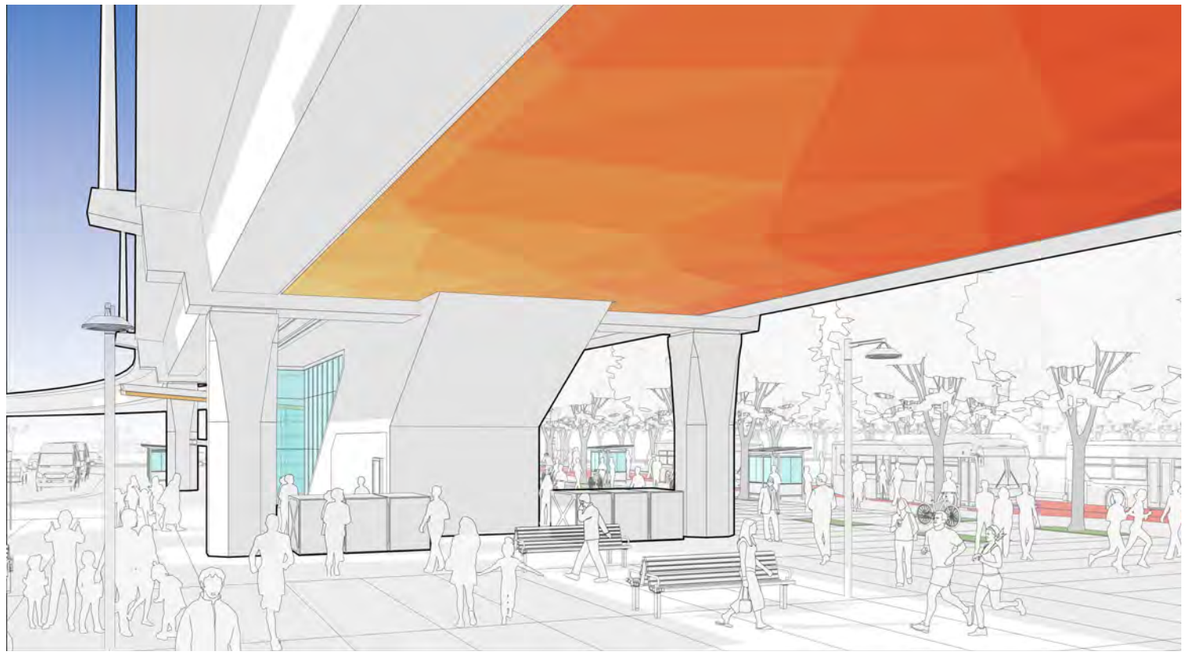


Figure i for 3.1.1 - Pedestrian view of elevated station at an intersection. A clear view to the station entrance must be made. Consider adding lighting, color, and art to improve the passenger experience

Figure iii for 3.1.1 - Passenger view of art at underside of parking garage at Redmond Technology Center Link Station

Figure iv for 3.1.1 - Colorful guideway ceiling panels at passenger view at South Bellevue Link Station

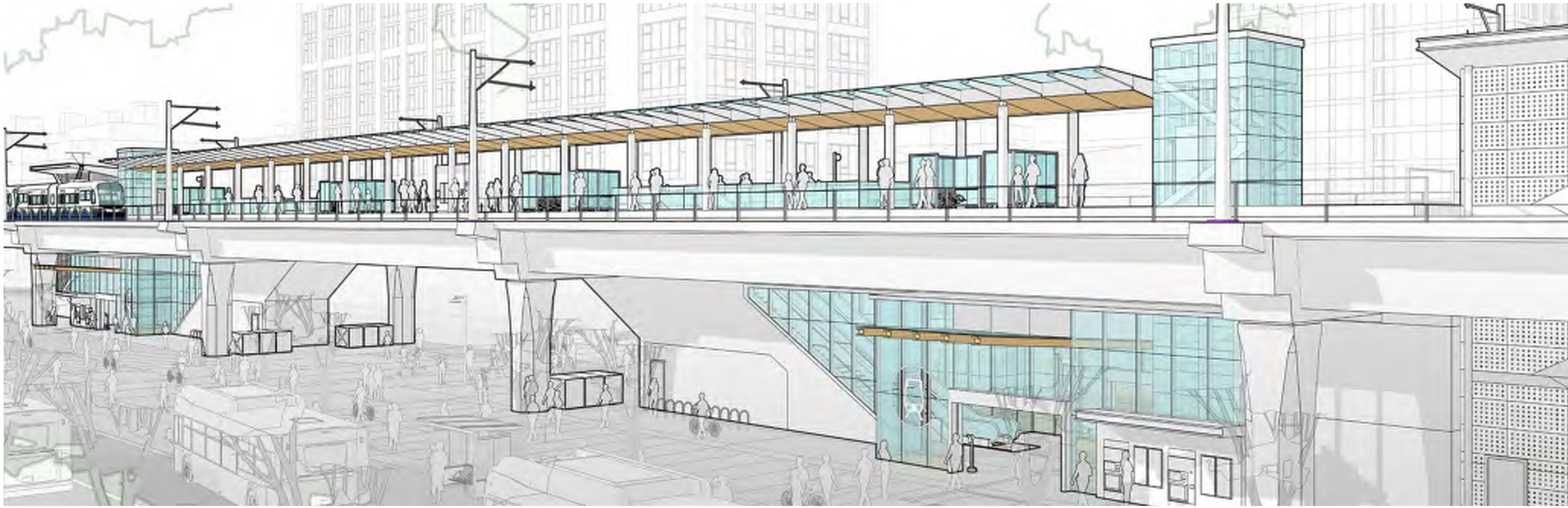
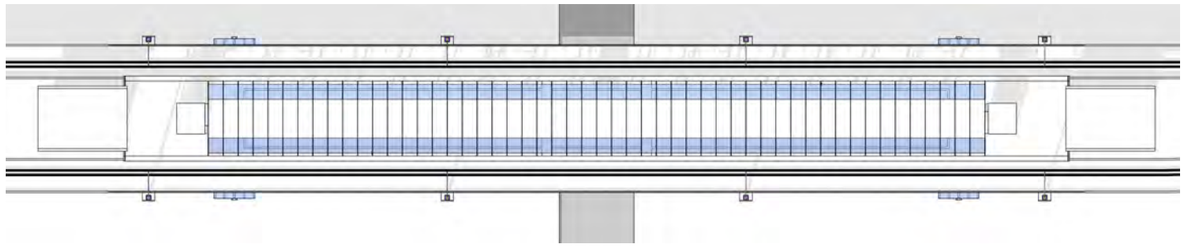


Figure ii for 3.1.1 - Example of two required entrances in an Established Urban, Multi-modla Station, as defined in Table 4.2.2

Elevated Station Configuration Alternatives

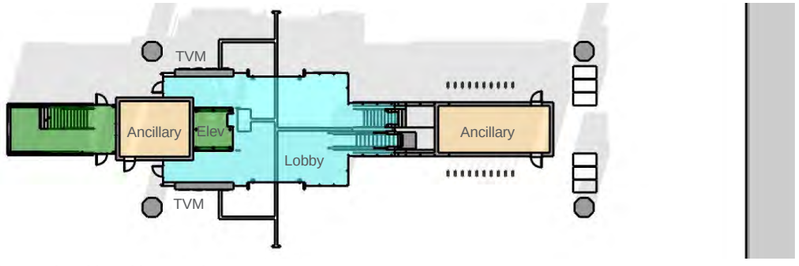
Symmetrical Bridging Stations

Elevation



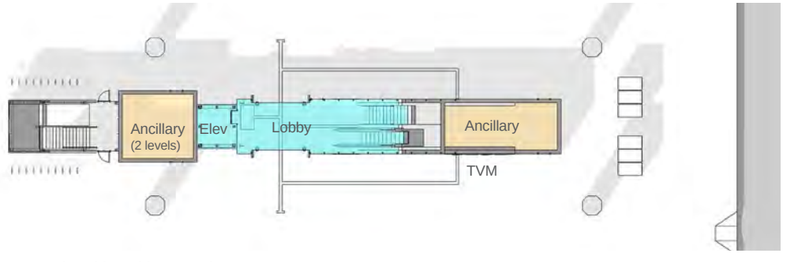
Roof Plan

Platform plan



Typical street level head house plan

Entrance



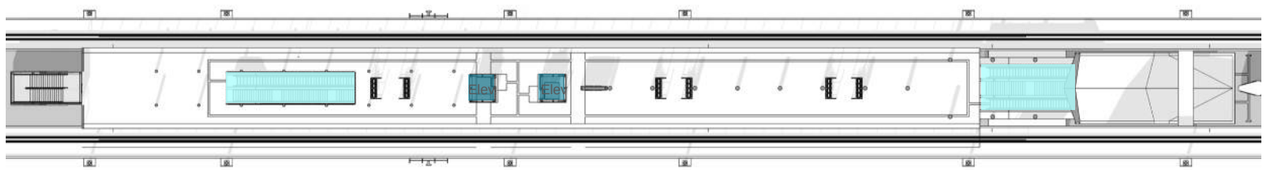
Compact street level head house plan

Elevated Station Configuration Alternatives

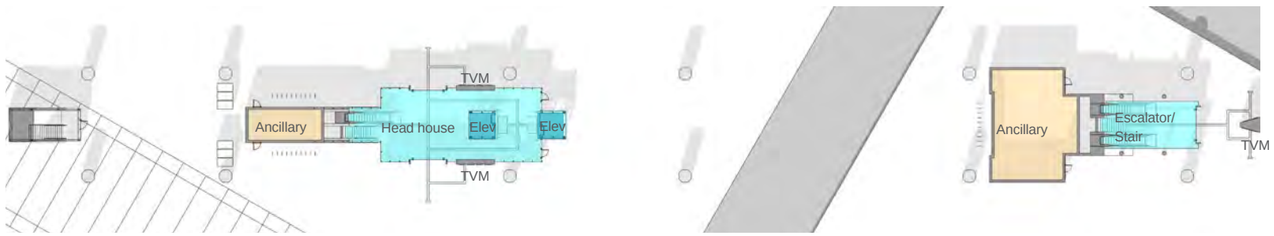
Asymmetrical Stations: Higher Capacity & Bridging (3 escalators, 2 public stairs, 1 emergency egress stair)

Head house at an end-loaded platform

Elevation



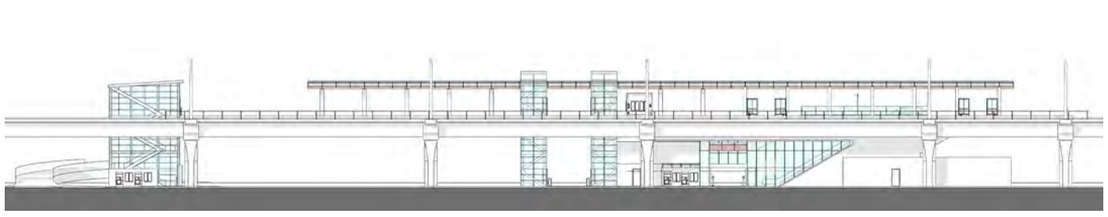
Platform plan



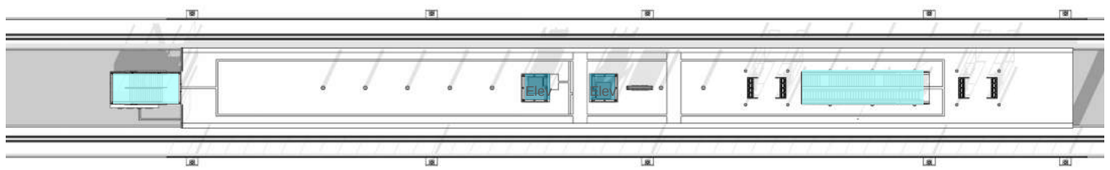
Ground level head house plan

Asymmetrical Stations: Lower Capacity (1 escalator, 2 public stairs)

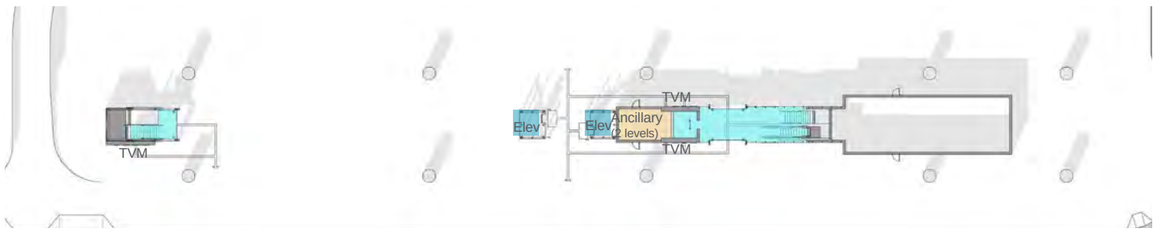
Head house with two elevators



Elevation



Platform plan



Ground level head house plan

3.1.2

Below-grade stations

Below-grade stations occur in areas where location and topography dictate that tracks are more ideally situated underground. Sound Transit's environmental process will determine where a below-grade station will be constructed.

Below-grade stations may be either cut and cover (retained cut) or tunnel stations, depending on the selected location and depth of the platform. In Established Urban areas (section 4.1) tunnel stations may be preferred over retained-cut as construction may be less disruptive to the surrounding areas and businesses.

Below-grade stations will have Sound Transit owned and operated Required Entrances which may be associated with head houses with at-grade entrance lobbies or entry portals, protected by either pavilions or canopies, with below-grade entrance lobbies. They may also have Additional Entrances through the base of a building, such as at Westlake Station. For more in-depth information about Adjacent, Overbuilding, and Integrated considerations for Joint Development station projects see section 4.5.

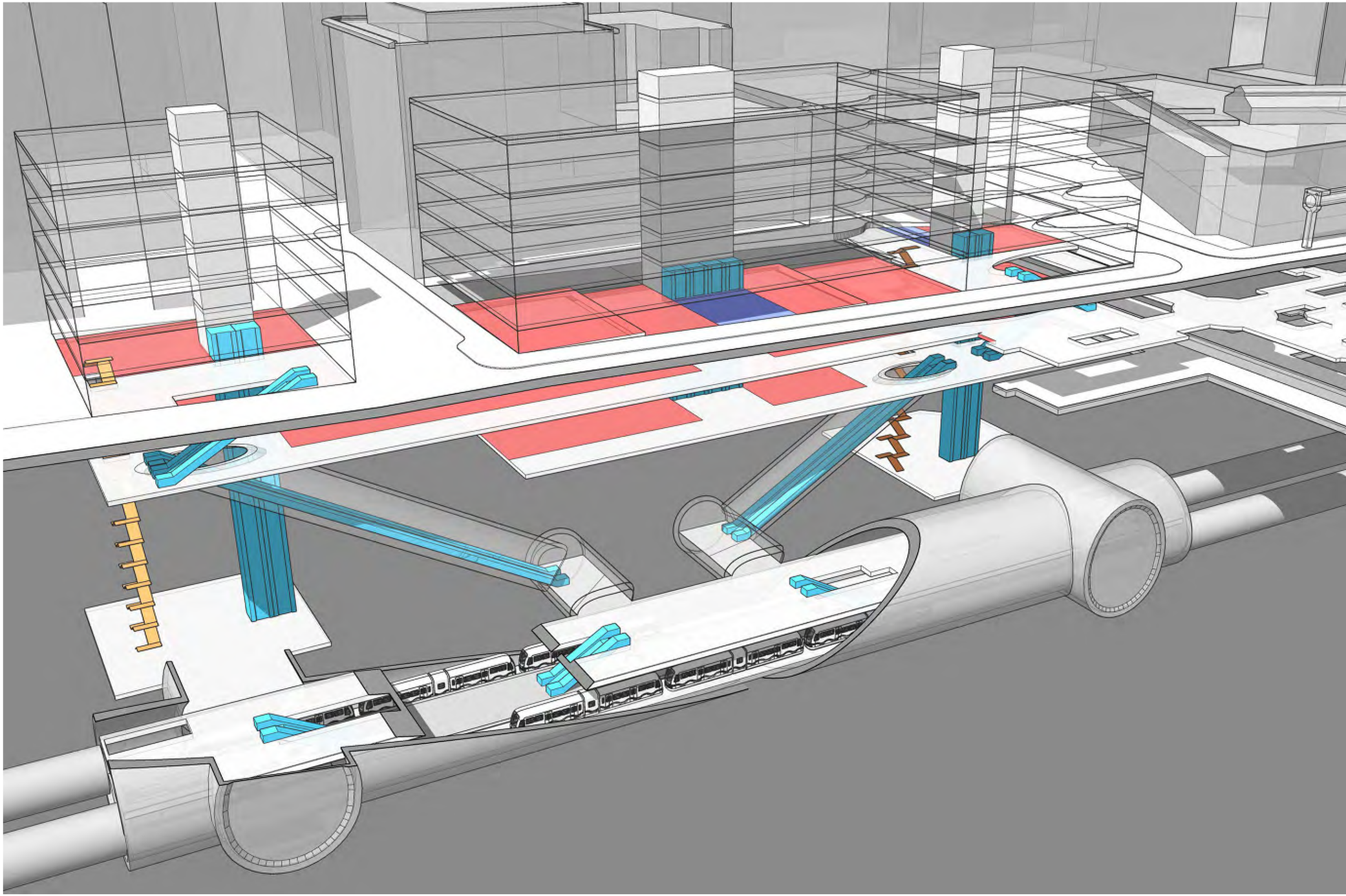


Figure i for 3.1.2 - Below-grade Tunnel Station - clear direct passenger circulation that engages with multiple levels of development and a seamless transfer to another line

3.1.3

At-grade stations

At-grade stations currently exist at several locations throughout the Sound Transit Link System. They are in general the most cost-effective station type to construct, but they have limited viability if there are track crossings. Track crossings limit train frequency and thus transit capacity.

Future at-grade pedestrian track crossings should be avoided whenever possible. However, under some circumstances with required hazard analysis and other studies, as well as considerations for accessibility, they may be allowed at Sound Transit's discretion. Elevated or below-grade pedestrian track crossings are the preferred method for access to the other side of the tracks.

Pedestrian tunnels or bridges require CPTED (crime prevention through environmental design) solutions to ensure passenger safety and comfort. Design solutions should include wide, well lit, and highly visible pathways to allow for comfortable, safe circulation. Below-grade crossings should be a recommended minimum width of 12’ plus additional required clearances as needed for ticketing and/or surge zones. For pedestrian bridges, a recommended minimum width of 16’ should be provided.

Figure i for 3.1.3 - Columbia City Station connecting into the neighborhood and supporting adjacent multi-family development.

Figure ii for 3.1.3 - 185th Street Station is an At-grade Station with an elevated track crossing to provide grade separated access.

Figure iii for 3.1.3 - East Main Station is an At-grade Station

Platform Configuration

Whether a station is elevated, below-grade, or at-grade, there may be different platform configurations

Center Platforms

Center loaded platforms are preferred for each because they provide an easier passenger experience, provide operational simplicity, and reduce the amount of vertical circulation required. With this platform type, trains going in either direction arrive at the same platform on either side, minimizing the transfer path between trains going in opposite directions. With a center platform, passengers can arrive at the platform and then choose a direction of travel, reducing the cognitive load for first time and occasional riders.

The width of the platform varies and will be affected by the projected ridership for the station. Refer to the Design Criteria Manual for required minimums and Platform Geometrics.

Center platforms are required for interim and terminus stations unless they are precluded by track geometry or other site constraint.

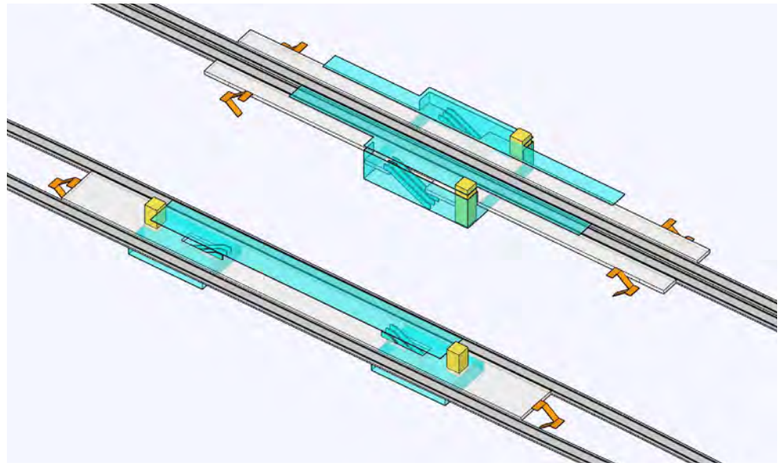


Figure i for 3.1.4 - Diagrams of elevated center- and side-loaded platforms

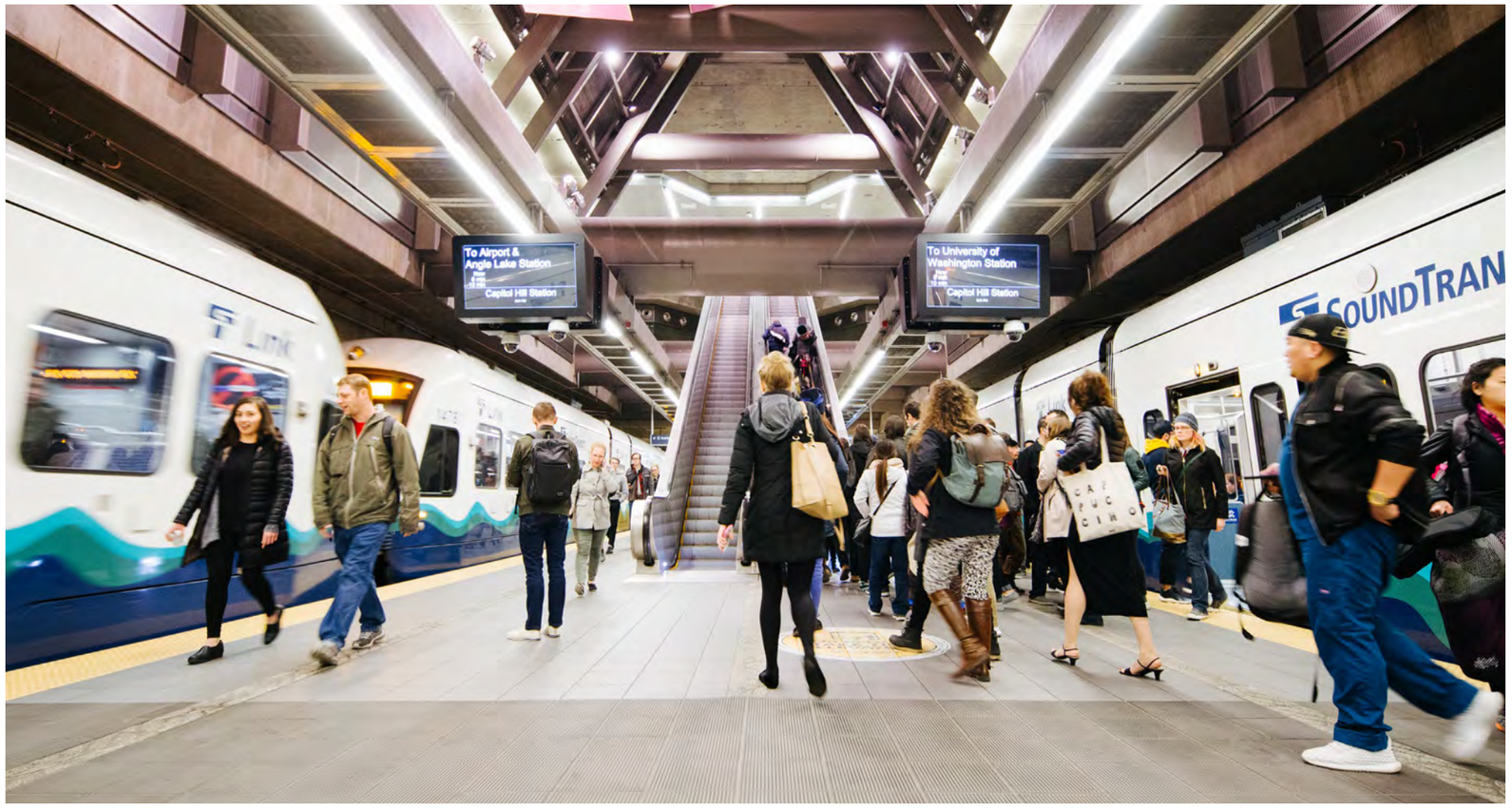


Figure ii for 3.1.4 - Capitol Hill Station has a center platform

Side Platforms

Side platforms provide two separate platforms for opposite directional travel.

This type of platform is sometimes required due to existing site constraints. Redundant access must be provided to each side of the platform, which can result in additional vertical transportation elements, (stairs, escalators, and elevators) as well as pedestrian bridges or tunnels to create required grade separated crossings.

Infill stations along an existing alignment will often have side platforms so that ongoing operations are not disrupted and the existing guideway doesn't need to be rebuilt.

A stacked platform is rarely used and not preferred. The exception can occur when site conditions preclude center or side platforms, when facilitating cross-platform transfer for two high volume light rail lines, or when site conditions demand a narrow footprint for the platform and guideway.

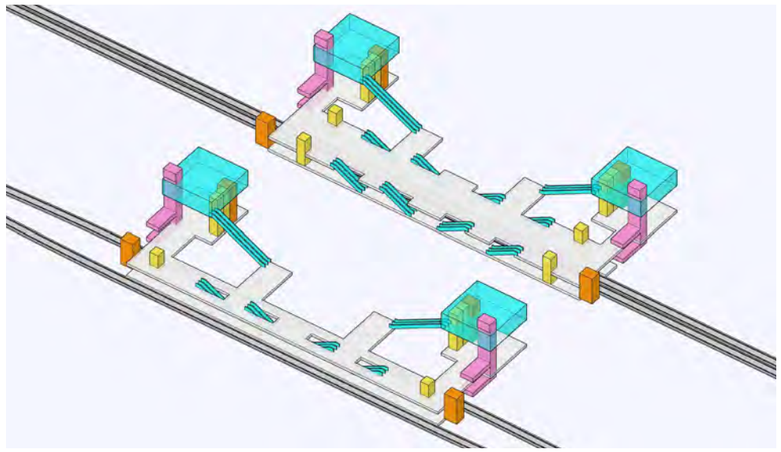


Figure iii for 3.1.4 - Diagrams of below-grade center- and side-loaded platforms

Figure iv for 3.1.4 - Side loaded platforms at Othello Station

3.2 Station Design Principles

The following section outlines the principles the design team should follow in order to organize, balance and integrate the Station Elements in Section 3.3 into an overarching design. Whereas the Design Criteria Manual states minimum requirements for station projects, this section specifically provides a means to fulfill broader Service and Passenger Goals through better design. These tools will allow designers to aim for higher design qualities, negotiate trade-offs, and create a hierarchy of design decisions in support of an overall solution.

These principles direct design teams to create a station that:

- Has both a Sound Transit system identity and a neighborhood identity;
- Is easy to navigate for all users;
- Reveals its purpose as a place of transit connection in an urban environment.

The Station Design Principles directly support the first three Passenger Goals of Simple, Seamless, and Intuitive (section 2.1.2) by reducing complexity, streamlining passengers' decision-making, and promoting wayfinding techniques to lead passengers in the right direction without confusion. They also support the Service goals of Safe, Available, and Informed by reducing crime through natural surveillance, prioritizing accessibility, and making information easily digestible as passengers journey through a station.

Figure i for 3.2 - U-District Station platform illustrates passenger experience with combination of wayfinding techniques, decision points, station art, lighting, signage, and vertical transportation

3.2.1

Identity

Use the Sound Transit system identity and develop a neighborhood identity for each station so that passengers recognize the station as part of a larger regional network rooted in its community.

A.

System Identity

USE STANDARD, REPEATABLE SOUND TRANSIT ELEMENTS TO DISTINGUISH THE STATION FROM ITS SURROUNDINGS, HELPING PASSENGERS TO SEAMLESSLY AND INTUITIVELY NAVIGATE ALONG THEIR JOURNEY.

Imagine not speaking or reading English and arriving in an unknown part of the city on a rainy, dark day and deciding to take light rail because it would be the fastest, most stress-free option available to get past traffic snarls and into downtown to meet up with colleagues. If only the station could be found! From a distance, the underside of an illuminated, horizontal canopy structure can be seen floating above the streets between buildings. As one approaches, more people can be seen walking in and out of storefronts and foot traffic increases in the direction of a small plaza. Set back with a canopy, a glass facade with a large graphic of a train symbol appears along with a large, well-lit colorful opening and station signage above. Though, this passenger didn't read the name of the station, it is clear from all of the other visual clues that this is the station. As they approach, the view to the ticketing kiosk becomes clear and one can see the movement of people up to the platform via an escalator or elevator.

Light rail stations are part of the urban fabric and a point of civic pride. They knit neighborhoods together across the city and become a familiar landmark of daily life. A common language across the network creates an identifiable system in what might otherwise be an unfamiliar environment. Pacific Northwest modernism takes cues from the environment and roots the station architecture in its region.

Standardizing the costliest components offers cost savings as well as creating a recognizable station architecture which strengthens system identity. Likewise, the consistent use of high-quality regional materials supports system identity, improves the passenger experience, and promotes positive behavior. See the Materials section 3.3.1 and Green Buildings and Infrastructure section 3.4.4 for more information.

Some examples of repeatable system identity elements are:

- Glazing for daylighting and transparency;
- Cantilevered spaces and structures;
- Canopies and awnings;
- Indoor/outdoor spaces, unheated, with rain and some wind protection.

All station types should prioritize transparency, illumination, linearity, and an overall orthogonal form that includes overhangs and layering of spaces to support wayfinding, intuitive decision-making, and the creation of a recognizable system language. Decorative elements, design fads, and ornate detailing should be eschewed in favor of simple, timeless design. While Union Station remains an important part of the Seattle's legacy, the arches and vaults of traditional, classical architecture don't necessarily project the current values of Sound Transit and the region.

Design inspiration in support of a system identity should come from:

- The expression of simple and straightforward structural steel framing at elevated stations;
- Contemporary interpretations of Pacific Northwest Native American and/or heavy timber post and beam construction with modern detailing;
- A blend of natural and industrial materials. Views of the natural environment and sustainability features should be celebrated.

Station design that considers routine maintenance and how materials will weather over time should result in practical, elegant structures rooted in Pacific Northwest modernism.

The system identity extends beyond the station entrance to include components within the public realm that aid passenger wayfinding. Passengers approaching the station will recognize not only signage elements but the family of canopies for bus, paratransit, and bicycles, as well as site furnishings and lighting. This continuity of components is a strategy to support intuitive wayfinding. See section 3.3.9 Canopies for more information.

FROM THE SOUND TRANSIT VISION:

"Making our transit service as iconic to our region as the Space Needle, Mount Rainier and ferries."

Pacific Northwest Inspiration

Figures i thru x for 3.2.1(Clockwise): i - Fort Vancouver Library, ii - Capitol Hill Library, iii - Maple Valley Library, iv - Seattle Space Needle, v - Multi Modal Terminal Mukilteo, vi - Nordic Museum, vii - Elliott Bay Seattle, viii - Mt. Rainier, ix - SLU Discovery Center, x - Washington State Ferries;

B.

Neighborhood Identity

Transit, at its best, is a community asset. The design team should anchor the station architecture within the neighborhood and become part of its identity. Art and design make transit facilities comfortable, human-scale places. The potential to establish vibrant people places through an emphasis on high quality urban design and public art provides an opportunity for a neighborhood to evolve. Stations are a point of connection from the neighborhood to the city and larger region.

» Establish distinctive neighborhood identity though the use of art, color, landscaping, and other placemaking strategies and through the integration of plazas and other public spaces with the station. While ST Light rail station entrances must comply with System Identity strategies (see Entries 3.3.5.3), the design team must execute a seamless and sensitive transition to the immediate station context. Incorporate community input where possible.

» Within the consistent elements of the passenger journey, find appropriate opportunities to create moments of delight or surprise. Unexpected juxtapositions, novel interpretations, and moments of respite can offer passengers transcendence from their immediate cares and worries, allowing them to think about and connect to their surroundings.

» Knit the station to the fabric of its neighborhood through the creation of an activated public realm (section 4.4).

Figure i for 3.2.1.2 - Plaza near entry at Roosevelt station

3.2.2

Navigation and Wayfinding

A.

Passenger Flow

ENSURE PASSENGER FLOW IS SMOOTH AND CONSISTENT BY STUDYING THE PROJECTED PASSENGER VOLUMES AND THEIR DESIRE LINES AND REDUCING THE NUMBER OF TURNS AND CROSSINGS OF FLOWS.

Passenger flow can be defined as the ability of passengers to continue to make fluid progress to and from the platform without interruption. As outlined in the Passenger Journey, people of varying ages, abilities, and familiarity with the system pass through any number of decision points, acquire destination information, access ticketing, tap into the card reader system, make a platform selection, choose vertical transportation, and select a train to board.

To reduce interferences, crowding, and delays, consider:

» Identifying the decision point locations to ensure that only one decision needs to be made at each point. This creates a smoother passenger flow and promotes intuitive wayfinding;

» Reducing the number of steps or decisions a passenger must make, simplifying as a design priority, improving visibility to the next decision point or destination, eliminating multiple turns of 90 degrees or greater and successive switchbacks where possible in favor of a simpler, less disorienting, and less prone to crowding paths of travel;

» Designing the station circulation to support the flows with minimal crossing paths, reinforcing natural desire lines whenever possible;

» Presenting rider cues and information in a seamless manner so that backtracking or stopping is not necessary;

» Using the station architecture to guide passengers intuitively from one space to another with integrated signage acting in a supportive role;

» Referencing the Sound Transit Signage Manual early in the design process to ensure thoughtful signage integration at adequately spaced decision points.

Finally, plan for interruptions along the travel path to occur, and provide passengers with options so the journey is resilient. Digital signage must be included to communicate information, alternate routes and links to transfer paths. A project team must use ridership projections for peak flow to calculate the required emergency egress width requirements for each station element (stairs, escalators, ramps, platforms, passageways, doors or gates) per NFPA 130.

REFERENCE:

Design Criteria Manual Chapter 9, Stations and Facilities, 9.4 Requirements, 9.4.1 General Design Parameters, 9.4.1.L Pedestrian Circulation

B.

Event Stations

CERTAIN STATIONS LOCATED NEAR MAJOR EVENT SPACES (HOSTING REGULAR EVENTS WITH A SEATING CAPACITY OF OVER 5,000 PEOPLE WITHIN A ¼ MILE RADIUS OF THE STATION), WILL REQUIRE FURTHER PLANNING BY THE PROJECT TEAM WITH LOCAL AGENCY PARTNERSHIP TO REACH A COMMON SOLUTION FOR MANAGING PASSENGER FLOW.

Events could cause surges exceeding the peak loads for which the station is designed. In such cases, vertical transportation for station exiting must be sized according to train capacity and headways, while crowds entering the station may be held back by station security in adequately sized public plazas (see Section 4.4). The design team shall prepare calculations for Operations for expected surges that could exceed platform, vertical transportation, and plaza capacity. All emergency exiting requirements must be met. A total station capacity must be determined with the use of crowd simulation software to coordinate with Operations' understanding of how many people or number of trains to allow into the station to avoid the accumulation of passengers on the platform.

Figure ii for 3.2.2.A - Passengers boarding a light rail train

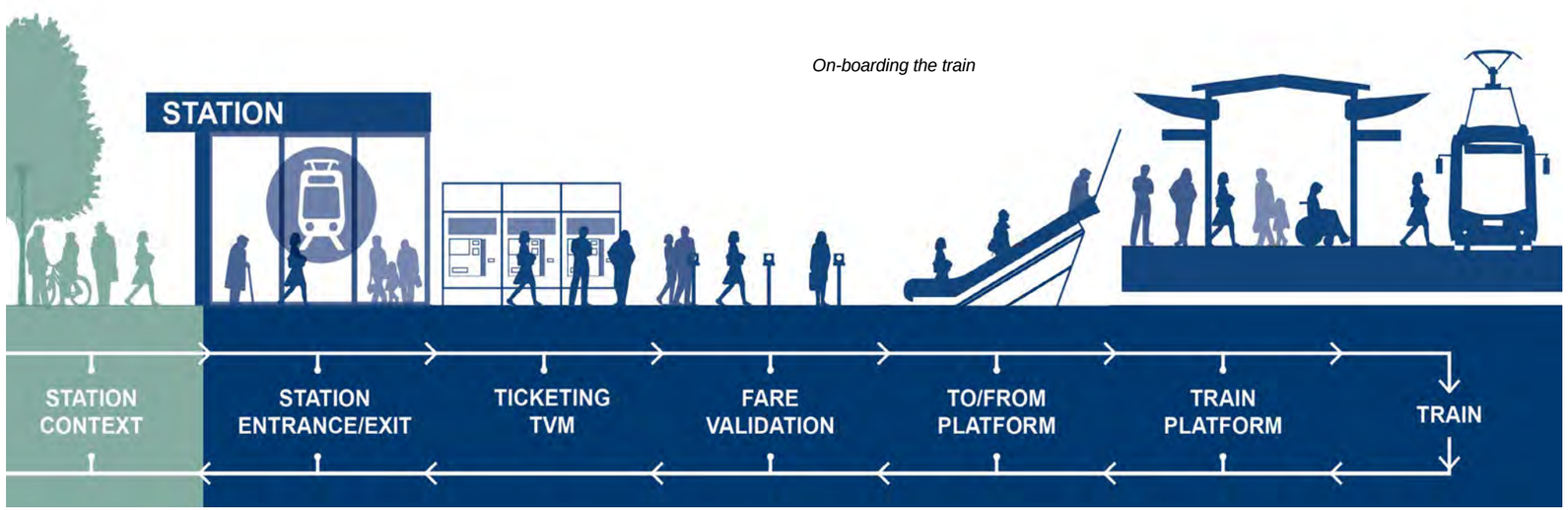


Figure i for 3.2.2.A - Passenger Journey sequence within a station

C.

Decision Points

DETERMINE SEQUENCE, SPACING, AND LOCATION OF DECISION POINTS TO REINFORCE GOOD PASSENGER FLOW.

Decision points are places in the passenger journey sequence where a passenger must make an informed choice about their direction of travel. In addition to aiding in the Passenger Goals of providing a simple, seamless, and intuitive journey, design priorities for decision points are:

Sightlines (see 3.2.2.D)

» In both entering and exiting directions, clear sightlines from one decision point to the next are important to aid in intuitive wayfinding.

Surge Zones:

» Decision points should not occur within surge zones. For more specific dimensional information on surge zones refer to Design Criteria Manual. If the station meets the definition for an Event Station, microsimulations may be necessary to adjust the minimum sizing of the surge zones. Occasionally, decision points overlap with surge zones. Passenger Flow Diagrams (see below) can aid with identifying and reducing these points. Design strategies such as railings at escalator landings in high volume station surge zones should be considered.

Recommended minimum distance:

» There should be enough distance between decision points to eliminate bottlenecks and provide clarity to the spatial sequencing.

» Decision points are often associated with signage locations, which have an 8’ minimum spacing on the platform; however, more space is often needed outside of the platform.

» Decision point spacing should take into account surge zones, passenger flow, and ridership. The minimum recommended spacing for decision points outside the platform is 16’.

Orientation:

» Locate furniture, plantings, advertising, retail, kiosks, art, or other fixed items not related to decision points adjacent to and parallel to the pedestrian path without creating a potential obstruction. Conversely, locate signage, which aids decision-making, perpendicular to the pedestrian path.

Sequential decisions:

» Avoid co-locating multiple decisions at a single point. Minimize cognitive overload (or the processing time required by passengers) by sufficient spacing for quicker individual decisions, thereby smoothing out the overall passenger flow.

» Review passenger flow diagrams with Sound Transit before and during the 30% design phase. Ensure there are no gaps in decision points or conflicts with surge zones as well as inform the 60% signage plan. Examples are below. These diagrams chart ingress and egress, primary and secondary paths, as well as decision points along each journey to confirm locations of signage, coordinate amenities/ station elements, and identify any bottlenecks requiring redesign.

» At high capacity, transfer, and/ or Event Stations, use pedestrian modeling software to test capacities and identify potential conflicts of movement at locations such as transfer concourses, entrances, exits and points of vertical circulation. Document all locations where capacity is insufficient to accommodate passenger flow and review flow management strategy with station security and passenger experience division for incorporation into the Passenger Expectation Management Plan (see Chapter 2). This work should be complete by 30% design.

» Transfer paths occur both at concourse levels in multi-line stations and at the platform when there are cross platform transfers. In these cases, furnishings or other passenger amenities should be placed outside the most direct route of the transfer path across the platform.

Figure i for 3.2.2.C - Entrance decision points:

1) Identify Link Light Rail
2) Identify Station and Entrance
3) Purchase Ticket/Plan Trip
4) Choose Circulation to Platform

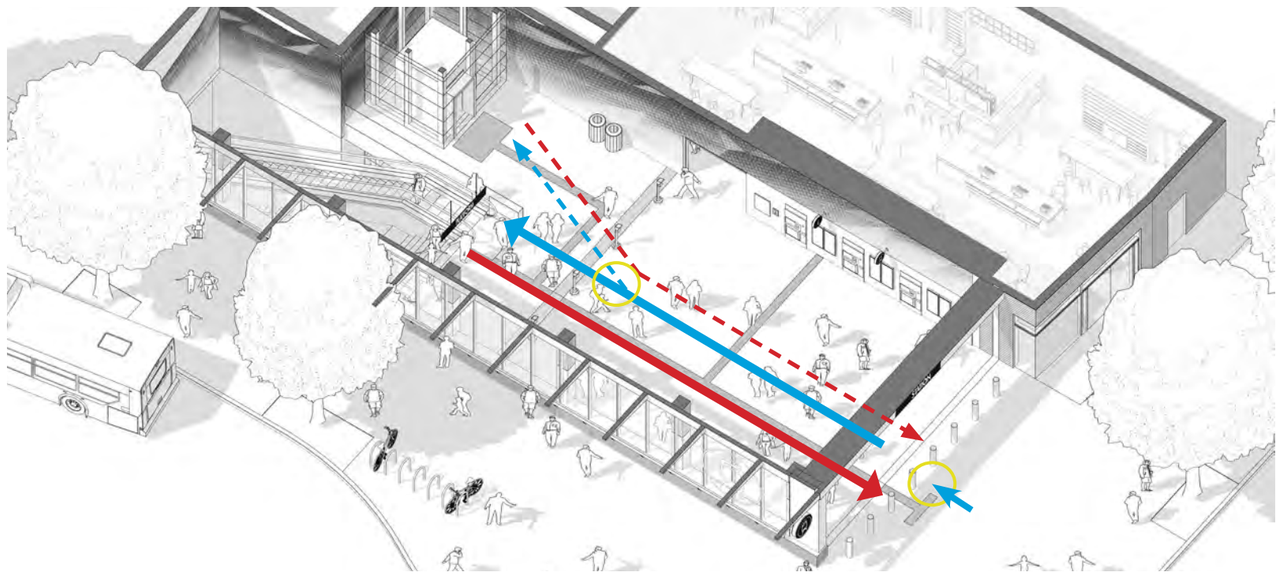


Figure ii of 3.2.2.C - Entrance decision points

Decision Point

D.

Transparency and Sightlines

MAINTAIN CLEAR SIGHTLINES FROM KEY POINTS IN THE PUBLIC REALM TO THE STATION AS WELL AS BETWEEN DECISION POINTS.

Transparency through the use of glass enables clear sightlines, promotes feelings of safety and allows for natural surveillance. At tunnel stations natural daylight through a transparent facade or canopy helps orient people and draw them towards the station exit. In the evening—or during the winter months with short daylight hours—a transparent façade emitting light acts as a beacon, guiding people towards the station entrances.

The use of transparent materials allows riders to preview the spaces they are moving between. Glass elevator walls and windscreens are examples of transparent elements within the station. Providing clear sightlines from one decision point to the next, as illustrated in the Passenger Journey diagram in section 3.2.2 is a design priority.

Use perspectives generated from 3D models, plans, and sections to review the mounting of overhead elements, ensuring clear sightlines between signs are maintained between each decision point. Maintain clear views to TVM's (ticket vending machine), signage, elevators, escalators, and stairs from the entrance and upon exiting trains as a design priority. Additionally, maintain clear sightlines to static customer signs, cameras, code required exit signage, digital signs, etc. This is particularly important at platforms, and care should be taken to avoid blind corners or hidden, alcove-like spaces.

Figure i for 3.2.2.D -Transparency at Capitol Hill Station

Figure ii for 3.2.2.D - Clear sightlines to station entrance, signage, TVM, Fare Paid Zone threshold and vertical circulation at Translinks Lincoln Station in Vancouver BC

E.

Pedestrian Priority, Accessibility, Tactile Elements, Signage

Imagine the challenges of a visually-impaired person taking light rail for the first time to interview for a new job, hoping to learn this route so that it may eventually become their daily commute. A successful transfer from a van shuttle, leads them to a wide sidewalk in front of the station where one can pause to get ones bearings. In the center of the opening into the station, the tactile wayfinding path can be found leading to a TVM. After purchasing an Orca card, one uses the same tactile path to locate vertical transportation options up to the platform. Once on the platform, another tactile path leads to a comfortable, sheltered waiting area and the train arrives almost immediately. A wider, differently coded path leads directly into the open train doors. The journey so far has been so simple, seamless, and intuitive that it fills the interviewee with confidence and hope that this will become their new routine.

The station design team must endeavor to anticipate the needs of all passengers before they do, thinking through the impact of seemingly small details about curbs and cane detection devices by integrating those details into the overall design. These elements can make a huge difference in the passenger experience.

Pedestrian Priority and Accessibility

In order to get into the station, passengers approach as pedestrians, sometimes with personal mobility devices to aid their movements. Within the immediate station context (0-2 blocks from the station) the volumes of pedestrians will increase and their seamless migration should be prioritized over other modes of transit and/or other cross traffic (see Section 4.3).

The design team of architects, planners, mobility experts, and civil engineers must collaborate early and often to ensure pedestrian routes have priority and are direct, well-lit, clearly marked, and free of barriers or tripping hazards. Provide clear definition of pedestrian routes with flared curb ramps, paving details, thermoplastic striping, and pedestrian-friendly lighting. Pedestrian crossings at intersections, driveways, and bicycle lanes must be clearly delineated, signaling that pedestrians have priority in the vicinity of the station (see Section 4.3 for additional requirements and guidance).

Consider that public transit is often the best and sometimes the only independent travel option for some people, and designing and building facilities that support and promote independent movement ultimately benefits everyone. The goal is to create stations, including the approach and connections with other public transportation that will allow for independent movement regardless of experience and inclusive of all diverse abilities, to meet Sound Transit's commitment to provide regional transit in the Puget Sound area. To achieve this goal, the design team must embrace barrier free, universal design as a core value (see Appendix A for an expanded definition of Universal Design).

Sound Transit expects that designers and contractors will meet, and exceed, ADA code requirements and FTA Guidance for accessibility. Every station shall provide an ADA path to station entrances in all plazas, and accessible pathways from major adjacent intersections. All entries and exits to public and back of house spaces must be ADA accessible. Placement of elevators bears consideration. Locating elevators adjacent to or near escalators and stairs provides spatial clarity to vertical circulation. Co-locating elevators at the station entrance nearest paratransit connections promotes efficiency. In all cases, two accessible paths are required at all station platforms. Recommendations for improving Universal Design, thereby enhancing independent travel for people with diverse abilities are encouraged, while efforts to circumvent this approach is strongly discouraged.

Figure i for 3.2.2.E - Braille signage

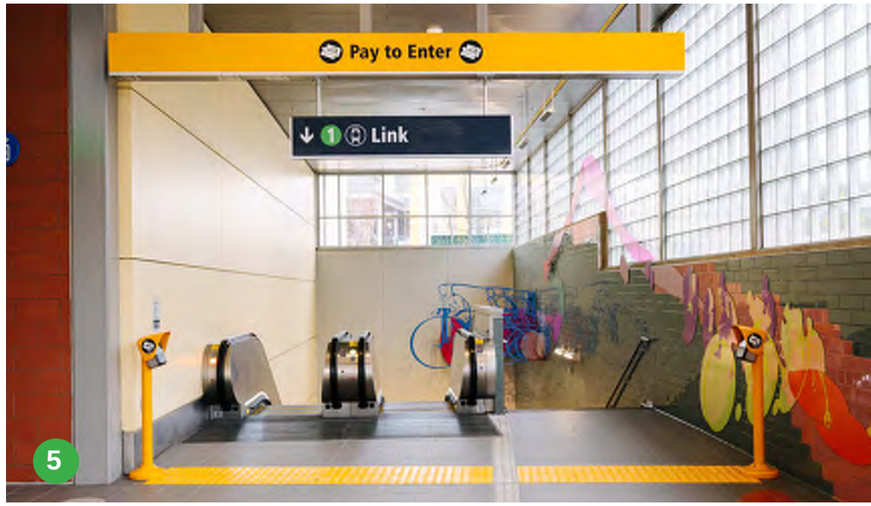
Tactile Wayfinding, Audio/Visual Messaging

Tactile wayfinding is incorporated throughout the Sound Transit Link environment. Sound Transit goes above and beyond federal requirements. In the Sound Transit system, tactile wayfinding is composed of a tactile pathway incorporated throughout the Link stations and tactile signage is located at key decision points along that pathway. The tactile paving is a system of textured ground tiles that provide detectable cues throughout stations and platforms to assist riders who are visually impaired. They are designed to be easily detectable by cane or foot. The tactile paving starts at Link station entrances and proceeds through the station branching to TVMs, the entry/exit to the Fare Paid Zone, and to the platforms and platform edges culminating at Link train doors. There are also tactile wayfinding components at off-street bus and paratransit stops. Additionally, other local jurisdictions such as the City of Seattle are exploring use of tactile wayfinding in the public right-of-way and connecting these efforts to our stations is important for consistency.

At Link stations with bus loops/transit plazas, tactile paving should be applied within the station environment to ensure accessible navigation between modes. Tactile paving is also to be provided to passenger restroom locations when provided.

There are four types of tactile pavers within the Link system that help passengers navigate stations with different types of service. (1) Domed pavers indicate ‘stop’ at all platform edges. This is the detectable warning strip that is required by ADA. (2) Ribbed precast pavers indicate waiting zones at elevator doors and two locations at the platform that align with vehicle doors. (3) Between car barriers are also located on the platform per federal requirements. (4) The three ridge linear granite pavers create the tactile pathway. (5) The Fare Paid Zone threshold is established by yellow tactile pavers running perpendicular to the path of travel. The intent is to standardize these components to the extent possible and new stations will refer to the updated Design Criteria Manual and Architectural Standard and Guidance drawings for additional detailed information.

In addition to tactile wayfinding, Sound Transit employs audio visual messaging to ensure accessible wayfinding and universal design. Examples include audio features built into our TVMs, audio cues within ORCA card readers to make payment confirmation easier, and digital dynamic signage in stations and on trains to provide audio/visual announcements about upcoming stops, stations, train arrival, and service interruptions.



1) Figure ii for 3.2.2.E - Domed pavers at platform edge
2) Figure iii for 3.2.2.E - Ribbed precast pavers indicate waiting zones
3) Figure iv for 3.2.2.E - Between car barriers
4) Figure v for 3.2.2.E - Detail three ridge granite linear tactile paver
5) Figure vi for 3.2.2.E - Fare Paid Zone Threshold

Signage

Signage and a strong brand identity are key elements for passenger navigation and system recognition. Signage should limit navigational choices and provide just enough relevant information to aid the decision-making process for passengers, as they flow through the station. Information overload on signage can slow down passenger flow and instead become an obstruction. In short, signage should provide easily identifiable, simple messages where a quick glance provides clear wayfinding with minimal processing time. See section 3.3.5.3 for special signage requirements at entrances.

Signage is typically installed by Sound Transit; however, depending on the proposed location and signage material, the installation may be done by the project team. The determination of responsibility for installation will be part of the Sound Transit review process. Signage should not be the primary wayfinding device for passengers; it will be supplemental to an architecture that supports simple, seamless, and intuitive navigation.

Also at entries, particularly in dense urban environments with tunnel stations add power and structure to support an illuminated station identification icon sign. Where multiple signals and signs are vying for pedestrian attention, backlit signage always performs better.

Pylons with the transit icon, station name, and a local map within the landscape/furniture zone of sidewalks or in plazas could also serve as useful wayfinding tool, particularly where there are many tourists and first-time users. Be sure to coordinate with any existing AHJ signage program.

As noted in section 2.3.3, station navigation does not want to rely solely on signage and instead wants to rely on simple/intuitive pedestrian paths, clear sightlines, and transparency to be the primary resources for navigation. Minimize the quantity of signs while strategically placing necessary signage at decision-making points. A common signage language placed at consistent locations will support the passenger wayfinding experience and strengthen system legibility. To ensure smooth flow and passenger confidence, signage should form a “chain” by maintaining clear sightlines, allowing passengers to see the next signed decision point as they move from one step of their journey to the next. Infrastructure for static signs should be included during station design.

Entrance signage must identify:

- that it is part of the Sound Transit Link light rail system
- the name of the Link station
- which lines serve the station

Within stations signage must identify:

- how to purchase & validate tickets
- the Fare Paid Zone
- paths to platforms
- direction of train travel
- train arrivals
- destinations
- labeled exit options
- labeled exits

Space signage at a preferred 16' apart, with a minimum of 8’ apart where necessary.

In addition to static signs, Link Light Rail trains employ digital dynamic signage, also referred to as variable message signage (VMS). VMS signage also includes Fire Life Safety messaging. In the event of a station shutdown or evacuation, these signs are clearly visible on the platform and at station entrances. Additionally, VMS displays schedule information and works with static signage to clarify direction of travel at platforms. Three double sided VMS locations must be provided per platform (i.e. 6 on a center platform). These signs should be placed in consistent locations for ease of use. Where concourses occur, VMS signage must also be provided. The Real Time Information System (RTIS) is currently dedicated to bus updates. See both the Signage Manual and the Design Criteria Manual for additional requirements.

Infrastructure for VMS at major decision points should be integrated with the station design. Depending on the decision point, VMS can include train arrival signage, train destination signage, bus connection and arrival signage, rider alerts, and public service announcements (PSAs).

See the Sound Transit Signage Manual for more details on signage standards and requirements.

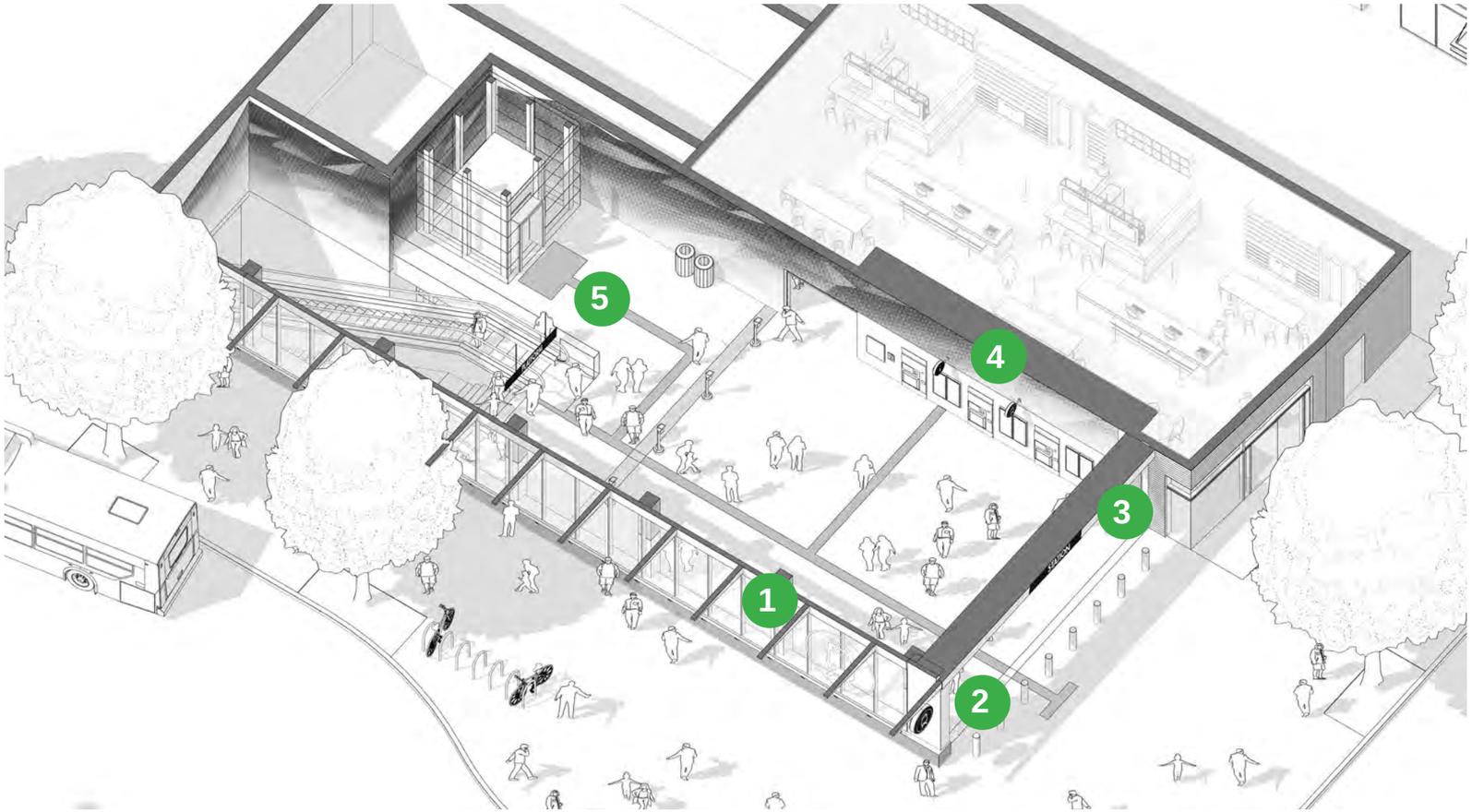


Figure vii for 3.2.2.E - Head house signage location diagram

1) Supergraphic mode icon at glazing

2) Sound Transit link light rail signage (internally illuminated when possible)

3) Link station identification

4) Ticket purchasing and information signage

5) Signage to platform

REFERENCE:

Refer to the Sound Transit Signage Manual and the Design Criteria Manual Stations and Communication chapters for **additional information about system signage.**

3.2.3

Spatial Legibility

Make it easy to understand the station building's primary public function through its form and general appearance, which is to provide ticketing and information to passengers, a means to get to the separated-grade platform, and protected waiting space for boarding and alighting trains. Through the creation of unified whole, the expression of movement, and the contrasting use of materials and construction methods, the station's transit role in the urban environment will be self-evident.

A.

Unity with a Hierarchy of Elements

Work to unify the disparate elements to create a station with a simple, coherent expression. Create a hierarchical order among the elements to emphasize important public moments while minimizing the back-of-house service spaces and to prioritize customization where it matters most.

Creating unity in the station design serves the Passenger Goals of a simple, seamless, and intuitive passenger journey by eliminating complexity, boundaries, and the need for conscious choices.

Reduce the number of separate elements, by visually combining them or creating a clear hierarchy to reduce visual competition among them. Reduced visual clutter enables the passenger to focus on navigational cues and/or signage where necessary. For frequent riders, it provides a more comfortable and relaxed environment for an enjoyable commute.

Figure i for 3.2.3.A - Simple, unified head house at University of Washington station

Figure ii for 3.2.3.A - Koge Nord Station in Copenhagen demonstrates unity by doubling as a pedestrian bridge over a freeway

Good examples of simplicity and unity of design are reflected in these examples:

- Clear public entrance/head house organization.
- Simple geometry and integrated materials at back of house spaces that create unity and support a hierarchy of spaces.
- Minimizing the extent of back of house facades at street level in emergent station areas improves the pedestrian experience and prioritizes passenger experience through a clear emphasis and priority on public spaces.
- A "family of canopies" with the platform canopy in the most prominent role.
- Simple, expressive canopy design at the platform that is reflected in the canopies at grade creates a unified design language.
- Emphasize structural framing and architectural detailing rather than decorative elements and ornate detailing to promote unity.
- Use durable materials with consistent architectural detailing to allow for simple and repetitive maintenance and cleaning.
- A modular approach for major structural elements in stations to provide opportunities for consistent and repeatable designs as well as prefabrication and associated cost savings. (See Case Study #1 in Appendix C)

Figure iii for 3.2.3.A - Unity, simplicity and a clear hierarchy are achieved in the Canada Line Richmond segment in Vancouver with the use of a limited material palette and form-making that places emphasizes on the shape of the escalator circulation and the wood canopy at the platform.

B.

Express Movement

REFLECT THE DYNAMIC FLOW OF PASSENGERS AND LIGHT RAIL VEHICLES INTO AND OUT OF STATIONS WITHIN THE LINES AND FORMS OF THE STATION ARCHITECTURE.

Transit is movement, the coming and going of passengers and light rail vehicles into and out of stations. Making those flows visible in the station architecture is an essential design principle in the service of intuitive wayfinding. Station elements should be designed to clearly indicate the location of the entry and vertical circulation. The overall form should be indicative of the programmatic function. The expression of movement can be achieved through the emphasis of:

- Horizontal lines and layers.
- The flow of people along vertical circulation.
- Long, low canopies to reflect the movement of the trains.

C.

Grounded and Lightness

DISTINGUISH BETWEEN GROUNDED, WEIGHTY, AND EXCAVATED ELEMENTS WITH HIGHER, LIGHTER, POST AND BEAM ELEMENTS IN SUPPORT OF CREATING UNITY AND EXPRESSING MOVEMENT. EXPRESS THE MEANS AND METHODS OF CREATING THE SPACE THROUGH THE DETAILS OF THE DESIGN.

For elevated, at-grade, and retained cut stations, use the contrast between grounded at-grade elements and lighter elements of movement up to and on the platform.

Guideways and ancillary spaces are ‘grounded’ spaces and materially coded as such by the use of concrete and masonry. Head house entries, vertical circulation, and canopies should be ‘light’ and therefore signal movement. Express the frames of post and beam construction.

The use of Northwest inspired materials at entries and canopies and the strategic up-lighting of those surfaces creates a feeling of lightness and warmth, beckoning people to the station. Locate up-lighting in areas of public importance protected from weather, and not exposed to rain and snow.

In Tunnel Stations, express the carved-out nature of the space created during the excavation process by retaining the elliptical form and using it to shape the space. Where the cavern of the platform and safety concourse meet with adits and/or vertical shafts, use the intersecting geometries in the details as a design opportunity. For passenger comfort, ensure that the space is well-ventilated with access to natural light to guide passengers out from below-grade.

Figure iv for 3.2.3.A - Uplit wood canopies and vertical circulation clearly identified in the architecture allows for intuitive wayfinding at Translink in Vancouver

Figure v for 3.2.3.A - Expressing the shape of the tunnel at the Macquerie University Station, Sydney

3.3 Station Elements

The design team exercises the Station Design Principles upon these constituent pieces, the Station Elements, to produce an overall design. The first group of elements (sections 3.3.1 – 3.3.4) can be used abstractly across the station to unify it or to provide contrast where necessary.

The second group of elements (sections 3.3.5 – 3.3.16) are the defined, concrete parts that can be arranged and configured as the design develops. Each of the station elements will have their own internal requirements, and can work together with the Station Design Principles to create a unified whole.

Figure i for 3.3 - Lynnwood Link Station Rendering

Materials

CHOOSE MATERIALS THAT SUPPORT BOTH SYSTEM AND STATION IDENTITY, HAVE LONGEVITY, AND REINFORCE SOUND TRANSIT'S GOALS OF ACHIEVING SUSTAINABILITY AT BOTH THE BUILDING AND REGIONAL SCALES.

The primary material components in station design are steel, glass, and concrete, and other Northwest materials as determined by the station standards. The use of high quality, durable, consistent, and easily maintainable materials promote positive behavior by creating an environment that is obviously cared for and people take pride in. Other materials that meet the requirements outlined in the Design Criteria Manual (DCM) may be used but in all cases safety, durability, ease of maintenance (section 3.4.2), economy (section 3.4.3), and sustainability (section 3.4.4) are essential attributes that must be satisfied.

Specify materials that are durable and attractive without paints and coatings that would require regular renewal particularly in touch zones or exposed exterior elements. Use stainless steel for handrails and guardrails at public areas and anti-graffiti coatings on all materials, including glass up to 9' per the DCM.

Select solid, integral materials and provide vandalism resistance. Surfaces need to provide vandalism resistance, for example, all concrete walls must have formliner patterns.

Any material choice must consider the total cost of ownership (refer to section 3.4.2.B) and be identified as part of the station standards issued by Sound Transit.

Glass

Glass, used in support of the Principle of providing transparency and clear sightlines, is one primary building material. Standardization of glass sizes and installation methods help foster a recognizable system identity. Maximize glass sizes where possible to improve sightlines. Glass sizes in Sound Transit owned and maintained headhouses, shelters, and windscreens should not exceed 4' x 8'. Larger sizes should be limited to areas away from platforms and tracks and in areas that are easily accessible. Where there are Additional Entrances (as defined in sections 3.3.5.1 and 4.5) into the station through a Joint Development agreement, larger glass sizes are acceptable at storefront and in canopies.

Rectilinear glazing is preferred to reinforce the linear expression of stations, as well as for ease of cleaning. Minimizing horizontal mullions and accentuating vertical mullions to maximize sightlines and reduce roosting and maintenance needs is preferred. Please refer to DCM for other standard sizes and bird deterrent requirements.

Captured systems, with mullions on all 4 sides, are economical and easy to replace. It is the system type most often used in existing Sound Transit stations. Disadvantages of this system are the frequent mullion locations that limit transparency, sightlines and the horizontal mullions that provide locations for bird perching.

In future stations, the emphasis on linearity encourages the use of other installation methodologies. Spider fittings are not allowed.

Silicone Structural Glazing (SSG) can be utilized in combination with a captured glazing system or solely as an SSG system. An example of a combination system is the University of Washington station.

SSG systems allow for increased openness which provides greater visibility. It is also compatible with the existing system language.

Sealant within the touch zone can be an issue for maintenance and is discouraged.

Steel

Steel framing is another of the primary materials in station design. In all cases, use high performance coatings to minimize maintenance and promote longevity (see section 3.3.2 and the DCM for the color palette). Framing systems should be reminiscent of timber construction with straight elements to reflect the heritage of the region and the trestles that first provided access to Union and King Street Stations.

Figure i for 3.3.1 - Richmond-Brighouse Station, Vancouver BC

Figure ii for 3.3.1 - Mukilteo Multimodal Terminal

REFERENCE:

Refer to the Design Criteria Manual for standard glazing size information. For more information about materials and finish performance requirements see the Sound Transit Standard Specifications

Mass Timber

As a primary material, mass timber combines several overriding benefits: it creates a strong language for a system identity and wayfinding; it is a strong link to and signifier of our Pacific Northwest location; the use of mass timber outside of the touch zone creates a warm, welcoming atmosphere which enhances the passenger experience; and mass timber is a highly sustainable building material with low embodied carbon.

Consider opportunities to implement modularity and prefabrication when using mass timber for potential savings and greater speed of construction. See section 3.3.9 for additional information about canopies.

Mass timber elements are to be used outside of the touch zone and must be detailed for rain and weather protection. Whenever possible, up-light mass timber to provide greater warmth and emphasis to this regional material.

Concrete and Masonry

At elevated stations, the concrete structure of the guideways, platform, columns, and bents visually impacts the station area. The horizontal guideway can also provide an anchoring element against which the station design acts as an interruption or a punctuation mark.

Follow the prescriptive octagonal concrete column shape for all station and elevated guideway support columns. They are structurally efficient while providing visual interest and act as a Link system identifier for the elevated guideway infrastructure. The octagonal shape also helps to distinguish Link columns from other SDOT and WSDOT infrastructure, which typically makes use of round columns. Exceptions to this requirement may be made by Sound Transit in areas where the column height is limited or the octagonal columns are not feasible. Columns should not impede sightlines or visibility along the major flow path to head house entries. Chamfer all concrete edges so the faces are at angles of 135 degrees or more.

Birds are a frequent and unwanted nuisance at stations. All primary and secondary structures should avoid providing surfaces for birds to roost and build nests. Exposed guideway girder flanges must be sloped 45 degrees or steeper to prevent bird roosting. Bird deterrent products should only be used where it is infeasible to design the structure to prevent roosting.

At elevated stations where ancillary spaces are included at grade level adjacent to the guideway columns, the wall finishes should blend with the concrete guideway. Adding detail in the concrete similar to Judkins Park or Redmond Technology Center provides visual interest to pedestrians while maintaining continuity with the other receding, grounding elements of the station infrastructure.

Low carbon concrete and white pigmented sealers are preferred. Even small reductions in the volume of concrete used makes a difference in the embodied carbon in our projects.

The use of a Concrete Life Cycle Assessment Calculator throughout the planning and design process can be a significant aid in reducing carbon.

Tunnel Walls

Materials that are applied on the tunnel walls of the below-grade station are to be efficient, durable, and water resistant. Along with the efforts to seal the structure, provide details for channeling of water infiltration as it is expected to happen below-grade.

Think through the routes for conduit to be installed for art or digital advertising.

Other materials

The use of metal panels at the interior is also suggested because it is durable, allows for factory applied color (where appropriate), and provides accessibility to required infrastructure for advertising, signage, or lighting.

Variety, tonal variation (University District Station is a good example), and texture are encouraged in public station areas, especially waiting areas for increased visual interest.

Figure iii for 3.3.1 - South Bellevue Station

Figure iv for 3.3.1 - University District Station Tunnel Walls

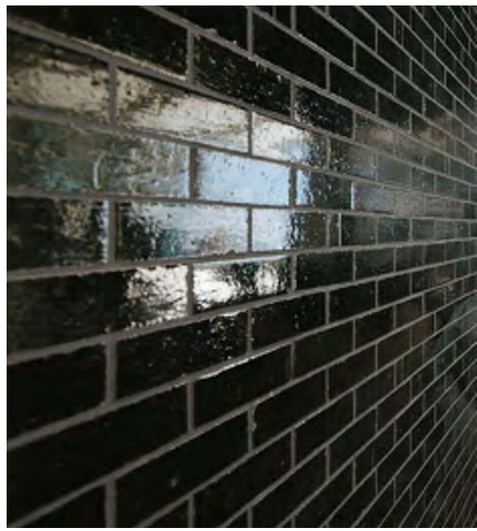


Figure v for 3.3.1 - Spring District Station

Figure vi for 3.3.1 - Redmond Technology Center Station

Figure vii for 3.3.1 - Judkins Park Station

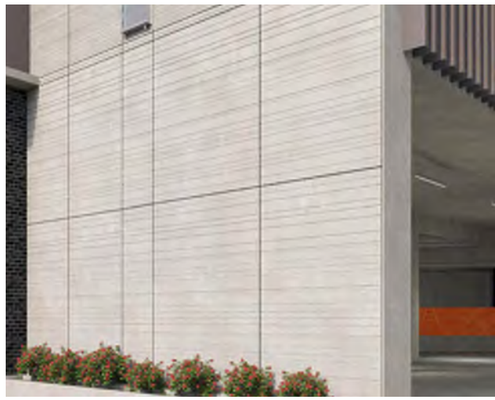


Figure viii for 3.3.1 - Concrete Form Liners

Figure ix for 3.3.1 - Concrete Bricks

Figure x for 3.3.1 - Concrete Block color and texture

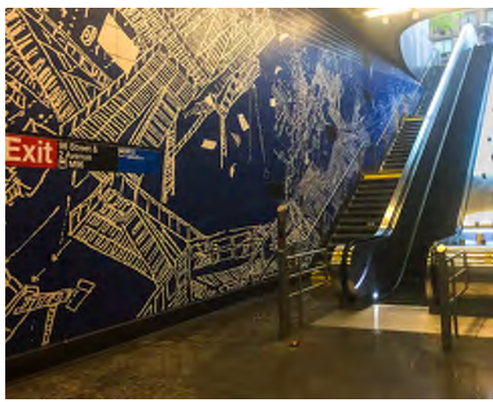


Figure xi for 3.3.1 - Ceramic Panels used for Tunnel Walls on a new MTA subway station

3.3.2

Color

Color plays an important role in passenger wayfinding and creating Neighborhood Identity. Station design encompasses two different color typologies, one for structure and steel components that make use of high-performance paint, and the other for accent colors that play a key role in placemaking and the overall station design. Accent colors must not occur in field painted items but in factory finished or integral color components to avoid paint touch-up requirements by maintenance.

Architectural colors for the painted steel or other structural components are defined in the Design Criteria Manual, and acceptable paint products can be found in the ST Standard Specifications. These colors are neutral and range from light to dark. The intent is to provide a quiet backdrop for form, material, and accent colors that create a distinctive station identity. Use of lighter gray colors in recent stations have created markedly 'brighter and livelier' station environments (Northgate station is one example).

Use accent colors to create visual interest, complement the design, and foster community identity through placemaking. Coordinate the color with stakeholders and the AHJ to help establish station identity. Station accent colors are an opportunity to enhance the passenger experience, act as a deterrent to vandalism, and draw the eyes to key decision points.

While bold accent colors are useful for placemaking take care that the accent color selection and location does not conflict with or match too directly the wayfinding or art. Sound Transit has identified colors for the different route lines and to avoid passenger confusion those colors should not be used as accent colors.

Sound Transit will make final approval on accent colors based on integration with the larger station and system.

Figure i for 3.3.2 - Entrance into Roosevelt Station illustrates color and neighborhood identity in an urban environment.

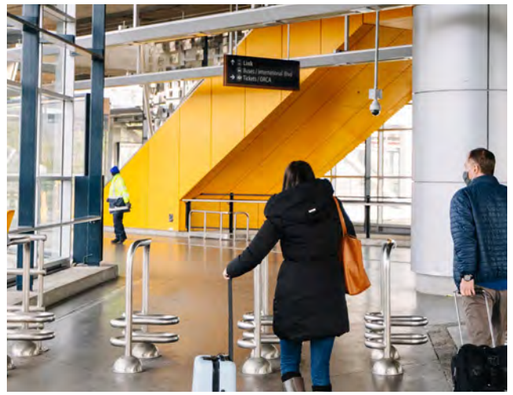


Figure ii for 3.3.2 - Bright yellow metal panels at the escalator surrounds at Seatac/Airport Station draw the eye to vertical transportation

Figure iii for 3.3.2 - Color at the pedestrian bridge at Overlake Village Station

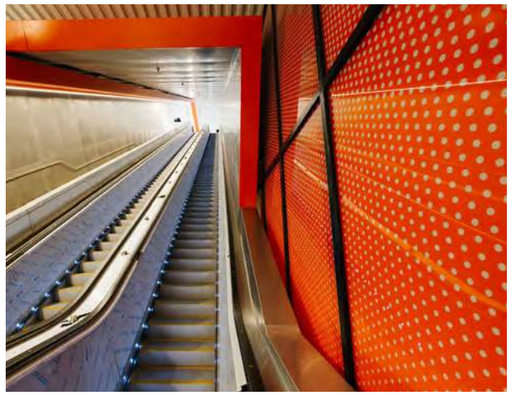


Figure iv for 3.3.2 - Color at the vertical transportation at U-District Station

Figure v for 3.3.2 - Diagram of typical head house accent color locations in blue

3.3.3

Lighting

Use natural light as a wayfinding strategy wherever possible and incorporate it into below-grade stations to guide passengers out.

Sunlight is a prominent feature used in other below-grade station systems around the world such as: Pittsburgh's Gateway Station, Canary Wharf in London, Foster's portal entries for Bilbao, and in New York at the Dey Street Station.

Lighting design has a substantial effect on a person's perception of space and can markedly enhance the users' experience and comfort. Lighting must minimize glare and shadows while creating areas of emphasis to draw people toward them and guide people from one decision point to another.

Effective lighting strategies are also critical in the perception of safety. Light vertical surfaces, especially at eye level to increase the perceived brightness of a space, and to reduce glare while illuminating peoples' faces which creates a feeling of safety. Where possible within stations, wall-wash with light and use diffusing lenses to avoid directing exposing a lamp within a passenger's view. Focus should be on the quality of the light over the quantity of light to reduce glare and create a better user experience with increased safety perceptions. Refer to Case Study #2 in Appendix C.

All lighting types and locations must be responsive to long term maintenance needs and safe access. Placement of lighting on structural columns is also discouraged, as incorporating the conduit within columns can be difficult, exposed conduit is not preferred, and column caps add expense. Use similarly shaped light fixtures and fabricated metal enclosures for consistency throughout the stations.

Employ similar lighting strategies and color temperatures across the network to allow for a consistent experience. While the individual station form, materials, colors, and details might change, the quality of light in each of the stations should remain the same. A welcoming soft white light for illuminating people's faces and providing a sense of security. Avoid over-illuminating the floor surface, creating glare and harsh shadows, and/or using off-color lighting.

Coordinate lighting transitions between spaces from the station platform through to the station plaza or other pedestrian environment to create a seamless passenger experience. For enclosed stations and garages, provide a smooth transition between a brighter interior and a dimmer exterior environment to create a more comfortable passenger experience. Sound Transit Design Criteria and AHJ requirements for Energy Code and regulations for light pollution must all be balanced for pedestrian lighting at exterior plazas and spaces.

Follow BUG (Backlight, Uplight, and Glare) ratings of B=0, U=0, and G=0. Use shielded luminaires and minimize light trespass across property lines, especially into multi-family residential buildings. Only wash the ceiling of a canopy or roof structure where the luminaires can be installed in a weather-protected location. Lighting is not permitted within the floor or ground.

Figure i for 3.3.3 - An example of a maintenance-accessible Formed Metal Enclosure (FME) used to house lighting, speakers, and attach signage while concealing conduit and cables..

Figure ii for 3.3.3 - Entrance / exit at Tottenham Court Road Station in London uses natural light, wall washers, and high reflectance materials with color to lead passengers into and out of stations.

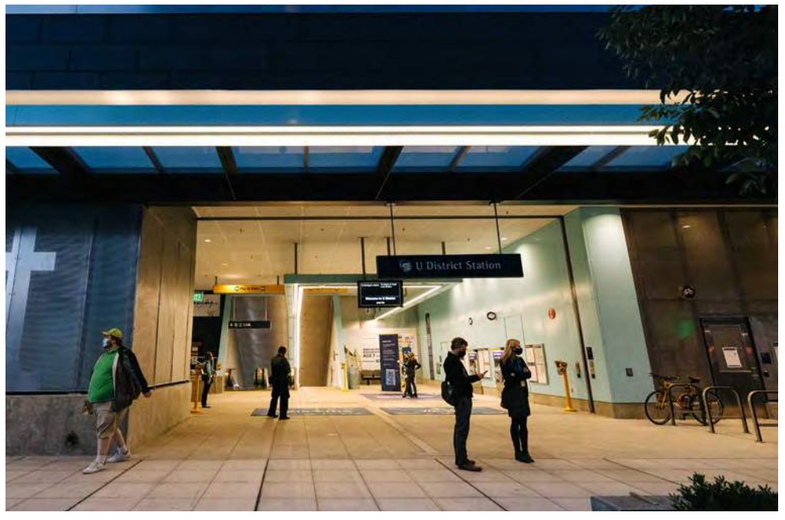


Figure iii for 3.3.3 - Entrance of U-District Station illuminated at night acts like a beacon for passengers with clear sightlines providing a sense of safety

Figure iv for 3.3.3 - Uplighting the canopy, the ceiling of the entrance, and the brightly colored steel signals passengers from a distance and makes the station inviting at Tukwila International Blvd.

3.3.4

Public Art

Public Art enlivens transit facilities by bringing a human-scale, local meaning, and unique element to individual stations. As Sound Transit's light rail stations become more standardized by the necessity of cost-efficiency and operational requirements, artwork serves as points of distinction within a system that requires continuity.

Art in transit can take many forms, from temporary to permanent, highly integrated within station architecture to stand-alone plaza markers, and includes space for performative art in the station flow. Developing art opportunities is defined through studying each station's unique site context.

The Sound Transit Art Program (STart):

» Analyses each station's characteristics to determine art opportunity zones;
» Consults with local jurisdictions and communities for feedback;
» Brings the perspective of artists into the planning and design process;
» Collaborates with design teams to create holistic integration.

Artists develop site-specific artwork proposals after being contracted with Sound Transit. STart has found that to produce a meaningful artwork an artist needs to be incorporated into the project, should research the neighborhood, and work with the design team prior to proposing an artwork.

A successful public artwork will be a prominent feature in public transit spaces, will work harmoniously with the architecture while also contrasting with it, will have clear sightlines that enhance the passenger journey throughout the facility, and will work in complement with the placement requirements for Sound Transit's Signage-Wayfinding and Fare Paid Zone systems. Art should not be placed in locations that block passenger sightlines, within primary passenger flows, decisions points, surge zones, or mixing zones. Artwork locations and development will take CPTED guidance into consideration, along with current requirements from Sound Transit Safety and Security. Consideration should be given when locating art to potential issues with maintenance or repairing and cleaning.

Figure ii for 3.3.4 - Ellen Forney, Walking Fingers 2016. Porcelain enamel on steel. Forney's bold Walking Fingers invite people from the street into the station, and draw passengers up to street level from a pedestrian tunnel.

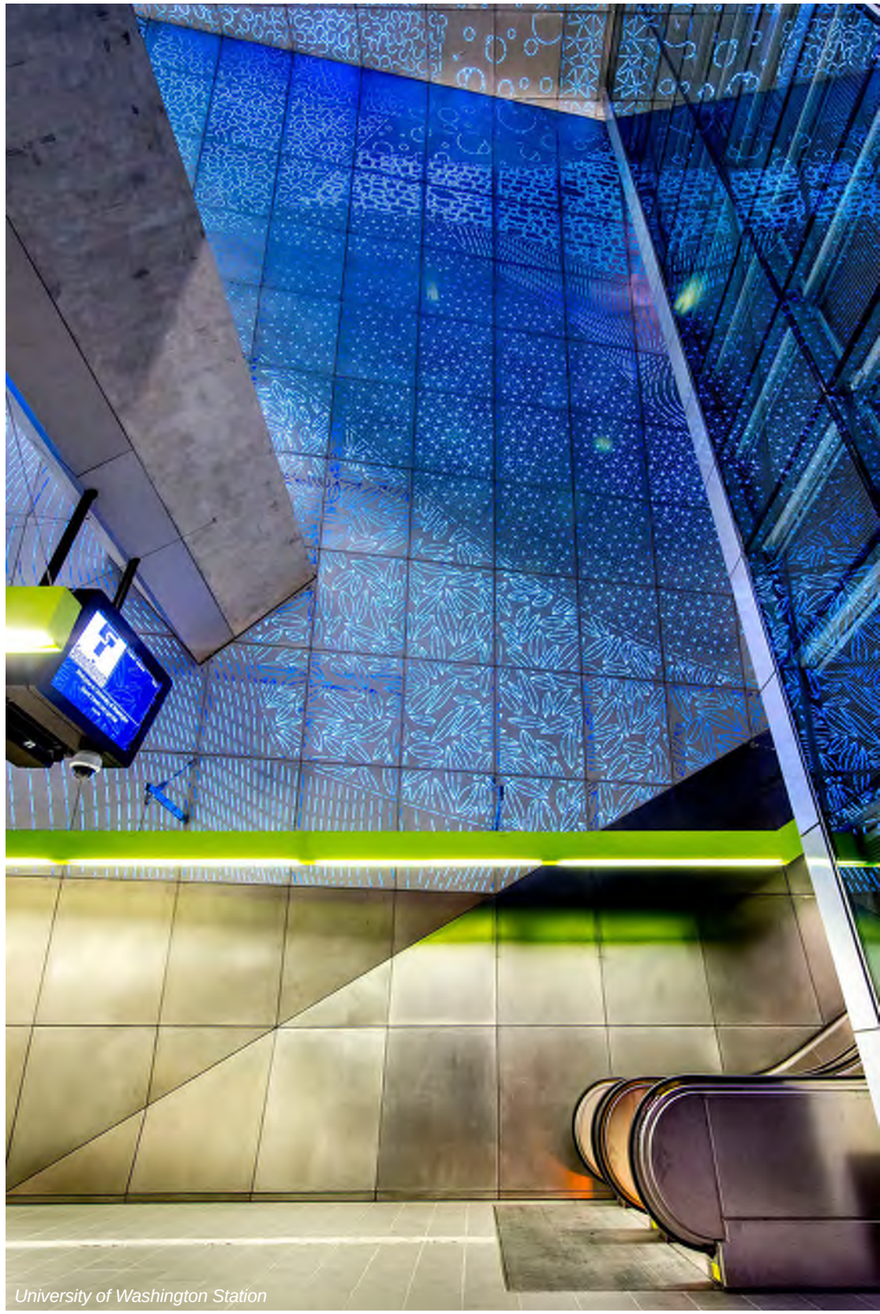


Figure iv for 3.3.4 - Leo Saul Berk, Subterranium, 2016. Aluminum and polycarbonate. Completely covering the walls of this vertical circulation chamber, this artwork creates an immersive environment, mitigating the long descent into the tunnel station. To make the most of a project like this, careful attention should be paid to visual obstructions in the space which could detract from the artwork.

Figure i for 3.3.4 - Kenji Stoll, Untitled, 2025. Glass Mosaic. A plaza under an elevated station will host a garden of 50 6 ft x 12 ft artwork billboards featuring work by 10 artists from diverse backgrounds and experience levels

Figure iii for 3.3.4 - Wayfinding: Artist Clark Wiegman's Surroundings inspired by local history serve as a marker to the station entrance, and a meeting place for passengers. The artist worked with the STart staff and the architects to determine placement, and structural needs. Electrical accommodations were included in the project design.

Art locations and opportunities are designed to work with other program and station goals to support the passenger experience. Artwork placement works alongside Signage, Way-Finding and Fare Paid Zone indicators to make using a Sound Transit facility an intuitive and pleasant journey. Art is particularly suited to support wayfinding by Low English Proficiency passengers (LEP). For instance, intentional use of art at platforms could help distinguish between multiple platforms at the same station.

Making memorable places requires the STart team and its artists to have early and ongoing collaboration with stakeholders and jurisdictions for artwork concept direction and with design and construction teams for the implementation of the owner-supplied feature. The Sound Transit Board has allocated a 1% of construction cost art fund for producing integrated public art with the expectation that artwork and the thinking of artists will be incorporated into all its capital expansion projects. Artwork is an integral part of a Sound Transit facility, not an extra component.

STart staff is responsible for implementing all aspects of integrating artwork in station design and construction phases. Generally, artwork is incorporated into Sound Transit facilities as an owner-supplied feature, with some exceptions developed through team collaboration and coordination. Artwork details and responsibilities with the contractor are described in specification and project requirement documents. STart staff must stay involved with design and construction teams throughout the duration of the Sound Transit project to resolve issues that may arise related to artwork integration. This collaborative work includes submittal reviews and involvement with scope changes that affect the artwork.

REFERENCE:

Refer to the Design Criteria Manual for **additional information on the STart Program.**

Figure vi for 3.3.4 - Haddad Drugan Cloud, 2016. Painted steel, stainless steel wire rope, polycarbonate discs, custom lighting. This sculptural cluster of colored, translucent discs shimmers in the wind and sun, activating the station from a distance, and providing passengers a calm moment while waiting for a train. Allowing for a charismatic, centrally-located landmark can anchor a station within a busy streetscape. A light show in sunset colors animates Cloud after dark, providing a strong night-time and day-time experience.

Figure vii for 3.3.4 - Community Engagement/Unique Site: The local topography led to a large unique atrium space, which artist Tad Savinar used for his "Molecule of Tukwila" with I love, I remember, I wish sentiments from community members etched into granite platform pavers.

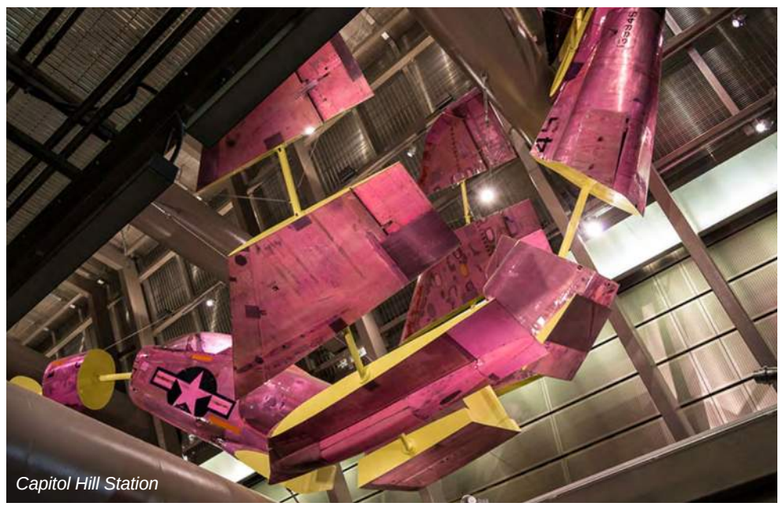


Figure v for 3.3.4 - Mike Ross, Jet Kiss, 2016. Re-purposed jet fighters, acrylic. A massive organic form confined by a rectilinear volume adds depth and energy to what could otherwise seem like a cavernous space in the underground station. Allowing for improvisation within a well-defined space provides a kind of texture that may not be possible with architectural surfaces.

Figure viii for 3.3.4 - Christian Moeller, Nails, 2020. Painted steel. These playful, unexpected objects serve as a distraction from views into a facility about which neighbors were anxious, and satisfied the City's desire for a perimeter amenity. Close coordination on the structures needed to support Nails made the design and installation processes simple and achievable.

Vision For Artwork Location Selection

Successful artwork is located in prominent locations where people gather, where passengers pass through on their station journey, and where sightlines are visible to the public outside the station. Those artwork locations are typically on vertical surfaces in entries, on vertical circulation and station walls, on exterior elevator towers, and on platform windscreens. Artwork can be in plazas to create a sense of welcome and in platform areas, with consideration for surge zones and safety. Artwork can become or be incorporated into required elements, such as railings, benches, and acoustic panels.

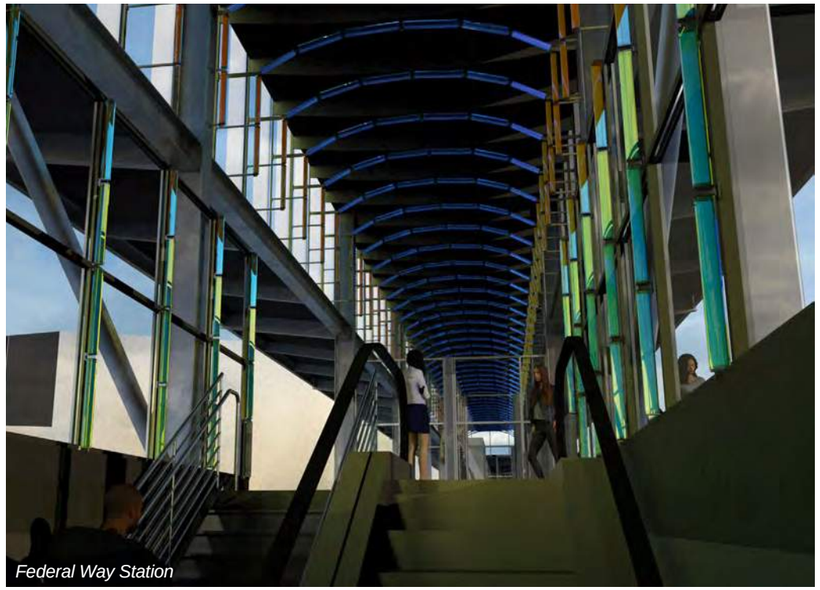


Figure ix for 3.3.4 - Catherine Widgery, Untitled, 2024. Dichroic glass with steel supports. The Artist was able to enhance the existing station architecture using a dynamic material attached to the structure that creates a cathedral-like feeling in the space. The dichroic glass fins will absorb and reflect ambient light and color throughout the facility. The artist will be installing the artwork which is attached to the existing curtain wall mullions and clerestory canopy, so this needs to be clearly identified in the construction documents for clash detection and for inclusion in subcontractor mullion system design.

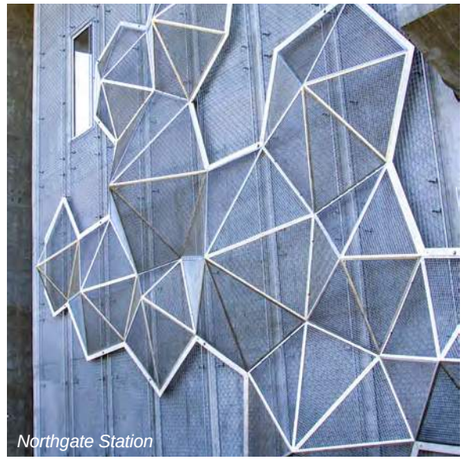


Figure x for 3.3.4 - Cris Bruch, Overlay, 2021. Stainless steel. Modifying the vernacular forms and materials of a contemporary wall trellis structure, the artist has subverted the rigid geometry of the surrounding architecture, creating a bridge between those forms and the plant life that will grow over the sculpture

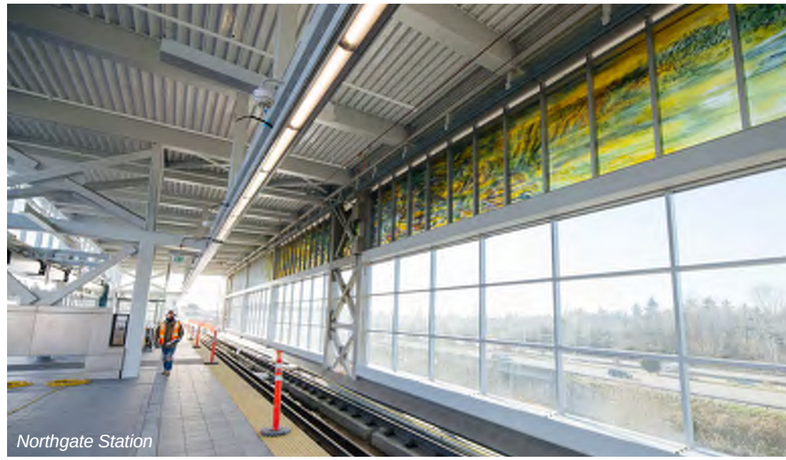


Figure xi for 3.3.4 - Mary Ann Peters, Darner's Prism, 2024. Vitreous enamel hand painted glass. The artist replaced existing glass planned for the platform clerestory and in a stairwell with hand painted glass that conformed to the engineering requirements and mullion system. The artwork pulls color and light into the station and creates moments of exploration for views as they travel to the platform and wait for their train

Figure xii for 3.3.4 - Guy Kemper, Rain, Steam and Speed, 2009. Blown sheet glass. This simple gesture works to identify the station from a distance in a way similar to a supergraphic. This strategy works best when the content of the artwork has meaning within the context of its surrounding community.

Figure xiii for 3.3.4 - Victoria Fuller, Garden Shovel, 2009. Bronze latex paint. The 26 feet high shovel covered in plants from the many countries were neighbors originated sits at the corner of a busy intersection adjacent to a station, and has become a point of pride to the community.

Figure xiv for 3.3.4 - Building Blocks, 2020. Steel and aluminum. This dramatic sculpture marks the station from a distance and creates a gathering place at its feet. The sculpture's enormous scale is unexpected and charming. Integrating an area into the hardscape design specifically for a marking object added spice to the architectural composition of the station.

Figure xv for 3.3.4 - Hank Willis Thomas, Untitled, 2021. Porcelain enamel on steel. This bold, prominent placement facing the surrounding street anchors the entrance to the station and celebrates both an important local figure and the history of an under-represented community. Consider how artwork can signal the entrance to a station -the site for this artwork could have been stronger without the heavy entrance canopy.

3.3.5

Entrances

The station entrance represents the access point to the station from the public right-of-way or adjacent development and varies according to the station form, surrounding context, topography, and possibility of tying into joint development. This section covers the definition of Required Entrances and Additional Entrances, their possible configurations, system and station identification, and the components of an entrance lobby.

A.

Required and Additional Entrances

Depending on the surrounding context, a station could have a number of different connections and entry points. If there is varied topography or urban barriers over which the station could serve as a bridge, a land use context that either is Established or Emergent (see 4.1.2), a constrained right-of-way, and/or high ridership numbers, two or more entries may be required. If there is a primary approach for most passengers and lower ridership numbers, having only one entrance may be allowable.

For more information on the minimum number of Required Entrances, please refer to the land use and station access matrix in 4.2.2. A Required Entrance must follow the guidance below.

Joint development projects may provide Additional Entrances beyond the minimum required – see section 4.5 for guidance.

B.

Configuration of Entrance Elements

The station entrance from the public realm may occur through a head house with all of the lobby components (ticketing, maps, a Fare Paid Zone threshold, and Vertical Transportation connections to the platform). It may also occur through a simple pavilion or canopy structure housing the vertical circulation elements within a right-of-way, a niche or atrium integrated into a building mass, or at a grade-separated pedestrian bridge or tunnel connection that lead to a lobby at a concourse level.

Lobby within a Head House

A head house is an at-grade, weather-protected space with a lobby connecting to the Link Light Rail System. The number and placement of head houses and lobbies is context-sensitive and determined on a project-by-project basis. When two head houses are required, the preferred location is towards either end of the platform to decrease the travel distance for pedestrians to transfers or their final destinations and to expand the accessible walkshed area.

Providing a head house offers another opportunity to reinforce system identity, provide shelter for ticketing (when located within the head house), a waiting area, and access to vertical transportation.

Lobby at a Concourse Level

Where an intermediate concourse level is provided that is within a vertical distance (maximum of 40 vertical feet) of the station entrance Sound Transit may consider moving the lobby functions and beginning the fare paid zone at either an above-grade or below-grade concourse level.

Site circumstances may dictate that a Required Entrance occur within simple pavilion or canopy structure housing vertical circulation elements in a public right-of-way. The larger lobby footprint then has more space available at a concourse level.

The existing Downtown Seattle Transit Tunnel utilizes niches within existing buildings with minimal street-level footprints, using vertical circulation only to lead to a full lobby on a concourse level. If width permits, a grade-separated pedestrian bridge or tunnel connection could also house a lobby.

Figure ii for 3.3.5.B - Headhouse elevation

Figure i for 3.3.5.B - Headhouse entry

C.

System and Station Identification

Though the exact sequence may vary slightly from station to station, repetition of the same identifiable elements in similar compositions will aid in overall system legibility.

Entrances have standard components that reinforce System Identity: glazed canopies, signage including a wayfinding transit icon, context relevant finishes, and station identity finish elements.

If there is a head house or other glazed entrance within a building façade, a transit icon supergraphic is a fifth standard component.

THE ENTRY MUST BE INVITING

Glazed canopies enhance the visibility of the station entry, create a threshold between the public realm and the station, and provide weather protection.

Exterior canopies must relate to the other station canopies (see 3.3.9) or to a larger building development and must comply with any additional jurisdictional requirements.

Additionally, all Required Entrances must have roll down doors to secure the station after hours as well as digital dynamic signage directed towards incoming passengers. At stations with a retail component, stations will have a roll down door independent of the retail. See Retail section 3.3.16 for more information.

THE ENTRY MUST BE CLEARLY RECOGNIZABLE

Use of the light rail supergraphic mode icon on a transparent façade serves two purposes: it helps establish an iconic marker for the light rail system and it plays a key role in wayfinding. The supergraphic can be either transparent or opaque and will work in conjunction with other standard signage elements.

Use illuminated blade signage oriented perpendicular to and above the entrance to capture the sightlines of pedestrians on the sidewalk. Mount the light rail mode icon supergraphic on the façade to be visible to people on the opposite side of the street and approaching at an angle.

In certain heavily touristed areas, consider coordinating with the local DOT to install an illuminated pylon sign with the light rail mode icon and a local map oriented perpendicular to the entrance within the furnishing zone of the sidewalk or plaza. The pylon will reinforce the other signage.

In addition, station identity signage installed over the station entrance confirms for the passenger that they are entering the correct station. See the Signage Manual for more detailed information on signage types.

THE ENTRY MUST BE A BEACON ATTRACTING PASSENGERS TO THE STATION FROM THE PUBLIC REALM

The use of glazing at station entries serves a multitude of purposes. Light emanating from the station attracts passengers while natural light entering the station serves as a wayfinding aid for people exiting the station.

Bold color or artwork must be used behind a transparent façade at a station entrance as it creates visual interest and draws people to the station. Views into and out of the station also allow passengers to see the next step in their journey.

In addition to the station entry requirements outlined in sections 3.2 and 3.3.12, head houses also include station identity elements and finishes that relate to adjacent buildings or surroundings.

Transparency and lighting, along with a concentration of color or art helps to create a vibrant, inviting entrance. Masonry and/or metal panels where solidity is required rounds out the palette at station entrances. Where used, masonry color, size, and pattern selection should be context-specific (see also 3.2.8 Materials) and may be coordinated with the public art. Refer to Design Criteria Manual for additional masonry specifications.

Consistent use of these materials and strategies, along with Sound Transit system signage at station entrances, confirms to the passenger that they have arrived at a Sound Transit station. Entrance lobby design should prioritize the reinforcement of the passenger's direction of travel to the platform and take care not to attract passengers to back of house or non-public spaces. Additionally, entrance lobbies should be sized to provide eddies, on both sides of the Fare Paid Zone, for people to step outside the main traffic flow for trip planning, waiting for companions, or taking a few minutes to regroup.

Figure i for 3.3.5.C - An inviting and recognizable entrance at Dey Street Station in lower Manhattan

Figure ii for 3.3.5.C - Sound Transit blade Signage

Figure iii for 3.3.5.C - Example of illuminated iconic entry signage

Figure v for 3.3.5.C - U-District Station

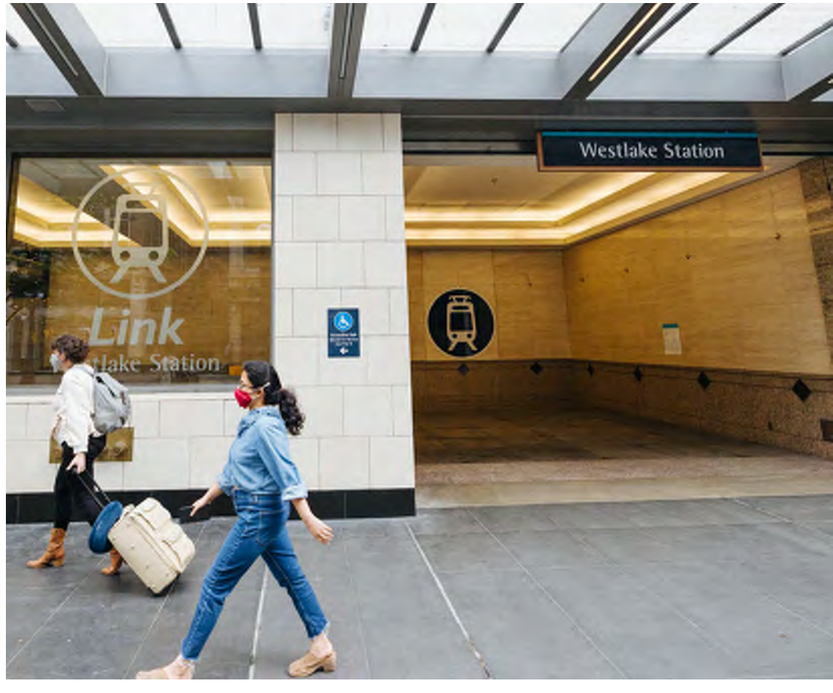


Figure iv for 3.3.5.C - Westlake Station

D.

Lobby Components

Sizing and Layout

Size the lobby according to passenger flow simulations and organize the elements so that conflicts are minimized between exiting and entering passengers. Maintaining clear sightlines from one decision point to the next and providing ample space between decision points will support good passenger flow. Likewise, careful arrangement of entry, equipment, and vertical transportation is important to avoid overlapping pedestrian traffic patterns. When possible, arrange traffic flows to reinforce intuitive right-handed traffic flows. Minimum interior dimensions must accommodate these activities comfortably with the required surge zones. See the Design Criteria Manual for detailed information.

Ticketing and Fare Paid Zone thresholds should occur within the lobby and must be clearly delineated prior to vertical circulation (where it occurs) to the platform. (See also 3.3.6 for the configuration of vertical transportation). Care should be taken when planning flooring materials to account for wet floors as people walk in from outside.

Ticketing

Successful wayfinding will provide an intuitive ticketing experience for new riders and a consistent, convenient one for frequent passengers and commuters. While there will be some variation with the ticketing configuration based on site constraints, the components of the ticketing system will be consistent.

Standard components include: Ticket Vending Machines (TVMs), surge zones in front of TVMs, real-time arrival/departure screens, wayfinding and informational signage, benches (away from path of travel) and trash/ recycling cans.

Ticket Vending Machines must be consolidated into the fewest number of locations possible. This supports passenger experience by providing a simple, central location for passengers to buy tickets. It also shortens wait times during busy periods of ticket purchases. Signage does not work to direct people to additional TVMs. People will typically use the first set of machines that they encounter, even if there are long lines.

In addition to reducing the number of TVM locations, TVMs should follow the same placement strategy in each station. For example, locating them at street level at one entrance and at the concourse level at another entrance within the same station creates unnecessary confusion. TVMs should be located as early in the passenger experience as possible.

Make ticketing readily visible from entry paths. Locate standard signage next to TVMs.

Placement of ticketing at street level prior to vertical transportation is preferred, but should site conditions warrant, it may be located at a concourse level. The Fare Paid Zone (FPZ) should be located adjacent to ticketing.

For at-grade stations, ticketing occurs immediately before the platform and is followed by the FPZ threshold.

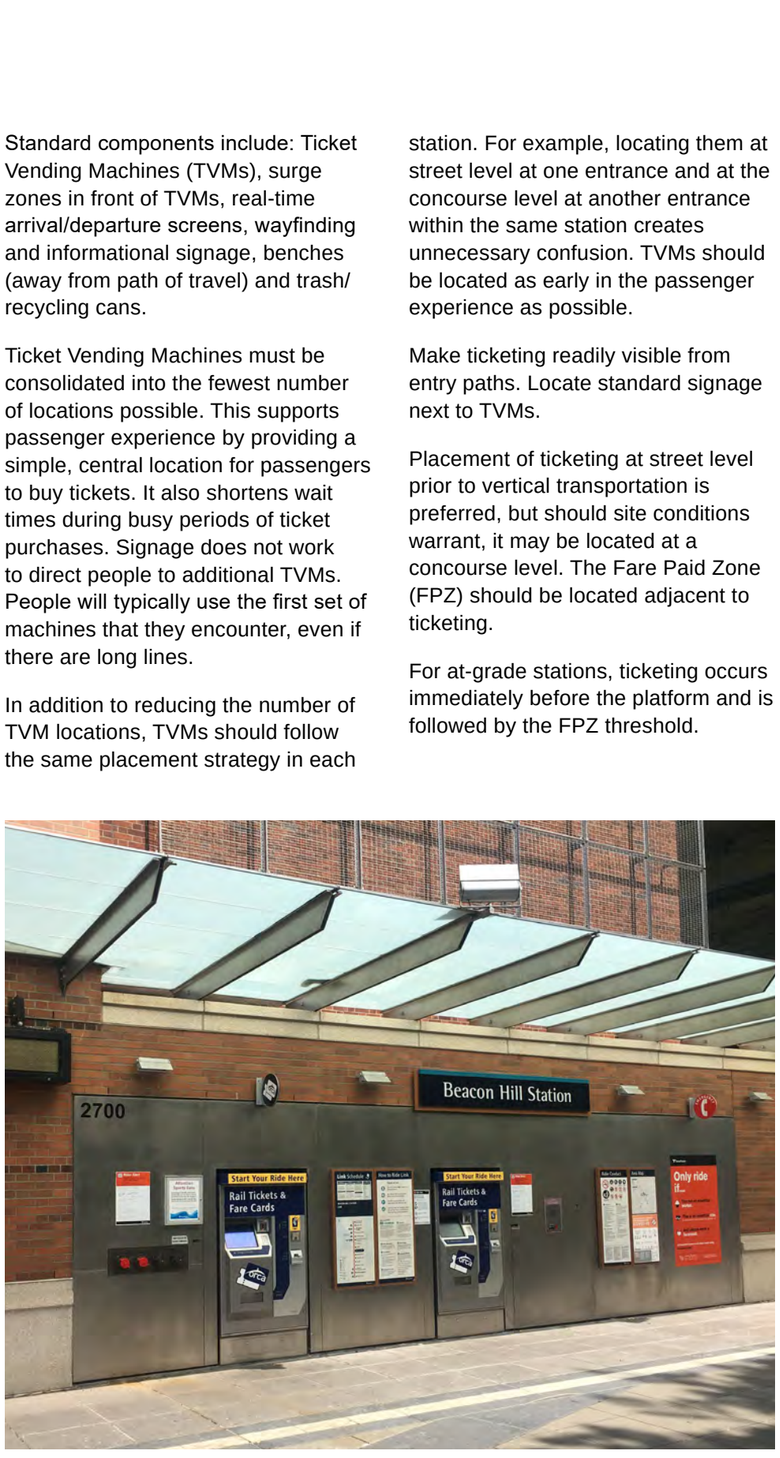


Figure i for 3.3.5.D - Ticketing at Beacon Hill Station with glass canopy covering to provide weather protection over surge area

Figure ii for 3.3.5.D - Head house ticketing and surge zones

Figure iii for 3.3.5.D - Ticketing at the concourse level at Tukwila International Blvd Station

Fare Paid Zone Threshold

The Fare Paid Zone (FPZ) and fare enforcement begins on the other side of the FPZ Demarcation line.

Locate the Fare Paid Zone directly after ticketing and prior to vertical transportation to the platform. To ensures that all passengers are aware of crossing the threshold and create a seamless ticketing experience, locate the threshold within the main path of travel. The Fare Paid Zone threshold supports universal design by ensuring the paid area and ORCA readers are easily discoverable by all.

Avoid having multiple Fare Paid Zone thresholds in the same entrance lobby. Combining elevators with other vertical circulation entries with stairs and escalators creates an efficient consolidated Fare Paid Zone. Like ticketing, a consolidated single Fare Paid Zone creates a better, simpler passenger experience. Refer to the passenger flow diagram in Chapter 2.

Standard elements at Fare Paid Zone threshold include:

- ORCA card readers (2 minimum) located along the tactile threshold;
- 2’ deep floor marking of yellow tactile pavers ;
- Fare Paid Zone signage sized to the width of the threshold;
- Overhead Fare Paid Zone Signage

When the circulation path is more than 14’ wide there should be additional ORCA card readers.

The design of the Fare Paid Zone must allow areas for passengers to step aside to look for their ORCA card so as to not adversely affect the flow of other passengers. A 20’ clear zone around Fare Paid Zones is preferred.

Additional details for Fare Paid Zone design standards can be found in the Standard Drawings.

For at-grade stations, the Fare Paid Zone is located at the ends of the platform outside of the 380’ platform length.

Transfer between lines should occur within the Fare Paid Zone so that passengers do not need to leave and re-enter the Fare Paid Zone. If the transfer concourse is being used for passage between public spaces, then this area is not included in the Fare Paid Zone and FPZ threshold must be located immediately prior to the surge zone for the vertical transportation to the platform. See link to Link transfer stations in Passenger Experience and Decision Points along Journey Sequence, Section 2.3.4..

In the design of Link stations where there are two different sets of platforms, transfer concourses are preferred to occur within the Fare Paid Zone. This enables passengers to transfer between Link lines without tapping off then back on, eliminating complexity and providing a simple, easy connection. When transferring to other transit modes, such as the ST Express bus for example, passengers should exit the Fare Paid Zone.

Figure vi for 3.3.5.D - Fare Paid Zone signage at vertical transportation into Northgate Station

Figure iv for 3.3.5.D - Fare Paid Zone elements at typical elevator entrance

Figure v for 3.3.5.D - Fare Paid Zone testing at Roosevelt Station

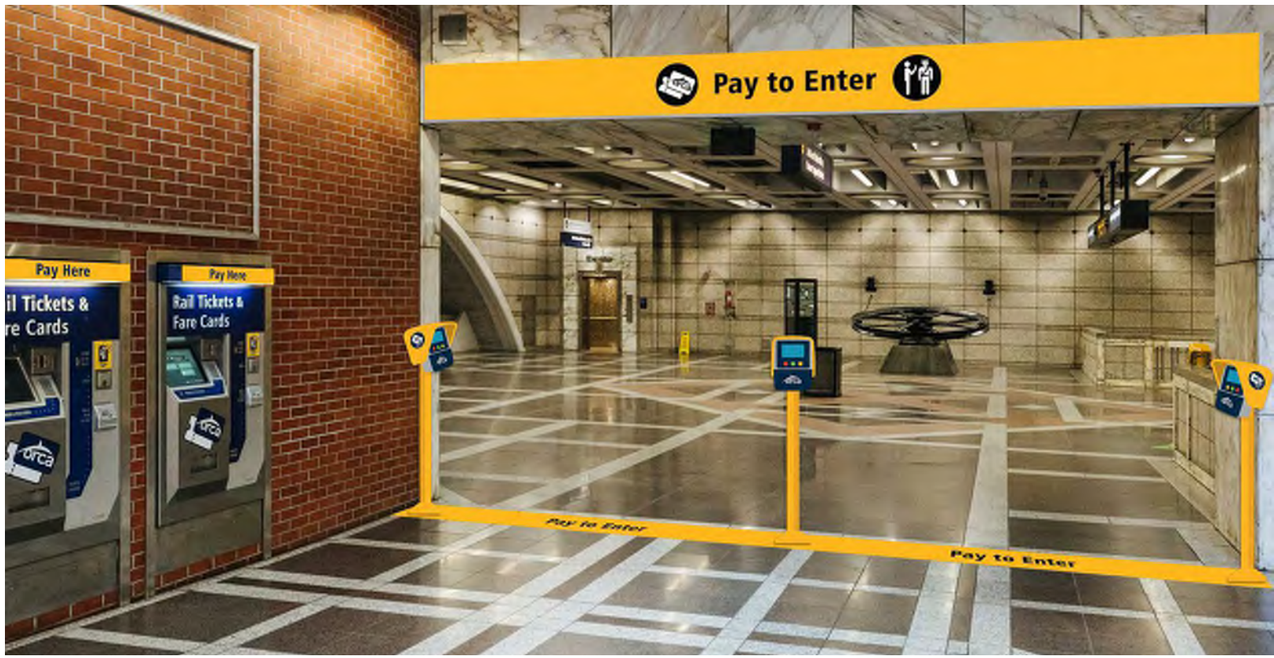


Figure vii for 3.3.5.D - Fare Paid Zone signage at Pioneer Square Station

Vertical Circulation: Ramps, Elevators, Stairs, and Escalators

Vertical circulation at stations allows the flow of passengers to and from grade-separated platforms and can provide access to safe pedestrian crossings at track and vehicular crossings. Additionally, ascending towards a platform with a view over the neighboring area or, at tunnel stations exiting towards the light, can be a moment of delight or interest in the passenger journey.

At station lobbies, access to stairs, escalators, and elevators must be combined to the greatest extent possible to consolidate a single Fare Paid Zone threshold. Create sightlines and a direct path of travel from key decision points to vertical circulations elements. Escalators must have adjacent stairs unless a reduced platform width due to site constraints prevents this from being feasible. Where two escalators or more are provided next to each other, place the stairs between the escalators.

Surge spaces occur where people crowd near entries and landings from both doorways and different forms of vertical transportation (elevators, escalators, and stairs). Minimum clearances for surge spaces are specified in the Design Criteria Manual (DCM). Surge zones are to be provided at all vertical circulation elements for passengers to flow freely and transition from vertical circulation to other spaces. Surge zones should not overlap each other. All vertical circulation surge zones must be protected from rain. Required sizes for surge zones vary per type of vertical circulation and are described in detail within the DCM.

Vertical mullions at vertical transportation elements are preferred over diagonals for ease of cleaning. Flat horizontal surfaces within elevator shafts must be eliminated; angled elements may be added to the top of these surfaces to eliminate this condition.

REFERENCE

For additional information on the layout and detailing of vertical circulation elements, see the Sound Transit Architectural Standard Drawings

Ramps

- Ramps must meet applicable building code and ADA code for slope and handrail requirements. Ramps are preferred when the grade change is 18” or less.
- The maximum vertical rise or length of a ramp, in lieu of elevator, shall be provided per the DCM requirements.
- Sloped walkways are preferred to ramps where site conditions allow.
- Ramps should slope away from station entrances to avoid ponding.

Elevators

- Elevators are essential at grade-separated stations for not only ADA wheelchair access, but also for people traveling with luggage, strollers, or having other challenges. Elevator cabs and shafts should be fully glazed at elevator stops where they would otherwise interrupt sightlines down a platform or into a station. Where extended elevator shafts may be seen from a distance in the station context and used for passenger orientation, use appropriate materials to create a beacon-like effect promoting wayfinding clarity and enhancing the sense of safety for the passenger. Elevator landings should be located outside of the path of travel, but clearly visible from decision points. To facilitate long-term maintenance of any glass in shafts, fall protection tie off anchors must be carefully planned.
- Elevators should be provided next to each other where possible. If there is only one elevator located at a headhouse, provide redundancy for accessible users by creating an alternative ADA accessible path (e.g. ramps, sidewalk, and crosswalk, etc.) to a second elevator elsewhere. Consider site constraints and pedestrian safety when making decisions regarding the pairing of elevators.
- Passenger elevators should be designed to support the heavy mobility devices to support passenger flow and reduce elevator down time. See DCM for specific elevator class requirements.
- To provide a pleasant experience for passengers, average wait times for elevators should be around 30 seconds and average ride times roughly 30 to 40 seconds during normal operation.
- When banks of elevators are located together, indicators must be located to notify passengers which elevator cab has arrived.
- Pass-through elevators may be used to manage passenger flow and circulation as well as for maintenance access to ancillary spaces.

Figure i for 3.3.6 - Ramp leading to one of Northgate Station's entrances

Figure ii for 3.3.6 - At night the glazed elevator at Mount Baker becomes a beacon for the station

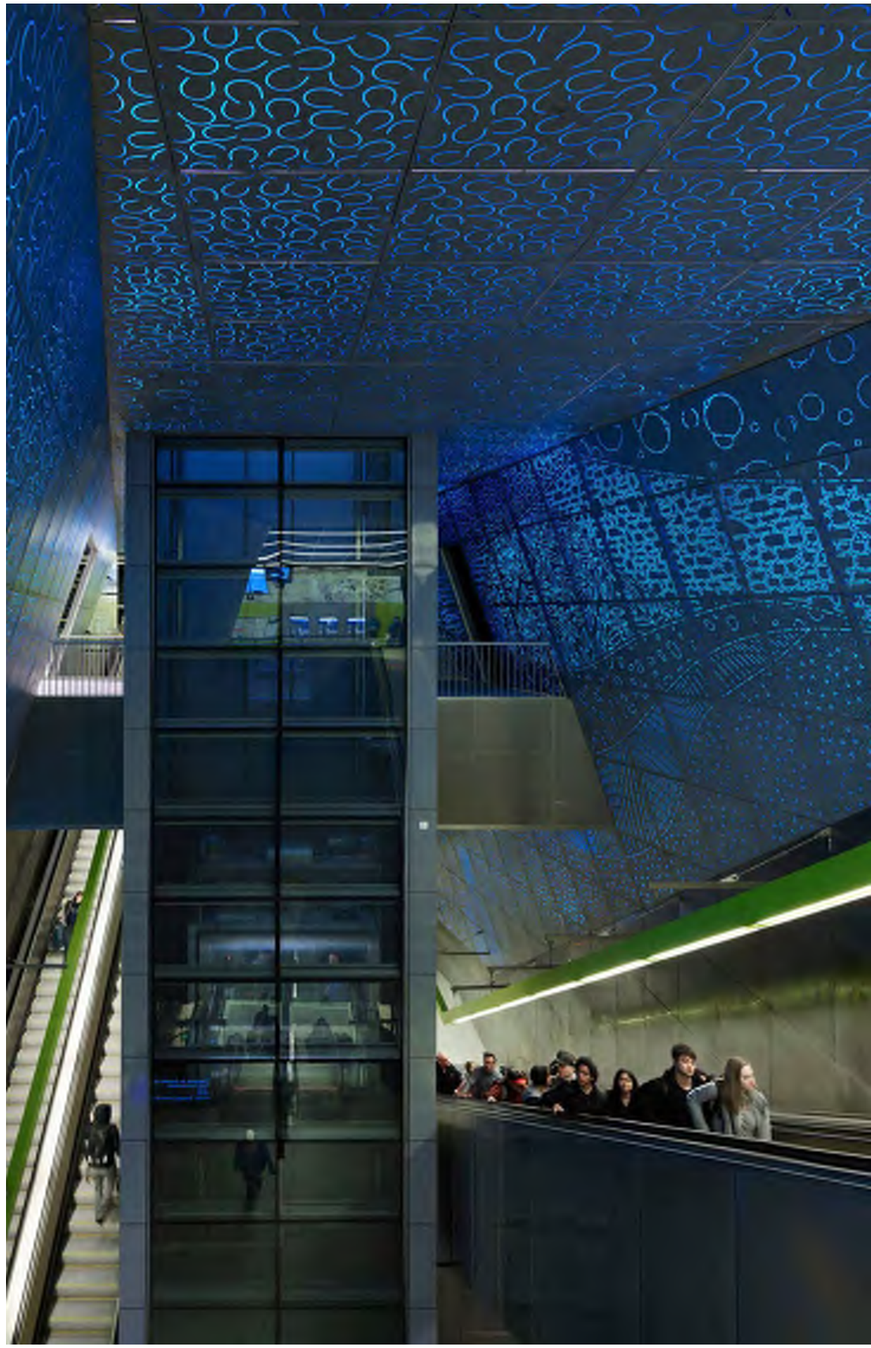


Figure iii for 3.3.6 - Glazed elevator shaft at University of Washington Station

Stairs

» Stairs in stations are identified as two different types: public stairs and egress stairs. The level of finishes and design considerations are different for each type. Public stairs to the platform are to be a minimum of 6’-0” wide and include bike runnels and cleaning troughs. Please reference DCM and the ST Architectural Standard Drawings for additional information.

» Egress stairs may be designed to meet the requirements of the public stairs at stations that will experience surge events.

» Locating stairs side by side with escalators increases passenger wayfinding confidence and encourages use. Sound Transit’s preference is for escalators to be located on both sides of the stairs when there is a two-escalator requirement. This configuration reduces conflicts between passengers moving in opposite directions upon entering and exiting the station.

» Drivers for lighting fixtures at stairs and escalators must be accessible by ladder to allow for maintenance access for repairs, see DCM and Sound Transit Architectural Standard drawings for reference.

Escalators

» Escalators must be transit-grade to provide increased durability for the anticipated patronage loads.

» If two escalators are provided within a station, then locate the stairs in-between the escalators. When platform width precludes side by side layout, stagger locations along platform.

» Escalators must have the capability to be reversed by operations to respond to large passenger surge events and to provide flexibility during escalator maintenance. Reversing escalators may be used to manage surge event flow at Event Stations and must include directional indicator lights that show the direction of travel for passengers. Additionally, adequate space for people to navigate switchback escalators should be provided.

» The walls surrounding and space above the stairs and escalators provide prime locations for art, color, or advertising and may further support the vertical circulation as a moment of liveliness and interest during the journey. Refer to Art, Color, and Advertising Sections (3.3.2, 3.3.4, and 3.3.11).

» Required standards for all vertical circulation, including required surge zones, are included in the DCM and Sound Transit Architectural Standard Drawings.

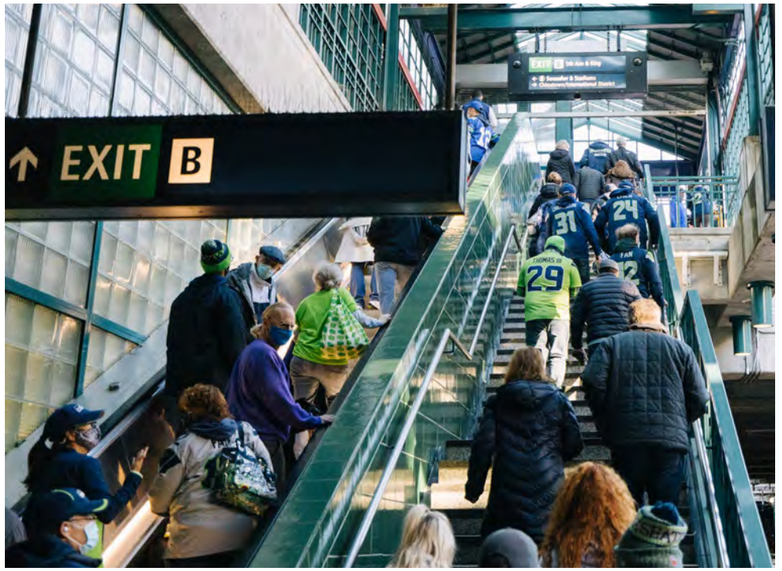


Figure v for 3.3.6 - Stairs and escalator at International District/Chinatown Station

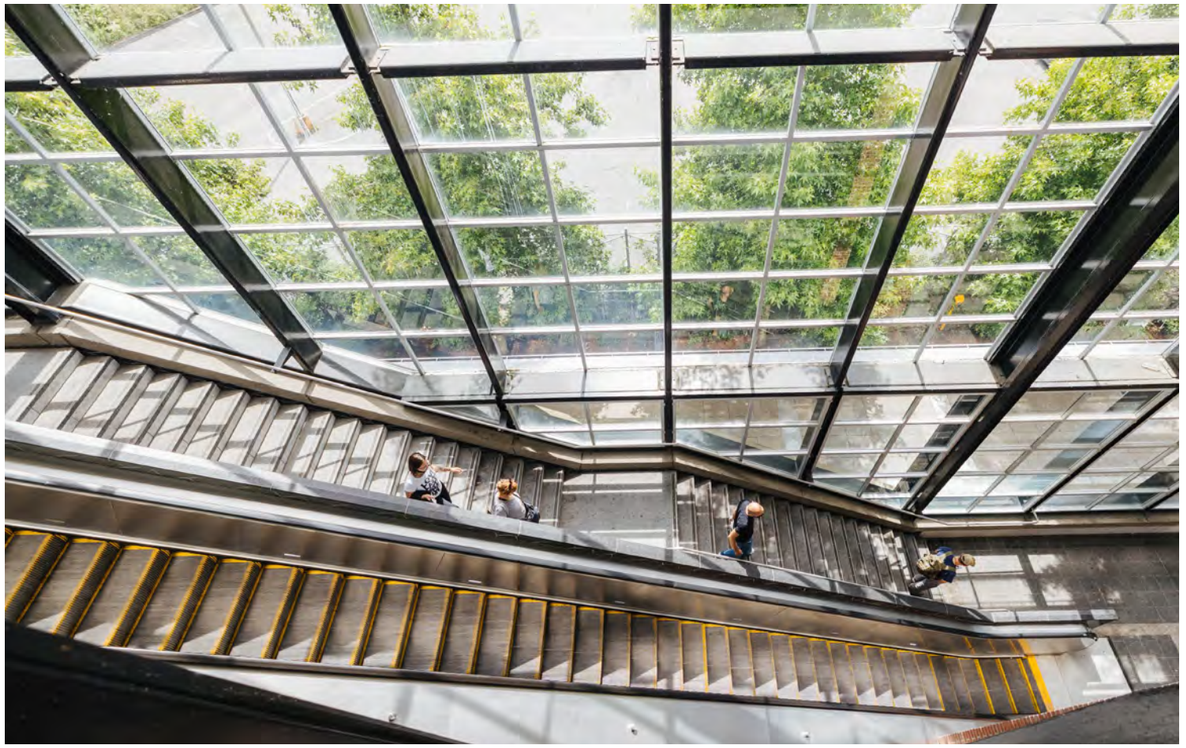


Figure iv for 3.3.6 - Stairs and escalator at Mount Baker Station

Figure vi for 3.3.6 - Stairs and escalators at Brighouse Station, Vancouver, BC

3.3.7

Transfer Concourses

Concourses allow for the horizontal shifting of passengers between head house locations and platform locations, transfers to other platforms, and connections to vertical circulation.

Other concourses, such as those in deep tunnel stations, may also serve as a point of safety.

Passenger restrooms, when provided, must be within the Fare Paid Zone unless approved by Sound Transit due to site constraints. Station restrooms must be all-gender, ADA compliant, and make use of durable materials as they may be frequently subjected to vandalism.

Retail may be located at concourses outside of the Fare Paid Zone, see section 3.3.15 for more information and requirements. If restrooms are required for the retail, those will also be located outside of the FPZ and will be maintained by the retailers.

Concourses may be a location for art or advertising, provided that it does not impede sightlines or path of travel for passengers.

REFERENCE

More detailed information on the design of the canopies and windscreens can be found in the **Sound Transit Design Criteria Manual**

3.3.8

Platforms

The primary purpose of the station platform is to provide space for passenger flow on and off trains, as well as a place for passengers to wait for the train. Provide protection from the wind and rain for passengers in the form of overhead canopies and windscreens. Use station location and exposures in conjunction with modeling to arrive at the most effective, efficient, and cost-effective weather protection. Canopy support columns must minimize obstruction to sightlines.

Vertical transportation that accesses the platform should be provided at locations that reflect the station type, station environment, and ridership. Elevators shall have glazed doors at publicly accessed levels to maintain clear sightlines for passengers down the platform. Placing elevators near the center of the platform allows accessible riders closer proximity to the tactile wayfinding elements for train boarding.

Figure i for 3.3.8 - Westlake Station Concourse showing Link supergraphic for wayfinding

Standard platform components are as follows:

Windscreens

- Orient windscreens to protect passengers from prevailing winds and to consider sightlines.
- Locate windscreens to provide areas of protection evenly distributed throughout the entire length of the platform. Provide windscreens around stair and escalator openings.
- Windscreen height must provide a gap to the canopy which allows smoke to escape in the event of a fire.
- Windscreens should be transparent to provide visibility to and from both sides for passenger safety.
- Windscreen design and sizing are standardized. See general windscreen configuration on this sheet in Fig. ii.
- Provide accessories, including benches and lean rails, at windscreen locations. See additional information about accessories and furnishings in section 3.3.13.

Tactile Wayfinding Elements

- Precast ribbed pavers are provided at platforms at elevator doors at each level.
- Ribbed pavers are to be provided at the center of platform to align with the train door openings.
- Design layout of ribbed pavers must respond to the existing train car model, as well as train models that Sound Transit currently has on order.
- A pathway of Sound Transit standard tactile pavers is to be located connecting fare payment, to Fare Paid Zone, to the vertical circulation elements, to the center platform ribbed pavers and information kiosk, and to center platform train doors.
- Domed pavers are located at the edge of platform.

Other Platform Elements

- Locate an informational kiosk at the center of the platform. This kiosk typically includes system signage, maps, and information, as well as a passenger emergency telephone. Provide conduit to this kiosk as part of future-proofing. See ST Architectural and Directive drawings for additional details on the information kiosk.
- Digital dynamic signage is a key requirement at platforms to provide arrival information. See section 3.2.2 for additional information.
- Ensure passengers with vision impairments do not mistake gaps between trains as train doors by installing Between Car Barriers at the edge of the platform aligned with the train car connector. See Sound Transit Directive Drawings.
- Use gates at the ends of the platform to prevent patrons from accessing the tracks.
- Art and advertising may be located on the platform in selected locations. See sections 3.3.4 and 3.3.11 for more information.

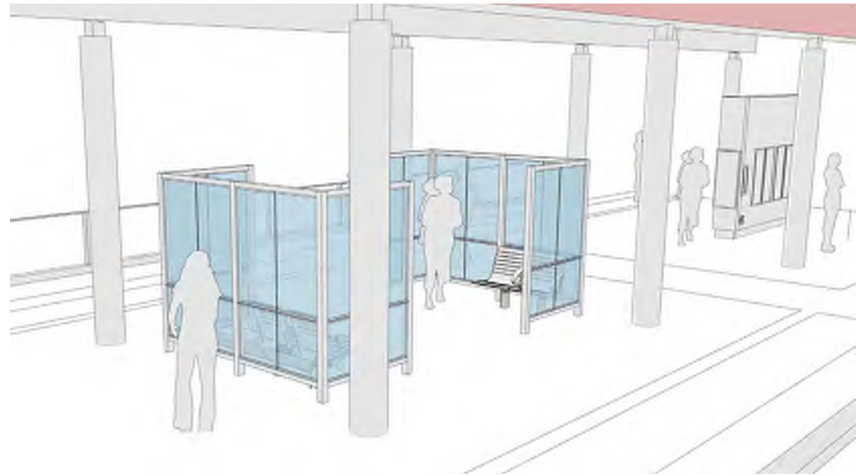


Figure ii for 3.3.8 - Typical platform windscreen with standardized glazing and bench seating

Figure iii for 3.3.8 - Angle Lake Station Platform with information kiosk at center of platform and benches for seating

3.3.9

Canopies

Within a station, a family of canopies may be comprised of paratransit, bus, and bicycle shelters; entrance canopies, and at Elevated or At-Grade stations, a platform canopy. In support of the Principle of Unity with a Hierarchy of Elements, the design of these canopies should be hierarchically related to each other with the platform canopy being the most important.

Canopy structural and architectural design should reflect regional design as described in the previous section on system identity.

Provide glazing within the canopy to allow for daylight on the platform. This enhances passenger well-being throughout the winter months by providing some daylighting even during rainy days and decreases the amount of artificial light necessary.

Where there is low slope glazing, provide an adjacent solid roof for maintenance access.

Integrate platform edge lighting into the canopy to make the tactile paver at that edge even more visible to help prevent accidents. Locate platform edge lighting away from the OCS to facilitate maintenance.

Provide support structure for static and dynamic signage at required locations and spacing along the canopy structure. The bottom of platform signage should typically be 9'-0" above finish floor and must be coordinated with other overhead canopy elements. Locate digital signage under canopies to reduce glare and increase legibility. See the Signage Manual for additional information and requirements.

Canopy depth at entrances and head houses should not be less than 6' and covered areas not less than 72 square feet.

Slope the canopies to drain away from the platform edge and provide internal drains. Accommodate access to station canopy roofs for regular maintenance of gutters.

Canopies present an opportunity to implement modularity into station design. Done right, modularity allows for shop pre-fabrication, schedule savings, and potential integration with other engineered components (see Case Study #1 in Appendix C).

Figure i for 3.3.9 - North Link: Butterfly

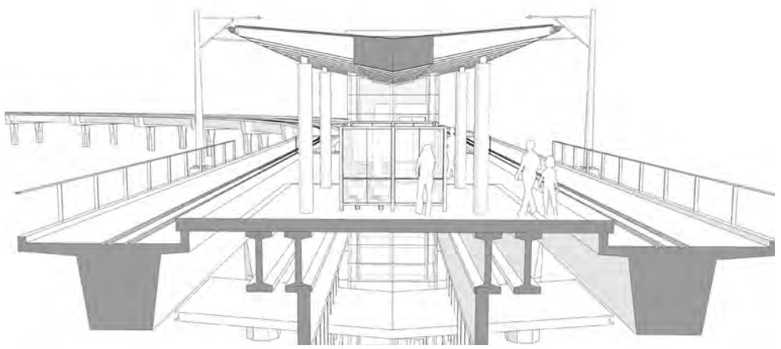


Figure ii for 3.3.9 - The butterfly canopy is a V-shaped canopy with sides that slope towards the center of the platform. The butterfly canopy generally has a combination of solid and glazed materials to provide natural daylight at the platform.

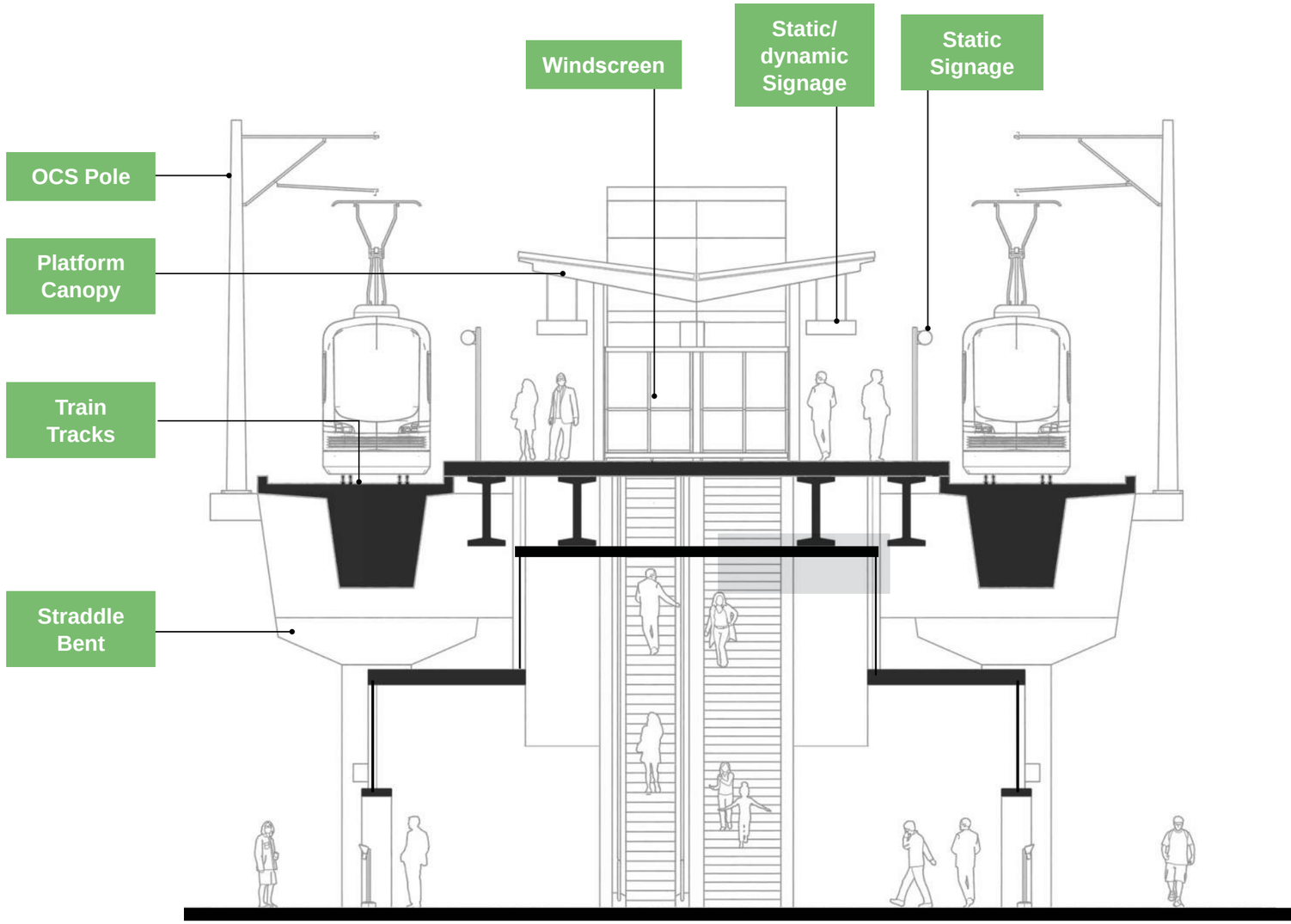


Figure iii for 3.3.9 - Typical platform section at elevated station

3.3.10

Exiting

Use architectural cues, such as changes in materials or increasing access to natural light, for wayfinding to exits. Provide sightlines through glass to exterior spaces.

As a secondary navigation tool, use overhead signage to label exit routes, visible from one decision point to the next. Refer to the Signage Manual for guidance on labeling exits with letters. Provide exit directories as a key to the labeled exits, starting at the platform level. Choosing an exit is the first key decision point passengers experience when leaving the platform. If there is a connected mezzanine or concourse, the exit directories should be placed at the top/bottom of the vertical circulation. Pair additional directories on wall surfaces with the exits to assist with wayfinding in the local area after exiting the station.

NFPA 130 codes govern typical emergency exiting requirements while Event Stations may have additional requirements to increase capacity during surge events.

Figure i for 3.3.10- Exits and vertical circulation are illuminated with clear sightlines at Northgate Station

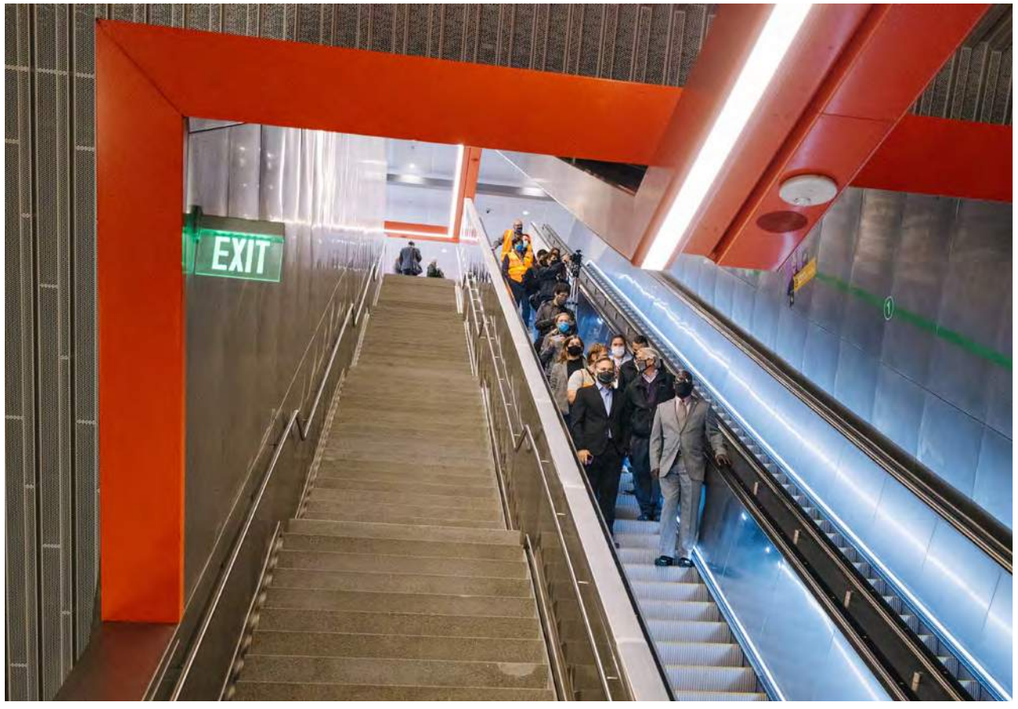


Figure ii for 3.3.10- Natural light is visible at the vertical circulation down to the platform at U-District Station

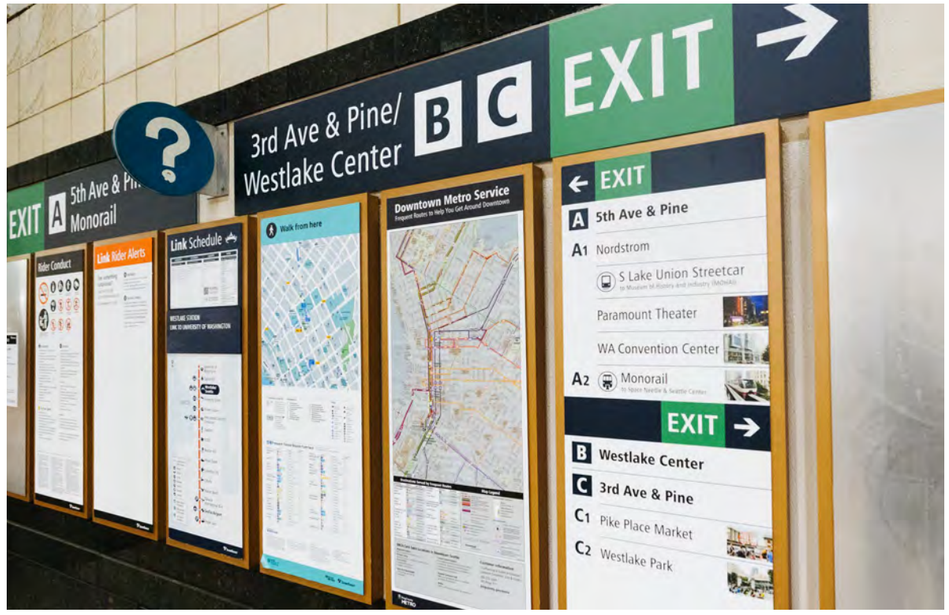


Figure iii for 3.3.10 - Typical station exiting signage and directories

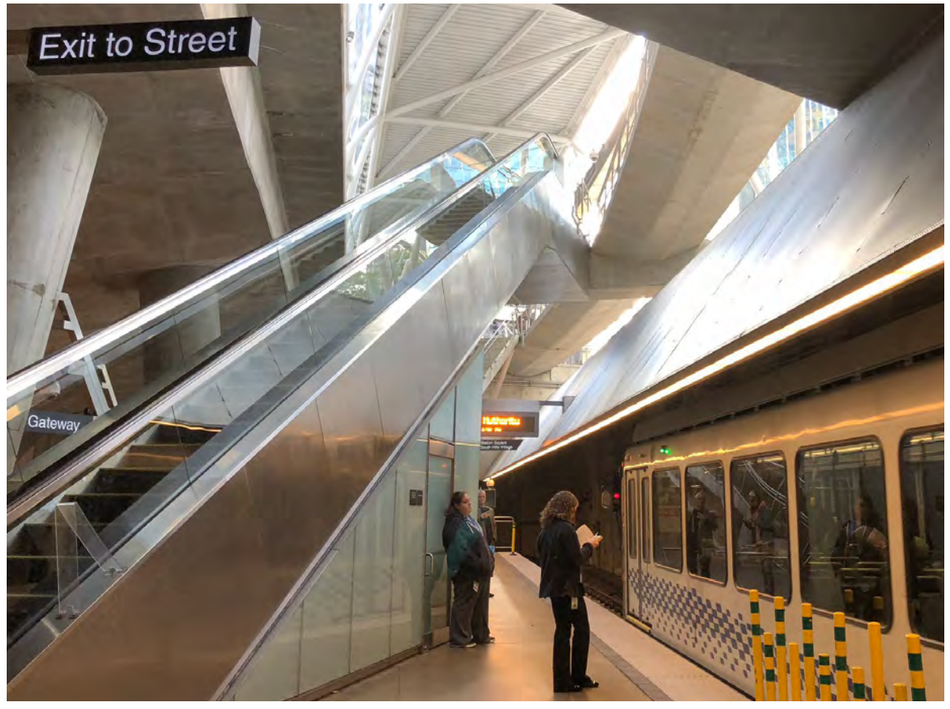


Figure iv for 3.3.10- Natural light aids in exiting Pittsburgh's Gateway Station

3.3.11

Advertising

Advertising can provide increased visual interest along the passenger journey and has the potential to create additional revenue. It could be either print (static) or digital. Appropriate locations are limited and must be approved by Sound Transit and coordinated with any advertising companies under contract. Carefully consider dedicated advertising space at high ridership stations. Advertising should never overwhelm the station architecture. For example, full size wraps on solid ancillary space walls near station entrances would detract from the station entrance.

Spaces that Sound Transit may consider for advertising:

- Surfaces parallel to passenger flow;
- Solid panels below glazing at windscreens;
- Walls at vertical circulation;
- Tunnel walls at below-grade platforms and concourses;
- Kiosks or other freestanding elements at concourse or entry levels, as long as they do not impede the main passenger flows and are ADA compliant.

Do not place advertising:

- On surfaces perpendicular to passenger flow;
- Anywhere it may interfere with sightlines to wayfinding signage or art;
- In areas with decision points;
- On glazing;
- Guideway structure outside of station areas;
- Kiosks or other freestanding elements on the platform.

At Sound Transit approved locations for digital advertising, provide power and data infrastructure and consider access for servicing and maintenance. Standard sizes for print and digital advertising and mounting requirements will need to be coordinated with advertiser. Content must meet accessibility requirements and conform to agency standards for allowed advertising content.

Figure i for 3.3.11 - London Tube Station, print advertising at station tunnel escalator walls

Figure ii for 3.3.11 - Hong Kong MTR (Causeway Bay Station) Digital Advertising

Figure iii for 3.3.11 - Yau Ma Tei Station by Fion Au, Illuminated static and dynamic platform advertising on tunnel wall

Figure iv for 3.3.11 - Digital advertising location inside of a subway station in New York

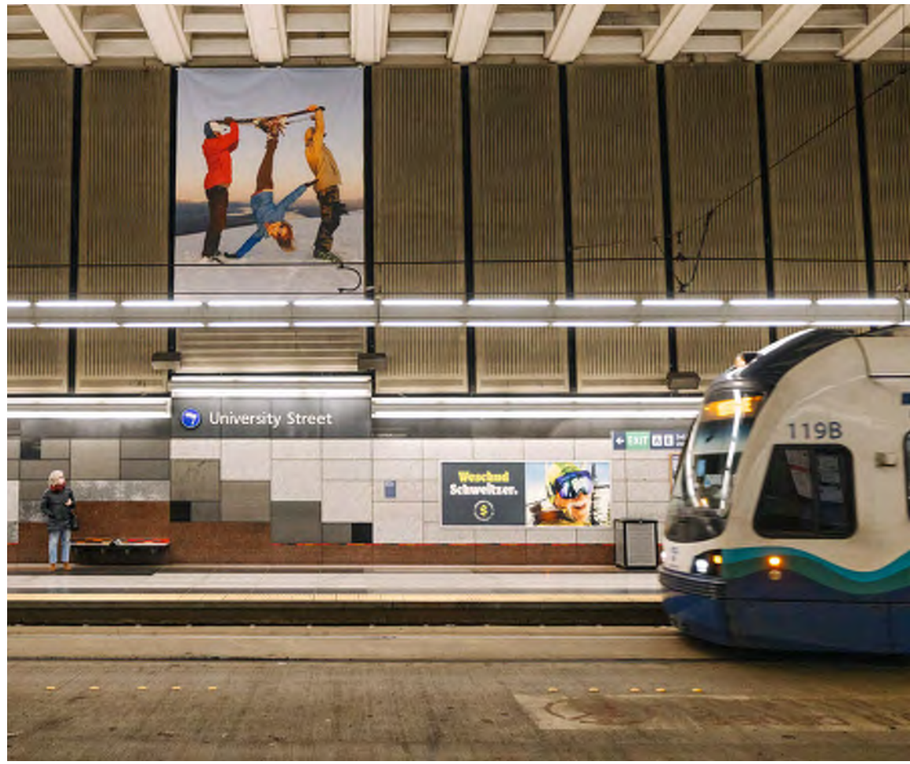


Figure v for 3.3.11 - Advertising location parallel to passenger flow and perpendicular to a waiting area at University Street Station platform

3.3.12

Ancillary Spaces

Ancillary spaces can be found at any level of the station and, while these spaces are essential to the functionality of the station, they are generally treated as non-public spaces and should blend into the general background of the station. Ancillary spaces should not block sightlines or create barriers that would interrupt the flow of passengers. Group ancillary spaces where possible to create operational efficiencies.
See the Design Criteria Manual for a detailed description of spaces, station types where specific spaces are needed, and required adjacencies for these rooms.

Ancillary spaces within elevated and below-grade stations must include:

» Mechanical Rooms
» Electrical Rooms and Electrical Closets
» Elevator Control Rooms
» Escalator Control Rooms or Closets
» Sprinkler Riser Rooms
» Fire Protection Valve Room
» Uninterrupted Power Source (UPS) Room
» Fire Command Room (FCR)
» Communications Room and Comm Closets
» Emergency Responder Equipment Room
» Security Office
» Staff restroom(s)
» Janitor's Room
» Storage Room

Additional spaces found within below-grade stations:

» Vent Shafts
» Tunnel Ventilation Fan (TVF) Room
» Fire Command Center (FCC) (replaces FCR in elevated stations)

Ancillary equipment and spaces within the station area:

» Traction Power Substation (TPSS) enclosure
» Trash/Dumpster Area
» Parking spaces for ST Staff
» Parking space(s) for operators from Peer Transit agencies
» Utility Transformers
» Signal Bungalow

Terminus and Interim Terminus Stations should include additional operations facilities:

» Staff restroom(s)
» Supervisor Office
» Crew Room
» Security Office

Ancillary spaces should be architecturally consistent with the station's style, quality, and materials of design where these spaces are viewed by patrons. Ancillary buildings are subject to AHJ development codes. The interior aesthetic level of finishes within these spaces is not as high as the public spaces, but should be of durable materials. The exterior solid walls of ancillary spaces may be prime locations for art or other targeted expressions.

The requirement for Traction Power Substations at stations and along the guideway is determined by load flow analysis. To deter unauthorized access to the equipment, screen it from public view with a separate TPSS enclosures. Landscaping is permitted to be used as screening in areas where the TPSS is located away from the public view. If the TPSS is located near a common path of travel or is within line of sight of passengers, provide a full enclosure with anti-climb security measures. Meet enclosure size, height, and materials per ST standards and applicable AHJ codes.

Figure i for 3.3.12 - Doors leading to Ancillary spaces beyond at UW Station

Figure ii for 3.3.12 - Tunnel fan ventilation Room at U-District Station

Figure iii for 3.3.12 - TPSS screened from view with concrete masonry and landscaping

Figure iv for 3.3.12 - Metal grating panels provide screening for the TPSS building at Northgate Station

Accessories and Furnishings

Accessories and furnishings are standardized elements throughout the Link system. Standardization provides consistency and simplicity for maintenance and operations teams.

Passenger amenities are provided in order to make the journey more comfortable, and selected by Sound Transit for their longevity and resistance to vandalism.

Within stations at waiting areas, provide Sound Transit standard benches that are ADA compliant and have intermediate arm rests to prevent sleeping on them. Benches and seat walls in transit plazas may be customized for the location. Where provided, use sleeping and skateboard deterrents or leaning rails as an alternative.

Trash and recycling cans are not provided at station platforms but may be inside lobbies and at concourses.

Standard accessories at entrance lobbies include: a waiting area with benches and trash/recycle (outside of the path of travel), TVMs, informational signage and dynamic digital signage with real-time arrival and departure screens.

Standard accessories at Fare Paid Zone include: ORCA card readers, yellow threshold, and Fare Paid signage.

Standard accessories at station platforms include: bollards at train car connection, informational kiosk with maps and signage, benches, lean rails, dynamic digital signage with real-time arrival information, wayfinding signage, and train car stop signage.

Accessories and/or furnishings provided in transit plazas maintained by Sound Transit must be part of the approved, standardized kit of parts. In public plazas maintained by others, other accessories and furnishings may be used.

Figure i for 3.3.13 - Orca Card Readers

Figure ii for 3.3.13 - Bike runnel at stairs

Figure iii for 3.3.13 - Dynamic station signage

Figure iv for 3.3.13 - Trash/Recycling receptacles

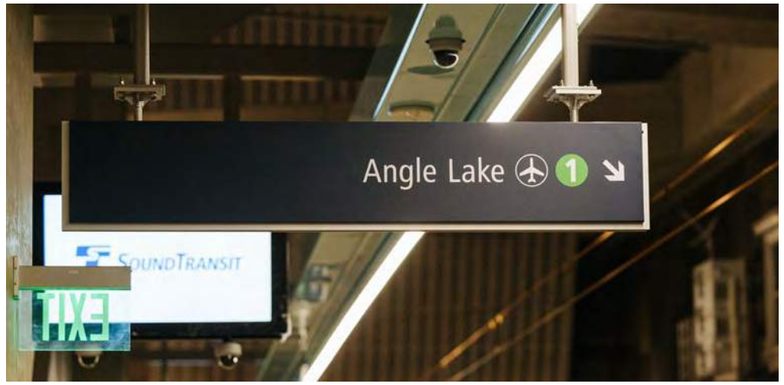


Figure v for 3.3.13 - Static station signage at the platform

Figure vi for 3.3.13 - Bench seating

Figure vii for 3.3.13 - Between Car Barriers

3.3.14

Bicycle and Micromobility Storage

Use the two main types of bicycle storage at stations: short-term in the form of open u-shaped racks and longer-term storage in the form of on-demand bicycle lockers. These different types allow frequent and infrequent patrons to have access to bicycle storage. The quantity of the bicycle racks and e-lockers are determined by Sound Transit's Access and Integration Program as informed by anticipated demand and site conditions, in collaboration with local jurisdictions and other stakeholders. Identify areas that will allow for additional racks or lockers for system expansion. A more detailed description of the types of standard racks and storage lockers may be found in the Design Criteria Manual.

Locate bicycle storage with clear sightlines to station entrance and near the path of travel. This helps deter theft and/or vandalism of bicycles. Bicycle storage or access must not impede pedestrian traffic flow in the station environment.

Bicycles are permitted on board of Link trains. Though there is not a dedicated path for bikes once they are brought inside the station, bikes may be carried up or down to the platform via the elevators and stairs are equipped with a bike runnel for easier transport and to minimize disruption to passenger flow.

New modes of access such as bike and scooter shares must be accounted for and may impact the amount of bicycle storage space provided at the station. While coordinating parking locations with the AHJ, follow the principle of maintaining clear sightlines along main pedestrian paths to entries and vertical conveyance to find adjacent protected and visible spaces. The furnishing zone of the sidewalk may also accommodate bike share and micromobility parking.

Coordinate with AHJ requirements to provide short-term bicycle parking. Create adequate space adjacent to the path of travel for ease of use, but out of the way so as not impede passenger flow.

For more information on how Sound Transit estimates bicycle parking demand, refer to the System Access Implementation Plan.

Bike cages can be found at several existing transit stations. Unless they are to be manned as a third party amenity, ST will not be installing bike cages at future transit stations.

Figure i for 3.3.14 - Typical bike E-Lockers

Figure ii for 3.3.14 - Bike parking at UW Station

Figure iii for 3.3.14 - Organized parking for scooters

Figure iv for 3.3.14 - Passengers bringing bikes onto a Link train

3.3.15

Retail

In certain stations where passenger loads and dwell times are projected to be higher, Sound Transit may direct the project team to include retail spaces and restrooms within the station outside of the Fare Paid Zone as passenger amenities. The retail should complement other established retail spaces in the area and will not serve solely to enliven a blank façade. Incorporating retail at an Event Station between a major event venue and the station entrance may serve as a strategy for reducing the effect of extreme peak passenger loads.

Retail improves the passenger experience by contributing to the community, creating economic development opportunities, and improving operations if the design team can consider key implementation factors early. See Case Study #3 in Appendix C for an example of providing a market for transit passengers.

The location within a station concourse, head house, or in adjacent space in a Joint Development project, should have substantial footfall and visibility to passengers. The design team should plan for the infrastructure (mechanical, sprinkler, plumbing, electrical, as well as storefront glazing and signage) by 30% design to avoid substantial redesign of systems or expensive, disruptive retrofits.

Critical Success Factors Checklist

Façade and Signage

- Maximum façade transparency
- Well-defined retail presence where there is foot traffic
- Organized and distinct retail signage
- Exterior lighting that promotes activity and security

Access

- Retail should be located adjacent to the pedestrian path through the station and passengers should not be forced to walk through retail at any point along their journey.
- If the retail is at street level, provide on-grade entrances to each retail space and include peripheral amenities such as benches and bike racks.
- If the retail is in a concourse or mezzanine, provide level entrances to each retail space and a pathway to a dedicated service elevator (and pathway or ramp) for loading and unloading.
- Restrooms for patrons and employees and additional garbage/ recycling receptacles may be necessary if food and beverage is offered and may be shared between a number of different retailers.
- All retail related restrooms, trash, storage, and peripheral amenities must be maintained by retail entities and remain separate and distinct from those elements required by Sound Transit.

Interior Architecture

- Provide adequate height clearances to facilitate a variety of tenant buildouts: a minimum of 15’ floor to floor with a minimum clearance of 12’ floor to bottom of interior systems including structural beams, sprinklers, and ductwork.
- Create an organized, convenient column grid spacing (18’ x 18’ o.c. min.)

Mechanical, Electrical, Plumbing and Fire Protection

- Provide individually metered and adequate mechanical, electrical, and plumbing (MEP) service to support a variety of tenants, appropriately supplementing as required for priority tenant types.
- Per NFPA-130 5.4.4.1, install an automatic sprinkler protection system in areas of stations used for concessions, and in any other similar areas with combustible loadings.
- Use Type I or Type II noncombustible construction in tenant spaces.
- Prevent flammable and combustible liquids intrusion.

REFERENCE

Integrating Retail into the Sound Transit Experience, a Technical Memo by Hatch and ZGF, 2021

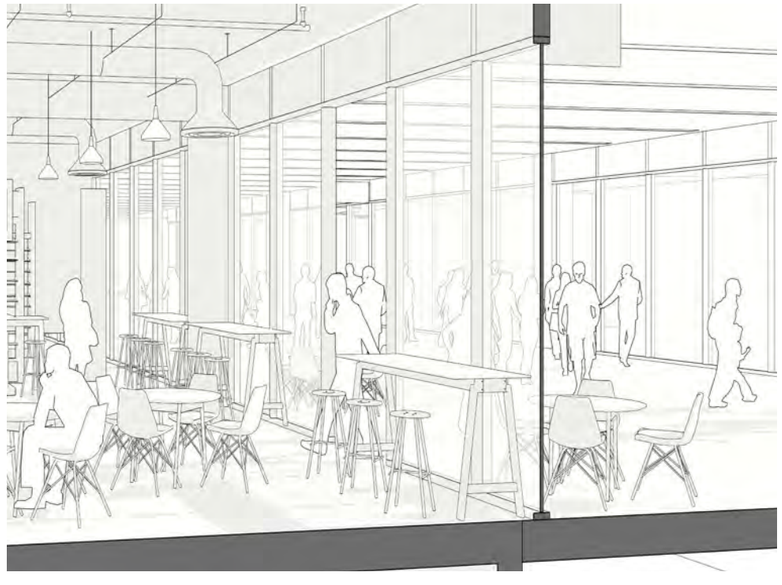


Figure i for 3.3.15 - Section perspective of example retail within an elevated station

Figure ii for 3.3.15 - "Loyal to the Local" (L2L) is a Sound Transit program that encourages people to patronize local businesses in their community while stations are under construction in their area.

Figure iii for 3.3.15 - Fish House Cafe is an Loyal to the Local business in the Hilltop neighborhood near the anticipated Tacoma Hilltop Station.

Figure iv for 3.3.15 - North Slope Coffee House is an Loyal to the Local business in the Stadium District near the Tacoma Dome Station.

Figure v for 3.3.15 - Mr. Mac Ltd. near the anticipated Tacoma Hilltop Station

Figure vi for 3.3.15 - Red Elm Cafe is a Loyal to the Local business in Hilltop neighborhood.

Figure vii for 3.3.15 - Ma's House of Fitness near the anticipated Tacoma Hilltop Station

3.3.16

Third Party Amenities

On a case-by-case basis, Sound Transit may accommodate partner transit agency amenities or others with third-party funding considerations.

No third party signage is allowed inside or outside of the station except with an application to and approval by Sound Transit at the requesters expense. Third-party signage is never allowed on guideway due to operational and maintenance issues.

An example of approved third party signage at the plaza level is at Redmond Tech Center for Microsoft, which included a financial agreement.

Sound Transit will engage in preliminary discussions on potential applications for third-party signage to determine feasibility. Contact Wayfinding, Signage, and Real Property within Sound Transit for third party signage requests and community bulletin boards. The same application process is used for both amenities and signage. Application is for review/consideration only and must include proposed design. All costs are to be borne by the requester, and due to federal requirements, there will likely be a fee for space on Sound Transit Property. Maintenance is the responsibility of the requester. Sound Transit reserves the right to remove bulletin boards at any time.

Facilities Operations within Sound Transit has policies and a permitting process in place for coordinating busking. During the design process, the design team should work with Sound Transit Art to determine whether and where busking could be accommodated. The local AHJ may require them they should be anticipated in high-ridership stations. Only space and no facilities will be available for busking. Designate these location with a star mark on the ground or other sign outside of but adjacent to the main passenger flows.

Figure i for 3.3.16 - Second Cycle bike shop is an example of the type of Third Party Partner Amenity that Sound Transit facilities could incorporate into stations. There is a proposed bike pop up repair shop to be included in Spring District station

Figure ii for 3.3.16 - Musicians performing at Roosevelt Station

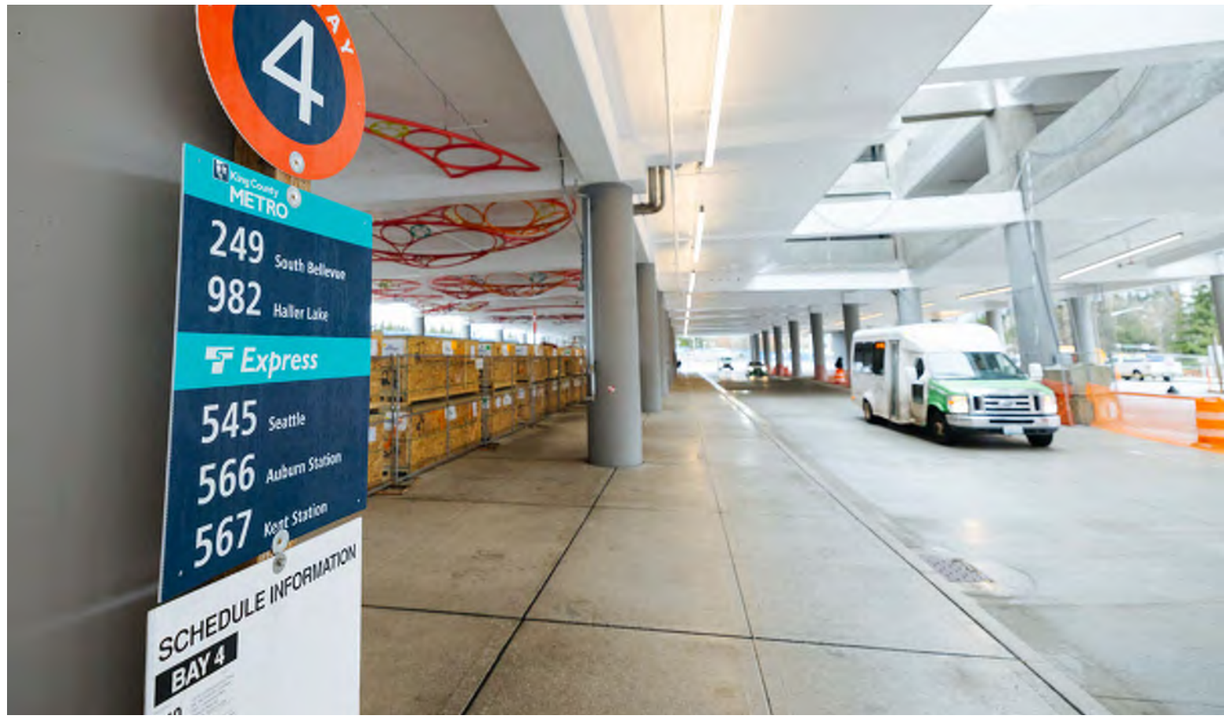


Figure iii for 3.3.16 - Third party shuttle systems and associated signage at Redmond Technology Center Station Garage

3.4 Resiliency

This section covers the fourth Passenger Goal of Resiliency during the Passenger Journey (section 2.1.2) as well as a broadened definition of resiliency that includes the station itself. A resilient passenger journey and station design aid in achieving the Fundamental Service Goals of being Dependable, Available, Clean, and having Informed passengers (section 2.1.1) by future-proofing to avoid disruptive maintenance while coordinating space and passenger flows so routine maintenance and operations activities can easily take place, by having redundant and/or back-up systems in place, and by ensuring that communication with passengers are maintained during periods of planned and unplanned disruption. Furthermore, a resilient station must assemble the puzzle pieces of maintainability (section 3.4.2), balanced life cycle assessments and costs (section 3.4.3), achieving sustainability goals through green building design (3.4.4), and integration with the public realm (4.4).

Station planning and design will evolve with a culture of preparedness to address the occurrence or recurrence of emergencies or major natural disasters or projected changes in development patterns, demographics, or climate change and extreme weather patterns.

As an integral part of the region's critical infrastructure, the Link light rail system mitigates disruptions during snowstorms, periods of I-5 congestion, and other periods of possible disturbance. FTA grant solicitations have defined resiliency as:

Those projects designed and built to address current and future vulnerabilities to a public transportation facility or system due to future occurrence or recurrence of emergencies or major disasters that are likely to occur in the geographic area in which the public transportation system is located; or projected changes in development patterns, demographics, or climate change and extreme weather patterns.

Resiliency and equity have a positive relationship with each other. The Central Puget Sound region will be made more resilient and equitable as access to Link light rail improves. It provides an affordable and reliable means of transportation for an ever-growing population and increases the mobility of under served populations. For land use patterns and daily habits to change in Station Areas, the investment in light rail transit must be visible, long-term, durable, and stable yet flexible enough to adapt to change, and the Passenger Journey must be made resilient.

Figure i for 3.4 - Trains running during snowfall

3.4.1

Passenger Journey Resiliency

Make the passenger journey resilient by providing alternate routes for passengers when operating under different scenarios to avoid disruptions.

DESIGN TEAMS ARE ENCOURAGED TO THINK ABOUT HOW TO ENHANCE AND ADD TO THESE EXAMPLES WHICH ARE ALREADY DETAILED ELSEWHERE IN THIS MANUAL.

- Create multiple pathways to a station entrance from the station environment (section 4.3).
- Provide accessible, redundant Vertical Transportation (section 3.3.6).
- Locate canopies, windscreens, and other shelter so that passengers feel comfortable during inclement weather (section 3.3.6 and 3.3.8).
- Use dynamic signage to inform passengers of alternate routes (section 3.3.7 and in the Signage Manual).
- Where possible, coordinate street-level activation, amenities, and retail so that in the event of crowd surges or other temporary disruptions, passengers can focus their energy elsewhere (section 4.4).
- Incorporate a feedback system so that Sound Transit is informed of passenger concerns.

Figure i for 3.4.1 - Bird's eye view of Northgate Station showing multimodal connections to surrounding neighborhoods - an example of robust travel options and enhanced resiliency for passengers.

3.4.2

Station Resiliency

A.

Maintainability

Design the layout of a station and placement of equipment with routine maintenance activities in mind. Help Sound Transit's Operations and Maintenance Teams meet their Service Goals by providing convenient space for these activities outside the main flow of passengers. The passenger experience is directly affected by the condition of all station elements and the ease of their maintenance.

- Prioritize ease and simplicity in access/maintenance activities. With a non-revenue hour window of less than 3 hours, station designs should minimize the amount of maintenance required during those non-revenue hours.
- Service to the station should never block or prevent access to or through the station/platform. Equipment handling/storage during revenue hours should not impact the passenger.
- All design must take into account maintenance activities including: cleaning, lighting repair, equipment replacement, fire protection systems, de-icing, vandalism, etc. Designs should not require unique equipment or procedures for routine maintenance. Designs should provide support for replacing equipment over time including tunnel ventilation equipment.
- Ensure that lighting and other elements that require servicing or cleaning are easily accessible by maintenance crews. Where access to equipment is required, include maintenance access panels in finished walls.
- Locate equipment, drains and other items requiring maintenance to eliminate or minimize the level of fall protection required. Following the hierarchy of Fall Protection, the design should eliminate or minimize the need for work requiring fall protection. Maintenance access by ladder is allowed up to 14'. Maintenance access by scissor lift which can fit into a passenger elevator is up to 25'. Maintenance walkways, bosun's chairs, or other means of access must be provided if equipment is above 25' above finish floor.
- Eliminate or minimize maintenance needs within 10' of the OCS. Design platform canopies for minimal maintenance due to the short maintenance window. Any maintenance activities provided at canopies must be accessed by safe and efficient means.
- Surfaces should be sloped to prevent accumulation of debris, especially surfaces visible to passengers.
- Ensure rainwater management includes gutters rather than relying solely on surface drainage for all areas including canopies.
- Design to prevent and discourage birds from roosting and nesting in the facility. This can include minimizing exposed structure with flat surfaces and sloped surfaces to reduce the reliance on bird deterrent. Eliminate bird perching places as much as possible.
- Attention to the details necessary for on-going maintenance during the design process contributes greatly to the success of a station over time.

Figure i for 3.4.2 - Durable seating options at plazas

Figure ii for 3.4.2 - Stainless Steel Furnishings

Figure iii for 3.4.2 - Sound Transit Maintenance Team member cleaning the stainless steel handrails at the public stairs.

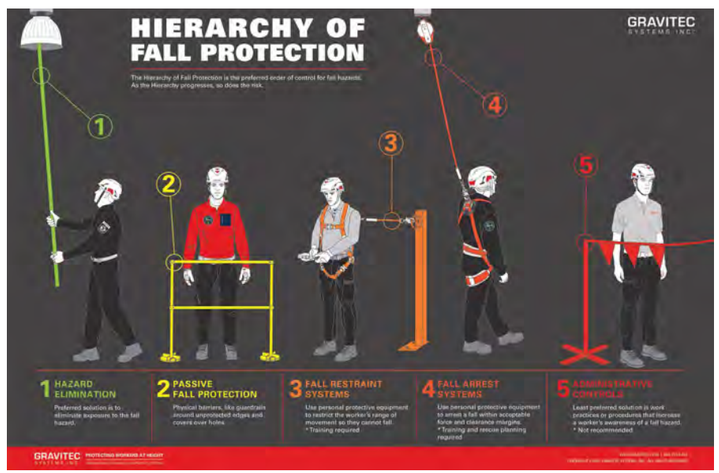


Figure iv for 3.4.2 - Fall Protection Criteria - image used with permission from Gravitec

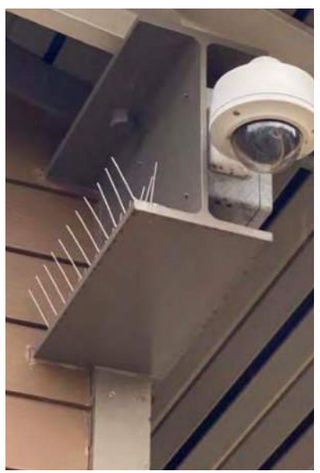


Figure v for 3.4.2 - Bird Roosting

Figure vi for 3.4.2 - Bird Roosting

B.

Life Cycle Costs & Assessments

EVALUATE HOW DESIGN DECISIONS WILL AFFECT THE TOTAL COST OF OWNERSHIP AS AN APPROACH TO ASSET MANAGEMENT. ADDITIONALLY, EXPLORE THE USE OF NEW TOOLS AVAILABLE TO THE AEC COMMUNITY (EC3, ATHENA, TALLY) TO EVALUATE THE EMBODIED CARBON OF MATERIALS USED IN TRANSIT PROJECTS TO GIVE A MORE COMPLETE LIFE CYCLE ASSESSMENT.

Sound Transit facilities are subject to a wide variety of environmental impacts. High volumes of pedestrian traffic, de-icing salts, weather exposure and wet environments, and intentional vandalism all point to the need for facilities that are designed to resist deterioration and damage. Chapter 1 of the Design Criteria Manual outlines design and service life for buildings and infrastructure.

For non-durable items that may be replaced in less than 50 years, the design team must also perform a Life Cycle Assessment to further consider how to balance trade-offs between environmental impacts and lowest overall financial cost.

As a general rule, Sound Transit prefers to invest in higher performance materials and equipment to reduce maintenance costs in order to perform at a lower agency cost over the operational lifetime of the project. Examples include: using stainless steel station elements, porcelain enamel wall panels, or glass in lieu of fiberglass or acrylic glazing; and creating storm water ponds in lieu of vaults.

Before exterior wood products are proposed for a design, a Total Cost of Ownership life cycle cost must be assembled as compared to at least one viable non-wood alternative for review and approval by Operations."

Additional design strategies may include:

» Use materials with lower embodied carbon where maintenance costs would be equal or less than the alternative.

» Select and use design configurations and products that can be reused or re-purposed through the local businesses to minimize material use, maximize carbon reductions, and create economic uplift in the community.

» Develop a palette of station furnishings that can be repaired and redeployed using local companies and resources.

» Upcycle waste from construction sites for secondary use by local third party nonprofits supporting access to local employment opportunities.

» Make stations and the overall system resilient by investing in future-proofing, avoiding obsolescence from technological updates, and preparing for foreseeable risks.

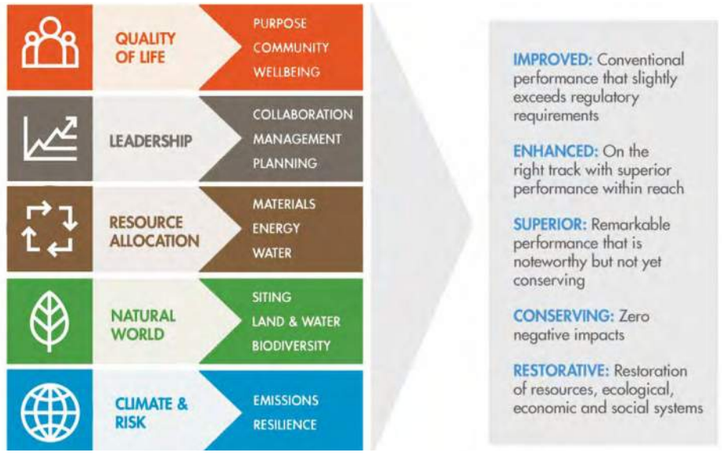


Figure i for 3.4.3 - The Envision Rating System, version Ev3, includes a holistic approach to Life Cycle Costs and Assessments

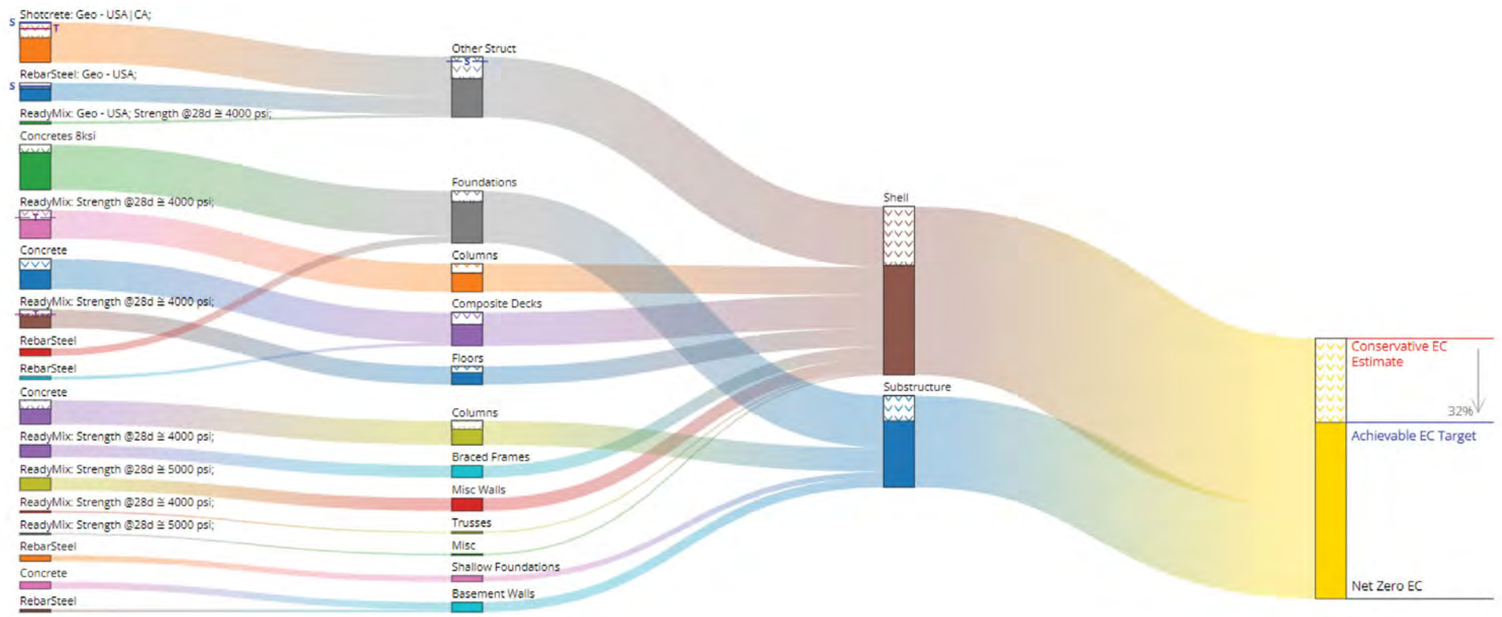


Figure ii for 3.4.3 - Sankey diagram depicting carbon values of different materials across a single project. Graphic produced using the EC3 tool.

REFERENCE

For additional information, please see the Sound Transit Sustainability Plan - 2019 Update

C.

Green Buildings and Infrastructure

LEAD IN SUSTAINABILITY EFFORTS TO REDUCE OUR IMPACTS ON THE ENVIRONMENT, THUS REDUCING THE NEED FOR ADDITIONAL CLIMATE CHANGE RESILIENCY MEASURES.

Sustainability is a core mission at Sound Transit. Sound Transit encourages sustainability by providing affordable, environmentally friendly travel options that connect people to where they live, work, and play. Delivering transit projects and services also helps foster a healthy environment, community, and economy.

Sound Transit's Sustainability Mission defined:

To improve the quality of life for the region for future generations with regard to people, planet, and prosperity.

Help PEOPLE move freely and affordably by providing regional transit service.

Promote stewardship that conserves the PLANET's natural environment.

Support community PROSPERITY by providing affordable mobility and access to opportunity.

Green Building and Infrastructure in Sound Transit Capital Projects

The purpose of integrating sustainability into Sound Transit projects is to:

- Promote environmental stewardship and sustainable development
- Reduce environmental risks and liabilities and ensure regulatory compliance

Improve environmental performance with a focus on:

- Reducing the impacts of natural resource use and (refer to lighting and materials use sections)
- Focusing on the long-term operations and maintenance of building approaches and materials
- Enhance passenger experience and outreach with all stakeholders
- Identify cost effective green building and infrastructure solutions

The sustainability principles embedded in the agency's design criteria focus on the following key considerations:

CONSERVE NATURAL RESOURCES

- Use building approaches and materials that result in reduced use of energy and water over the lifetime of the assets being constructed. Maximize efficiency, with a focus on energy and water.
- Use less. Design facilities and infrastructure to use materials wisely. Consider resource conservation in the composition and durability of the materials selected for use.
- Implement features with restorative functions (such as renewable energy production or advanced low-impact development) only after conservation efforts have been pursued.
- Consider the repair and re-purposing of materials and furnishings to reduce demand in resources and to lessen future carbon emissions.

CONSIDER GREEN BUILDING AND INFRASTRUCTURE SOLUTIONS IN CLOSE COORDINATION WITH PARALLEL TOD, STATION ACCESS, AND PASSENGER EXPERIENCE OPPORTUNITIES:

- Maximize benefits by pairing sustainability features with designs intended for passenger comfort; for example, using photovoltaic solar panels as a rain cover for passenger walkways, integrating LID (low impact development) features into pedestrian and bicycle access improvements, and consider integrating efficient utility planning for the station and TOD developments in conjunction.
- Coordinate with efficiency and sustainability initiatives being pursued by the utilities that serve a project's jurisdiction(s).
- Align with the sustainability initiatives of the AHJs served.

The agency applies sustainable design criteria to all major capital projects:

SOUND TRANSIT SPECIFIC CRITERIA

- The agency's customized Sustainability Checklist is required for use on all projects and is focused on infrastructure building requirements specific to transit and other agency priorities. The checklist applies regardless of facility type.
- All Sustainability Checklist measures are chosen to be achievable, best value, and or a proven technology. Measures in the checklist have been prioritized based on their alignment to the agency's sustainability priorities for capital projects.

PEOPLE	PLANET	PROSPERITY
Social equity addressed and implemented as an agency value	Achieve carbon free operations: -Electricity (facilities and light rail) by 2030 -All fleets by 2050	Build resilience to climate change and natural disasters
Enhance ecosystem functions	All Staff champion sustainability	Maximize operational efficiency

THIRD PARTY CERTIFICATIONS

- Sound Transit has developed sustainability requirements for projects based on nationally-recognized third party sustainable building and infrastructure rating systems. Designers are encouraged to pursue more aspirational levels of sustainability than those outlined below where feasible and cost effective.

ENVISION CERTIFICATION CRITERIA

- All Sound Transit projects eligible to meet the ISI Envision rating system for civil infrastructure will be certified, at a minimum to the silver level.

LEED CERTIFICATION CRITERIA

- All Sound Transit funded facilities eligible to meet USGBC LEED Standards must, at a minimum, be certified to LEED Silver standards. Facilities that are not eligible for LEED certification, such as parking garages and park and ride facilities, must at a minimum meet the agency's Chapter 30 criteria.

OTHER CERTIFICATION CRITERIA

- Sound Transit is open to integrating or applying additional third party sustainability criteria, especially those with a focus on equity and health – from the JUST label to WELL and others.

Figure i for 3.4.4 - Wilburton Station Guideway Infrastructure

04 Station Environments

4.0 Station Environments

This chapter covers the experience of people moving within evolving Station Environments, to and from Link light rail stations, both existing and planned. A Station Environment encompasses the 10-minute walkshed, or approximately a half-mile radius, around a station (station area), the access pathways and travel modes connecting to the station (station access), and the immediate 1-2 blocks adjacent to the station entrance, including the public realm and joint development (station context). Sound Transit works in partnership to strengthen the relationship of the station to its environment at each of these scales

Research and experience demonstrate that transit utilization is closely connected to the type and density of land within in a 10-minute walk of the station. The long-term performance of the station area benefits from coordinated action of multiple stakeholders to ensure that surrounding development sustains safe, walkable environments in station areas. Planning for the desired movement of people in these areas anticipates how light rail station operations can present a unique set of opportunities and challenges for the communities it serves.

Section 4.1 sets out to define a Land Use and Station Access Typology while the subsequent sections 4.2 – 4.4 offer guidance on how to plan and design for the long-term outcomes for projects within the Station Environment.

Figure i for 4.0 - The Station Environment at Capitol Hill Station

The Land Use & Station Access Typology

It is meant for all station project teams, local governments or Authority Having Jurisdiction (AHJ) planning and transportation departments, property developers, transit agencies, and others who might contribute to the formation of a station area. In some cases, Sound Transit facilities have a larger footprint in the Station Environment, such as with an elevated alignment and station plus off-street bus and/or parking facilities (Emergent Urban and multimodal); in other cases, the footprint is more minimal, such as at-grade with a below-grade tunnel and a station fully integrated within joint development or the public right-of-way (Established Urban and Walk/Bike). The design team will use the guidelines in this document as well as relevant AHJ requirements in laying out and configuring the station footprint and context. Other projects may use the guidelines to help reinforce the character of the Station Environment. Outside of the direct Sound Transit investments and partnerships, the AHJ will decide desired zoning constraints at each station and create the optimal street grid conditions for the evolution of the station area.

To meet the Passenger Goals set out in Chapter 2, the passenger journey through the Station Environment should also be simple, seamless, intuitive, and resilient. Strategic and well-designed investments to integrate the station with various land uses and modes of transit can jumpstart the formation of a station area. Station area development will then be well-positioned to sustain the benefits of convenient regional transit connections provided by the station and light rail service, further enhancing equity and increasing system ridership.

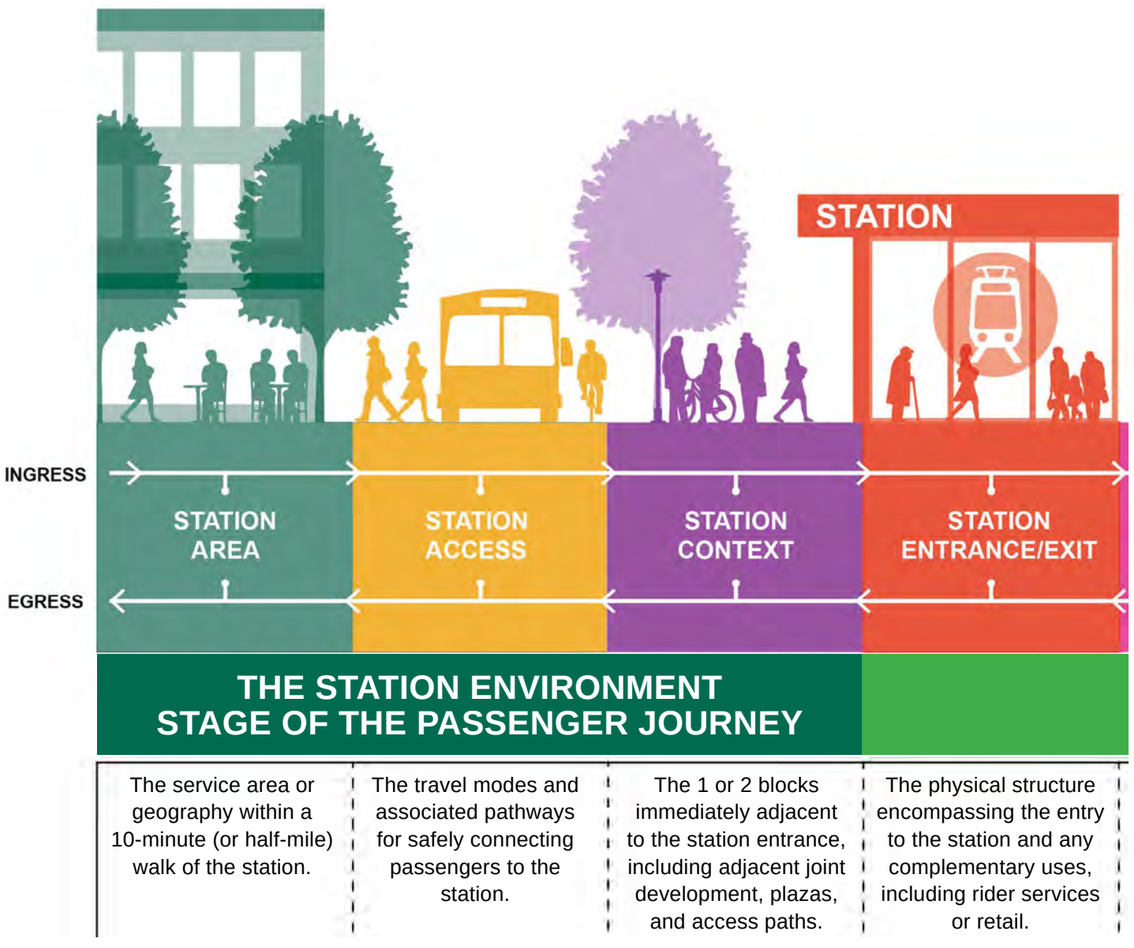


Figure i for 4.0.1 - The Station Environment - Stage of the Passenger Journey

4.0.1

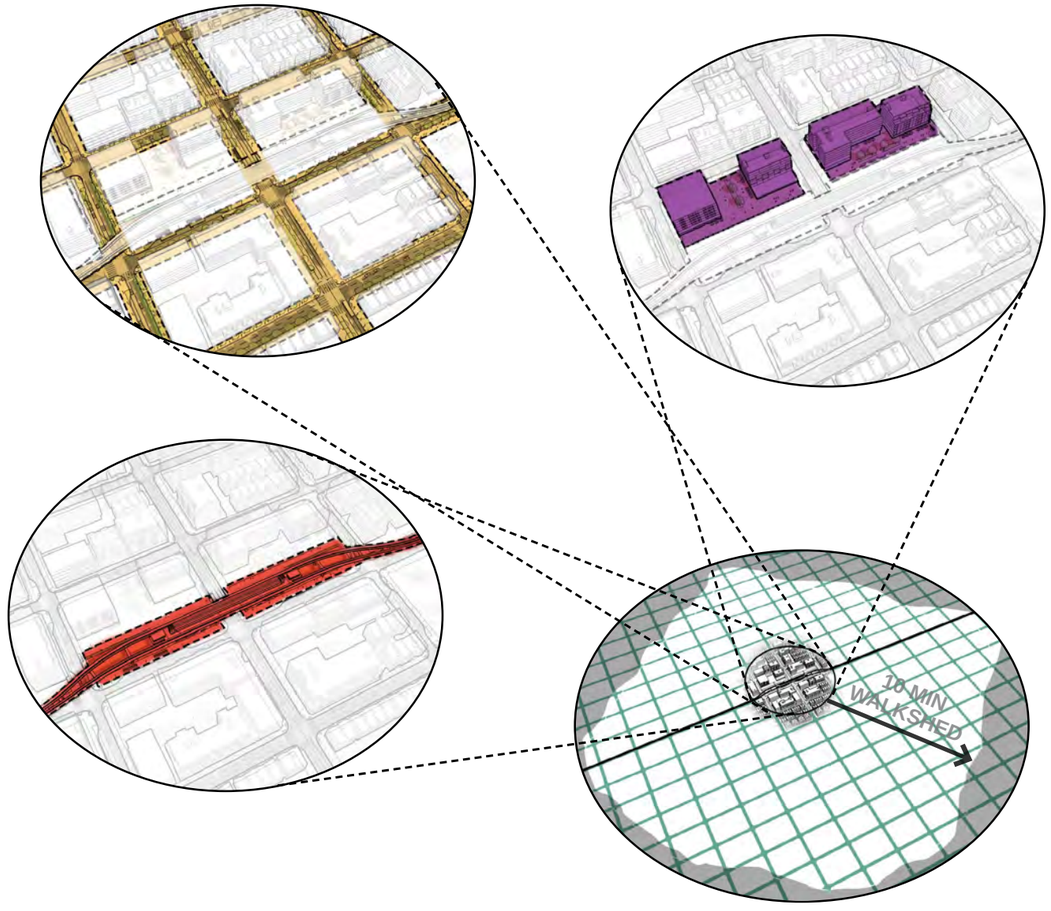
Zones of Responsibility within the Station Environment

Station Access

Enhanced routes connecting to the station that Sound Transit may identify (see the System Access Implementation Plan) and can be supported with Sound Transit's System Access Fund or Station Access Allowance funding, must involve third party contributions, and will likely be delivered by others.

Station Context

A more tightly defined zone surrounding 1-2 blocks from a station that is directly affected by station construction and operation, and which may include adjacent or integrated TOD done by others in conjunction with the transit project.



The Station

A Link station and its alignment built and operated by Sound Transit. This is where Sound Transit's responsibility is most enduring with respect to maintaining efficient operations and a state of good repair in support of an excellent passenger experience.

Station Area

The greater 10-minute walkshed within the ½ mile of the station that will evolve over time. This portion of the Station Environment is a shared zone of responsibility between local jurisdictions, transit agencies, property owners, and others.

Figure ii for 4.0.1 -Zones of Responsibility within the Station Environment

4.0.2

Key Elements of the Station Environment

The station environment is composed of urban form and adjacent development (4.3), modal connections and station access features (4.4), and public realm and integrated development (4.5). Reference the following sections for specific guidelines governing each of these elements that work together to form successful station environments.

4.2

Urban form and adjacent development

1. Block sized to support urban scale, mixed-use development pattern
2. Multifunctional street grid
3. Appropriate relationship of active frontages to station approach
4. Emphasis on housing affordability

4.3

Modal connections and station access

1. Pedestrian and bicycle
2. Curbside
3. Vehicle

4.4 & 4.5

Public realm and integrated development around the station entrance

1. Sight/desire lines to and from the station entrance from primary arrival zones
2. Mixing zones
3. Retail servicing transfer flows
4. Hardscape vs. softscape
5. Equitable TOD

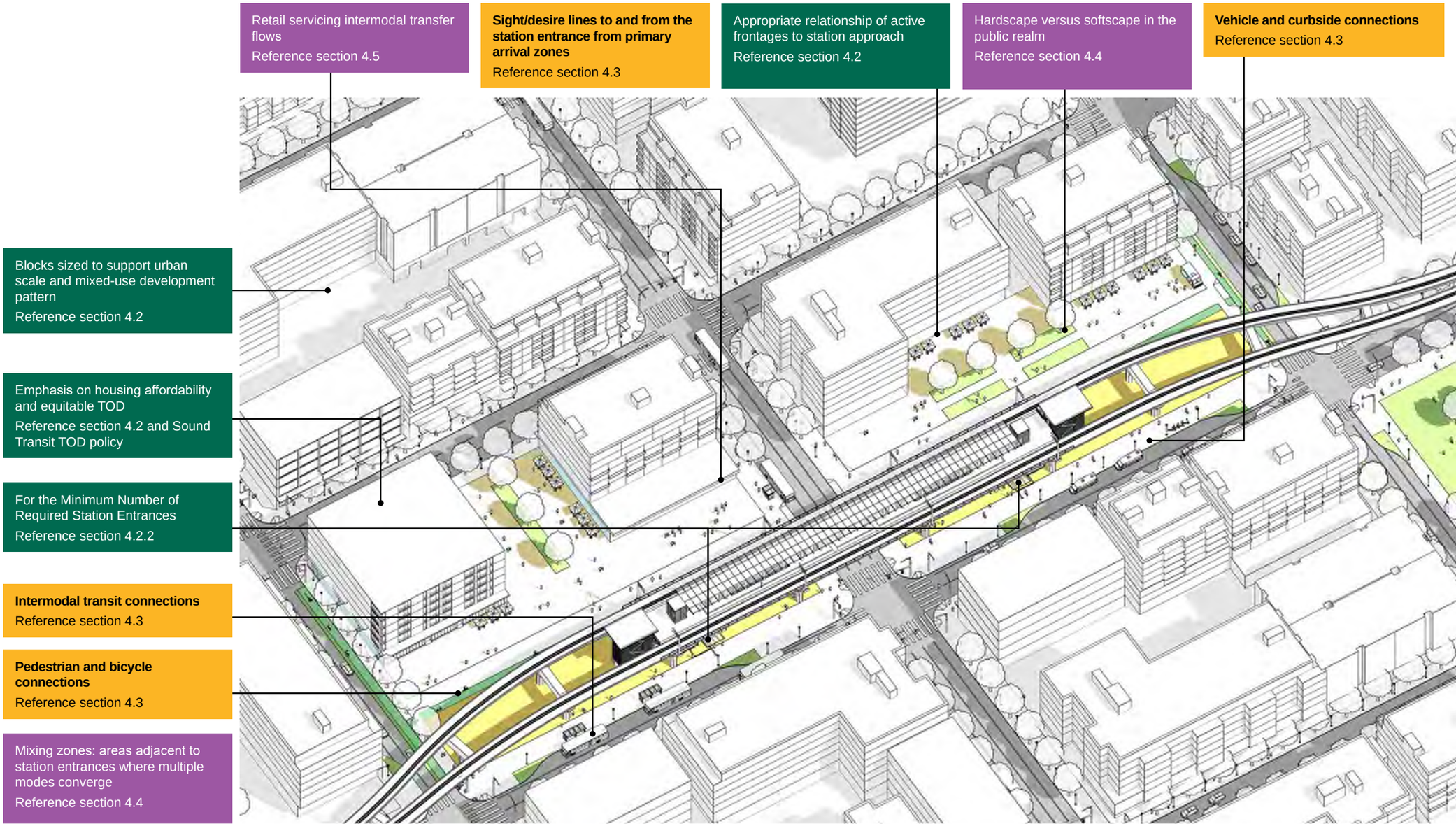


Figure i for 4.0.2 - Key Elements of the Station Environment Chapter key

4.1 The Station Environment Typology Matrix

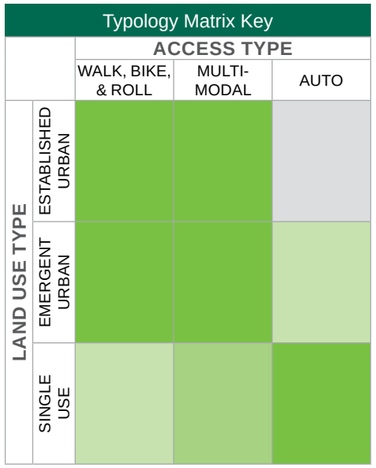


Figure i for 4.1.1 - This Typology Matrix Key correlates the land use type with the access type to provide clarity in the means to provide a good passenger experience. Refer to Table 4.1.4 in section 4.1.4 to review the combinations of Types in the Station Environment Typology Matrix.

REFERENCE

Reference the System Access Implementation Plan listed in Appendix E for information to understand how and when Station Access Types are selected.

4.1.1

How Land Use Type and Station Access Type Intersect

What are the Types?

Though each station interfaces with a unique context, common sets of opportunities and challenges exist across different contexts in urban form, block patterns, modal connections and access, zoned development potential, and neighboring development. These characteristics have been grouped into different Land Use and Station Access Types so that relevant sets of guidelines can be applied to each. The immediate and long-term conditions of a Station Environment will change over time, adding capacity to sustain community goals and provide resiliency.

Land Uses in Station Environments range from low-density with large parcels and a low propensity for change (Single Use) to areas with a high propensity for change (Emergent Urban) to a higher-density with fine grained urban development (Established Urban).

Likewise, Station Access Types range across a sliding scale of mobility options that will fluctuate over time. Though they are all multimodal to some degree, investment priorities have been grouped according to the dominant mode at each station: Walk, Bike, and Roll; Multimodal (often including bus layover facilities); and Auto.

This framework will be used to tailor decisions using urban design strategies in specific contexts. A long-range goal for the future of the station area may be for the station area to change incrementally, becoming more resilient as a walkable setting with a greater mix of uses and people using the station. It is critical that the Station Environment functions well at the onset of light rail service.

How to use the Typology Matrix

The typology is a tool for project teams to understand the existing and planned future conditions in the station environment and make programming and design decisions that supports a well-functioning station area. Information and direction offered by the Station Environment Typologies should be used to inform early project development, along with in-depth community and stakeholder engagement.

There are two categories of Station Environment Types:

» Station Land Use Types

» Station Access Types

The Station Land Use Types characterize Station Environments by urban form and land use patterns. The Station Access Types characterize Station Environments by access mode share and other characteristics, like the supporting street network. Reference the System Access Implementation Plan for information to understand how and when Station Access Types are selected.

The Station Environment Typology Matrix

The relationship of land use and access in a station environment determines how a good passenger experience can be established and maintained outside of the envelope of the Sound Transit system. The Station environment typology matrix crosswalks access and land use types to help project teams sort through strategies and envision the future form of Sound Transit and partner investments to support equitable, passenger-centered outcomes in design. It should be used as an assessment tool, not a deterministic framework. Figure i for 4.1.1 is a typology matrix key that illustrates the crosswalk between access and land use types.

How Stations catalyze change in Station Environments over time

Policy goals of the Authority Having Jurisdiction (AHJs), community aspirations, accompanying capital infrastructure improvements, market activities, and the anticipated operations of the station may catalyze change in the station environment and induce changes in land use type and access types over time. Considerations of long-term service goals and design responses to community aspirations are important to adapt the station area as a resilient and sustainable station environment. It is anticipated that the Emergent Urban condition has the greatest potential to consider a dramatic catalytic and desirable change. Other urban type conditions may have equally important needs uniquely fit to community aspirations. The following pages illustrate examples with a “diagnosis” of the existing types and the potential to catalyze desirable change over time.

Figure ii for 4.1.1 - Othello Station with transit-oriented development

4.1.2

Station Area Land Use Types

Existing congested, auto-dominated areas; desired change for increasing equitable access

The Station Area Land Use Types group the urban form and land use patterns in the station environment. These types summarize characteristics of existing and potential development, uses and activity around the station, which ultimately affect the passenger's interaction with the station and the station's role in the community. Established Urban, Emergent Urban, and Single-Use are the three land use types that may be used to assess and describe the Station Environment.

The three land use types are:

- Established Urban
- Emergent Urban
- Single Use

The following section illustrates core attributes for each type and procedures for diagnosing a land use type.

CASE STUDY REFERENCE

The Spring District is an example of an Emergent Urban Type. Refer to Case Study #4 in Appendix C for more detail on the development of the district over time.

TABLE 4.1.2

Station Area Land Use Type Summary

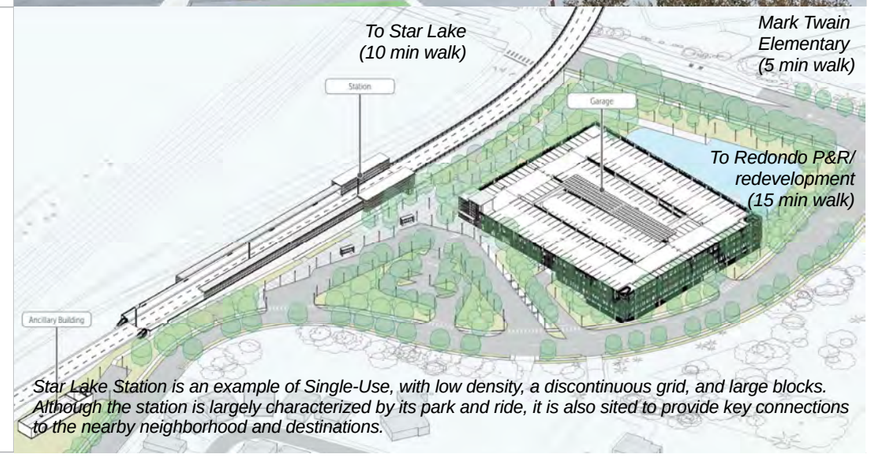
	DIAGNOSIS	PURPOSE / POTENTIAL OF THE STATION INVESTMENT	PRECEDENT
ESTABLISHED URBAN	» Area with a diverse mix of building activities along a grided street system that forms a safe walkable environment for transit riders. A networked bus service is already available. Though there is density, there may not yet be a mixed-use environment operating beyond the 9-to-5 workday.	» To relieve pressure on the existing, overloaded street grid from personal vehicles and to shift to a more pedestrian and bicycle friendly environment. » To increase population density, mix of active uses at the ground level, and use of streets to form active and vital transit passenger experience.	 *86th Street in New York is an example of Established Urban*
EMERGENT URBAN	» Area with a limited mix of activities at the ground level along a few streets and pathways serving transit riders. Density and mix of uses is limited. There are large blocks and few, if any, facilities exist to support a high quality walkable environment.	» To catalyze a more intensive land use. Future growth will be directed to these areas in order to preserve the urban growth boundary and minimize environmental impacts as the region grows overall. » Consolidate utilities and streets to allow a network of open spaces development sites to afford increasing density and provide ground level activities along accessways to station.	 *The Spring District is an example of an Emergent Urban Type.*
SINGLE-USE	» Area with a single dominate use and significant barriers to change; suburban in character with limited activity at the ground level along streets and pathways which may or may not serve transit riders.	» To collect and connect people living and working in low density areas while accepting that the immediate adjacent land uses are unlikely to change in the near future. » Strategically locate and activate pathways to the station and other modes of transit with ground floor active uses supporting pedestrian use and extend to increase connections to nearby neighborhoods.	 *Star Lake Station is an example of Single-Use, with low density, a discontinuous grid, and large blocks. Although the station is largely characterized by its park and ride, it is also sited to provide key connections to the nearby neighborhood and destinations.*

Table 4.1.2 - Station Area Land Use Type Summary

Established Urban

Higher density, mixed-use, walkable areas that have a defined street grid, frequent and consistent intersections, and smaller (urban scale) block sizes all characterize an Established Urban area. Streets have a defined, active building edge and buildings that contain a mix of uses.

Typology Matrix Key				
		ACCESS TYPE		
		WALK, BIKE, & ROLL	MULTI-MODAL	AUTO
LAND USE TYPE	ESTABLISHED URBAN			
	EMERGENT URBAN			
	SINGLE USE			

Figure i for 4.1.2.A - Typology Matrix Key - Highlighting Established Urban Land Use

The following attributes can assist in defining an Established Urban condition:

- Floor Area Ratio (FAR): 5.0 FAR or greater per parcel
- Block Permeability: No more than 300’ between publicly accessible rights-of-way
- Activity: Greater than 700 activity units per acre (Activity Unit: total number of jobs and residents living and working in the area per acre.)
- Jobs to Housing Ratio up to 3:1

An Established Urban area has the potential to intensify a mix of uses to the limit of facilities assigned for each access mode.

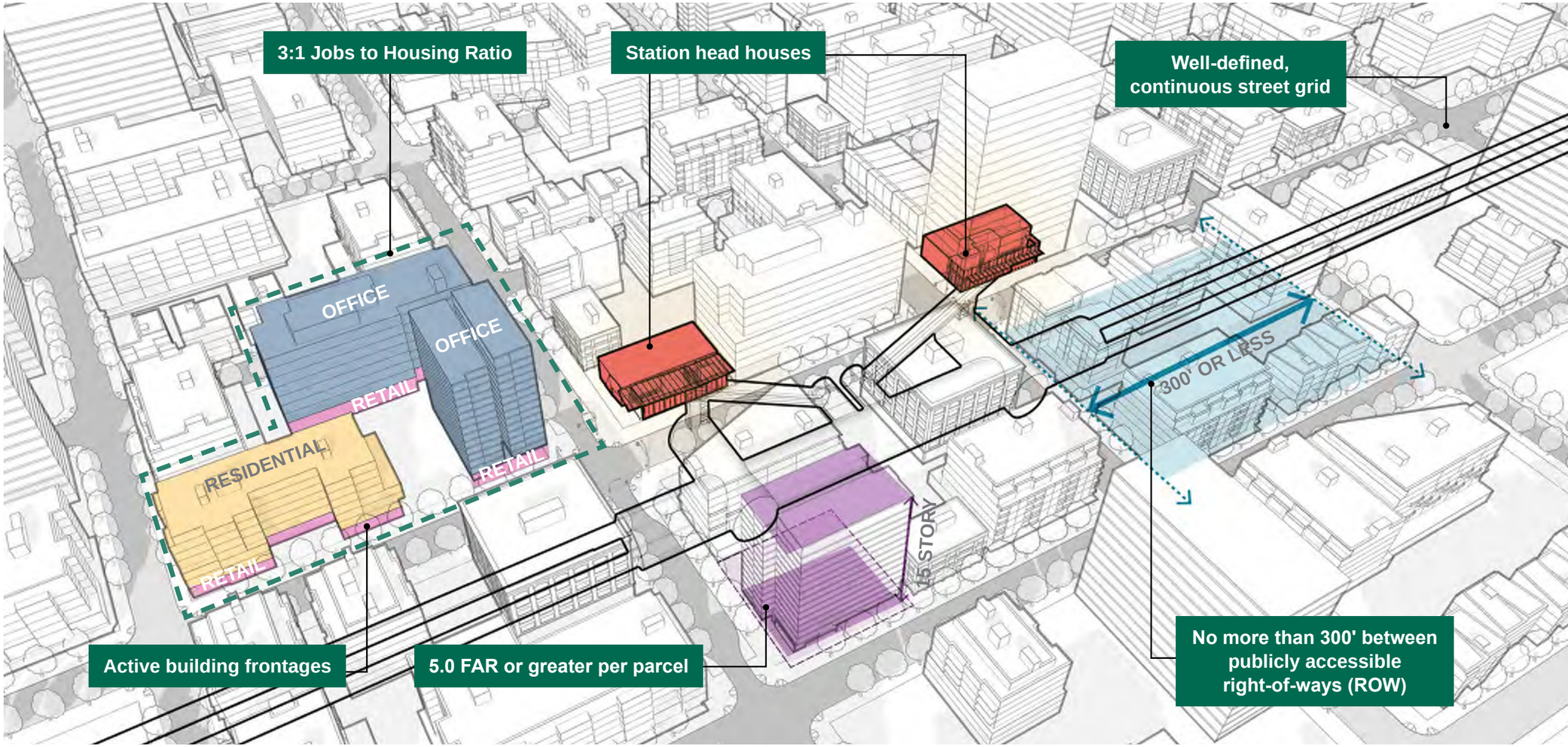


Figure ii for 4.1.2.A - Established Urban characteristics

Emergent Urban

Emergent Urban is characterized by one or both of the following:

» An urban scale block form and street pattern that is already established or can be readily encouraged (as depicted in Established Urban, an urban scale block form and street pattern consists of a well-defined street grid, frequent and consistent intersections, and smaller block sizes)

» Some mixing of uses with a walkable scale

The development density in Emergent Urban is moderate with emerging active building edges supporting a transition to a more walkable, consistent street grid.

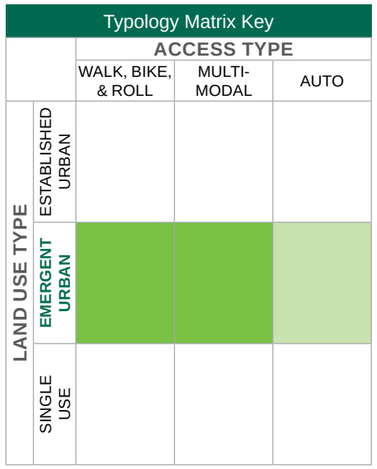


Figure i for 4.1.2.B - Typology Matrix Key - Highlighting Emergent Urban Land Use

The following attributes can assist in defining an Emergent Urban condition:

» Floor Area Ratio (FAR): 1.0 FAR or greater per parcel

» Block Permeability: 300' - 600' between publicly accessible rights-of-way

» Activity: 100-700 activity units per acre (Activity Unit: total number of jobs and residents living and working in the area per acre.)

» Jobs to Housing Ratio: 1:1

An Emergent Urban area has the potential to improve multimodal connectivity and induce development that supports pedestrian-oriented ground level activities.

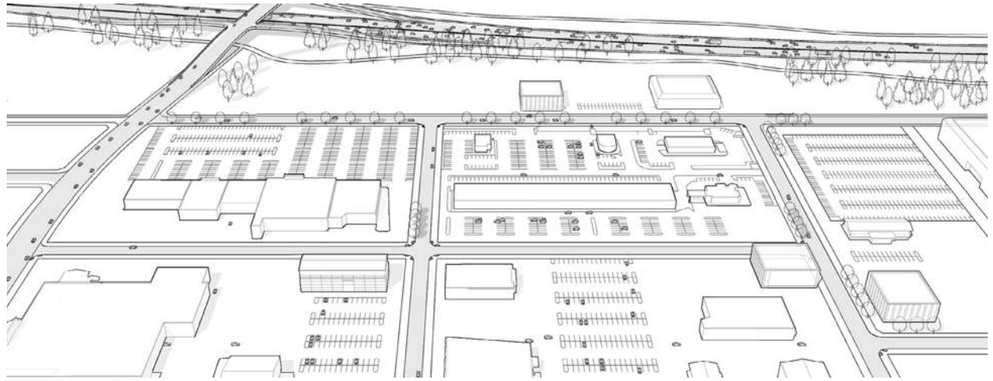


Figure ii for 4.1.2.B - Emergent Urban before Sound Transit station

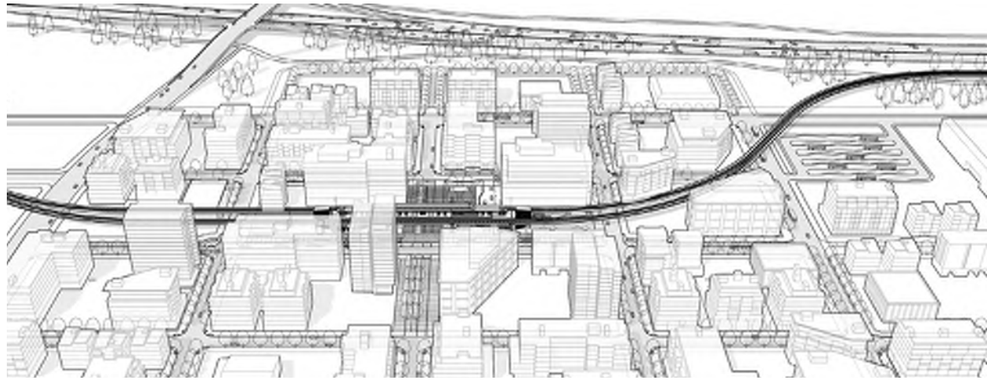


Figure iv for 4.1.2.B - Emergent Urban long-term development pattern condition as a response to station investment

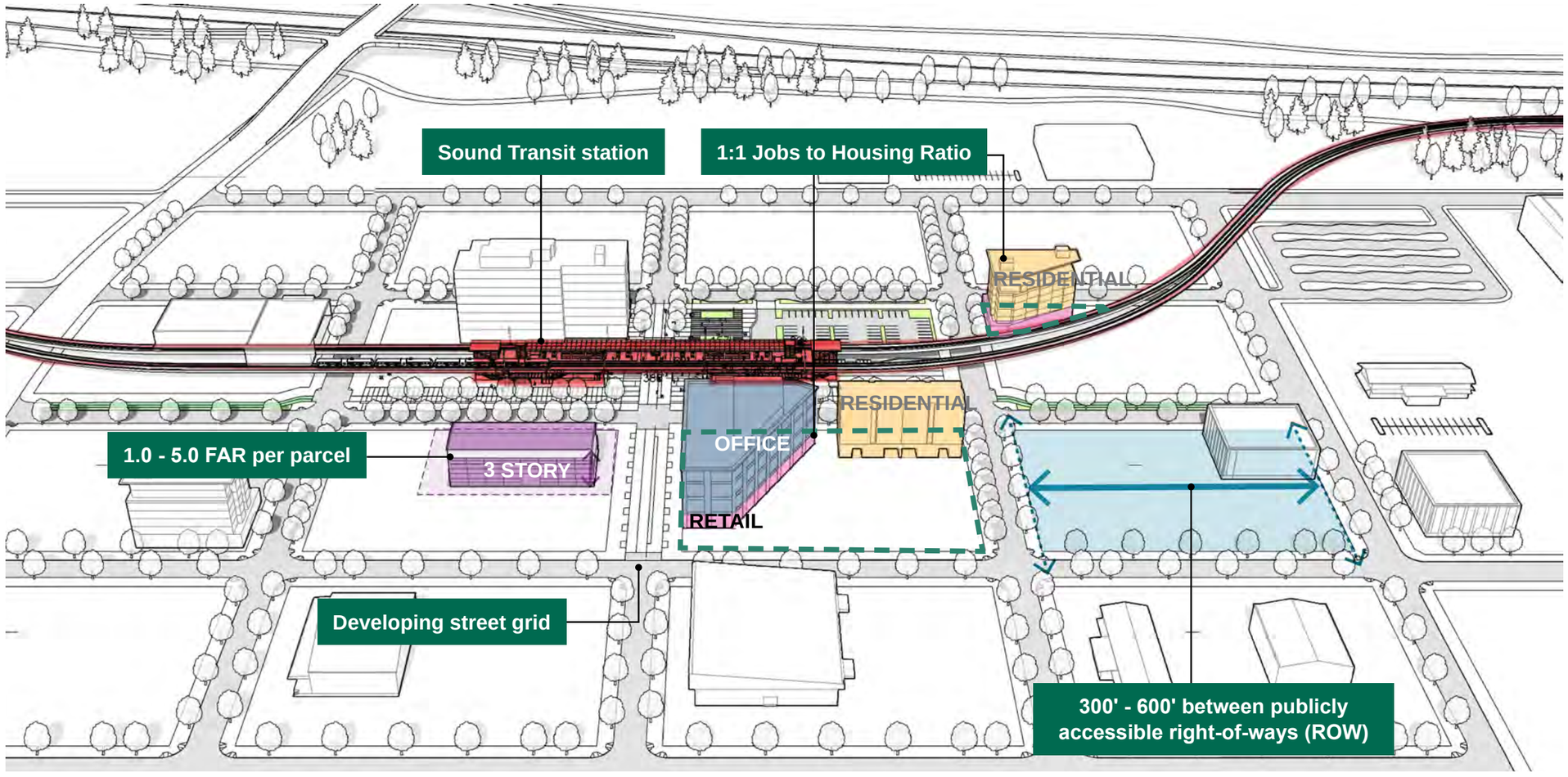


Figure iii for 4.1.2.B - Emergent Urban transitioning with Sound Transit station

Single Use

Single-Use is characterized by low density areas that are predominantly one use, such as suburban residential, or commercial and industrial.
With large or irregular blocks, a discontinuous street grid, adjacency to a freeway, and/or less active frontages, these areas are not as walkable as the previous land use typologies.

Typology Matrix Key				
		ACCESS TYPE		
		WALK, BIKE, & ROLL	MULTI-MODAL	AUTO
LAND USE TYPE	ESTABLISHED URBAN			
	EMERGENT URBAN			
	SINGLE USE			

Figure i for 4.1.2.B - Typology Matrix Key - Highlighting Emergent Urban Land Use

The following attributes can assist in defining a Single-Use condition:

- Floor Area Ratio (FAR): 0.1 – 1.0 FAR per parcel
- Block Permeability: Greater than 600’ between publicly accessible rights-of-way
- Activity: 15 – 150 activity units per acre (Activity Unit: total number of jobs and residents living and working in the area per acre.)
- Jobs to Housing Ratio: 17:1 or 1:20

A Single-Use area has the potential to evolve over time providing safe pedestrian-oriented connections to nearby areas with pedestrian oriented ground level activities.

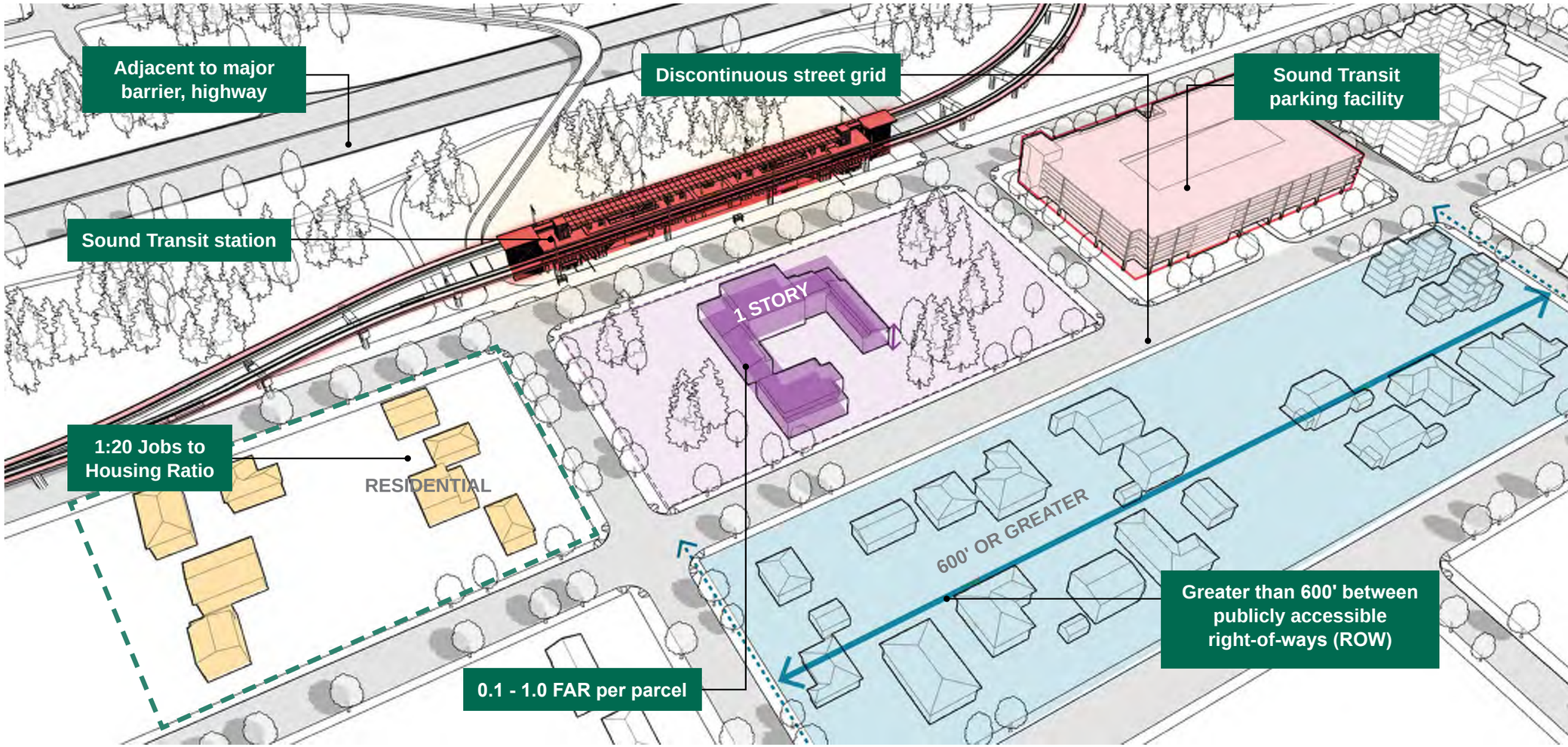


Figure ii for 4.1.2.C - Single Use characteristics

4.1.3

Station Access Types

Improving mobility for all

A Station Access Type reflects the predominant access modes that passengers currently use or will use to reach the station. The Station Access Type highlights the access elements and design features that Sound Transit and its partners must emphasize to support a high-quality passenger experience.

Sound Transit uses Station Access Types to describe existing and new stations based on access mode share and other access characteristics, including supportive transportation networks and station land use context.

While a range of multimodal investments support seamless passenger access and are likely to appear in all station environments, the Station Access Type helps determine the access elements that are necessary to support a station's primary access mode or modes.

There are three Station Access Types:

» Walk, Bike, and Roll

» Multimodal

» Auto

The following section illustrates core attributes for each type and features worthy of particular emphasis or consideration.

Figure i for 4.1.3 - The University of Washington Station is an example of Walk, Bike, and Roll station with pedestrian and bicycle amenities.

Figure ii for 4.1.3 - The Northgate Station is an example of a Multimodal station with off-street bus transit facility

Figure iii for 4.1.3 - Angle Lake Station is an example of an Auto station with a prominent park and ride garage.

Figure iv for 4.1.3 - The off-street bus transit facility at Tukwila International Boulevard Station fosters multimodal connections.

A. Walk, Bike, and Roll Stations

Most passengers arrive at and depart from Walk, Bike, and Roll stations by walking, bicycling, or rolling, reflected by a combined walk and bike access mode share greater than 50%. Walk, Bike, and Roll stations are usually in Established Urban or Emergent Urban Land Use contexts and are served by a surrounding street network with multimodal connections.

Typology Matrix Key				
		ACCESS TYPE		
		WALK, BIKE, & ROLL	MULTI-MODAL	AUTO
LAND USE TYPE	ESTABLISHED URBAN			
	EMERGENT URBAN			
	SINGLE USE			

Figure i for 4.1.3.A - Typology Matrix Key - Highlighting Walk, Bike, & Roll Access Type

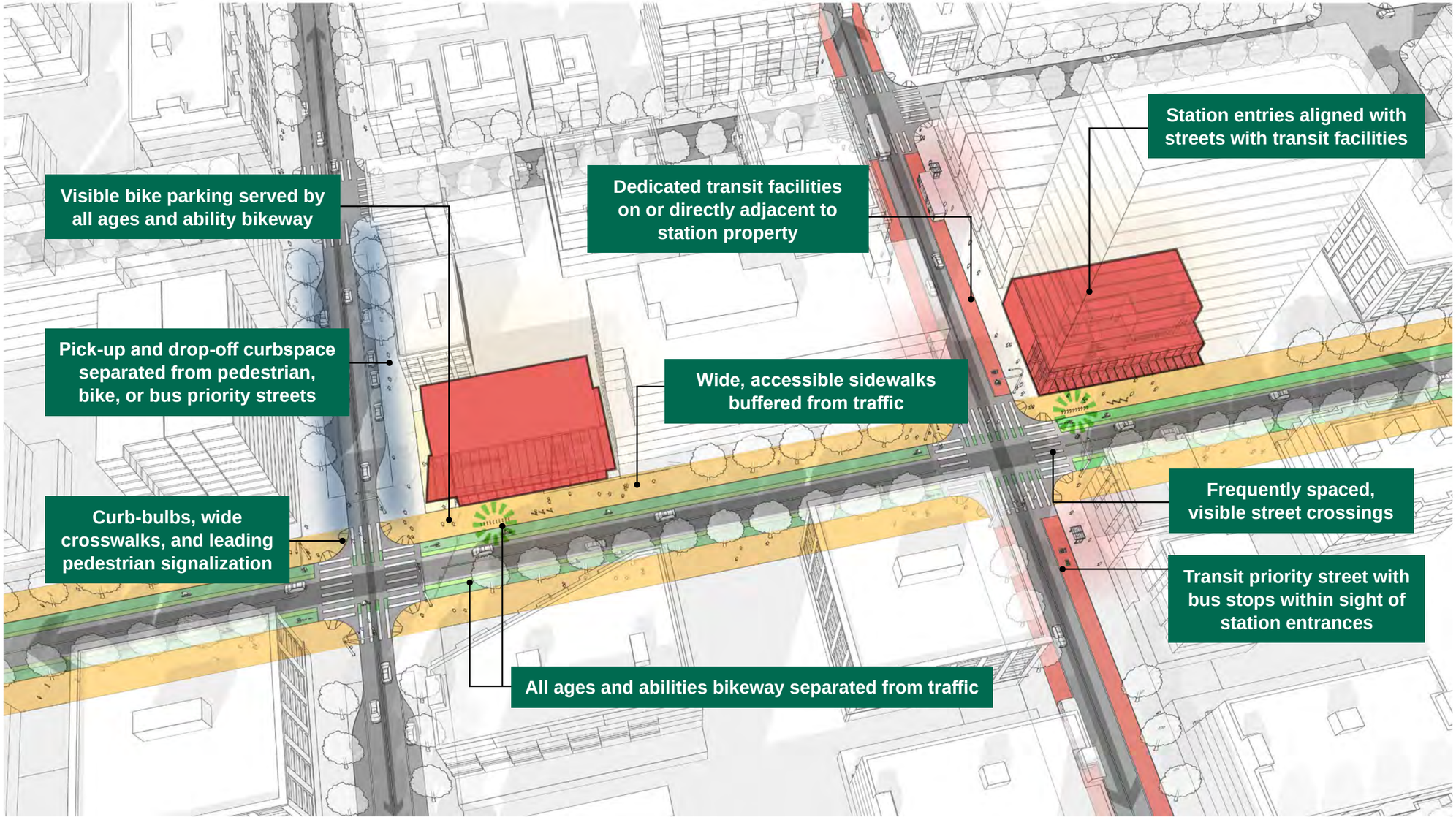


Figure ii for 4.1.3.A - Walk, Bike, and Roll station characteristics

Environments around Walk, Bike, and Roll station must include access features that support safe and direct walking, bicycling, and rolling, connections, like wide, accessible sidewalks buffered from traffic, frequently spaced, visible street crossings, and bikeways that are comfortable for riders of all ages and abilities.

Access elements supporting direct and comfortable walking, bicycling, and rolling, access will be prioritized along station frontages and connecting to station entrances. Secondary access elements include direct connections from adjacent bus stops and pick-up/drop-off curb space to station entrances.

Typical street rights of way in a Walk, Bike, and Roll station environment should be a minimum of 60’ to appropriately accommodate necessary features to support a high-quality passenger access experience.

B. Multimodal Stations

Passenger arrivals at and departures from Multimodal stations are split between various access modes: walking and rolling, bicycling, transit, and private or shared vehicles. At some stations, no access mode predominates. At other stations, a larger proportion of passengers access the station by connecting bus or rail transit. Multimodal stations are usually in Emergent Urban or Established Urban Land Use contexts and are served by a surrounding street network with multimodal connections.

Typology Matrix Key				
		ACCESS TYPE		
		WALK, BIKE, & ROLL	MULTI-MODAL	AUTO
LAND USE TYPE	ESTABLISHED URBAN			
	EMERGENT URBAN			
	SINGLE USE			

Figure i for 4.1.3.B - Typology Matrix Key - Highlighting Multimodal Access Type

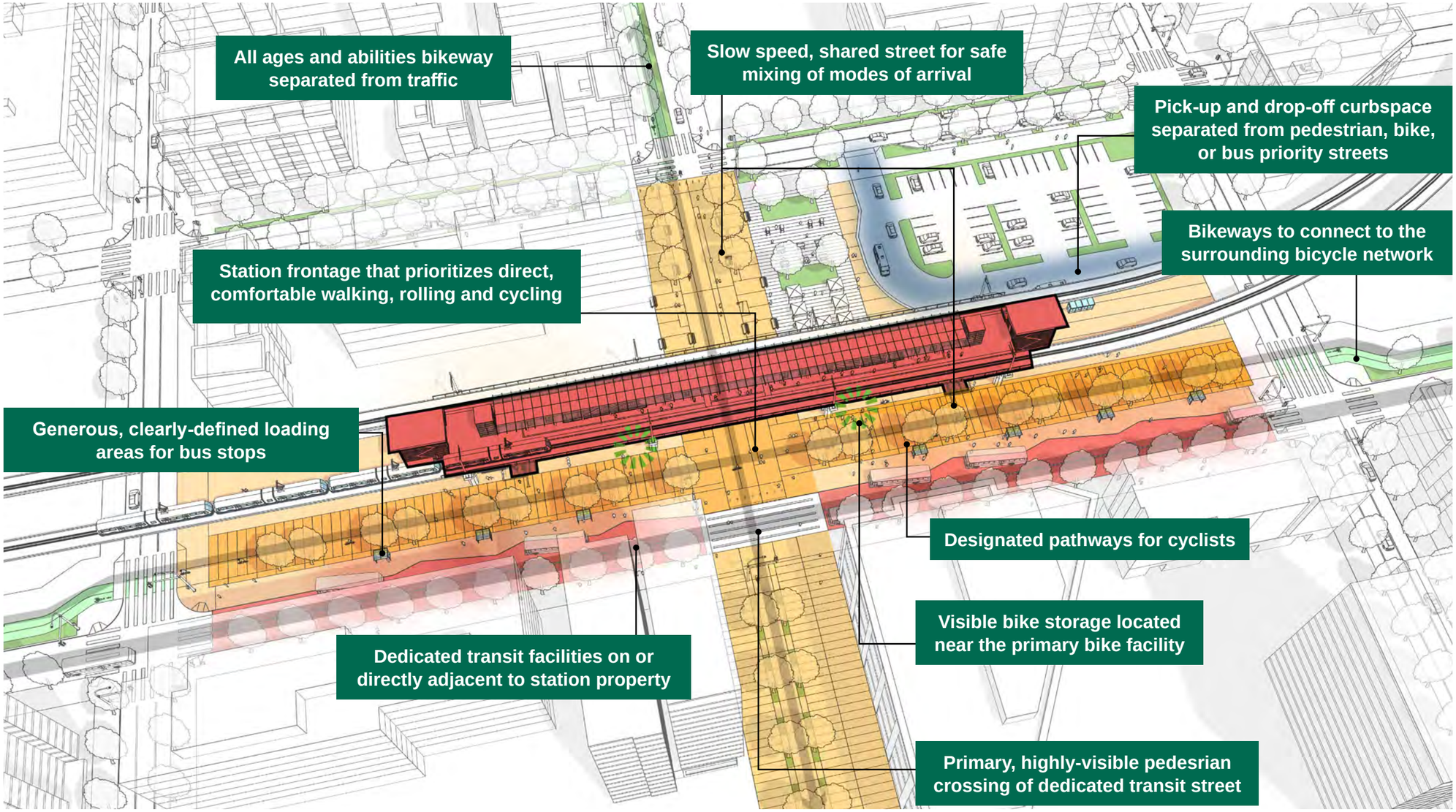


Figure ii for 4.1.3.B - Multimodal station characteristics

Environments around Multimodal stations must include access features that support direct and seamless transit connections, like bus stops near or on station property and transit waiting areas sufficient for assumed bus passenger volumes. Environments around Multimodal stations must also include access features that support safe, direct walking, rolling, and bicycling access.

Access elements supporting seamless transit connections and direct, comfortable walking, rolling, and bicycling access will be prioritized along station frontages and connecting to station entrances. Secondary access elements include connections from pick-up/drop-off curb space.

Typical street rights of way in a Multimodal station environment should be a minimum of 80’ on streets with connecting transit service and must be a minimum of 70’ for other street rights-of-way (exclusive of the station footprint, see section 4.2.4 an Elevated Station cross-section) in the immediate vicinity of the station to appropriately accommodate necessary features to support a high-quality passenger access experience.

C. Auto Stations

Most passengers arrive at and depart from Auto stations through pick-up/drop-off or by parking a personal or shared vehicle, which is reflected by a combined auto access mode share greater than 50%. Auto stations are usually in Single-Use or Emergent Urban land use contexts with less well-developed street networks or near freeways.

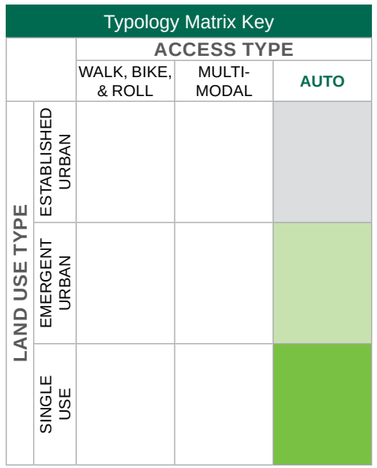


Figure i for 4.1.3.C - Typology Matrix Key - Highlighting Auto Access Type

Environments around Auto stations must include access features that support ample, dedicated curb space for pick-up/drop-off and direct, comfortable pedestrian connections between dedicated curb space and parking for privately owned vehicles.

Access elements supporting seamless and safe connections for passengers between pick-up/drop-off curb space and dedicated parking will be prioritized in Auto stations. Special consideration will also be given to separating predominant vehicle pathways from walking and rolling pathways. Secondary access elements include direct connections from adjacent bus stops and bicycle networks.

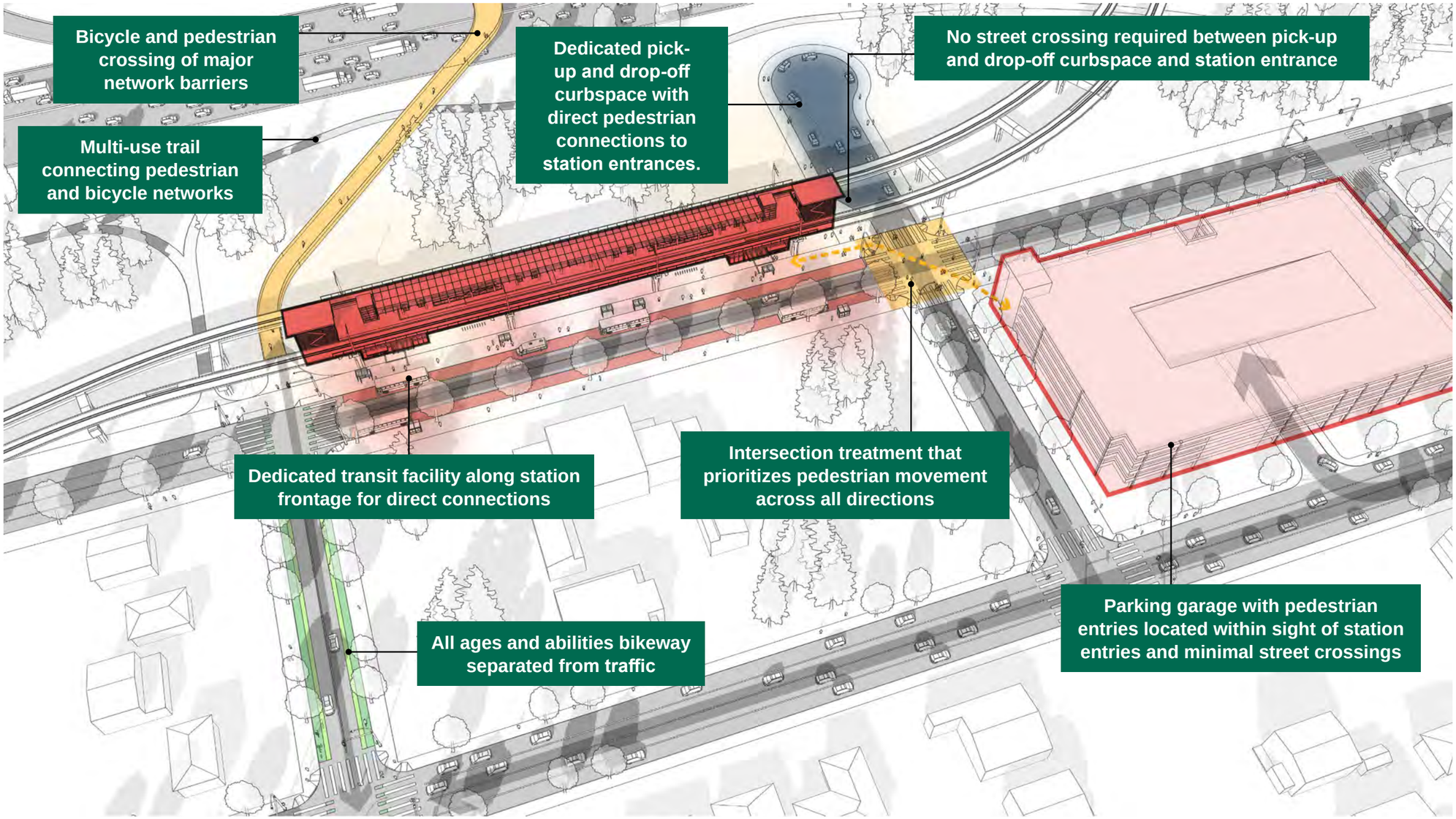


Figure ii for 4.1.3.C - Auto station characteristics

Auto station environments may include barriers for nonmotorized station access, such as freeways, large blocks, or critical areas that lack crossings. Larger scale nonmotorized access elements to overcome these barriers, such as a bicycle and pedestrian bridge, may be appropriate in Auto station environments.

Typical street rights of way in an Auto station environment must be a minimum of 70’ on streets with connecting transit service and must be a minimum of 60’ for other street rights of way in the immediate vicinity of the station to appropriately accommodate necessary features to support a high-quality passenger access experience.

D. Station Access Investment Framework

The Station Access Types are the foundation for Sound Transit's approach to improving and monitoring passenger access. It highlights the access elements and design features that Sound Transit and its partners must emphasize to support a high-quality passenger experience. The Station Access Investment Framework builds off the station access typology to articulate Sound Transit's access investment priorities by Station Access Type. It is a tool that identifies primary and secondary access investments and provides clarity and transparency for our approach to improving passenger access throughout the system.

TABLE 4.1.3

Station Access Investment Framework

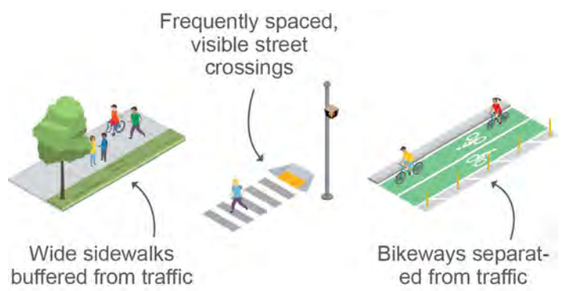
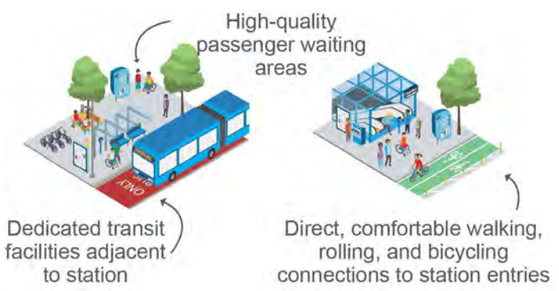
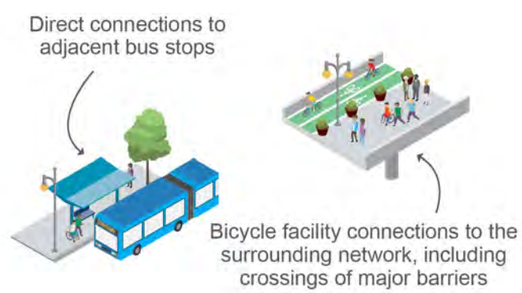
	WALK, BIKE, AND ROLL	MULTIMODAL	AUTO
	Most passenger access walk, bike, and roll stations on foot, by bicycle, or with a mobility device. » Walk, bike, and roll stations require access elements that support safe and convenient connections, such as wide, accessible sidewalks and bikeways that are comfortable for people of all ages and abilities.	Passenger access to multimodal stations is split between various access modes: walking, rolling, bicycling, transit, and private or shared vehicles. » Multimodal stations are often stations where many transit services connect; they require access elements that support seamless transfers between transit services and high-quality walking, rolling, and bicycling connections.	Most passengers access auto stations through pick-up/drop-off or by parking a personal or shared vehicle. » Auto stations include access elements such as dedicated curb space for pick-up/drop-off, regional park-and-ride facilities, or Sound Transit-owned parking. They require safe and direct connections for passenger walking or rolling from parking facilities.
ACCESS MODES	*PRIMARY* *SECONDARY* *NOT ENCOURAGED*	*PRIMARY* *SECONDARY*	*PRIMARY* *SECONDARY*
PRIMARY			
SECONDARY			

Table 4.1.3 Station Access Investment Framework

Using the Land Use Type and Access Type Matrix

Evolution/Transformation over Time

The Station Environment Typology Matrix is a tool that invites partner agencies and community members to evaluate the potential for each station environment to transition to a typology that is suited to improve multimodal access, density, mix of uses, and ground floor activities. It is intended to help agency partners and community members consider tradeoffs that may be present in each station environment so as to enhance the passenger experience. Table 4.1.4 Station Environment Typology Matrix crosswalks the three Station Access Types against the three Land Use Types, creating eight possible combinations. (Established Urban with an Auto Focus is not an applicable scenario due to the presence of established transportation networks, higher densities of activity and the associated high value of land.)

The most frequently observed combinations are:

- Walk, Bike, and Roll Established Urban
- Multimodal Established Urban
- Walk, Bike, and Roll Emergent Urban
- Multimodal Emergent Urban
- Auto-Focused Single-Use

A Station Environment has the potential to evolve over time due to policy goals, market activities, and the introduction of high-capacity transit. Table 4.1.4 also outlines common future state conditions that design teams may encounter. Commonly, local/regional land use vision and policy goals will push Station Environments to higher densities, more block porosity, more multimodal options, and greater walkability. Most frequently, Emergent Urban Types tend to have opportunities to densify, increase block porosity, and increase uses to transition to an Established Urban state. Emergent Urban Types are also likely to become more multimodal over time. Single-Use is defined as such because there seem to be barriers making it less likely to transition to a more dense, mixed-use state. A transition to a more multimodal future state should not be precluded. Therefore, a transition from Single-Use, Auto-Focused to Single-Use, Multimodal is a potential and desired future state.

Applying the typology to help identify priorities must be balanced against existing characteristics. This should be done through a collaborative planning and design process early in project development as defined in this manual, the System Access Implementation Plan (SAIP) and other Agency procedural documentation.

TABLE 4.1.4

The Station Environment Typology Matrix crosswalks the three Station Access Types and the Three Land Use Types

LAND USE	ACCESS TYPE: WALK, BIKE, & ROLL	ACCESS TYPE: MULTIMODAL	ACCESS TYPE: AUTO
	» Majority walk, bike, and roll access mode and » No off-street transit facility » No rail-rail connection	» Majority transit access mode or » No mode holds majority or » Rail-rail connection or » Off-street transit facility	» Majority Vehicle access mode (pick-up/drop-off, parking) » No off-street transit facility » No rail-rail connection
ESTABLISHED URBAN Areas characterized by: » Established Urban scale block form and street pattern » Existing mixing of uses establishing walkable environment » Higher development densities	Typically urban centers in metropolitan cities with high existing densities and well-established street grids Example: Capitol Hill	Typically urban centers in metropolitan cities with high existing densities and well-served by connections with local and high-capacity frequent transit service Example: International District / Chinatown	Not Applicable
EMERGENT URBAN Areas with one or both of the following characteristics: » Urban scale block form and street pattern already established or can be readily encouraged » Some mixing of uses with a walkable scale But characterized by lower development densities	Typically urban centers in large or small cities with planned growth in residential density Example: Spring District	Typically urban centers in large or small cities with planned growth in mixed-use density Example: Lynnwood	As with single use / auto-focused combination, may focus more on supporting transition to Multimodal access type Example: Shoreline South/148th St
SINGLE USE **Suburban Residential *or* Commecial and Industrial land uses** Areas characterized by: » Large or irregular blocks and discontinuous street grid » Predominantly suburban residential, commercial or industrial land uses » Low development densities	Depending on local/regional land use vision and policy goals, support transition to Multimodal access type, and potentially Emergent Urban land use type; otherwise, focus on small-scale interventions to enhance block porosity and directness of walking and biking routes Example: East Portland	Typically districts composed of specialized industrial and commercial uses of strategic importance to the region, with transit providing access to jobs Examples: SODO and SW Everett Industrial Center	Typically residential neighborhoods where trips originate. Depending on local/regional land use vision and policy goals, support transition to Multimodal access type, and potentially Emergent Urban land use type Example: Star Lake

Conditions encountered most frequently

Potential new condition with transit investment

Conditions encountered less often

Condition not applicable

Likely and desired future state condition

Likely path of transition over time

Multi-state transition path

Table 4.1.4 Station Area Environment Typology Matrix crosswalks the three Station Access Types and the Three Land Use Types

4.2 Urban Form and Station Siting Guidelines

The one to three blocks surrounding the station, or the station context, represents a pivotal point in the passenger journey. Just as the station area's urban form must be designed to enhance the station and passenger experience, the design of the station context and station itself must also support community goals for potential development. Together, the station, station context, and greater Station Environment can serve passengers and support communities to be livable, healthy, resilient, and equitable. The following section expresses guidance on the siting and layout of stations and supporting facilities, and the design of seamless urban spaces to support enduring transit-oriented development and support the Passenger Goals (section 2.1.2).

Imagine the diverse daily needs of an extended family with two people in the workforce - one at night school, a child in daycare and another in the local public school, and elderly parents in need of health care services. The commute times are so long that the family considers purchasing a second vehicle, just to get all of their trips in. Instead they begin to search for an affordable 3-bedroom unit close to Link light rail. They find one in a new development where some of their daily needs can be met by walking or biking. After they move in, their living expenses change, and they are able to rebalance their priorities in favor of having more time to spend with each other.

Figure i for 4.2 - Beacon Hill Station

4.2.1

Site Stations to Create or Preserve Land Efficiency

SITE STATIONS IN A MANNER THAT COMPLEMENTS EXISTING AND PLANNED URBAN FORM

The initial relationship between the station and the urban context begins with the location of the station. The site chosen for the station should complement and enhance the greater context by amplifying accessibility, walkability, and visibility.

A. Choose sites for stations with high potential to maximize walksheds in all directions

Maximizing the walkshed in all directions increases accessibility for all passengers to the station and surrounding uses. This not only increases overall ridership potential, it enhances the relationship between the station and the surrounding development, supports active ground floor uses, and makes better use of the overall transit infrastructure investment.

Where stations are sited adjacent to major barriers such as freeways, choose sites with potential to achieve the access priority investment framework and conditions contemplated in 4.3.3 and 4.3.4. Explore opportunities to partner with state, county or municipal transportation agencies on structures or features that enhance public access to and through the station site, and maximize the overall walkshed from the station.

Where significant topographic features and elevation change in Station Environments are in close proximity to a station, incorporate public vertical and/or horizontal circulation and entrances into station architecture and site design per Sound Transit Design Criteria Manual requirements and section 3.3.5.B.

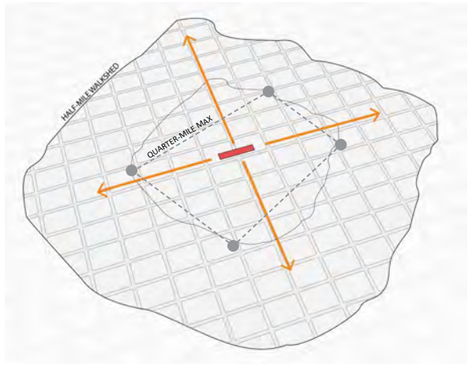


Figure i for 4.2.1.A - Half-mile walkshed diagram showing the station sited centrally and destination spots accessible within a quarter-mile from the statio

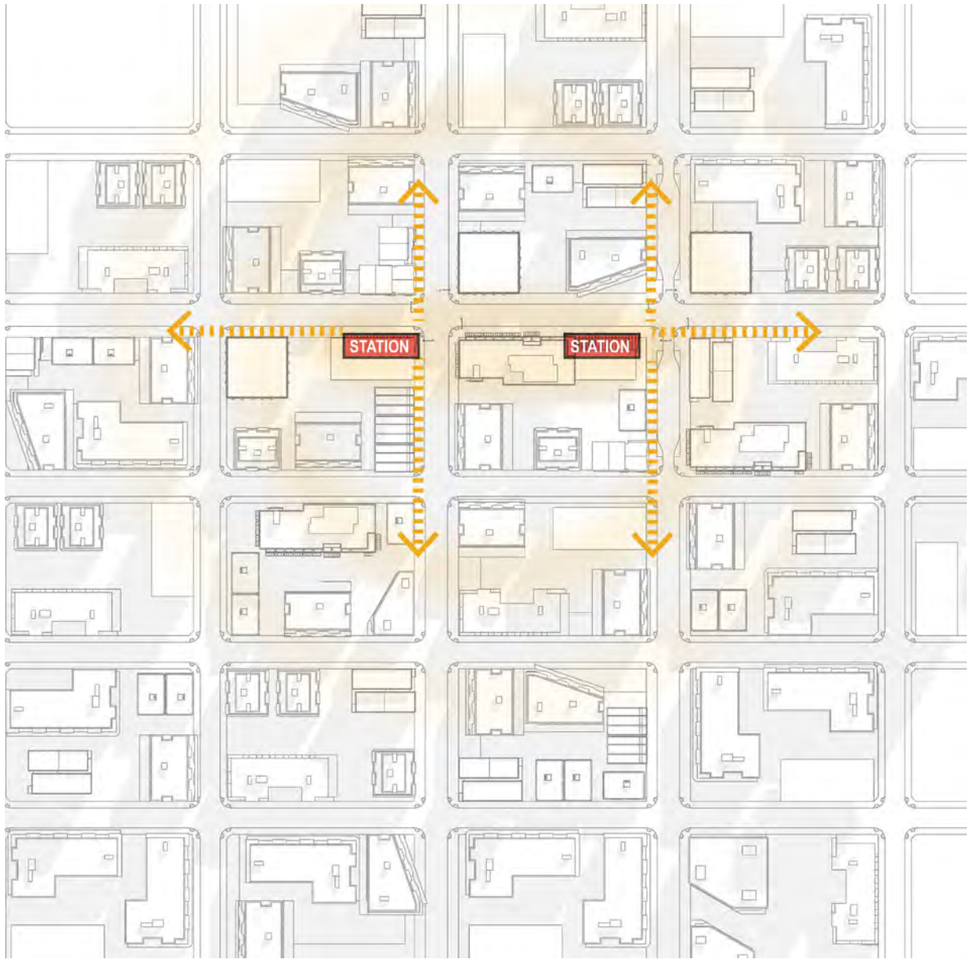


Figure ii for 4.2.1 - Established Urban station within an established street grid

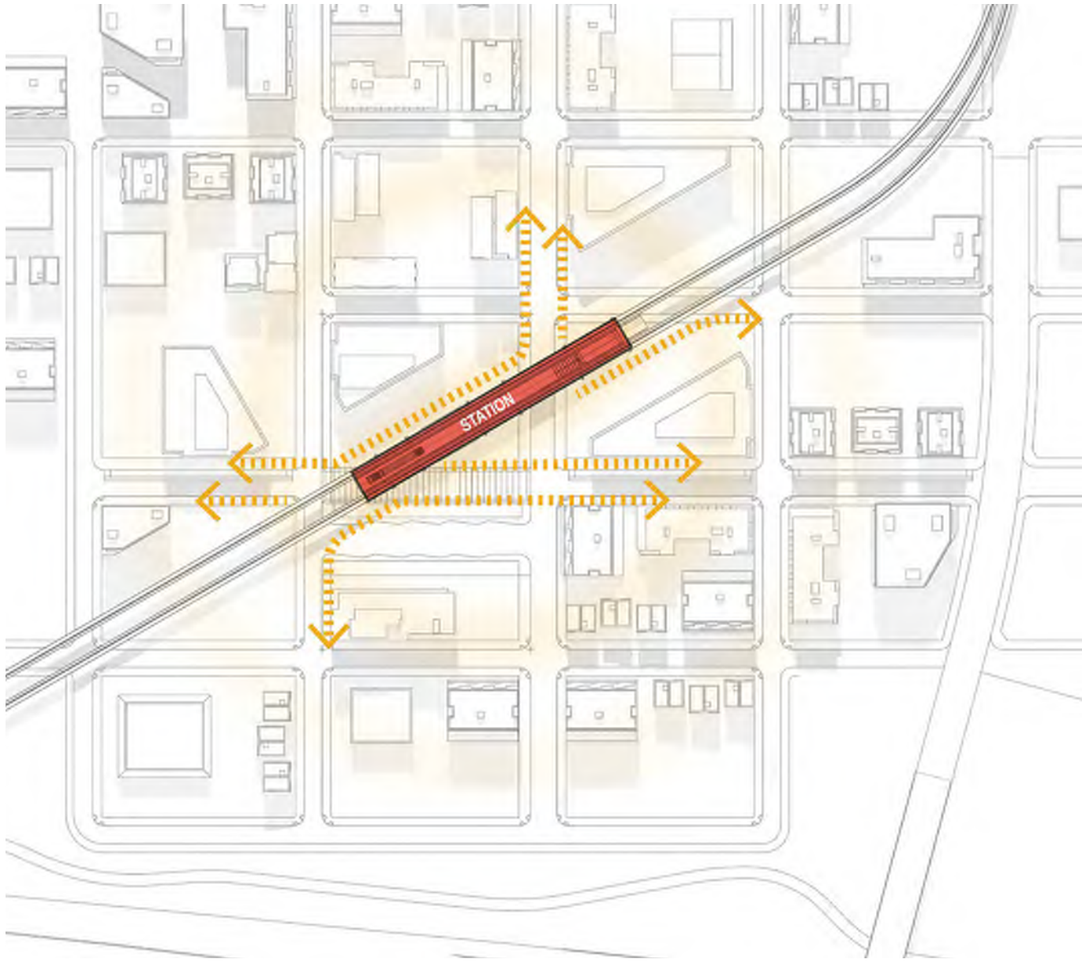


Figure iii for 4.2.1 - Emergent Urban station (diagonally configured) adjacent to a highway barrier

B. **Orient stations to the geometries of the established street grid and landscape features**

The basic dimensions of a station platform and adjacent guideways (380’ x 65’) are often longer than a city block and the equivalent width of an entire roadbed, necessitating careful placement to avoid excessive demolition of exiting fabric while creating new opportunities for development (see section 4.2.6 on Block Fragments and Urban Infill).

Orienting stations to the existing street grid and landscape features allows the station to fit within the existing urban fabric, creating more efficient and direct multimodal connections and more efficient parcels for future development. This also helps to interlay a grid of streets and blocks allowing any new development to relate to the community context already in place.

Where site conditions or engineering constraints make it difficult to align the guideway and station geometry to established block and street geometries, orient station entrances to the intersection of established grid of streets or landscape features, and in particular, site entrances at prominent corners, whenever possible.

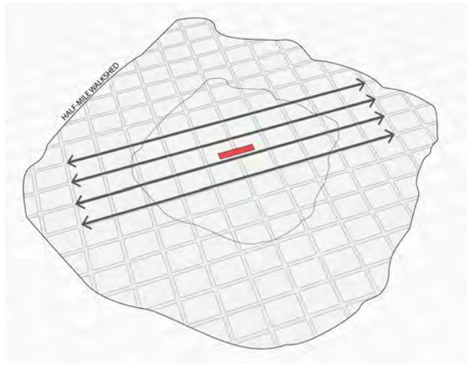


Figure i for 4.2.1.B - Half-mile walkshed diagram showing the station oriented to the established street grid

Figure ii for 4.2.1.B - A station orthagonal to the street grid

Figure iii for 4.2.1.B - A station diagonal to the street grid

C. **Orient and configure stations to straddle transit streets or arterials where possible to create safer, more accessible entrances for walk-ups and transfers.**

By straddling transit streets or arterials, the passenger approach has minimal conflicts, creating a more direct and welcoming experience to accessing the station entrance, regardless of approach direction.

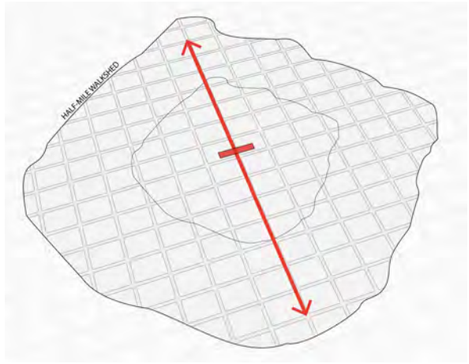


Figure i for 4.2.1.C - Half-mile walkshed diagram showing the station straddled over the street

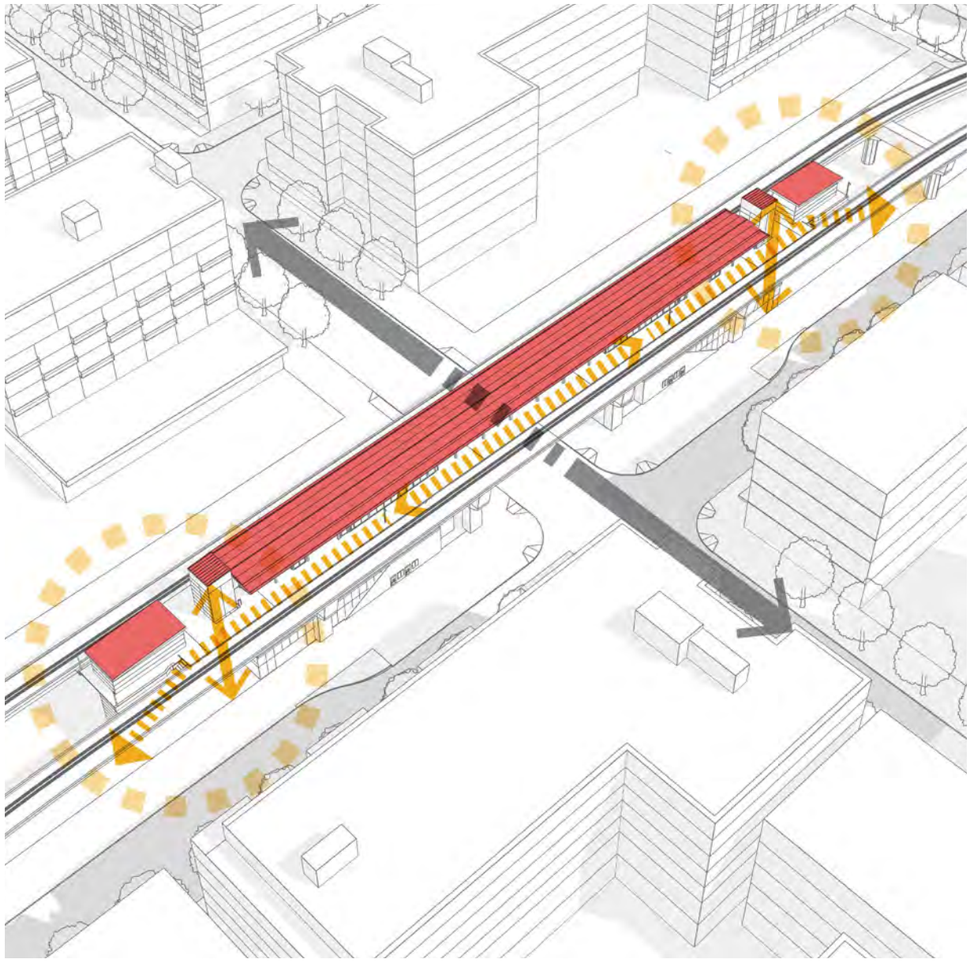


Figure ii for 4.2.1.C - Established Urban - Station straddling transit street

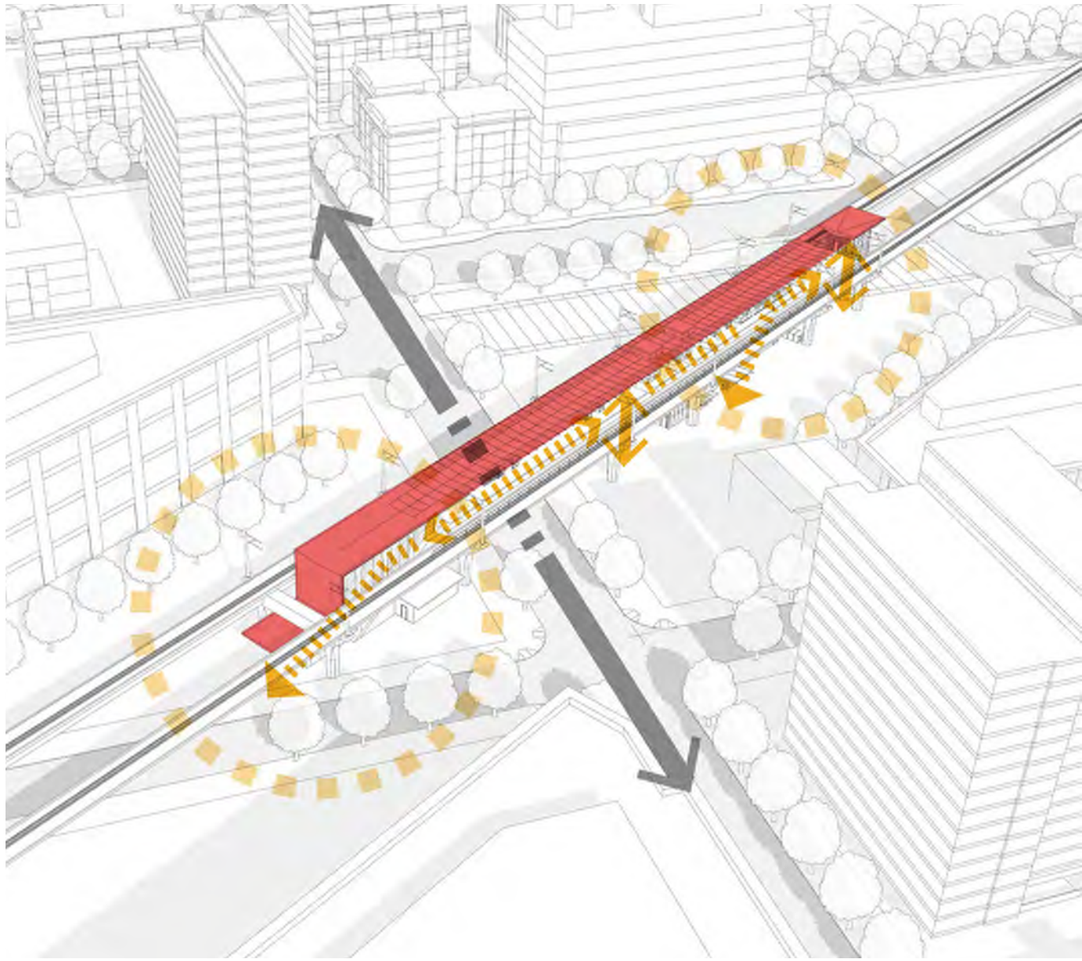


Figure iii for 4.2.1.C - Emergent Urban - Station diagonal to grid, straddling arterial

D. **Consider trade-offs and strategies to guide siting and configuration of the station structure and support facilities**

1. When the Station Box, footprint of the station below the street level, is within the ROW, advance opportunities to use concourses and head houses for integration into the surrounding development; when the station box is outside of ROW, site to the edge of the block to support efficient adjacent development (see section 4.2.5 for minimum ROW clearances for elevated stations).
2. Elevated stations require setback from guideway per NFPA for fire and aerial apparatus access, so siting elevated stations in ROW or at edge of a development block is preferable to allow aerial fire apparatus access from street side. When the station is located adjacent to a Sound Transit-owned property slated for future transit oriented development (TOD), the fire lane must serve both the Station and TOD property with consideration given to future utilities to serve the TOD property.
3. Optimize skewed or diagonal stations to maximize development block potential described in 4.3.2.c.i and/or create opportunities for view corridors and public realm

✱ 18' minimum sidewalk; 20' recommended to allow for an expanded landscape or furnishing zone

Figure i for 4.2.1.D - Station Box outside of ROW - headhouses integrated to the established development

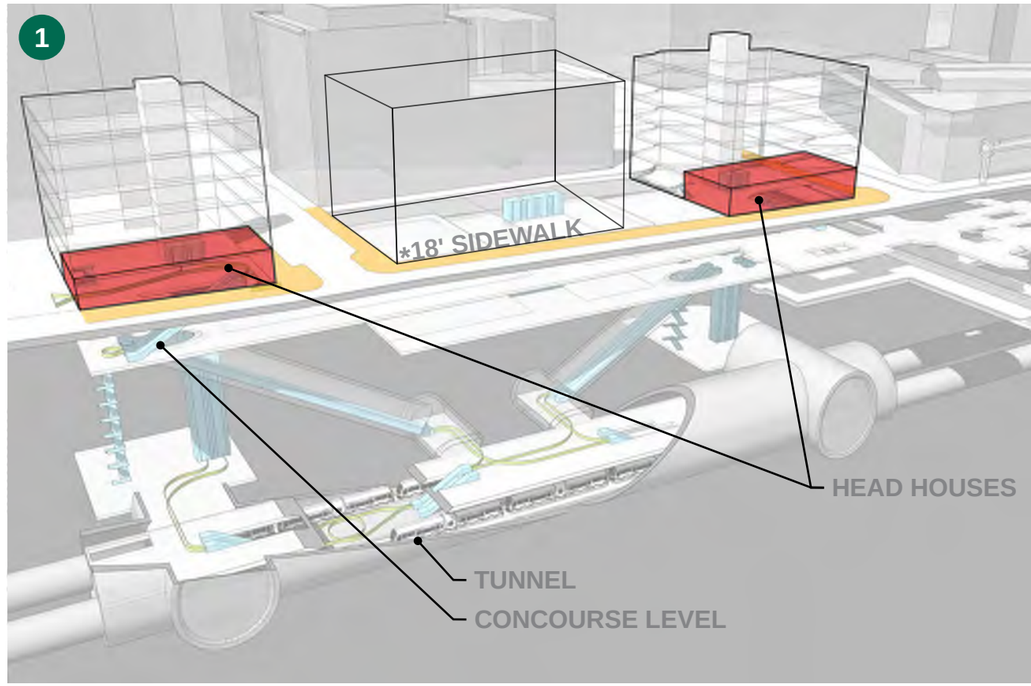


Figure ii for 4.2.1.D - Station Box outside of ROW - headhouses integrated to joint development

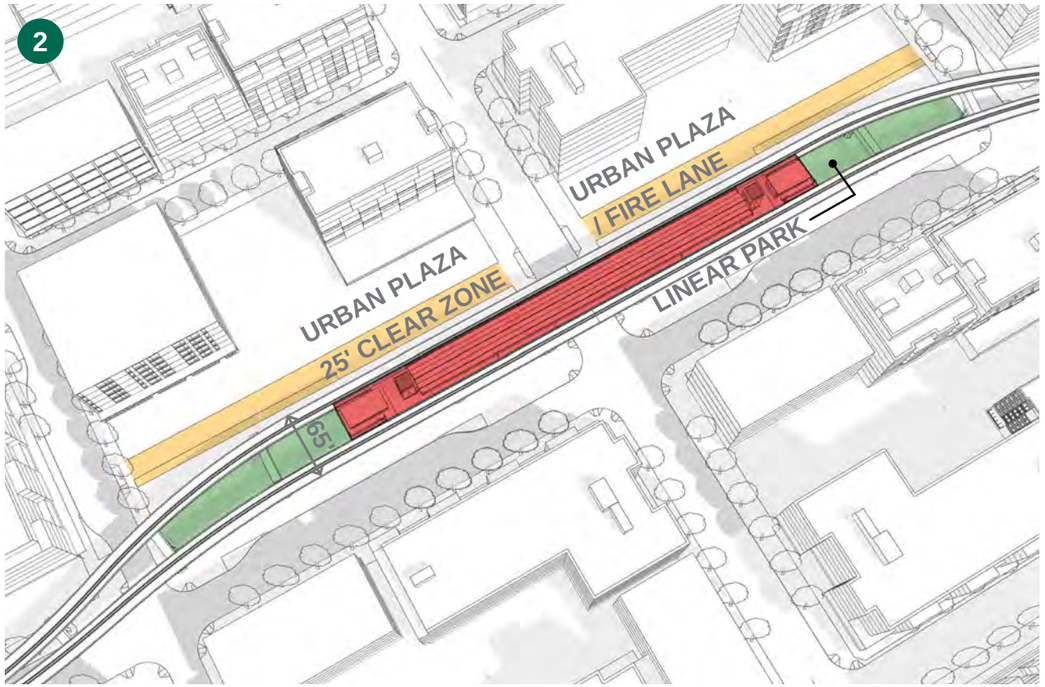


Figure iii for 4.2.1.D - Elevated Station outside of ROW

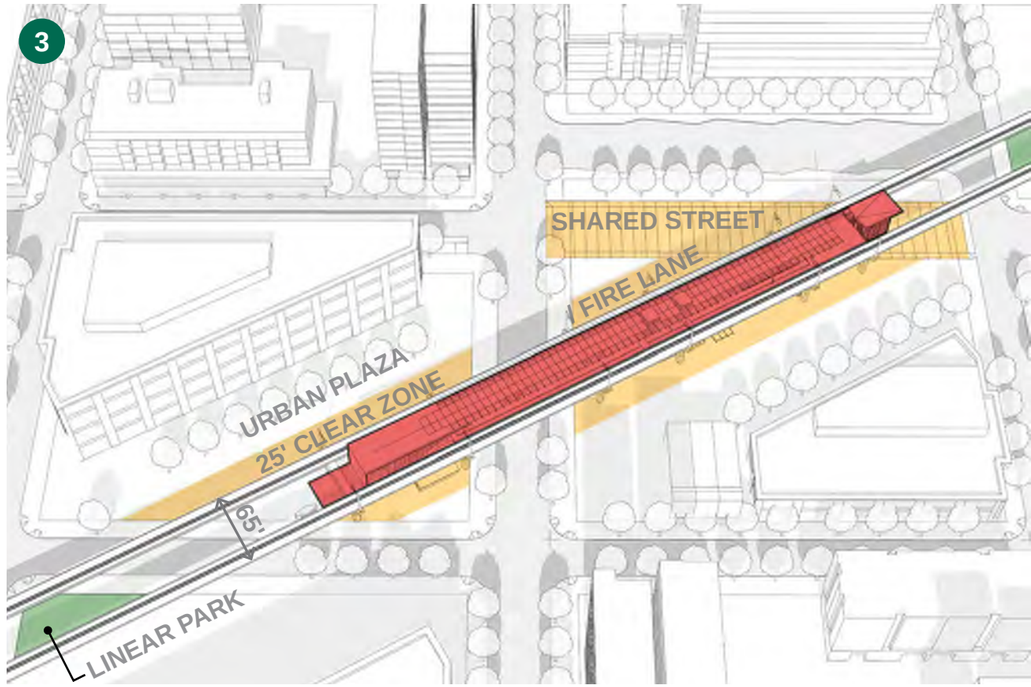


Figure iv for 4.2.1.D - Elevated Station cutting at a diagonal to the existing street grid

4.2.2

Minimum Number of Required Station Entrances

Sound Transit will use the Context Type Matrix and additional criteria below to determine the minimum number of Required Entrances per station and direct project teams to study the feasibility of adding secondary or additional entrances. Each station must have a minimum of two means of emergency egress from the platform to a public Right of Way (ROW).

Sound Transit must provide a minimum of one (1) Required Entrance to the station from the primary grade and/or public right-of-way. Sound Transit may provide two (2) or more Required Entrances and/or Secondary Sound Transit-controlled Entrances where the following conditions apply, or as supported by passenger flow level of service analysis tools such as microsimulation:

A. One entrance cannot provide the entry and exit width required for the projected ridership for passengers arriving to and departing from the station at peak hours;

B. The Right of Way onto which the station entrance is located is not wide enough to accommodate the flow of people entering and/or exiting (i.e., the sidewalk is less than 20’ wide and/or there is no transit plaza;

C. The street configuration or transit partner operations require greater than 50% of passengers transferring between modes of transit to cross an arterial projected to have 8,500 or more average daily traffic (ADT) volume;

D. It is an Event Station (as defined in section 3.2.2.B) where major event destinations lead to surges in demand for transit access that could be alleviated with additional or alternative entrances to the station.

Sound Transit-controlled Required Entrances and Secondary Entrances must follow the guidance in section 3.3.5.

Additional Entrances may be provided through connections to buildings and private property (see Joint Development at Stations 4.5.2.B)

TABLE 4.2.2
Station Entrance Siting Guidance

	WALK, BIKE, AND ROLL » Majority Walk/Bike access mode and » No off-street transit facility » No rail-rail connection	**MULTIMODAL** » Majority transit access mode or » No mode holds majority or » Rail-rail connection or » Off-street transit facility	**AUTO** » Majority Vehicle access mode (pick-up/drop-off, parking) » No off-street transit facility » No rail-rail connection
ESTABLISHED URBAN Areas characterized by: » Established Urban scale block form and street pattern » Existing mixing of uses establishing walkable environment » Higher development densities	Plan for one primary Required Entrance at grade and identify locations and configurations for a secondary Sound Transit-controlled entrance. Consider opportunities to deliver secondary Sound Transit-controlled entrances in the ROW or Additional Entrances integrated into adjacent development.	Plan for two Required Entrances at grade. Use ridership and contextual factors to determine need for additional entrances. Consider opportunities to deliver secondary Sound Transit-controlled entrances in the ROW or Additional Entrances integrated into adjacent development.	Not Applicable
EMERGENT URBAN Areas with one or both of the following characteristics: » Urban scale block form and street pattern already established or can be readily encouraged » Some mixing of uses with a walkable scale But characterized by lower development densities	Plan for one primary Required Entrance at grade while considering possibility of future secondary Sound Transit-controlled entrances.	Plan for two Required Entrances at grade. Consider opportunities to deliver secondary Sound Transit-controlled entrances in the ROW or Additional Entrances integrated into adjacent development.	Limit to one primary Required Entrance at grade.
SINGLE USE **Suburban Residential *or* Commercial and Industrial land uses** Areas characterized by: » Large or irregular blocks and discontinuous street grid » Predominantly suburban residential, commercial or industrial land uses » Low development densities	Limit to one primary Required Entrance at grade.	Limit to one primary Required Entrance at grade.	Limit to one primary Required Entrance at grade.

Table 4.2.2 Station Entrance Siting Guidance

4.2.3

Multifunctional Street Network

CONNECT THE STATION AND RELATED FACILITIES WITH A DIVERSIFIED STREET GRID ALLOWING FOR DIFFERENT MODES TO APPROACH WHILE LEAVING ENOUGH SPACE FOR WIDENED SIDEWALKS, ADJACENT ACTIVE USES, LOW IMPACT DEVELOPMENT STORMWATER INFRASTRUCTURE, AND STREETSCAPE ELEMENTS

In an Emergent Urban condition, with large parcels in the Station Area, working with partner AHJ planning and transportation departments and local property owners and/or developers to determine strategies for creating a multifunctional street grid.

Key considerations may include:

A. Reusing existing utility locations

B. Responding to existing property lines

C. Connecting streets through to existing grid patterns

Site, size, and design street rights-of-way and networks with the following principles in mind:

D. Provide wider sidewalks adjacent to station entrances to accommodate through travel and station walk-up access

E. Where there is mixing of motorized and non-motorized modes, provide protected bicycle facilities

F. Site transit and paratransit bays with convenient and direct access to station entrances, preserving lines of site where possible. Where the volume of connecting service and layover needs warrant, Sound Transit or partner agencies may opt to construct off-street transit center facilities. For these facilities, per Sound Transit Design Criteria Manual: a) 75% of connecting bus stops must be located within a 500' walk of the station entrance, and b) street crossings must be minimized for bus-rail transfer movements.

G. Private vehicle pick-up and drop-off will have a higher priority in Multimodal and Auto stations and a lower priority in Walk, Bike, and Roll stations. Circulation patterns must be considered and streets designated as priority modal approaches for pick-up and drop-off must consider potential modal conflicts, especially with nonmotorized uses.

H. Minimize curb cuts within 500' (measured by the walking network) of station entrances to minimize conflicting turning movements between vehicles and pedestrians in the station environment

Use or adapt a street grid to preserve or create a block pattern with efficient, yet flexible parcels in a station area to promote compact, walkable communities and urban development for the future.

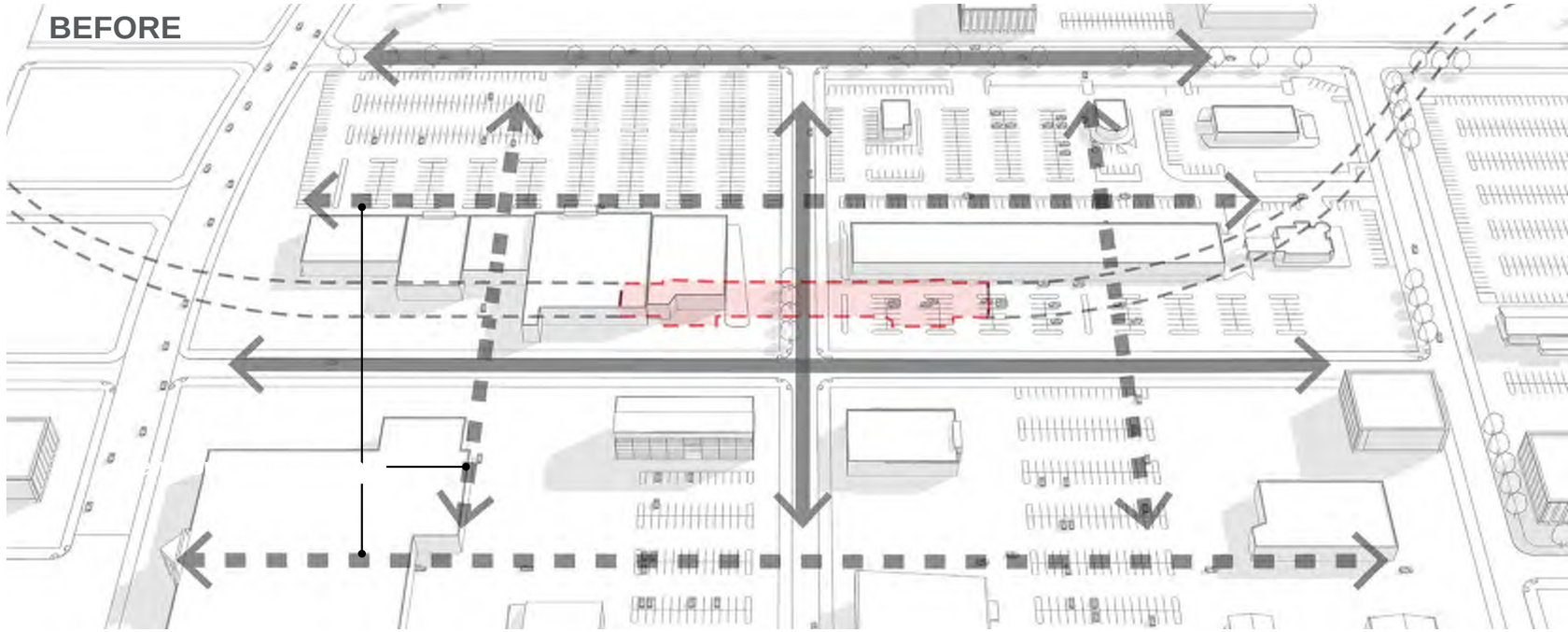


Figure i for 4.2.3 - Emergent Urban - existing development - large blocks to be subdivided into smaller blocks with the arrival of the Sound Transit Station

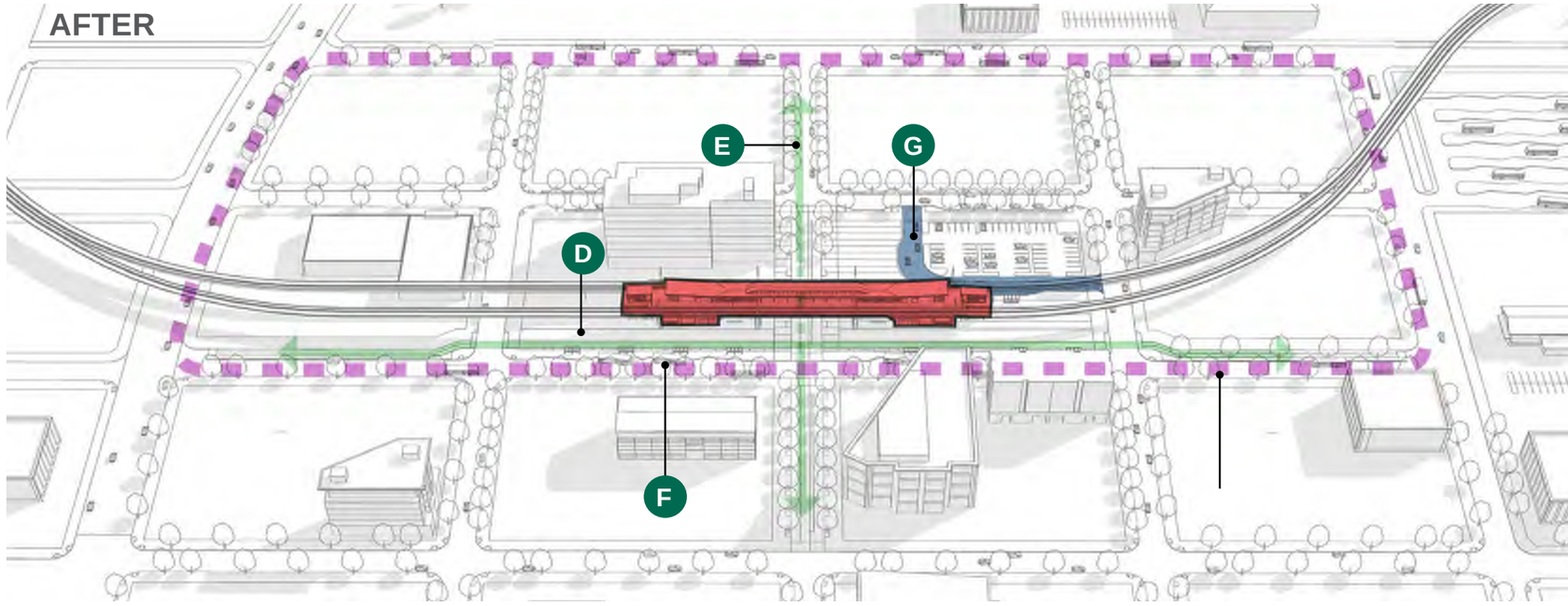


Figure ii for 4.2.3 - Emergent Urban - transition development after Sound Transit Station arrived

4.2.4

Urban Walkable Scale

FOSTER AN URBAN, WALKABLE SCALE AROUND THE STATION TO FACILITATE SEAMLESS, INTEGRATED ACCESS AND APPROACH

Block size, street pattern, and the configuration of loading and parking all contribute to the ease of passenger access to the station. Creating a human-scale, active ground level building frontages, and tree lined open spaces facilitates a more walkable, enjoyable environment.

A. **Support an existing pattern of streets and blocks while evaluating opportunities to create multiple pedestrian connections to the station where block faces exceed 300 feet in any dimension** (Specifically For "Established Urban" station land use types)

Increase block porosity and smaller blocks pattern to enhance pedestrian connectivity and increase pedestrian perception of a walkable environment; shorter distances encourage pedestrians to walk to destinations. Where possible, consider pedestrian-only thru-block mid-block connections or calmed pedestrian streets.

B. **Lay out a gridded pattern of streets and blocks to create or anticipate an urban scale, building on dimensional parameters identified in 4.3.2.c. for blocks and guidelines in 4.4.3 for street ROW sizing and organization** (Specifically For "Emergent Urban" station land Use types)

Where a dedicated bus transit center is necessitated by network design and associated end-of-route facilities, implement a geometric design for these facilities that complement the existing or planned pattern of streets and blocks, building on the physical parameters identified in 4.2.2.c and guidance in 4.3.1 and 4.3.2.

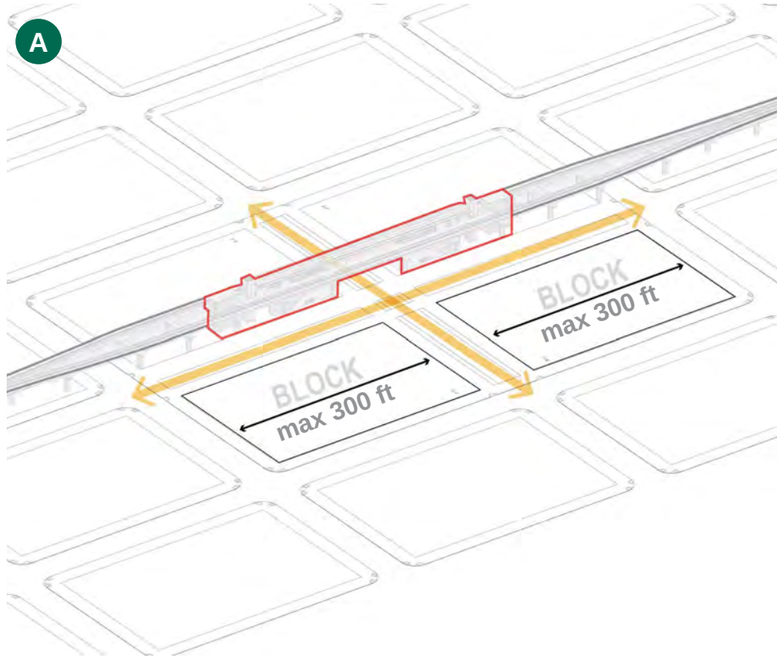


Figure i for 4.2.4.A - Support the existing street and block patterns while increasing "block porosity" where block faces exceed 300 feet

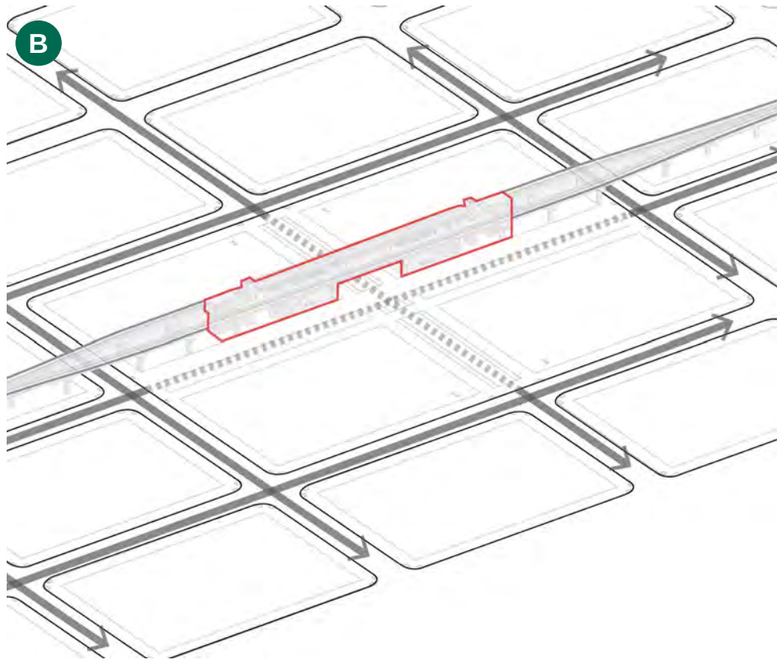


Figure i for 4.2.4.B - Create or anticipate an urban scale by laying out a gridded street or block pattern

C. **Minimize conflicts between local access functions such as service and loading and priority access modes described in 4.1.3 and 4.3**

Locate vehicular access points to adjacent development on side streets away from primary pedestrian and transit approaches to the station. This supports an uninterrupted approach for passengers walking, biking, and taking transit to the station.

D. **Site parking facilities in such a way as to support active development and public realm adjacent to the station**

Stand-alone, single-use parking facilities shall constitute no more than 50% of the frontage common to primary public realm in any station area.

Single-use structured parking facilities may be located up to a ¼-mile or a 5-minute walk (1-3 blocks) from the block on which a station entrance is located if the pedestrian pathway can be serviced by active ground-floor uses of existing or future development.

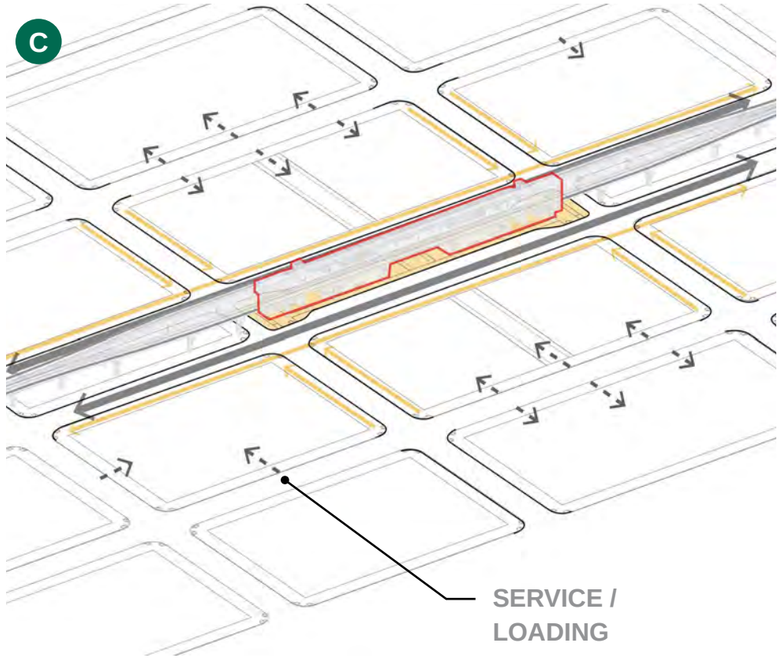


Figure i for 4.2.4.C - Adjacent development vehicular access points should be located on side streets away from primary pedestrian and transit approaches to the station

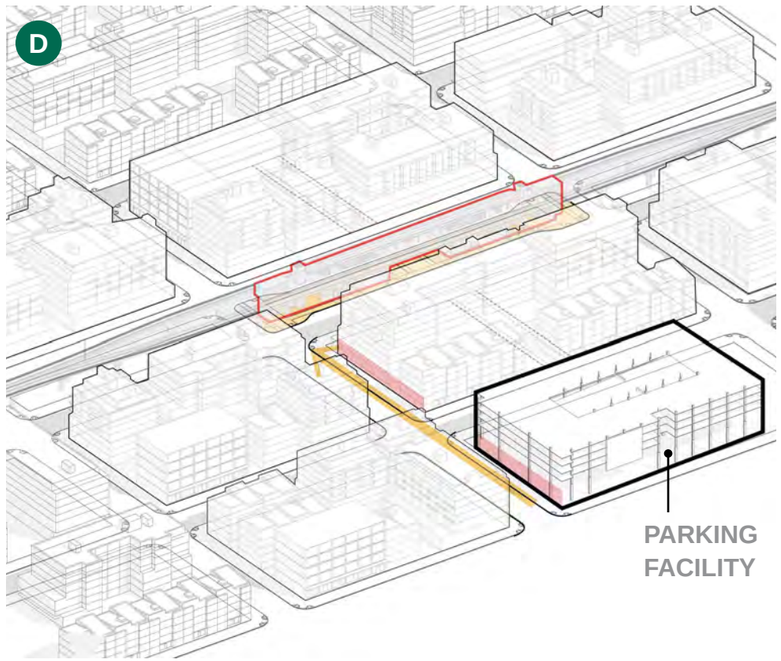


Figure i for 4.2.4.D - Site parking facility to support activated development and public realm adjacent to the station

4.2.5

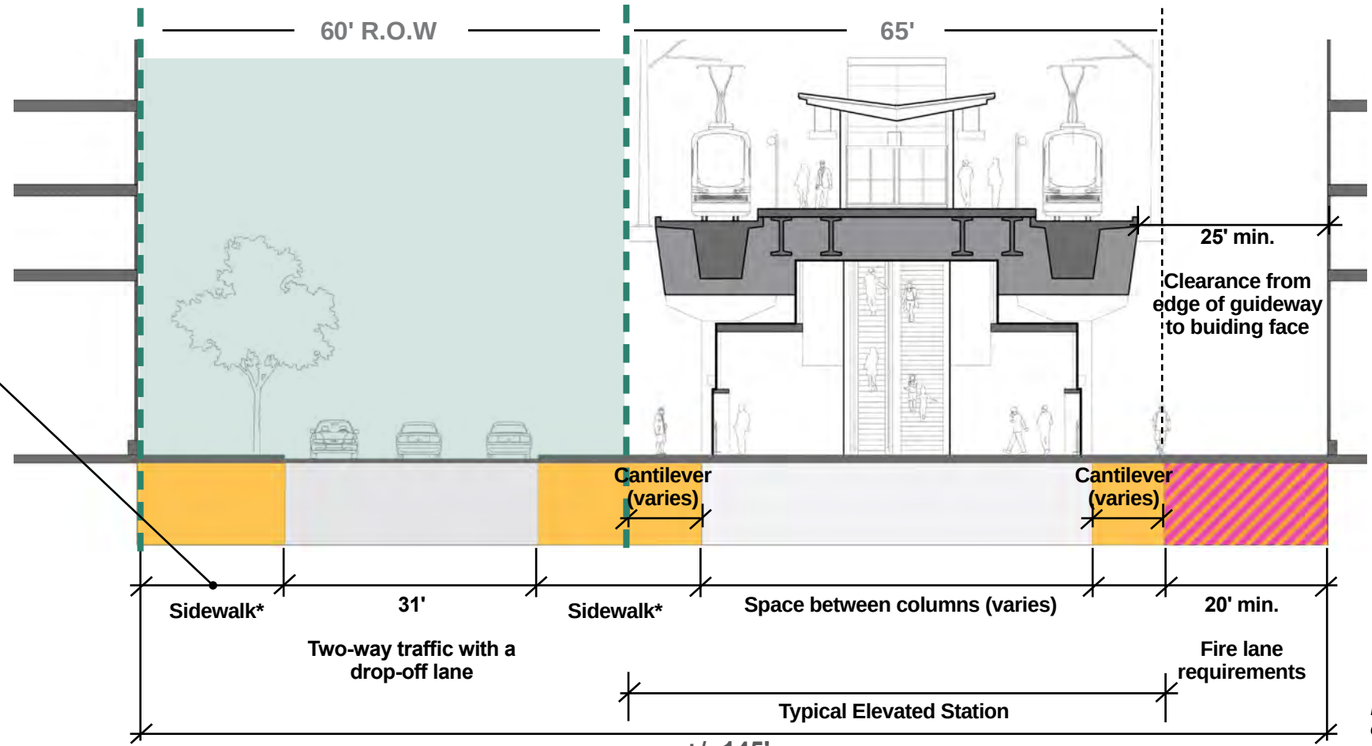
Minimum Right-of-Way Dimensions for an Elevated Station

IN CROSS-SECTION, THE TYPICAL MINIMUM RIGHT-OF-WAY WIDTH REQUIREMENT FOR AN ELEVATED STATION WITH ONE-SIDE STREET ACCESS IS 145’

This allows for a 25’ fire lane, 65’ station platform + guideways, and 70’ to meet all of the street access requirements (a 10’ cantilever of the guideway over the sidewalk is deducted from the total). Where a fire lane for the station is adjacent to Sound Transit-owned surplus property, the fire lane must also be constructed to serve the anticipated future TOD uses on the surplus property.

* Sidewalk widths will vary by land use context and access type. Generally, sidewalks will include a pedestrian clear zone and a zone that alternates between landscape/ furnishing areas and bus-loading or pick-up and drop-off areas, in addition to programmed setback or frontage amenity zones. 18' to 20' from back of curb to building face will satisfy the total sidewalk program in most cases.

Minimum Right-of-Way Dimensions



* The overall sidewalk **width** typically includes:

- **a frontage zone for the buildings,**
- **a pedestrian clear zone (min. 6'-8'),**
- **a landscape/furnishing zone (minimum of 6') that alternates along the length of the street with bus loading areas (minimum of 8').**

Figure i for 4.2.5 - Minimum Right-of-Way Dimensions

Preferred Right-of-Way Dimensions

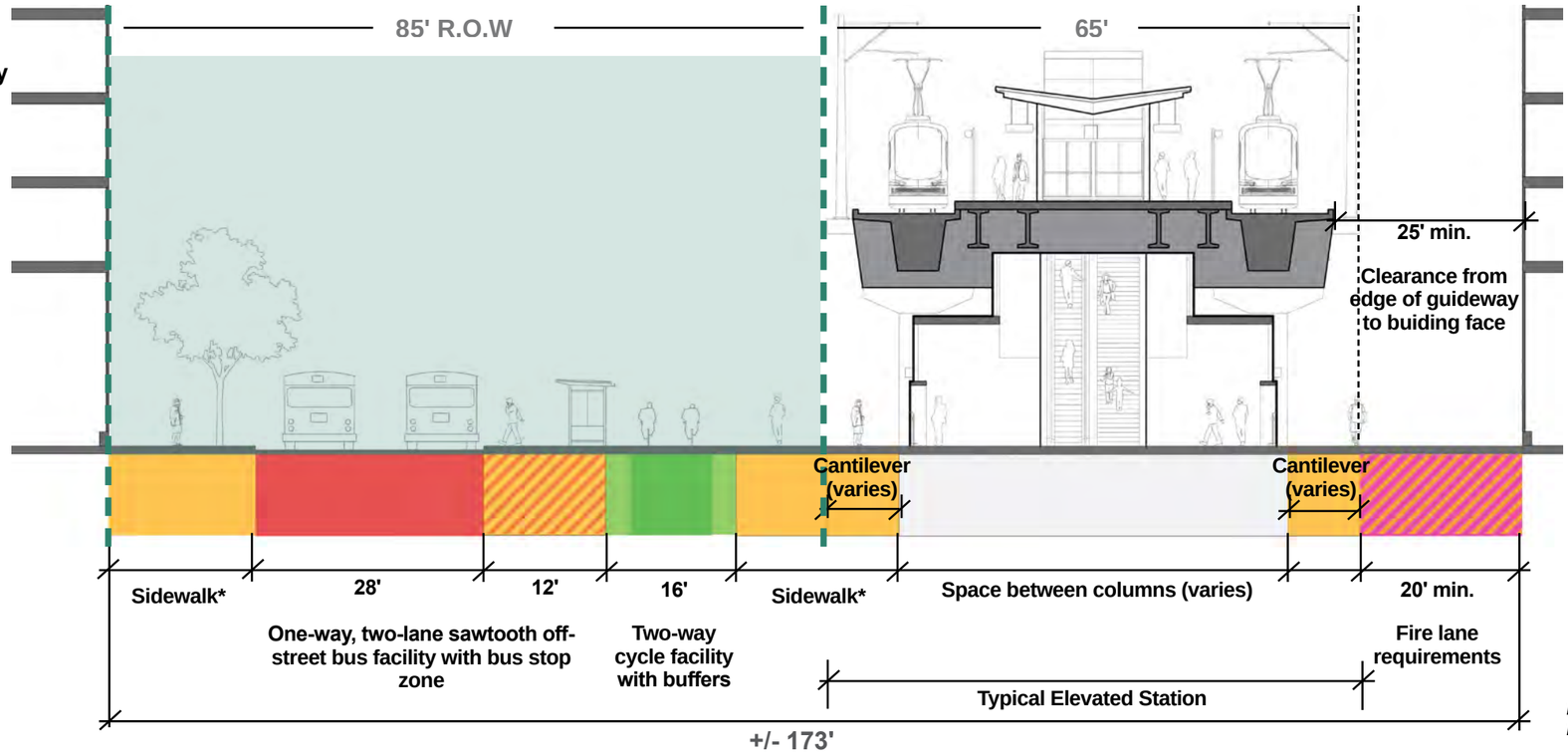


Figure ii for 4.2.5 - Preferred Right-of-Way Dimensions

4.2.6

Block Fragments & Urban Infill

LAY OUT STATION FOOTPRINT TO RETAIN OR ESTABLISH AN EFFICIENT FRAMEWORK FOR FUTURE REDEVELOPMENT

Layout station footprint to retain or establish an efficient framework for future redevelopment.

Block fragments resulting from organic development and/or a station or alignment cutting into existing blocks can be redeveloped according to an AHJ's station area plans. Parcels larger than 120' x 200' will easily accommodate a variety of uses including affordable housing and commercial office over a structured parking garage below. The economic viability of smaller parcels may depend upon reforms to local codes, improved walkability, and developing a mix of neighborhood services. Strategically infill development on these residual spaces is imperative to create healthier and more vibrant neighborhoods where the development types can fully benefit from the transit investment. Where development is not feasible, plan for integrating the fragments as open space into the public realm.

Where a station (see section 4.2.4 above for dimensions) cuts into existing blocks, plan them with one-sided access so development may still occur with minimum desired lot sizes for the development types described in the following sub-sections A-D.

A. Residential / Mixed use: High-Rise

(Established Urban and Emergent Urban)

Typical Parameters

Minimum lot size	80 ft X 100 ft
Floor plates	8,000 – 12,000 sf
Tower spacing	determined by AHJ code, 60 ft min.
Base height	1 – 6 stories
Total height	exceeds 85 ft

Considerations

» Aim to provide ample windows and doors from the units opening out to the street when retail or other active uses are not commercially viable

B. Residential / Mixed Use: Mid-Rise

(Established Urban and Emergent Urban)

Typical Parameters

Minimum lot size	
Market-Rate:	50 ft X 100 ft
Affordable:	200 ft X 100 ft
Floor plates	5,000 – 30,000 sf
Total height*	7 stories*

*5-over-2 up to 85' is allowed in Seattle and is typical in many other Central Puget Sound jurisdictions. Hybrid construction of mass timber and/or light gauge steel with concrete construction has the potential to go up to 180 ft, depending on AHJ codes.

Considerations

» Provide elevator access with two egress paths

» Optimized floor plate depth (around 65' for double-loaded or 40' for single point access) to allow for light and air to reach into all living spaces

» Incorporate appropriate façade modulation along street frontages to enhance walkability

» Plan for affordable developments to have between 100 and 250 units to be competitive for LIHTC funding and aim to lower parking ratios, have no parking minimums, and/or share parking with other uses such as transit to reduce development costs

» Be aware that a parking ratio of 0.5 spaces per unit or higher may trigger the need for structured parking which impacts the economics and feasibility of development projects

» Aim to reduce parking need by providing nearby transit, retail, and service amenities within walkable distances from affordable housing

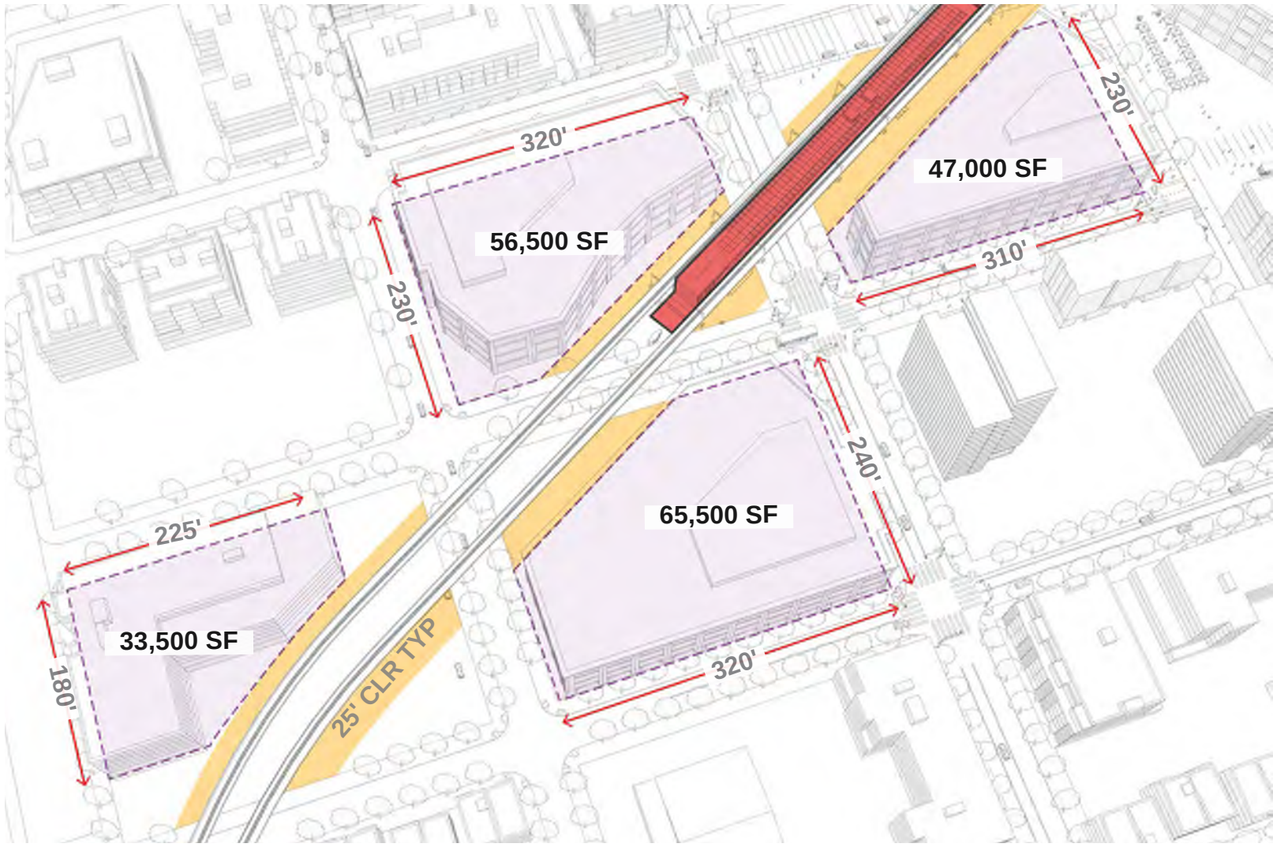


Figure i for 4.2.6 - Irregularly shaped blocks and parcels may still be developed if they can accommodate floor plates sufficient for market value uses

C. **Mid- to High-Rise Commercial office/mixed-use** (Established Urban and Emergent Urban)

Typical Parameters

Minimum lot size	100 ft X 100 ft
Floor plates	15,000 sf min. preferred for high-rise with a substantial core; 20,000 – 30,000 sf for tech office
Total height*	60 ft to 500+ ft

*Codes are rapidly evolving in Washington State for Type IV (mass timber) construction classifications that would allow for heights above 85' for all uses which would result in buildings having much lower embodied carbon.

Considerations

» Buildings over 85' in height trigger extra code requirements such as non-combustible construction, standpipes, sprinklers, pressurized stair cases, and fire control rooms

» Additional elevators may be necessary depending on the height and number of occupants

D. **Flex commercial/industrial use** (Single-Use)

Typical Parameters

Minimum lot size	100 ft X 100 ft
Floor plates	1,000 – 10,000
sf Height	1 – 3 stories

Considerations

» Prioritize preserving and/or repurposing existing buildings for new uses

» Street-level typically has a higher floor to floor to allow for loading dock access and efficient storage

» Integrate new buildings into the context that respect and/or complement the existing buildings. Districts may be eclectic in character as they transform.

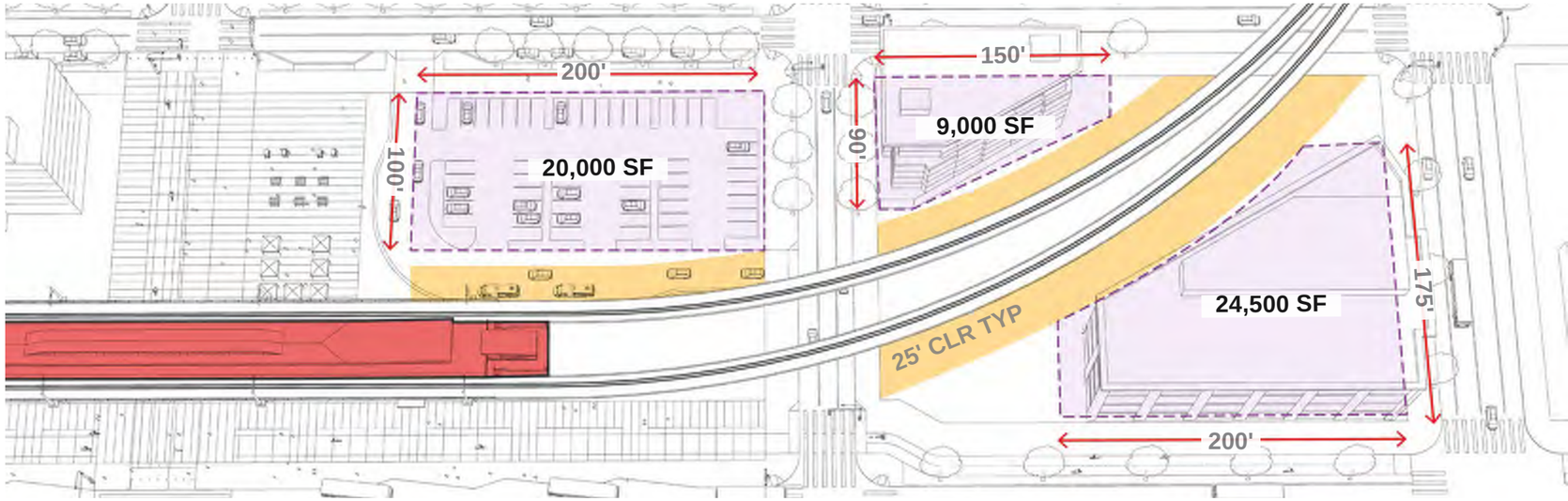


Figure ii for 4.2.6 - An ideal station siting condition leaves as many developable parcels in tact as possible

4.2.7

Active Urban Edge

ENCOURAGE BUILDING ORIENTATION, MASSING, AND USES TO CREATE AN ACTIVE, URBAN EDGE COMPLEMENTING THE STATION PUBLIC REALM AND ENTRANCE AREAS

Active building frontages and a mix of uses contribute to a vibrant, safe, and interesting passenger approach to the station. Greater activity and variation of land uses and amenities surrounding the station also support the goal of high-capacity transit to provide greater accessibility to a variety of community needs and assets.

A. **Active frontages should be oriented to station-adjacent public realm and primary pedestrian approaches to station entrances.**

B. **Provide setbacks to upper levels to allow for solar gain to the site, particularly where stations are elevated.**

C. **For structured parking facilities, see section 4.5.3.A.**

D. **Focus on uses that benefit from transit adjacency and reduce dependency on the automobile to cover essential needs.**

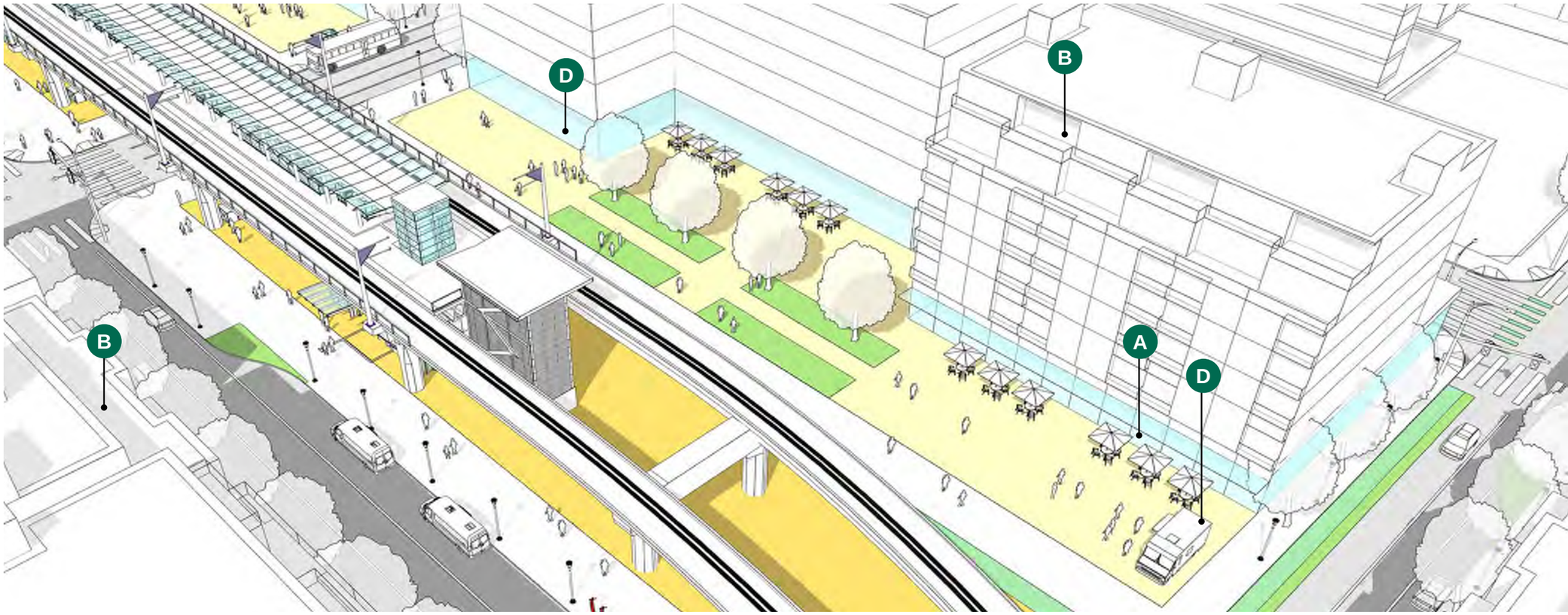


Figure i for 4.2.7 - Diagram depicting guidelines for Active Urban Edge

Figure ii for 4.2.7 - Beacon Hill, Active uses placed on the ground floor of building corners facing active pathways invigorate streetscapes, enhancing pedestrian safety, comfort and interaction.

Figure iii for 4.2.7 - Portland, Active building edge with transparent facades and sidewalk cafes

4.3 Access and Approach Design Guidelines

Imagine being a student at a university in a city where nearby housing options are so expensive that one lives off-campus and commutes more than 40 minutes via a used car that will soon be in need of an expensive repair. Then imagine weighing the options of getting a part-time job to pay for the repair, dropping out of classes, finding an already overcrowded rooming situation, or transferring to a university within the Central Puget Sound area. Imagine the relief at finding an educational option where one can get to class on time, travel to an internship in a downtown, relax with friends at a baseball game, and then arrive home again with just a bicycle and an Orca card.

Providing access to all increases the equity and resiliency of a station area. Prior to arriving to a Sound Transit station, a passenger must transition from a different mode of transportation. Whether that transition occurs on foot, bicycle, transit, or from a pick-up/drop-off or vehicle parking area, a passenger's access experience is influenced by the organization of the surrounding right of way, and the relationship and interaction between modes.

Supporting high-quality passenger access requires partnership between Sound Transit and local jurisdictions, transit agencies, the Washington Station Department of Transportation (WSDOT), and many others. It requires smart and strategic use of limited right of way and acknowledges that Sound Transit may have limited authority over how that right of way is allocated.

This section establishes core station access design principles and then demonstrates how these are applied in each Station Access Type. It contains guidance, diagrams, and qualitative and quantitative considerations that support right of way programming with an emphasis on design elements that align with the Station Access Investment Framework.

Figure i for 4.3 - Pedestrians and cyclists at University of Washington Station

4.3.1

General Station Area Access Guidelines

The following guidelines apply regardless of the Station Access Type and are necessary in supporting a successful passenger journey, especially at the start and end of a transit trip. Orienting design to achieve these principles will facilitate the resolution of inevitable trade-offs driven by station type, site conditions, right of way constraints, and other factors while creating high-quality passenger access to Stations and Station Environments.

PROVIDE DIRECT, CLEAR CONNECTIONS TO/FROM STATION ENTRANCES AND OTHER MODES OF TRAVEL

A transit trip is just one part of a passenger's journey, which begins before they arrive and continues after they leave a station. It should be easy and intuitive for a passenger to arrive and depart a station with direct connections to the pedestrian, bicycle, and transit networks within a Station Environment. All passengers should find these connections clear and simple to identify and use (see Passenger Goals section 2.1.2).

MINIMIZE CONFLICTS TO ENSURE SAFE ACCESS FOR ALL MODES OF TRAVEL

With various access modes converging on a Station, the interactions and relationships between modes are important to manage to create a safe and comfortable passenger experience. Modes should be clearly delineated and visible, with minimal conflicts between one another. All modal interactions, such as street crossings, should be accessible and understandable for all passengers.

REFERENCE

The System Access Implementation Plan and Appendix E for recommended/ required access design feature dimensions.

Figure i for 4.3.1 - Bus stop sited in station entrance frontage zone

Figure ii for 4.3.1 - A curbless streetscape design denotes an emphasis on pedestrians around Capitol Hill Station.

Figure iii for 4.3.1 - There is a direct, clear, and safe connection from the Angle Lake Station to the parking garage.

Figure iv for 4.3.1 - A sidewalk with a clear through zone and a clear furnishing zone

4.3.2

Guidelines Specific to Access Type

A

Walk, Bike, and Roll Stations

Walk, Bike, and Roll Street

Direct, clear connection

A. A station entry must connect to the principal pedestrian street wit sufficiently sized sidewalk facilities that include a landscape/furnishing zone and a clear path of travel. For tunnel stations in Established Urban areas, the minimum may be adjusted with passenger flow analysis and at Sound Transit's discretion.

B. A station entry must connect to a separated bicycle facility. Separated bicycle facilities should be a minimum width of 8', including a buffer from traffic. One-way or two-way bikeway configurations are acceptable based on the street network. This facility should connect with the surrounding bicycle network.

Minimize conflicts

C. The clear path of pedestrian travel in sidewalk zones must be a minimum of 8'. In addition, delineate space outside the clear path of travel as a landscaped buffer or furniture zone to create protection from the street or to accommodate streetscape amenities (e.g. benches) or clearly-designated parking for shared bicycles or scooters. This zone is recommended to be 6' wide.

D. Provide at least a 2' buffer between a bicycle facility and the adjacent travel lane, ideally with flexible delineators or planters to create separation between people bicycling and people driving. Bicycle facilities may be considered above the curb where appropriate and/or desirable; in those cases, buffers may be downsized or incorporated into furnishing zones.

E. Provide intersection treatments to ensure safe movements by all people, including 15' preferred crosswalk width, continuous bicycle facilities at and through intersections, and signals (including accessible pedestrian signals) that provide priority and/or head starts for pedestrians and bicyclists.

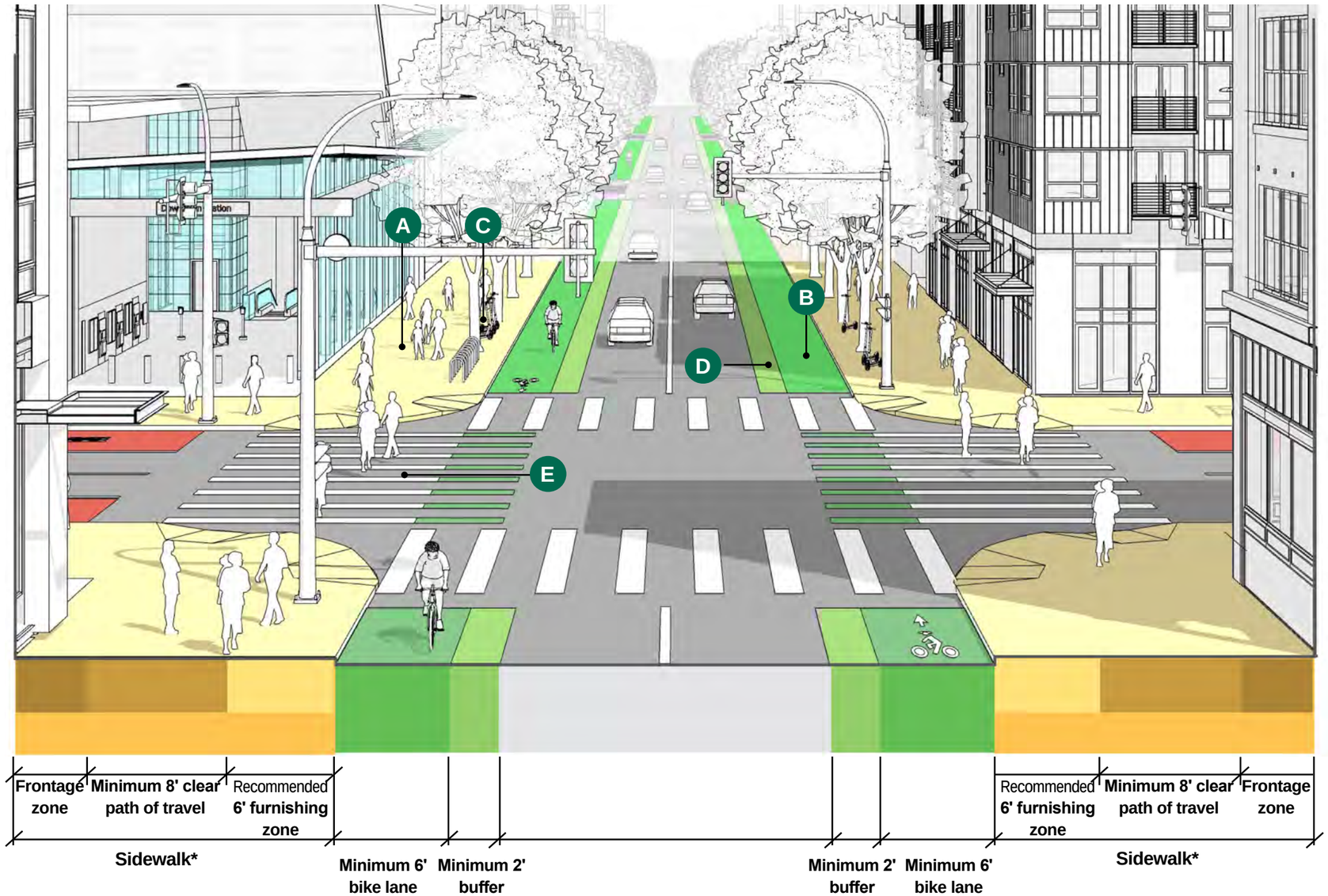


Figure i for 4.3.2.A - Section perspective diagram depicting the dimensional requirements and characteristics of and guidelines for a Walk, Bike, and Roll station on a Walk, Bike, and Roll street as noted to the left

* Sidewalks on walk, bike, and roll streets must include a clear path of travel and landscape/furnishing zone, and may include expanded landscape, furnishing, or frontage areas. Total widths will vary by land use context and specific access needs, with 18' to 20' generally recommended. See Appendix D for more details on elements and dimensions.

Transit Street

Direct, clear connection

A. Locate on-street bus stops within the sightline of the station entry so that transferring passengers can see their bus connections or the station entry.

B. Ideally, passengers will not need to cross a street to connect to local bus service and there shall be a maximum of one crossing between a station entry and connecting bus service. If there is a street crossing, high-quality treatments (e.g., wide crosswalks, a head start for pedestrians, slow speeds) must be applied. Sound Transit will work with partner transit agencies regarding whether near-side or far-side bus stops are most appropriate.

Minimize conflicts

C. Ensure fast, frequent, and reliable on-street transit connections by aligning station entries with streets with dedicated transit facilities for connecting bus service. Sound Transit will work with partner transit agencies to designate appropriate space for bus passenger loading based on the service network.

D. Clearly define bus stops and passenger loading areas. Bus stop zones should be sized according to expected ridership, with a minimum width of 8' and recommended widths of 10-12'. Sound Transit will work with partner transit agencies to confirm the appropriate amount of space based on service network assumptions.

E. Provide a minimum 6’ through zone for a sidewalk’s clear path of travel behind bus stops and passenger loading areas.

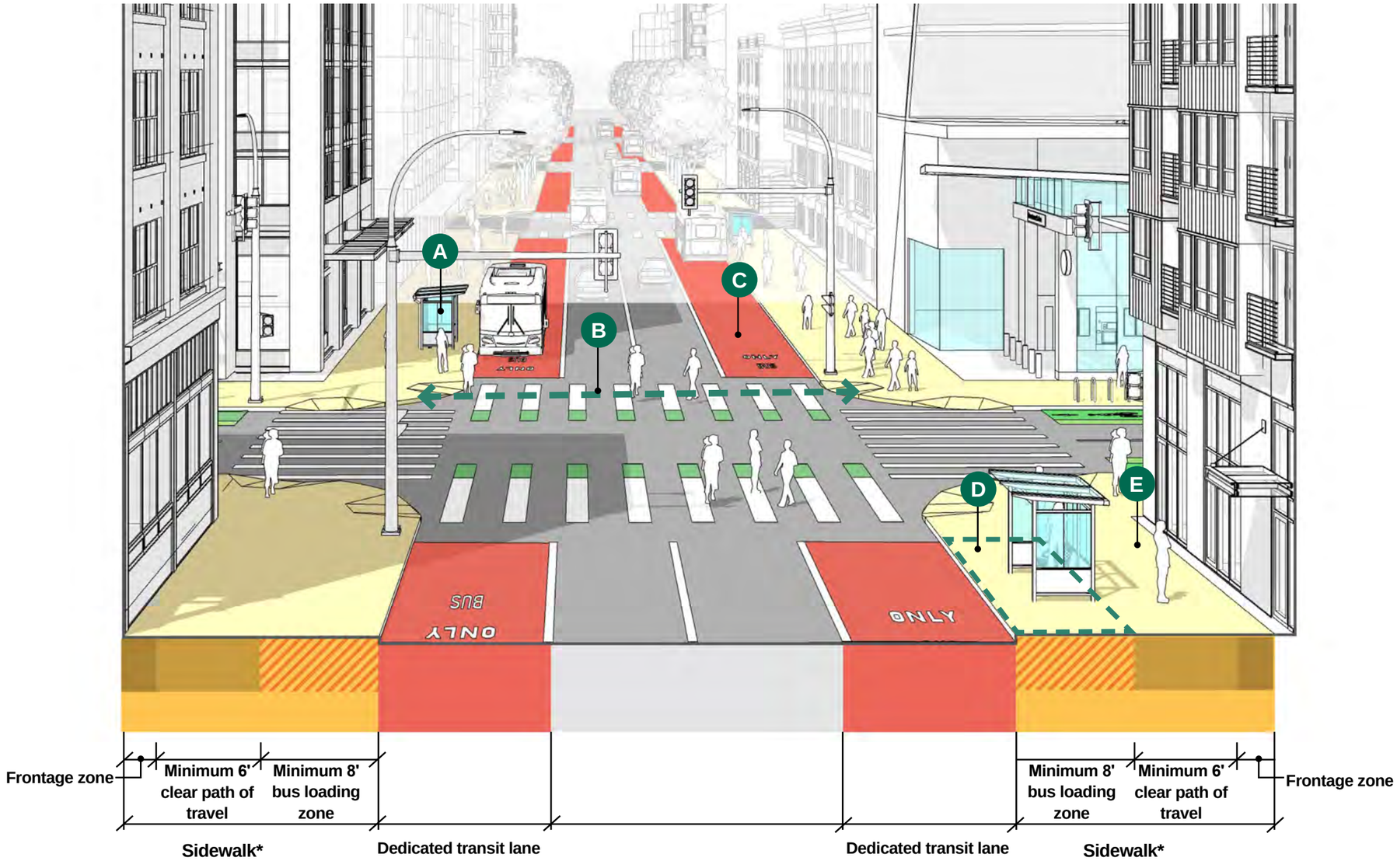


Figure ii for 4.3.2.A - Section perspective diagram depicting the characteristics of a Walk, Bike, and Roll station on a transit street

* Sidewalks on transit streets must include a clear path of travel and a bus loading zone and may include expanded landscape, furnishing, or frontage zones. Total widths will vary by land use context and specific access needs, with 18' to 20' generally recommended. See Appendix D for more details on elements and dimensions.

B

Multimodal Stations

Dedicated Transit Street

Direct, clear connection

A. Locate bus stops on or directly adjacent to station property. Passengers should not need to cross a street to access connecting bus service. Sound Transit will work with partner transit agencies to designate appropriate space for bus passenger loading based on service network assumptions.

B. Ensure clear, complete connections for people arriving on foot, by bike, and by bus. Provide designated pathways for passengers walking and for passengers dismounting and parking bicycles and micromobility devices in the approach to station entrances.

C. Locate bicycle storage near the primary bicycle facility connection to the station. Bicycle storage should be clearly visible from both the station entrance and primary bicycle pathways but should be located outside the pedestrian path of travel.

Minimize conflicts

D. If passengers must cross a dedicated transit street, a primary, highly-visible pedestrian crossing must be provided with a minimum width of 15' (and a recommended width of 20') with a stop bar located at least 8' in advance of the crosswalk to minimize conflicts between buses and pedestrians.

E. Mixing zone and shared street treatments must be used to ensure slow speeds and visibility for people arriving by a variety of access modes.

F. Clearly define bus stops and passenger loading areas. Bus stop zones should be sized according to expected ridership, with a minimum width of 8' and recommended widths of 10-12'. Sound Transit will work with partner transit agencies to determine the appropriate amount of space, as well as whether sawtooth or in-line bus zones better support reliable transit travel times and bus movements.

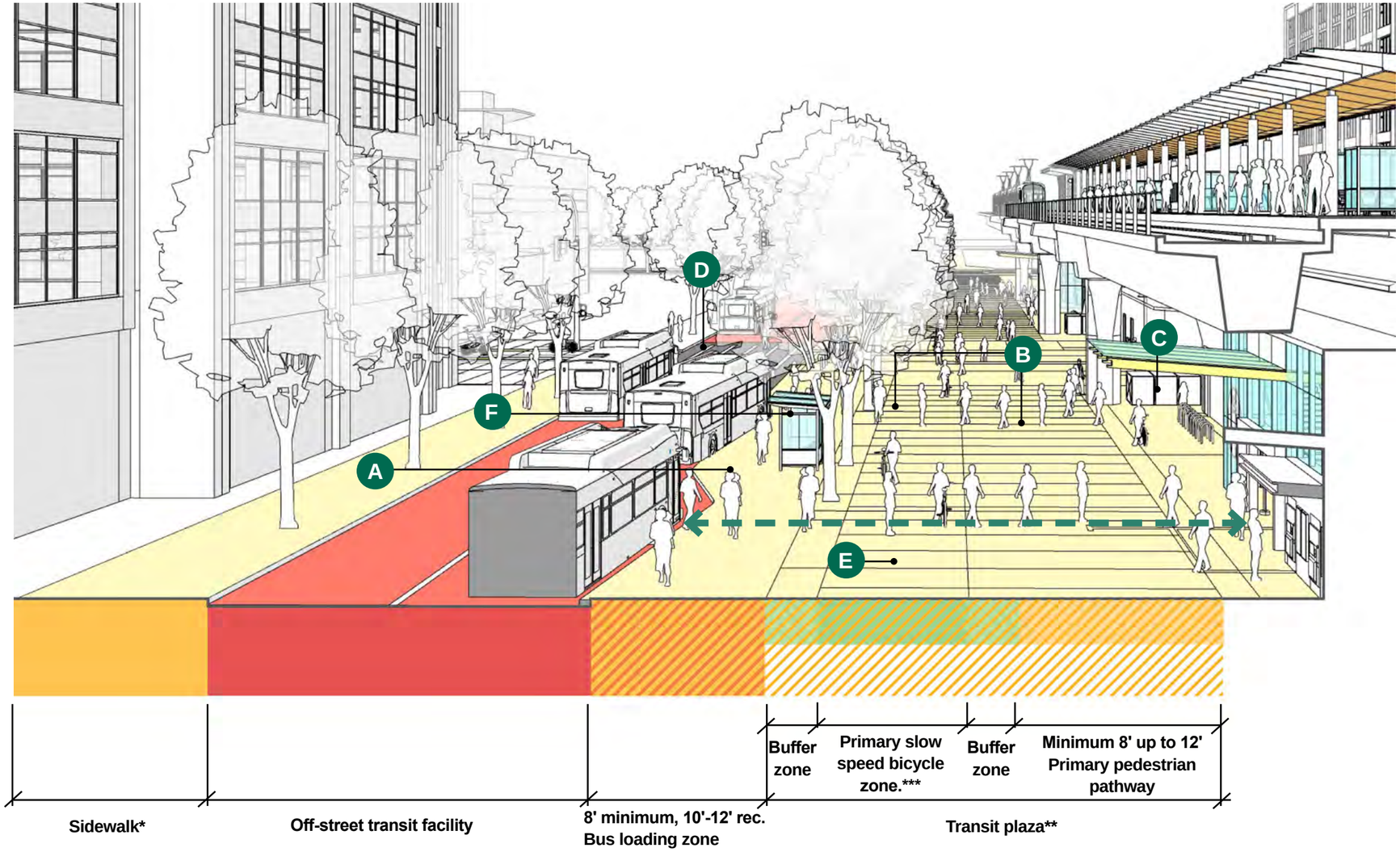


Figure i for 4.3.2.B - Section perspective diagram depicting the characteristics of and guidelines for a Multimodal station on a transit street as noted to the left

***** Sidewalks should include a clear path of travel and a landscape/furnishing zone, and may include expanded landscape, furnishing, or frontage zones. Total widths will vary by land use context and specific access needs, with 18' to 20' recommended. See Appendix D for more details on elements and dimensions.

****** Transit plazas are specialized facilities, typically used at transit centers, that combine traditional sidewalk programs in a mixed-use, integrated design. These may vary in dimensions and programming; see 4.4.2 for further guidance.

******* The width of slow speed bicycle zones could be between 6'-12' depending on directional configuration.

Shared Street

Direct, clear connection

A. Provide separate access pathways for people accessing the station on foot and by bike, and by vehicle. Curb space for passenger pick-up and drop-off should be on a separate street from the all ages and abilities bicycle facility.

B. Utilize access management (e.g., bollards) and shared street treatments to create slow, legible, and comfortable mixing zones close to station entrances. Prioritize connections for people walking and bicycling along pathways closest to station entrances.

Minimize conflicts

C. Provide intersection treatments to ensure safe movements by all people, including 15' wide crosswalks, continuous bicycle facilities at and through intersections, and signals (including accessible pedestrian signals) that provide priority and/or head starts for pedestrians and bicyclists.

D. When people arriving on foot or by bicycle cross streets or share space with people arriving by vehicle, utilize access management techniques, traffic calming, and pedestrian-scale street design to ensure safe and comfortable mixing.

E. Reference Section 4.4 for additional treatments for these areas.

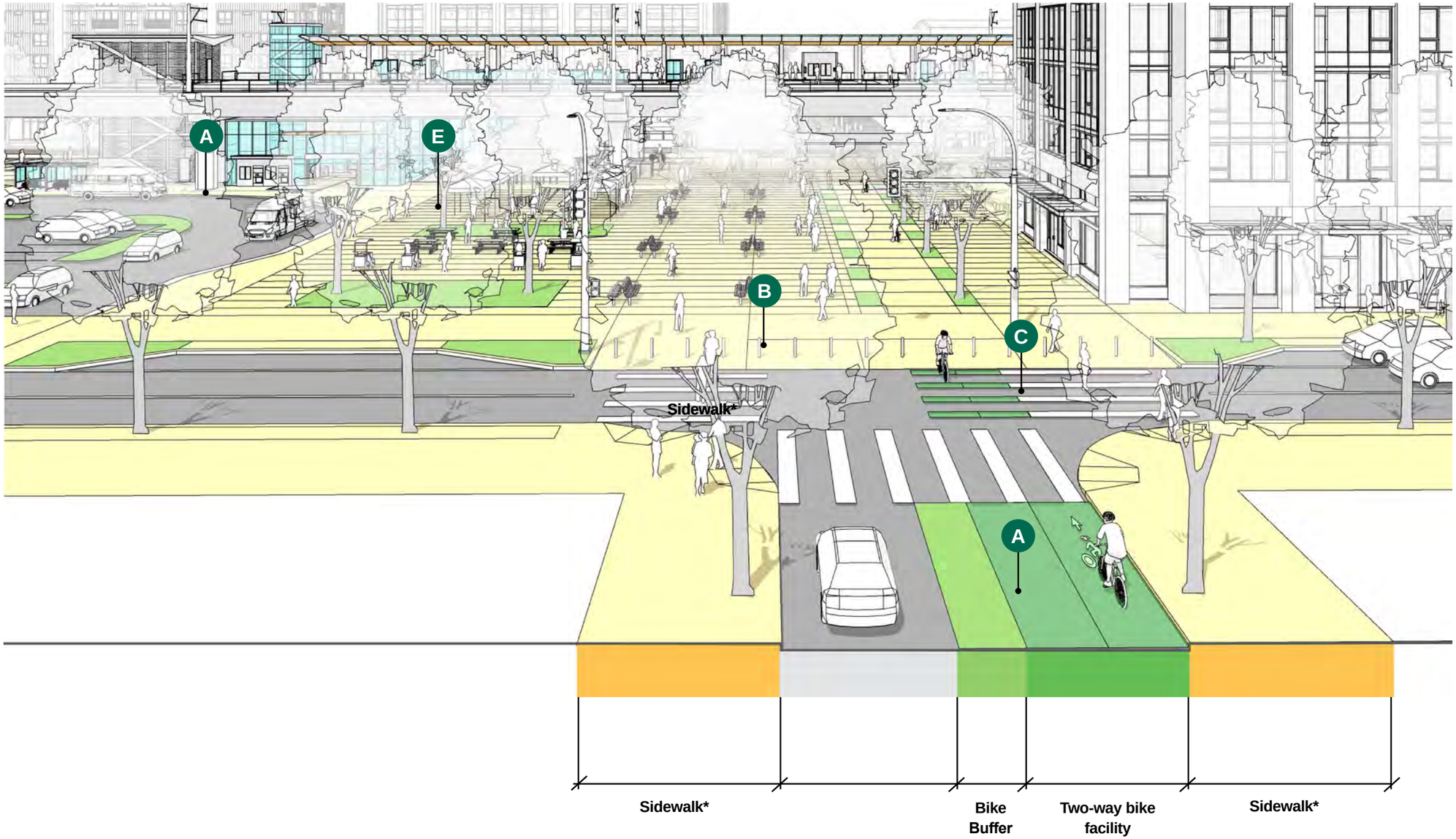


Figure ii for 4.3.2.B - Section perspective diagram depicting the characteristics of and guidelines for a Multimodal station on a shared street as noted to the left

✱ See Appendix D for recommended widths of cross-section elements to apply to multimodal shared streets. Total widths will vary by land use context and specific access needs.

C

Auto Stations

Walk, Bike, and Roll Connections

Direct, clear connection

A. Provide a station entry connection to the principal pedestrian street, ideally with connections to the surrounding pedestrians and bicycle networks, especially facilities such as multi-use trails or pedestrian/ bicycle crossings of major network barriers (e.g., freeways).

B. Ensure fast, frequent, and reliable on-street transit connections by aligning station entries with streets with dedicated transit facilities for connecting bus service. Sound Transit will work with partner transit agencies to designate appropriate space for bus passenger loading based on service network assumptions.

Minimize conflicts

C. Provide intersection treatments to ensure safe movements by all people, including 15' wide crosswalks, continuous bicycle facilities at and through intersections, and signals (including accessible pedestrian signals) that provide priority and/or head starts for pedestrians and bicyclists.

D. Where significant barriers exist adjacent to stations (e.g., freeways), Sound Transit will work with key partners, including local jurisdictions and WSDOT to determine whether dedicated pedestrian and bicycle crossings are feasible.

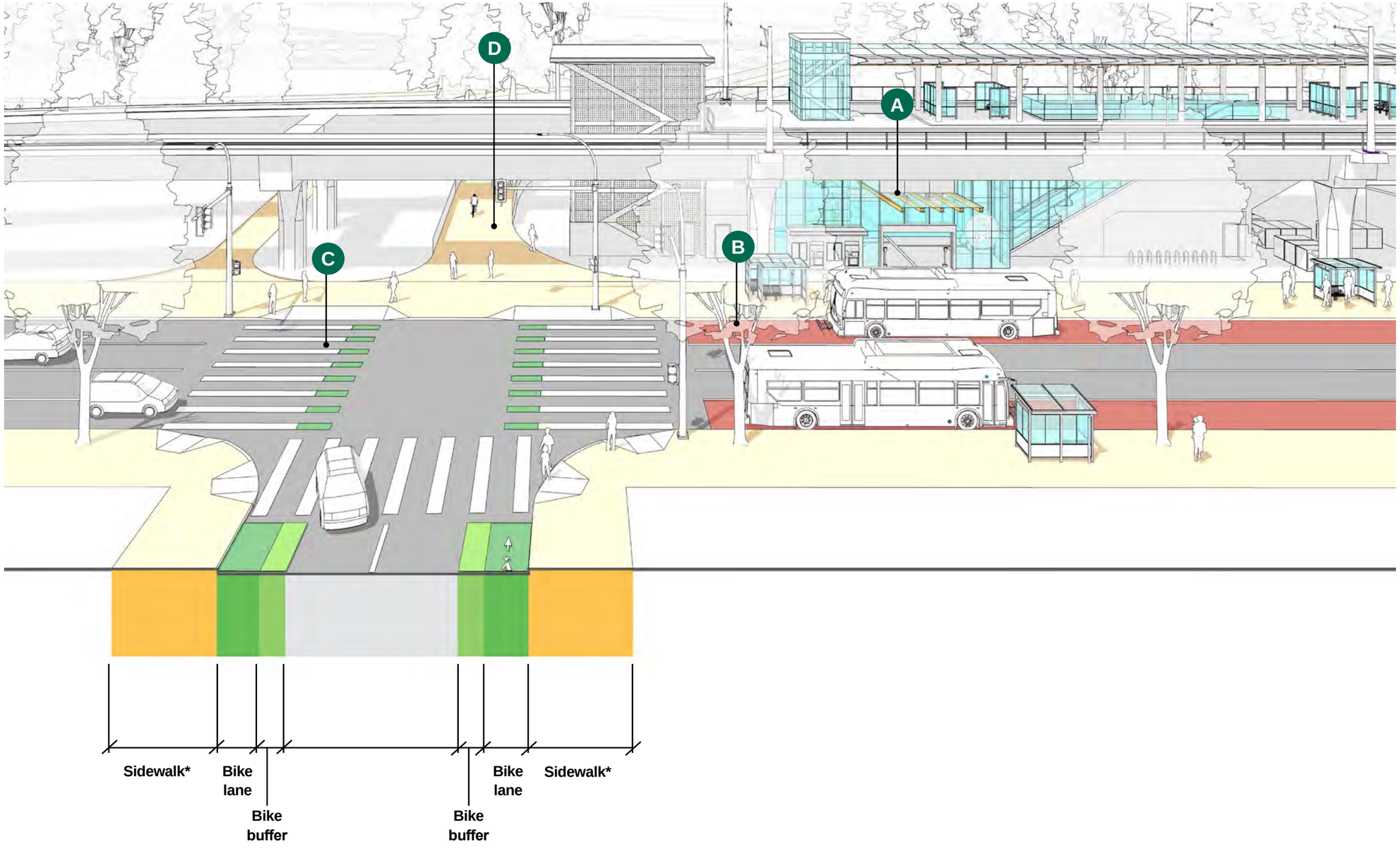


Figure i for 4.3.2.C - Section perspective diagram depicting the characteristics of and guidelines for an Auto station with walk, bike, and roll connections as noted to the left

* See Appendix D for recommended widths of cross-section elements to apply at auto stations. Total widths will vary by land use context and specific access needs

Drop-Off and Garage

Direct, clear connection

A. Provide direct pedestrian connections from station entries to pick-up/drop-off areas. Ideally, passengers will not need to cross a street to connect to pick-up/drop-off curb space and there shall be a maximum of one crossing between a station entry and a dedicated pick-up/drop-off area.

B. Prioritize dedicated pick-up/drop-off curb space closest to station entries for paratransit and shuttles.

C. Locate parking garage pedestrian entries within sightlines of station entries. If parking garage entries are beyond the sightline of station entries, use clear wayfinding and signage to direct passengers to the appropriate station entry/exit to access parking.

Minimize conflicts

D. Provide dedicated pick-up and drop-off areas with sufficient curb space to accommodate peak demand (using the Curb Space Demand Estimation Methodology defined in the System Access Implementation Plan). Based on site conditions and potential demand, Sound Transit may need to work with local jurisdictions to appropriately manage adjacent curb space.

E. Provide intersection treatments (e.g., raised crosswalks) to prioritize pedestrian movements across intersections with large volumes of pick-up/drop-off activity.

F. Minimize street crossings between station entries and parking garage entries. Provide multiple intersection treatments, including all-way walk signal phases during peak travel periods to ensure safe, convenient connections between station entries and adjacent parking.

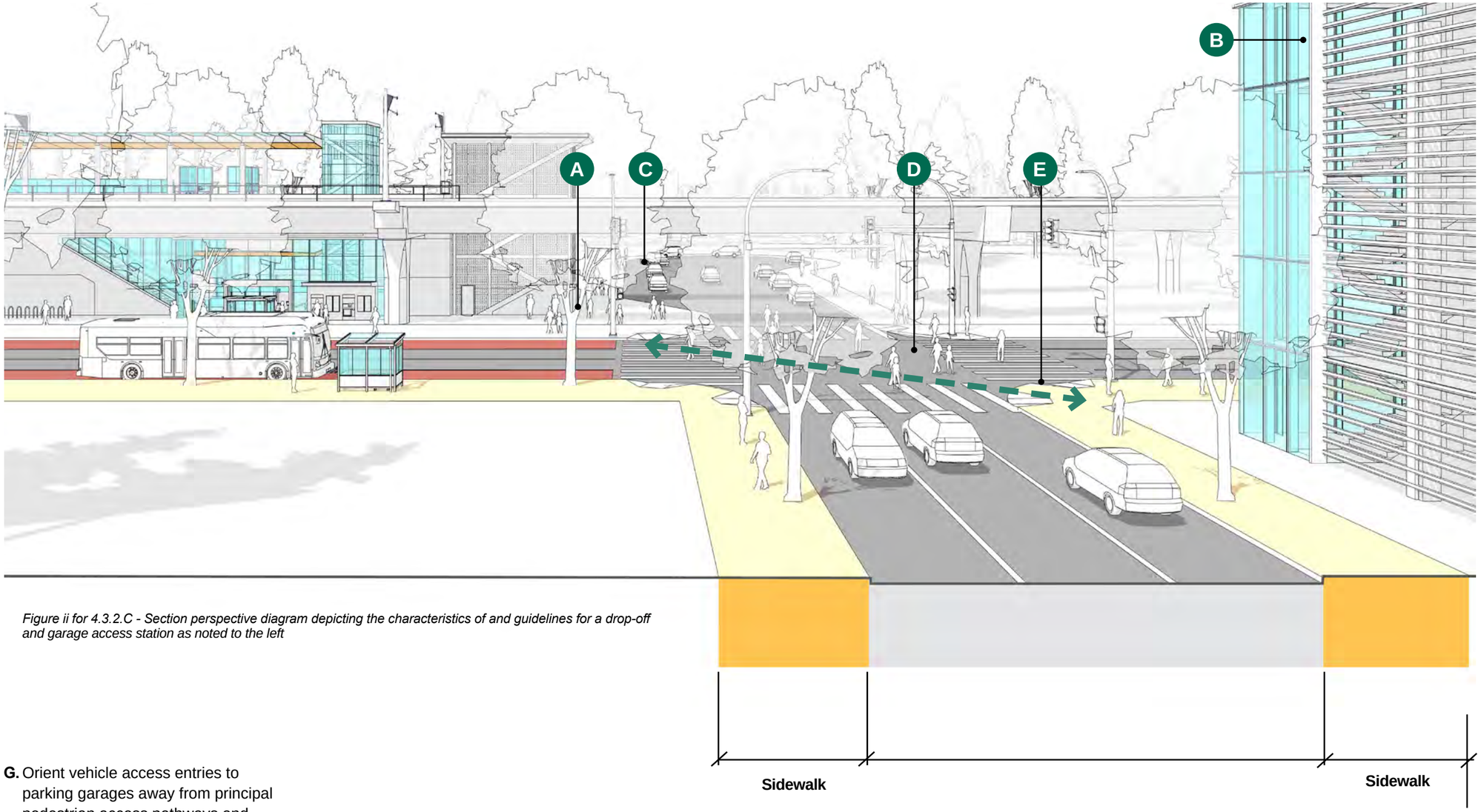


Figure ii for 4.3.2.C - Section perspective diagram depicting the characteristics of and guidelines for a drop-off and garage access station as noted to the left

G. Orient vehicle access entries to parking garages away from principal pedestrian access pathways and crossings. When possible, locate vehicle entries to parking garages opposite from station entrances and closest to predominant vehicle access pathways.

4.4 Public Realm and Plazas

This section contains guidance for the design, planning, configuration, and programming of the blocks surrounding the station on which station entrances are located with particular emphasis on the public realm immediately adjacent to the Station and extending into the Station Context. The public realm and plaza connect the station to the Station Area through the Station Context (the first few blocks including the station). The public realm and plaza design is critical to the passenger experience facilitating seamless connections to other activities. These spaces may have multiple objectives and settings, with the aim of providing service for passengers in a simple, seamless, intuitive, and resilient way. Linked spaces and their programs need to be carefully considered to satisfy service and design goals connecting the Station and Station Areas.

Sound Transit, agencies having jurisdictions, and local community organizations have a shared responsibility for the public realm outside of the station boundaries. Collaboration between these partners can result in a seamless transition between public and private plazas or station frontages with connections to local streets, open spaces, and other modes of transportation. Public spaces surrounding the station should reflect the community's identity and character while being recognizable as one facility as part of a larger, cohesive transportation network.

Design elements such as landscaping, public art, and material finishes can contribute to distinctive, placemaking elements and a cohesive system.

Furthermore, a successful design for resiliency will rely upon the complementary integration of landscape design with station access features within the public realm.

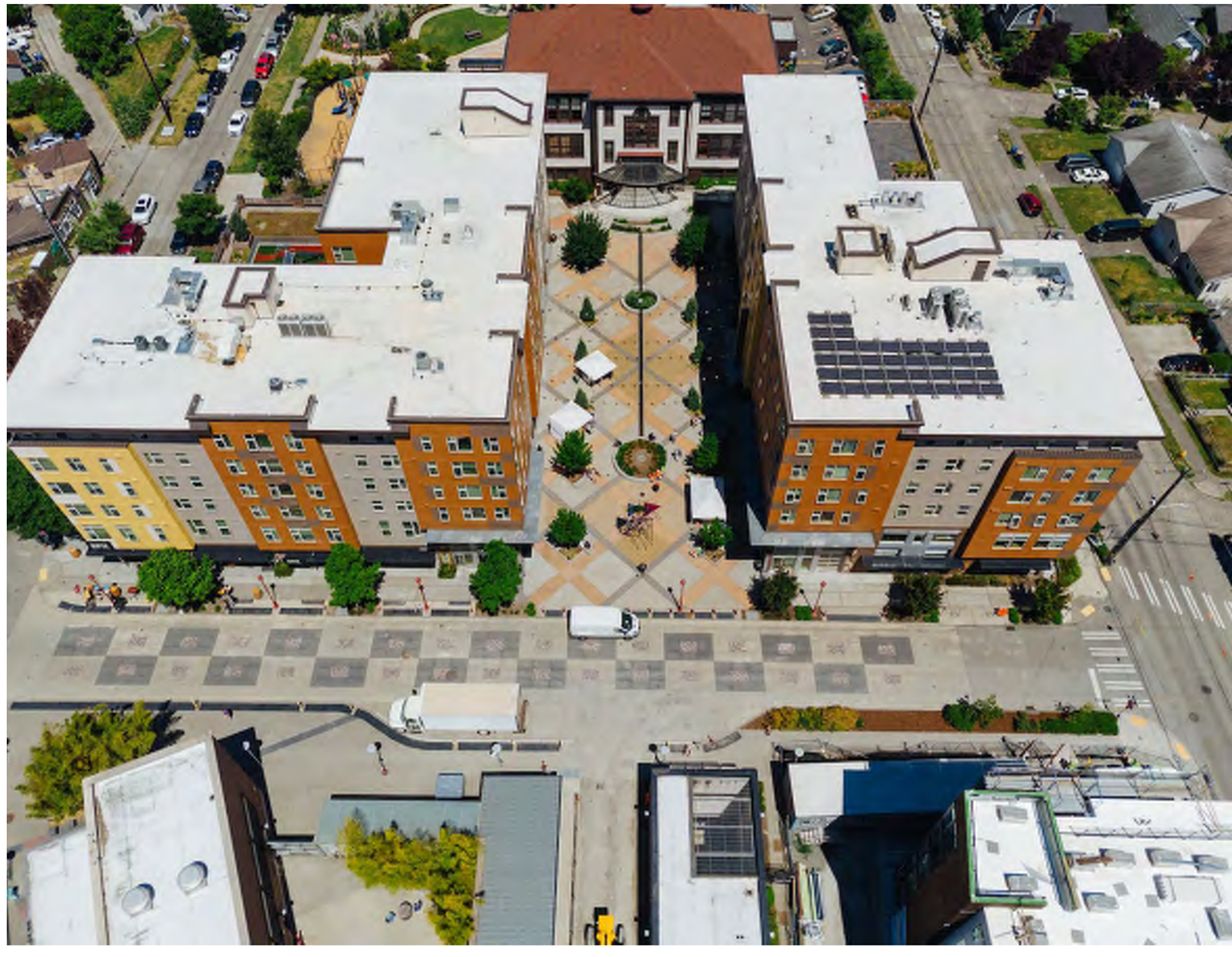


Figure i for 4.4 - Roberto Maestas Festival Street and Plaza Roberto Maestas at Beacon Hill Station

4.4.1

Station Frontages and Setbacks

The station frontage is the section of public right-of-way in the Station Context that has a direct interface with the station structure and station entrance, where Link passengers mix with the general public. Every station will have frontage, and this zone should be sized in accordance with guidance provided in 4.3 for sidewalks and other passenger access facilities in different station environment types.

The need for additional capacity provided through setbacks or further right-of-way dedications shall be evaluated during project development to ensure that pedestrian space surrounding stations can handle throughput of the general public while providing safe, direct, and intuitive transfer pathways and waiting zones for passengers transferring between modes. Use of microsimulation analysis is encouraged to determine adequate sizing of facilities.

THE OUTDOOR SPACES IN STATION FRONTAGES AND STATION SETBACKS SHOULD PROVIDE ACCESS AND YEAR-ROUND COMFORT WITH COVERED AREAS, TREE CANOPIES, AND FURNISHINGS TO MEET SERVICE GOALS.

Outdoor seating, queuing, and ticketing should be located on passenger access facilities to ensure comfort in relation to sun exposure, wind, and rain to provide a resilient service to passengers. The station frontage should be laid out and designed to create clear view corridors from the principal block face(s) to where station entrances are oriented. Building massing, street furnishings, and landscaping should be appropriately scaled, placed, and/or set back to reinforce view corridors and provide a direct, unencumbered approach to the station entrance.

A. **Where direct sightlines from active bus bays and drop-off zones to the station entrance may be obscured, use clear, consistent wayfinding signage, vertical elements, and/or color to help direct and communicate station entrances and other amenities.**

B. **Where station siting requires mixing of pedestrians and bicycles along the station frontage, prioritize pedestrian pavement material type, use of pavement markings, signage, landscape architecture elements, and landscaping to communicate where cyclist dismounting is necessary.**

C. **Where appropriately paired with adjacent joint development in supportive land use contexts, consider use of canopies or arcades to serve as weather protection along the station frontage and provide additional pedestrian space and more direct path of travel.**

D. **Provide consistent light illumination levels and lighting elements to inform and differentiate primary and secondary access routes within the station area. Model lighting levels using fixture shields and lenses to eliminate glare or light overspill on to adjacent properties. Adjust the design using fixtures suited for preventing light pollution (see section 3.3.3).**

E. **Manage surface runoff using on-site planters or other pervious areas to improve plant longevity and reduce irrigation.**

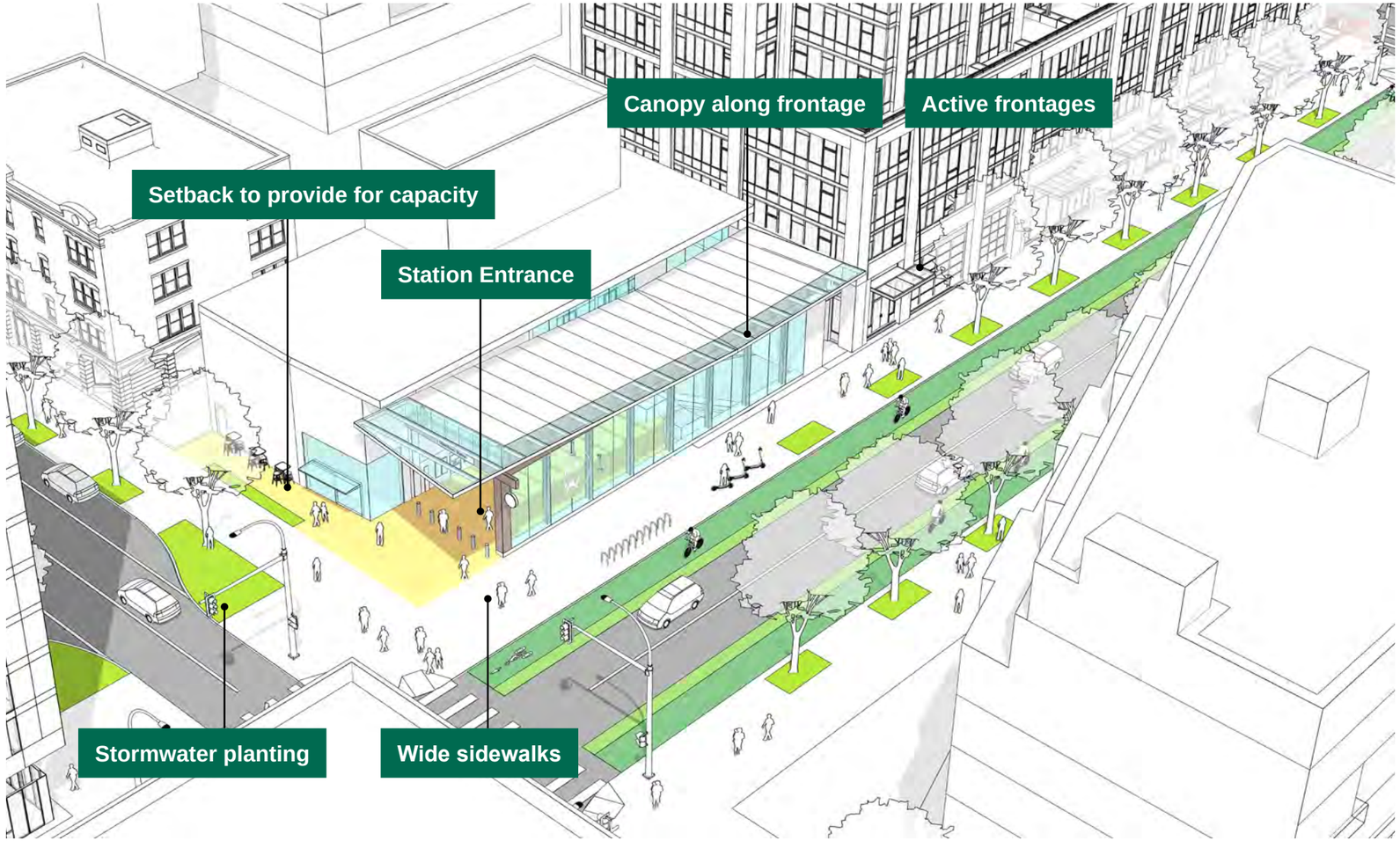


Figure i for 4.4.1 - Characteristics of a station frontage and its setbacks

4.4.2

Transit Plazas by Sound Transit

Transit plazas are dedicated open spaces for a transportation use on lands owned by Sound Transit, Agencies Having Jurisdiction, or other private property owners outside of the public right of way that serve passengers arriving at a station and transferring between modes of transportation. These plazas aid in passenger navigation by framing the view of the entrance to the station and accommodate passengers waiting for connections or seeking information and mobility services that otherwise could not be accommodated in the station frontage or setback. The owner of these lands is responsible for ongoing maintenance and programming of these spaces.

Transit plazas should be considered in multimodal station environments with heavy intermodal transfer volumes, dedicated off-street transit facilities, or major event destinations, where it may be desirable to create a clearer separation between general public throughput and transit passenger access and needs.

TRANSIT PLAZAS SHOULD CONTAIN CLEAR ZONES FOR THROUGHPUT/CIRCULATION AND WAITING, AND SHOULD BE SITED, SIZED, AND DESIGNED TO DISCOURAGE LARGE GATHERINGS OF THE GENERAL PUBLIC.

A. **As such, transit plazas should be located outside of the frontage zone, and likely perpendicular to the primary walk-up/pedestrian approach to a station entrance.**

B. **Transit plazas should be located "on the way" of the connecting walking path between modes of transit, particularly where such connections are provided in an off-street transit facility.**

C. **The station plaza unites the station with the public realm and will include overlapping elements of both System Identity and Neighborhood Identity. Include the following within the overall design of a transit plaza:**

» Waiting shelters

These will often be located in plazas adjacent to the station. When these shelters are to be maintained by Sound Transit, the design of the shelter is to be consistent with Sound Transit's standard shelter design. These shelters are part of a family that also relate to the canopies and windscreens on the platforms (see section 3.3.9 and 3.3.8.A). Shelters in the plaza should be provided with the following:

- Modular glazed panels that may be easily replaced by maintenance
- Continuous sloped glazed roof to allow light into the shelter
- Gutter system with downspout(s)
- Metal or perforated panel at the base of the shelter to deter damage

» Other transit plaza elements reflecting System Identity:

- Wind screens
- Bicycle Parking
  For further guidance, see also: Bicycle Parking & Storage 3.3.17, Landscaping 3.5.2, the System Access Implementation Plan and/or Project Specific Requirements for the quantity and type of bicycle parking and storage.
- Drop off zones

» Transit plaza elements reflecting Neighborhood Identity

- Pedestrian Lighting
  lighting to be studied to minimize glare and minimize light bleeding off site onto other properties with use of full cutoff lighting fixtures.
- Seating, lean rails
- Landscaping (see section 4.4.4)
- Paving

» Art: Coordinate with the STart program if the plaza is chosen as an installation site

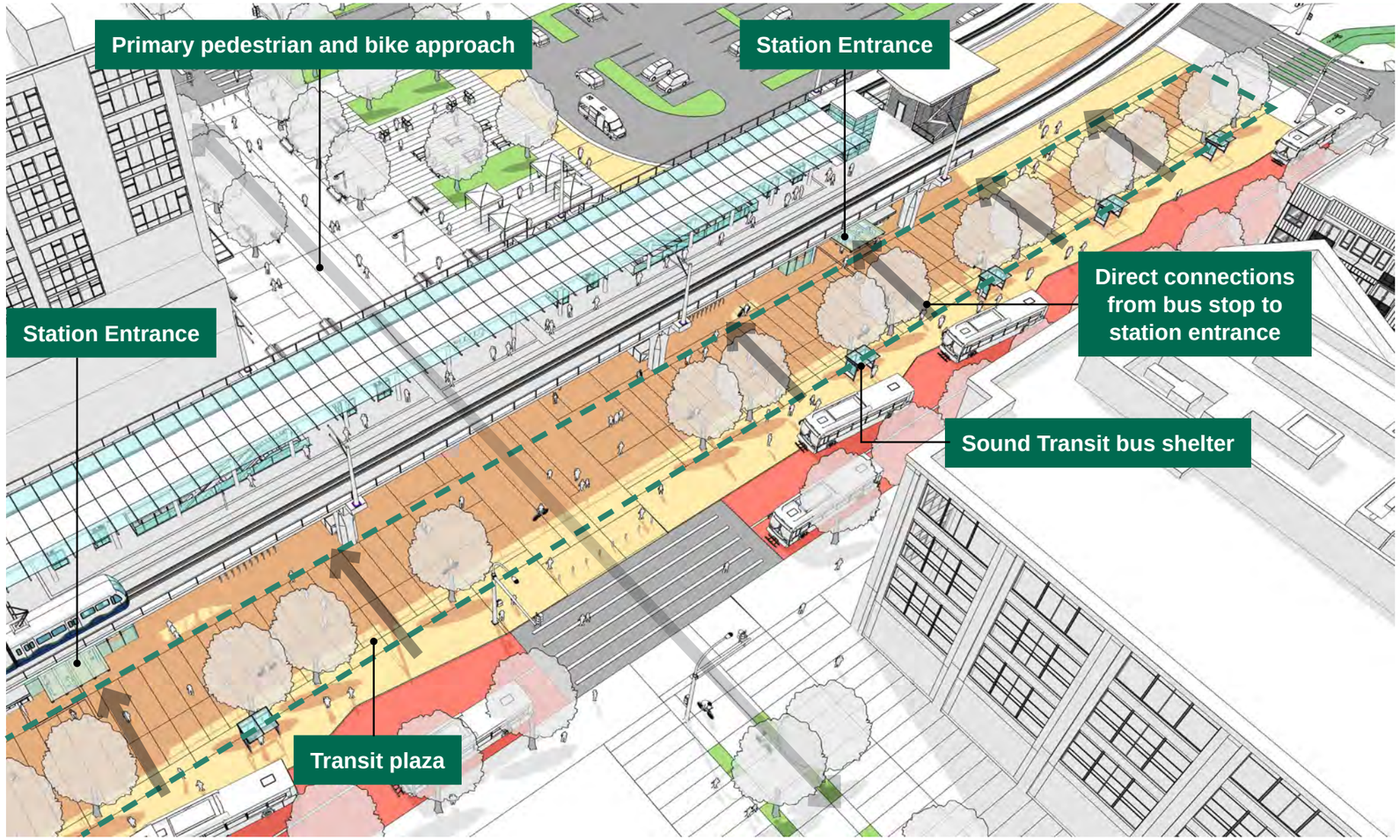


Figure i for 4.4.2 - Characteristics of a transit plaza

4.4.3

Public Plazas by Others

Plazas and general-purpose open space connected to Sound Transit that are owned and maintained by private interests and Agencies Having Jurisdictions should provide setting and activities that contribute to the passenger experience. These areas should provide space for gathering and community use, and can include programming as diverse as playgrounds, public art, performance, or temporary markets. Station environments provide a terrific opportunity for such spaces, but these must be thoughtfully sited and designed to prevent conflicts with the access and transportation functions of a station.

CONSIDER INCLUSION OF PUBLIC PLAZAS IN PLANNING AND DESIGN OF ESTABLISHED URBAN OR EMERGENT URBAN STATION ENVIRONMENTS IN THE FOLLOWING WAYS:

A. Where plazas, parks, or gathering spaces are located within a ¼ mile (5-minute) walk of a station entrance, use a consistent streetscape and frontage treatment, setbacks, and signage scheme to create a clear connection between these spaces and the station entrance.

B. Where there are not plazas, parks, or gathering spaces located within a ¼ mile (5-minute walk) of a station entrance, consider creating a plaza or outdoor gathering space along the connections to the Station with transit-supportive public ground level activities contributing to the passenger experience.

C. A plaza may be either contiguous to or separate from station frontages or transit plazas and are great strategies to activate these spaces to include food trucks and other programmed community events.

D. Use landscape and plantings to provide a natural setting for activities in urban spaces that manage stormwater runoff. See 4.4.4 for guidance on use of Low Impact Development design strategies to treat stormwater runoff.

E. When it is anticipated that a future plaza may be constructed by others next to stations, engage the authority having jurisdiction (AHJ) and other stakeholders to develop clarity around design parameters for the future plaza such as any passenger access desire lines and pathways, and the grading, programming, and material treatment of the interface between Sound Transit's and others' properties in the public realm.

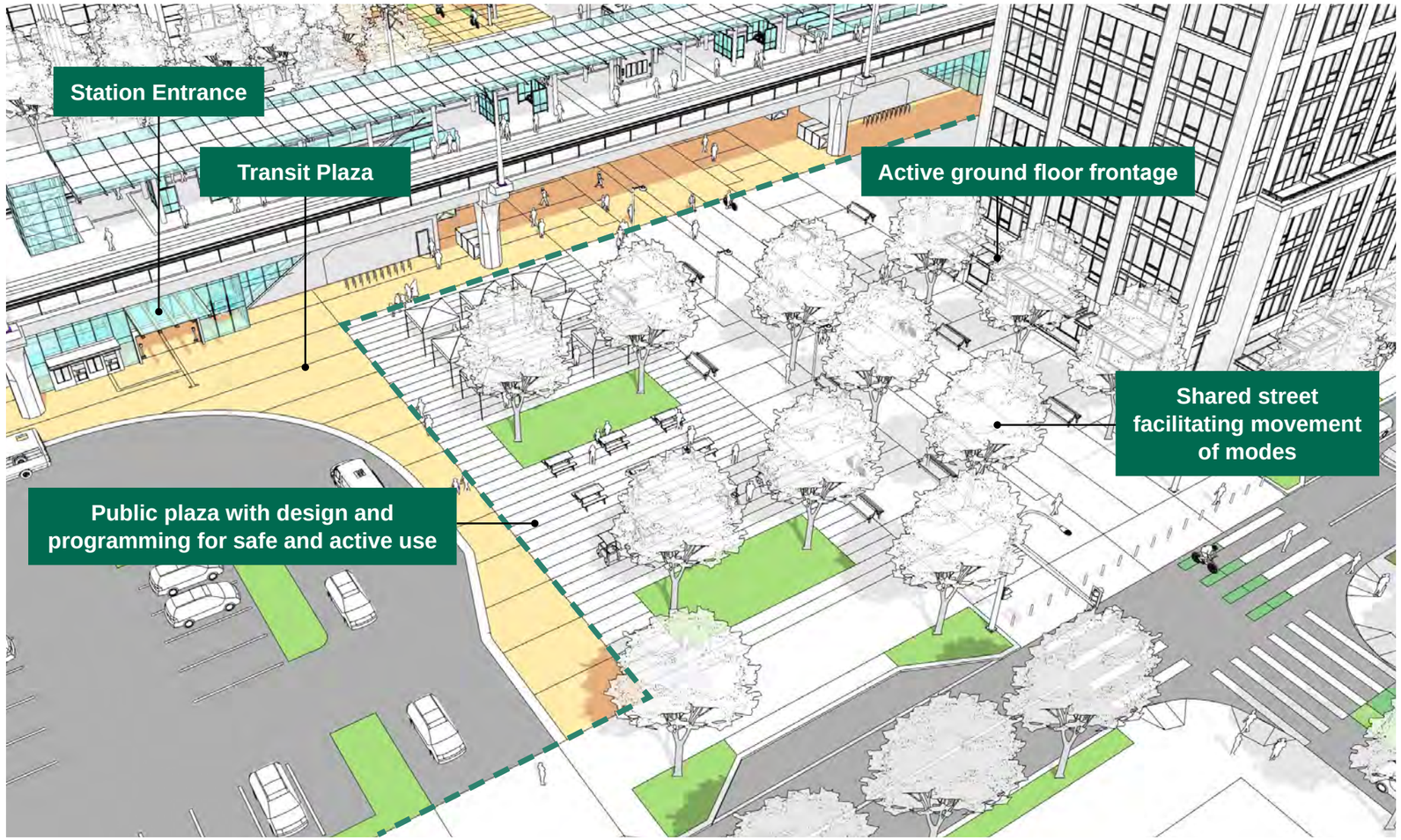


Figure i for 4.4.3 - Characteristics of an AHJ owned and maintained public or private plaza

4.4.4

Activated Ground Plane

Successful urban plazas are typically 5,000-10,000 GSF in size but may range up to a half-acre depending on context and use (much larger, and the space would be better understood to be a public square or park). Urban plazas should be programmed and designed in such a way as to create a safe, active environment for passengers and the general public alike. Ground level building frontages on public plazas should be activated by retail, food and beverage, or other uses that benefit from proximity to pedestrians and gatherings. Where private or joint development shares a frontage on a plaza with a station entrance, at least 70% of the ground floor frontage length, of any such development should be occupied by active uses for building faces greater than 100 feet, or by glazing/ transparent materials or public art for building faces less than 100 feet.

Figure i for 4.4.4 - Dilworth Park at 15th Street Station in Philadelphia

Figure ii for 4.4.4 - The Evergreen Line

Figure iii for 4.4.4 - A plaza at Capitol Hill Station provides a center for community gatherings and various forms of programming, including a farmers market.

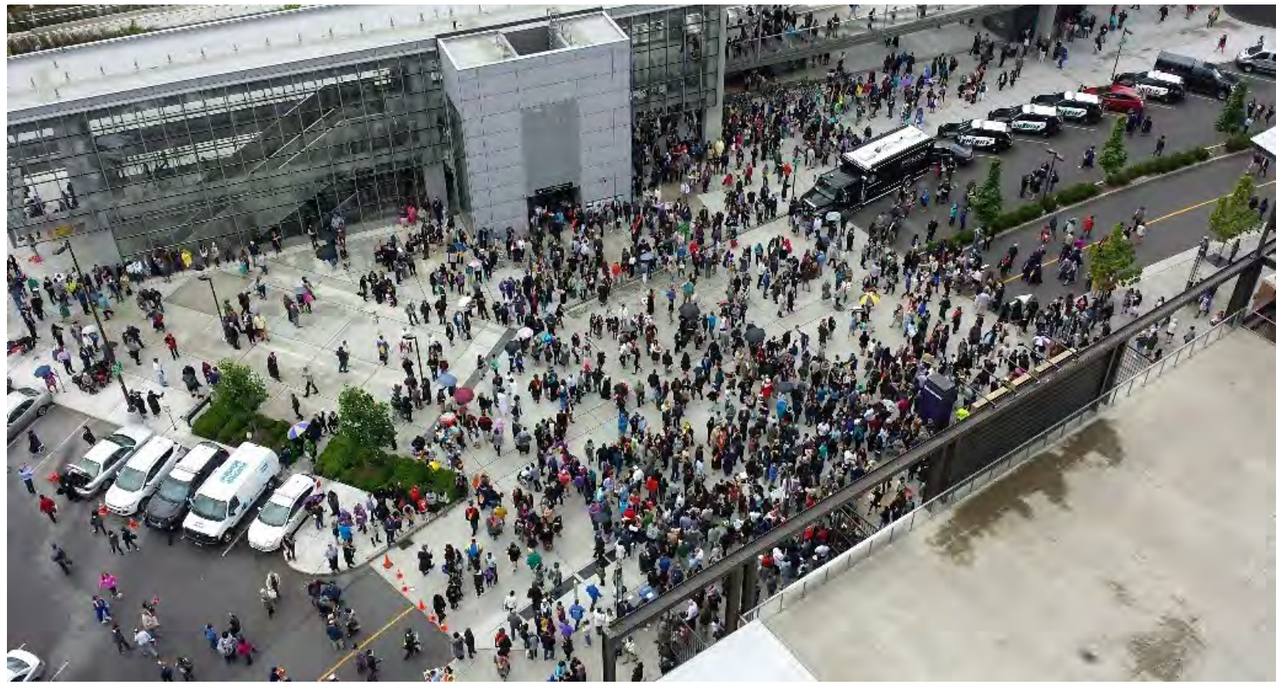


Figure iv for 4.4.4 - The plaza at University of Washington Station helps manage surge events from the adjacent stadium.

4.4.5

Landscape Integration

The landscaping in this section pertains to anywhere Sound Transit owns property at the station, station context, and along the alignment and should connect to natural conveyance systems that are within the Station Environment.

LANDSCAPE DESIGNS ARE TO MAKE USE OF NATIVE AND ADAPTIVE PLANTING.

These plants will have a high draught tolerance consistent with the Pacific Northwest region. There is a complete list of approved plant types in Design Criteria Manual, which in addition must be coordinated with the plant list of the AHJ.

USE LOW IMPACT DEVELOPMENT (LID) STRATEGIES TO MANAGE STORMWATER INCLUDING RETAINING OR DETAINING RUN OFF IN BASINS AND USING SPECIALIZED PLANTINGS THAT HELP TREAT STORMWATER RUNOFF.

Infiltration or flow through planters may be used to clean stormwater before it is discharged into receiving waters within the Station Environment. Integrate these LID strategies as a visual amenity, landscape feature, and setting for activities that contribute to the passenger experience.

Green roofs may be provided at non-station facilities and should be evaluated at the project level.

Deploy Low Impact Development in partnership with the Agency Having Jurisdiction to improve the local watershed.

Figure i for 4.4.5 - Newly planted vegetation below the guideway by Northgate Station.

Figure ii for 4.4.5 - An example of landscaping used to promote placemaking and integrate into public art.

PLAN FOR IRRIGATION

Use xeriscaping principles in the selection of native and climatized plant communities that only require a two-year establishment period using irrigation. Station area, pedestrian plazas, and park and ride facilities are to include automatic irrigation systems for establishment.

TREES AND LANDSCAPING ARE PERMITTED TO BE PLANTED BELOW THE GUIDEWAY IF THEY MEET THE VEGETATION CLEAR ZONE

The Vegetation Clear Zone requires a minimum clear area between the plantings and the guideway and support structure.

LANDSCAPE DESIGN SHOULD FOLLOW CPTED PRINCIPLES.

In pedestrian areas provide a clear zone from 24" to seven feet above ground. Taller trees and dense plantings may be provided in areas where pedestrian activity is unlikely to occur.

LANDSCAPING AT THE STATION CAN BE UNIQUE TO ITS NATURAL SETTING TO REFLECT LOCAL PLACEMAKING.

For example, in urban areas, urban design should integrate plants in spaces assigned to transportation uses to visually connect to adjacent plazas. Coordinate with requirements in Neighborhood Identity section 3.2.1.B and Transit Plazas section 4.4.2.

In less populated areas, existing hydrology and established natural landscapes should be protected and expanded on site. In all cases, plants should be placed to provide visual continuity, seasonal thermal comfort, manage stormwater, and form a natural setting for transportation and non-transportation activities

The following types of plantings are not permissible for use on ST stations:

- Bamboo
- Noxious Weeds, Washington State, Noxious Weed Control Board
- Flowering or fruiting vegetation
- Green walls or planted walls
- Vines on structure (can't inspect it)
- Landscaping inside Fare Paid Zone

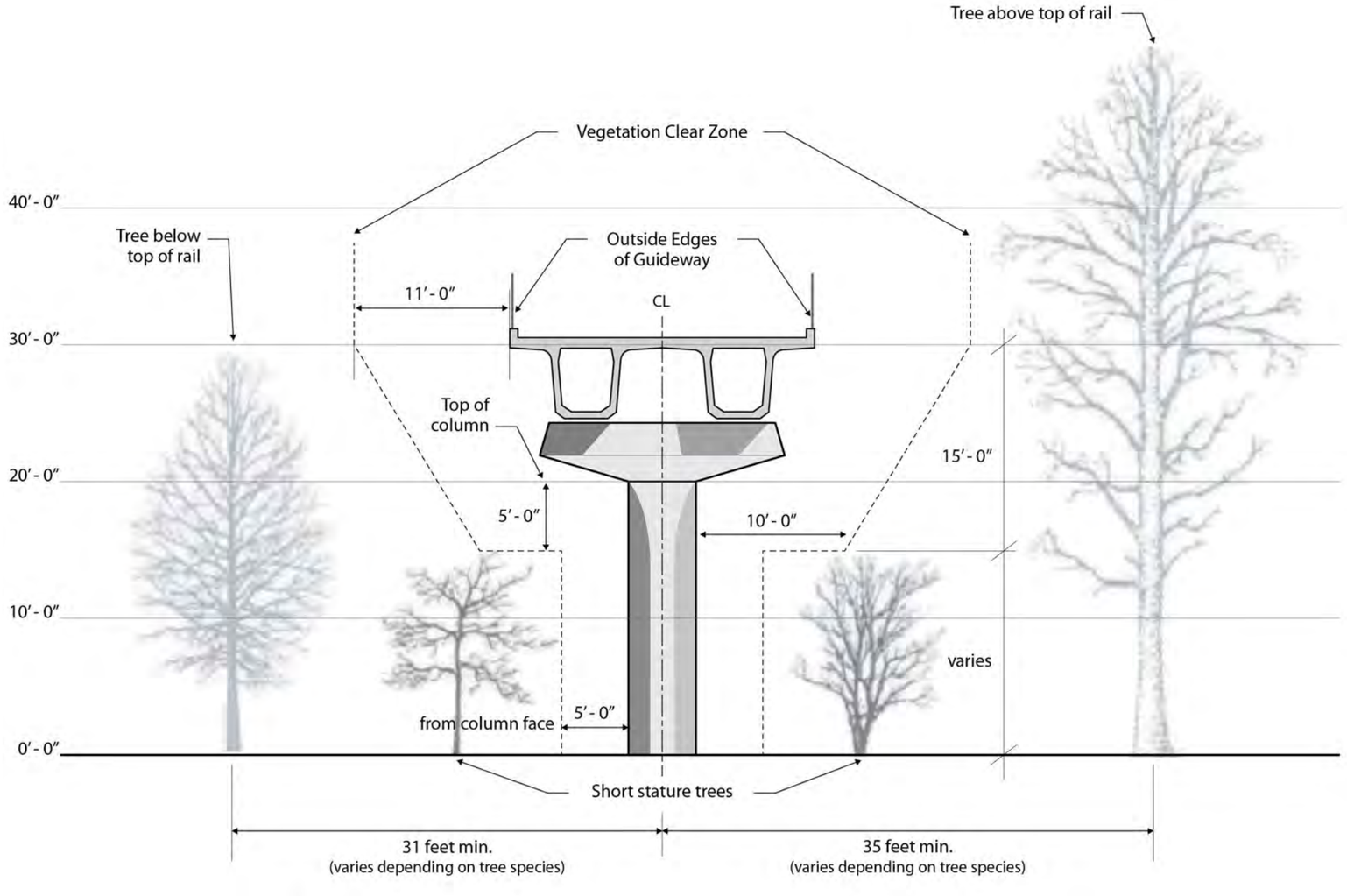


Figure iii for 4.4.5 - Vegetation clear zone from outside edge of guideway from Design Criteria Manual R-5

4.4.6

Utilities

DESIGN STORMWATER, UTILITY, AND STATION SERVICE INTERFACES CONSISTENT WITH PUBLIC REALM AND INTEGRATED DEVELOPMENT PLANS.

A. **Create "utilidors" within the ROW where possible, otherwise under dedicated access facilities like driveways or in setback zones, that maximize space efficiency and access.**

B. **Where utilities must intrude into public realm or adjacent development (particularly Agency TOD) parcels, establish a reasonable easement that follows ROW and parcel lines.**

C. **Locate Sound Transit maintained stormwater facilities on Sound Transit property.**

D. **Coordinate with joint development projects, new adjacent development, and/ or local jurisdictions, to locate underground stormwater utilities such as vaults within the street ROW or under sections of public realm that would not disrupt access and operations to either station facilities or adjacent or integrated Agency TOD when maintenance or unit replacement is warranted.**

E. **Locate station maintenance and utility functions (including access to these functions) to reduce conflict with spaces of active movements or gathering/rest in the public realm surrounding stations.**

4.5 Surplus Property and Parking Facilities

Sound Transit's Equitable Transit Oriented Development Policy (Resolution No. R2018-10) states that "when Sound Transit no longer has a transit use for a property or the property may accommodate additional uses, it may declare property surplus or available for joint development." This section sets out physical design guidelines as Sound Transit seeks to dispose of surplus property, pursues joint development, and considers long-term approaches to providing parking facilities near stations.

Figure i for 4.5 - King George Hub, Surrey BC

4.5.1

Equitable Transit Oriented Development

SUPPORT PLANNING AND DEVELOPMENT IN STATION AREAS THAT ADVANCE THE FOLLOWING EQUITABLE TOD PRIORITIES

The Sound Transit system strives to promote the health and well-being of the communities it serves and to enhance access and mobility. Sound Transit projects seek to enhance equitable access to housing, community services, retail, and economic opportunities.

A. Plan for affordable housing development on Sound Transit TOD sites and support affordable housing production in the station environment, per Sound Transit and regional policies.

B. Sound Transit's equitable TOD policy directs the agency to prioritize production of permanently affordable housing for a variety of income levels, such as mixed-income/workforce (60-80%) and very low-income/ supportive (0-60%), which are secured through land acquisition by Sound Transit or qualified entities.

C. Cities, housing authorities, and community-based organizations should enact policies and pursue projects that expand the supply of affordable housing in station areas. This could include tools like multifamily tax exemptions (MFTE) for affordable housing, inclusionary zoning, community land trusts, tax increment finance or housing benefit districts, and affirmative marketing of affordable housing opportunities to long-standing residents.

D. Integrate community services into mixed-use developments, including but not limited to:

childcare/early learning centers, health and social services, library or community gathering center, and education and training/career development.

E. Create opportunities for ground-floor retail that serve transit passengers, including convenience goods, groceries, and food and beverage. Also, allow for small-scale spaces that can support startup businesses (e.g. food vendors, local merchants).

F. Support small businesses that offer living wage employment opportunities that are accessible to transit.

G. Size parking requirements to reflect the abundant access and mobility light rail stations provide.

i. Established Urban

Residential: 0 parking spaces required, maximum of 0.5 space/ dwelling unit allowed;

Commercial: 0 spaces required, maximum of 2 spaces/1000 sf of office use;

Retail below 4000 sf, 0 required
Retail above 4000 sf, maximum of 2 spaces/1000 sf of retail use

ii. **Emergent Urban or terminal station facilities:**

Residential: 0 parking spaces required, maximum of 1 space/ dwelling unit allowed;

Commercial: 0 spaces required, maximum of 3 spaces/1000 sf of office use;

Retail below 4000 sf, 0 required
Retail above 4000 sf, maximum of 3 spaces/1000 sf of retail use

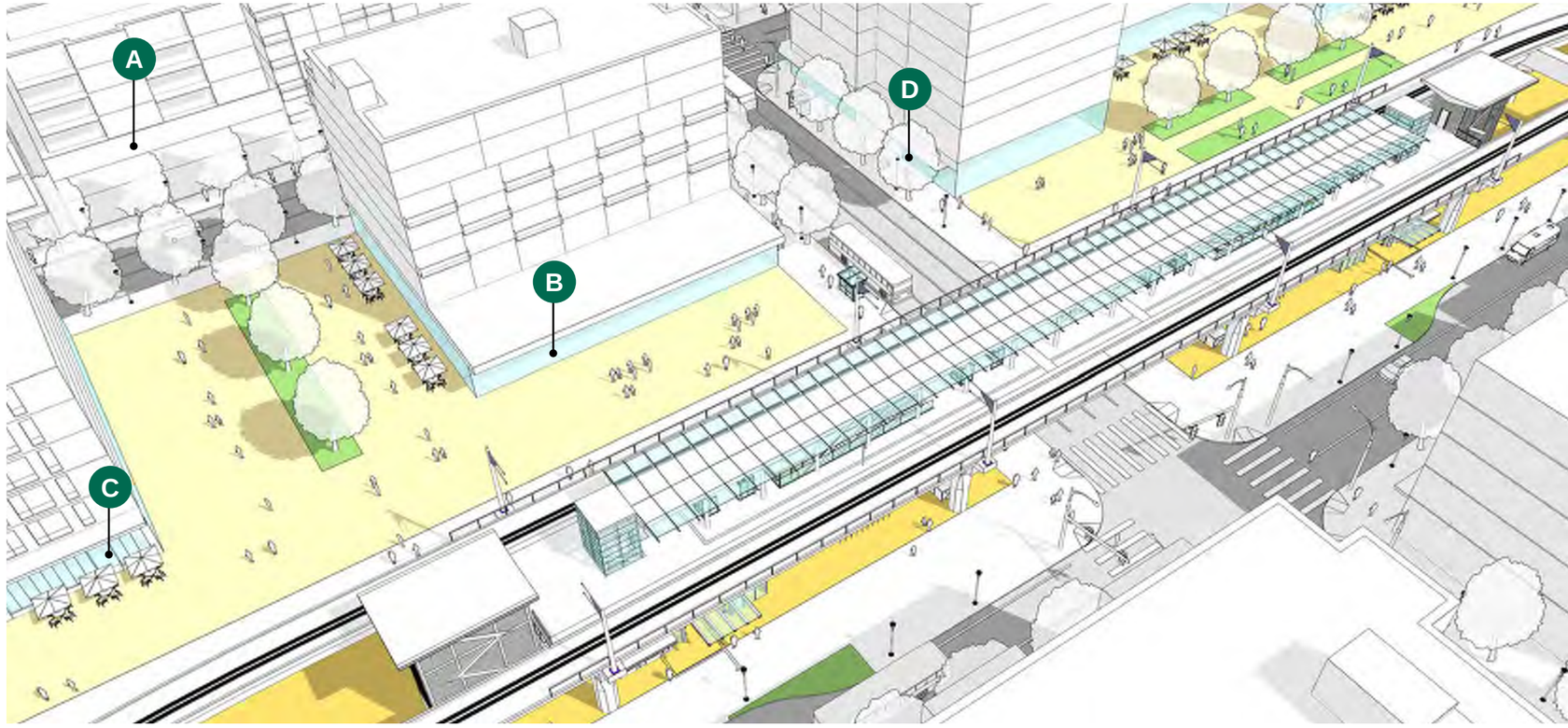


Figure i for 4.5.1 - Diagram depicting guidelines for Equitable TOD

Figure ii for 4.5.1 - Future NE 67th St and the Cedar Crossing project, offering affordable apartments, community center, daycare, courtyard and a through-block connection with ground level commercial space.

Figure iii for 4.5.1 - The Centilia Cultural Center is an anchor on the Plaza Roberto Maestas, providing an important community asset adjacent to Beacon Hill Station.

4.5.2

Joint Development at Stations

SUPPORT OPPORTUNITIES FOR JOINT DEVELOPMENT OF STATION FACILITIES THAT ACTIVATE PUBLIC SPACES WITH RETAIL AND SERVICES FOR PASSENGERS

Joint Development projects are commercial, residential, retail, or mixed-use development that have an ongoing spatial relationship with a Sound Transit Link light rail facility, whether entrances or ventilation towers. Joint development may also be implemented at bus and intermodal facilities (section 4.5.4). Models and methods for partnering with public, private, or non-profit development entities, which are an important facet of joint development are not within the purview of this document.

Sound Transit's role in joint development is supported and guided by the goals and commitments contained in the Board's Equitable Transit-oriented Development Policy.

Joint Development at a station may be especially advantageous in Established Urban environments, where land values are at a premium, there are high volumes of passengers, and people will pay for convenience in more complex, mixed-use environments. While the individual development agreements that will be negotiated between Sound Transit and third-party developers for joint development opportunities will govern each party's responsibilities, some specific areas of concern and consideration are mentioned in the guidelines that follow.

A. General Guidelines

a. Structural requirements for overbuilding and any future access to and routing of utilities must be planned for when station access, concourses, or platforms pass below developments.

b. Encourage and utilize retail and services to activate station environment spaces for passengers.

» Locate and prioritize retail immediately adjacent to the station entrance and in spaces that are publicly accessible and easily visible.

» Design ground floor spaces to be flexible to easily allow for retail, commercial, and other changes in use over time.

» Orient spaces for retail and services, storefronts, and other active uses along pedestrian routes to and from the station entrances where possible.

» Ensure retail concourses have a minimum width of 30' to ensure programmatic and functional feasibility. Retail bays in station concourses should not obstruct pedestrian flow as per NFPA 130.

» Encourage glazing and transparency between adjacent retail and commercial spaces and the station.

» Provide space for signage on the façade of retail and commercial spaces. The scale of retail and commercial signage must be appropriate to relevant structures and station entrances.

» Restrooms or access to restrooms are typically required by code for retail spaces of a certain size or use, such as those producing and vending food and beverage on-site.

c. Use a design process that allows for input from community groups, adjacent property owners and public agencies to ensure a well-designed and intentional place.

» Use Station Environment Typology Matrix to build community consensus on the type and potential for the Station Environment, see Chapter 4.1.4 Station Environment Typology Matrix

» Use Station Environment and Station Component Guidelines to assess compliance with passenger experience in physical design or policy planning.

TABLE 4.5.2
Joint Development Types:
The following joint development types illustrate typical head house overbuild options likely to be considered for Sound Transit's stations.

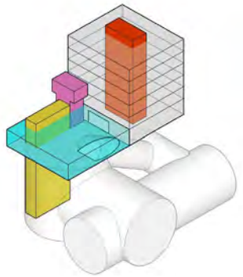
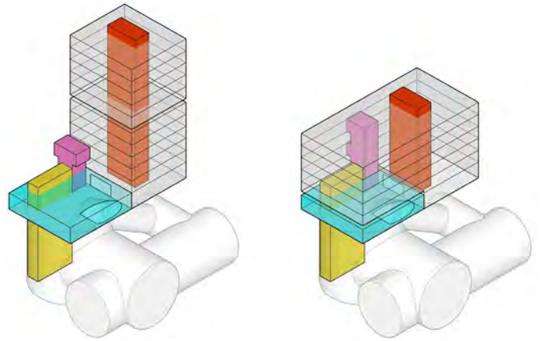
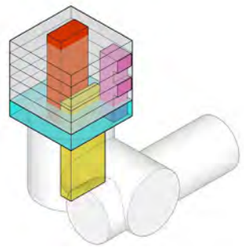
	TYPE I - ADJACENT	TYPE II - AIR RIGHTS	TYPE III - INTEGRATED
			
DEVELOPMENT LOCATION	» Development next to a station with minimal structural interface with transit infrastructure, such as guideways, tunnels, and platforms; and often separate service access.	» Development that occurs within air rights of station and may have some vertical interface with transit infrastructure.	» Development that is fully vertically integrated with the station and relies on the structural system of transit infrastructure.
TYPICAL PROPERTY ACQUISITIONS	» Larger property acquisitions of 1 acre or greater that allow for separate building and station footprints.	» Property acquisitions of less than 1 acre that are occupied primarily by the station footprint but have some additional room for building footprints.	» Limited property acquisitions under ½ acre that do not allow for building footprints beyond the station footprint.
TYPICAL PROGRAM AND DESIGN ELEMENTS	» Additional Entrances, separate lobbies » Siting supports direct horizontal access to station entrance at grade or via connection to station concourse » Separate building envelope supports completely independent vertical circulation core. » Service and any parking access likely fully independent of station	» Additional Entrances, separate lobbies » Siting supports horizontal access to station entrance at grade and potentially within the envelope of the building » Building envelope and floorplates extend over the station entrance, though building lobby and vertical circulation are physically separate » Station service access or parking may be accommodated within the building, along with mobility hub program elements	» Required Entrances and spatially combined lobby » Siting supports access to station entrance within the building envelope » Building and station lobby are within the same envelope, though potentially separated by walls or other partitions. Section 4.5.2.a provides guidelines on delineation between Fare Paid Zones and non-Fare Paid Zones. » Station and building service access are common, and some elements of station program may be located in basement or upper floors of shared structure.

Table 4.5.2 - Joint Development Types

B. Configuration of Additional Entrance Elements

Sound Transit may directly site, design, construct and operate any Additional Entrances to a Link light rail station or may partner with others, such as adjacent development or authorities having jurisdiction (AHJs), to do any of the same. Additional Entrances must:

i. Comply with section 3.3.5.D and signage requirements in the Signage Manual;

ii. Have roll-down gate that meets Sound Transit standard criteria and is operable by Sound Transit at the Fare Paid Zone threshold;

iii. Have independent fire-protection and ratings.

Additional Entrances shall not count toward the required ingress and egress capacity of the station.

The lobby of an Additional Entrance may use non-standard, mutually agreed upon finishes for the glazing, flooring, ceilings, walls and other miscellaneous items.

C. Joint Development Types and Guidelines Specific to Type

Evaluate which of the three main types will be used for the Joint Development project and follow the accompanying guidelines:

» Adjacent
» Air Rights
» Integrated

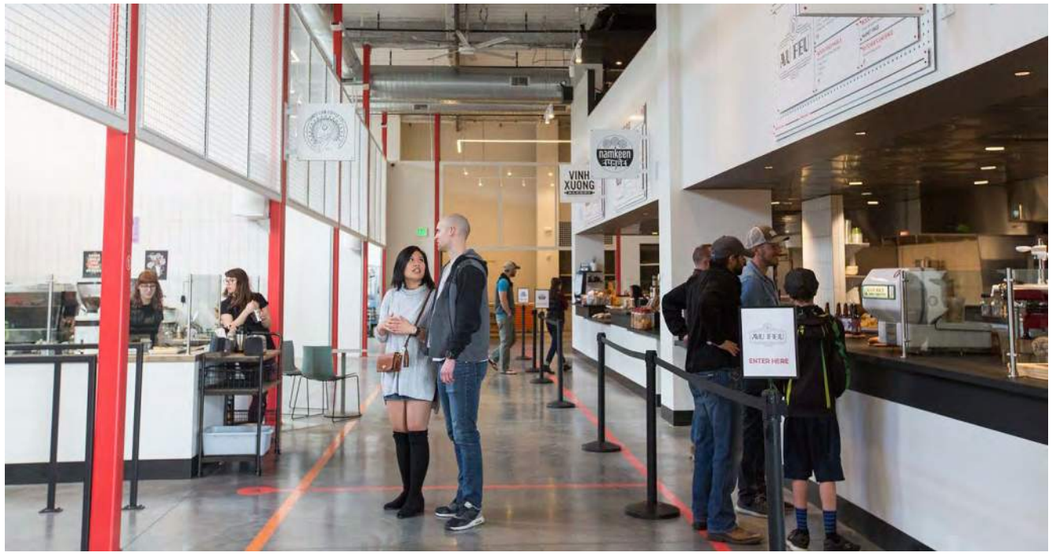


Figure i for 4.5.2 - Zeppelin Station, Denver

Figure ii for 4.5.2 - Denver Union Station - the waiting hall is enlivened with different forms of seating serving the food and beverage retailers along the perimeter

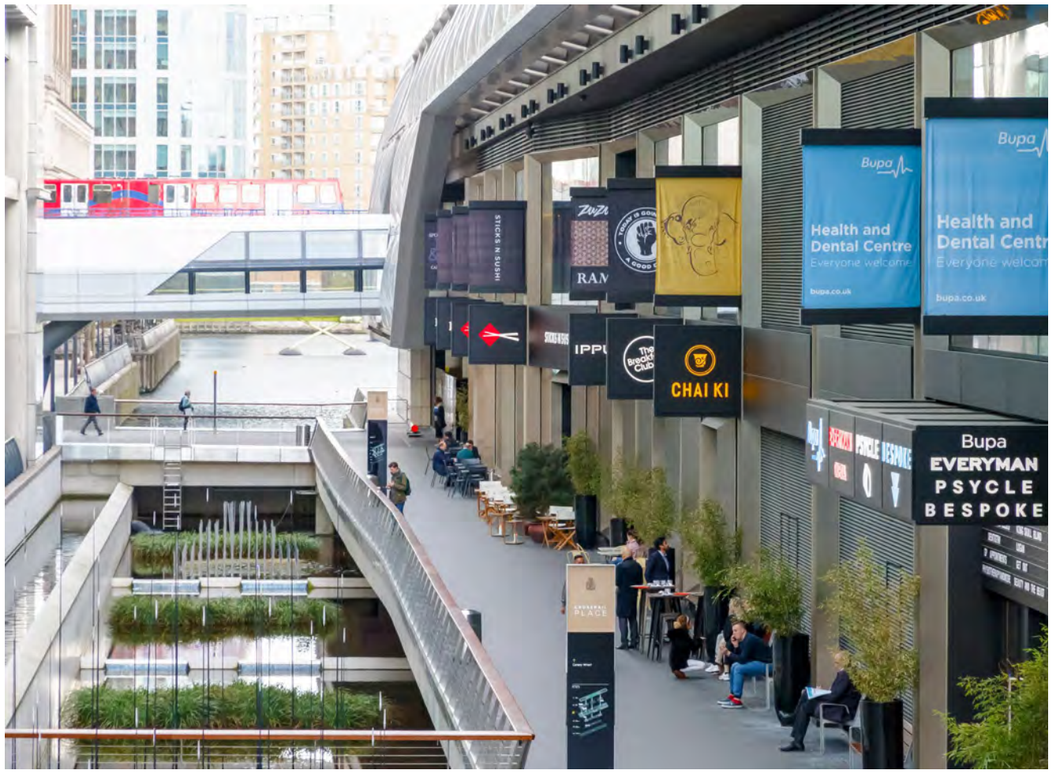


Figure iii for 4.5.2 - Crossrail Place, Canary Wharf, London

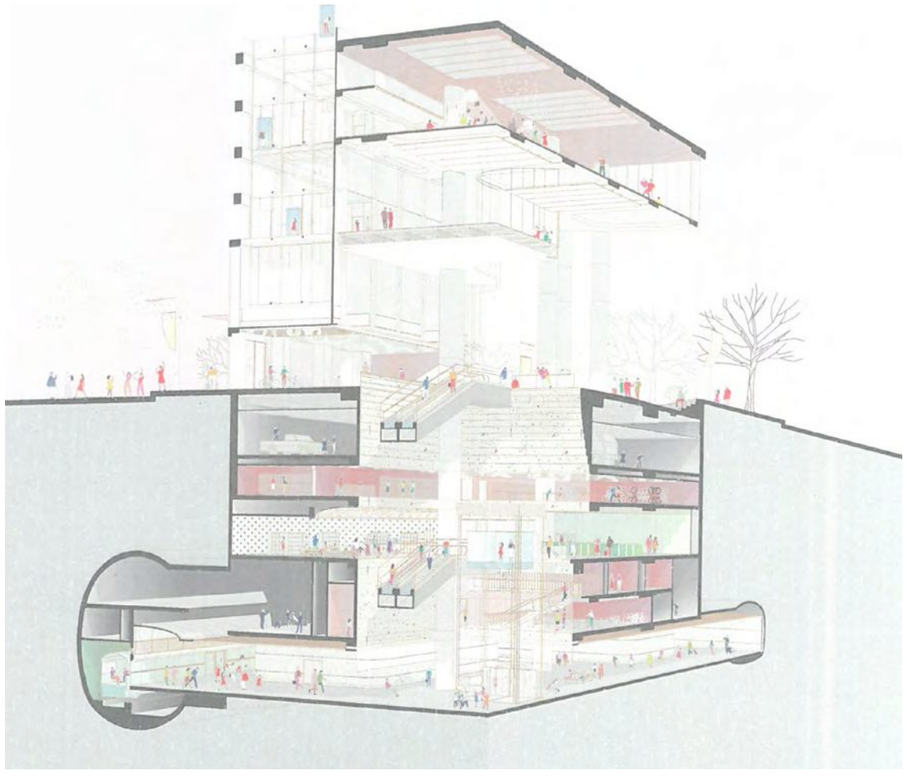


Figure iv for 4.5.2 - Martin Place Station, Sydney Australia (see also: Case Study #5 in Appendix C)

Type I – Adjacent

Where feasible and appropriate, an Adjacent development may share an entrance directly between the station and the development without passing through a right-of-way. It would be considered an Additional Entrance and must comply with sections 4.5.2.A and 3.3.5.D.

Lobbies and vertical circulation of the station and adjacent development should be separated to the extent practicable, though pedestrian flows and connections should be strategically considered:

- Maximize connections to stations from and through adjacent development, including utilizing retail and services where relevant, though not at the expense of direct circulation paths.
- Orient spaces for retail and services, storefronts, and other active uses along pedestrian routes.
- Ensure all routes to and from the station entrance(s) have clear sightlines that promote intuitive wayfinding to the Fare Paid Zone. Place signage at appropriate locations.
- Where adjacent development in in Established Urban land use types may connect directly to a grade-separated station, position fare paid zones to allow station concourses to tie directly into second story or below grade development within the unpaid area.

Place station ventilation towers away from operable windows and/or air intakes for the Adjacent development.

Sound Transit back-of-house services should be independently operable and have secure access.

Figure i for 4.5.2.C - Station House, Capitol Hill, Seattle: Station House is a 7-story project co-located with the Capitol Hill Light Rail Station and is a part of the larger Capitol Hill Station development that includes four buildings. It was completed in 2020 and includes 110 affordable units.

Type II – Air Rights

There are two configurations for Air Rights station development: one where there is a legal transfer of air rights above the station to an adjacent property, and another where the air space above the station is utilized by an adjacent building on a shared property.

In the first case, the adjacent property becomes taller leaving the station roof with the possibility of being open to the sky. Place station ventilation towers away from operable windows and/or air intakes for the Adjacent development.

In the second case, the air rights are utilized above the station by either cantilevering over or overbuilding the station head house while the vertical circulation a lobby for the development remains entirely separate from the station. The required tunnel ventilation shafts, including both intake and exhaust, may be routed through the building above. They should exhaust to the atmosphere and prevent smoke from being sucked into building openings in the case of a fire. Placement of tunnel ventilation shaft grills can either be through the roof or side of a building.

Considerations for station entrances, lobbies, vertical circulation, and pedestrian flows and connections are similar to to Type I.

Sound Transit back-of-house services should be independently operable and have secure access.

Figure ii for 4.5.2.C - Avenir, Boston: The Avenir is a ten-story mixed-use building with 241 units, including 17 affordable units, and nearly 2,000 square feet of retail located over Boston's North Station. The project is a ground lease with Massachusetts Bay Transportation Agency. Station entrances are integrated into the ground floor of the building, and internal parking is wrapped by residential units.

Type III – Integrated

An Integrated station development occurs when the building and the station share some lobby and vertical circulation elements with the station, and the structure of the building bears upon parts of the station below. Any Required Entrances to the station must comply with sections 3.2.2 (Navigation and Wayfinding), 3.3.5.C (System and Station Identification) and 3.3.5.D (Lobby Components). If there are only vertical shafts connecting to the station below, the station footprint may be minimized. This joint development type may pair best with elevator-only station configurations.

The required tunnel ventilation shafts, including both intake and exhaust, may be routed through the building above. They should exhaust to the atmosphere and prevent smoke from being sucked into building openings in the case of a fire. Placement of tunnel ventilation shaft grills can either be through the roof or side of a building.

The station and the joint development may share back-of-house services (loading, recycling and trash etc.).

Placement of vertical circulation cores on a tight site should be considered so as not to inhibit access or surge zones for either the development or the station.

Figure iii for 4.5.2.C - MiamiCentral, Miami: MiamiCentral is currently under construction and when finished, multiple buildings constructed around the Brightline Station will contain office, retail, and more than 800 residential units that rise above parking podiums and elevated trackways. The stations are elevated above building entrances to allow for ample ground floor usage. The parking is located in vertical structures.

4.5.3

Parking Garage Structures, Off-street Bus Facilities, and Parking Lots

WHERE SOUND TRANSIT OR PARTNER BUS FACILITY OR PARKING CAPACITY INVESTMENTS ARE PLANNED, CONSIDER POTENTIAL FOR DIFFERENT HYBRIDIZED FORMS OF DELIVERY IN SITE IDENTIFICATION AND LAYOUT

A. Stand-alone parking garage structure (Design Criteria Manual standard)

Typical Parameters

2-bay, 120 ft wide with internal ramping of 200 ft in length [5% Slope at 10' floor to floor]

3-bay, 180 ft wide with internal ramping of 200 ft in length [5% Slope at 10' floor to floor]

Considerations

» Optimize floor-to-floor heights to provide the potential for conversion to different future and flexible uses

» Vehicle entrances and exits should be located facing away from the station entrances to avoid conflicts with pedestrians, bicyclists, and other transit riders

» Setback entrances and exits to enhance sidewalk visibility

» Vertical circulation access elements should be glazed for passenger security and sited to release passengers onto the primary pedestrian approach to a station

» Pedestrian entrances of parking garage structure should be located a 500 ft maximum distance from a station entrance. In Emergent Urban conditions when parking could be delivered more cost effectively, Sound Transit may consider parking within 1/4 mile of the station

» Internally illuminate all pedestrian entrances to serve as beacons

» Provide ground level landscape improvements to integrate with the public realm

» Sound Transit will decide the extent of screening for parking levels from public spaces and whether to provide active ground level uses based upon its internal requirements for retail and/or third party amenities

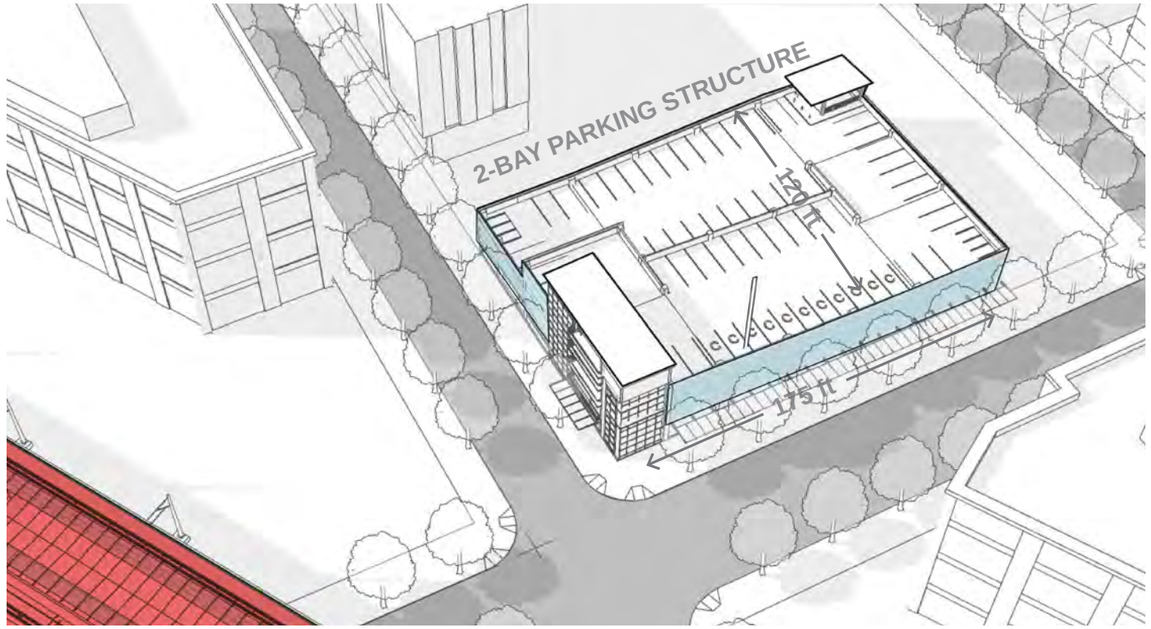


Figure i for 4.5.3.A - Stand-alone, 2-bay parking garage structure

Figure ii for 4.5.3.A - Stand-alone, 2-bay parking garage at 145th

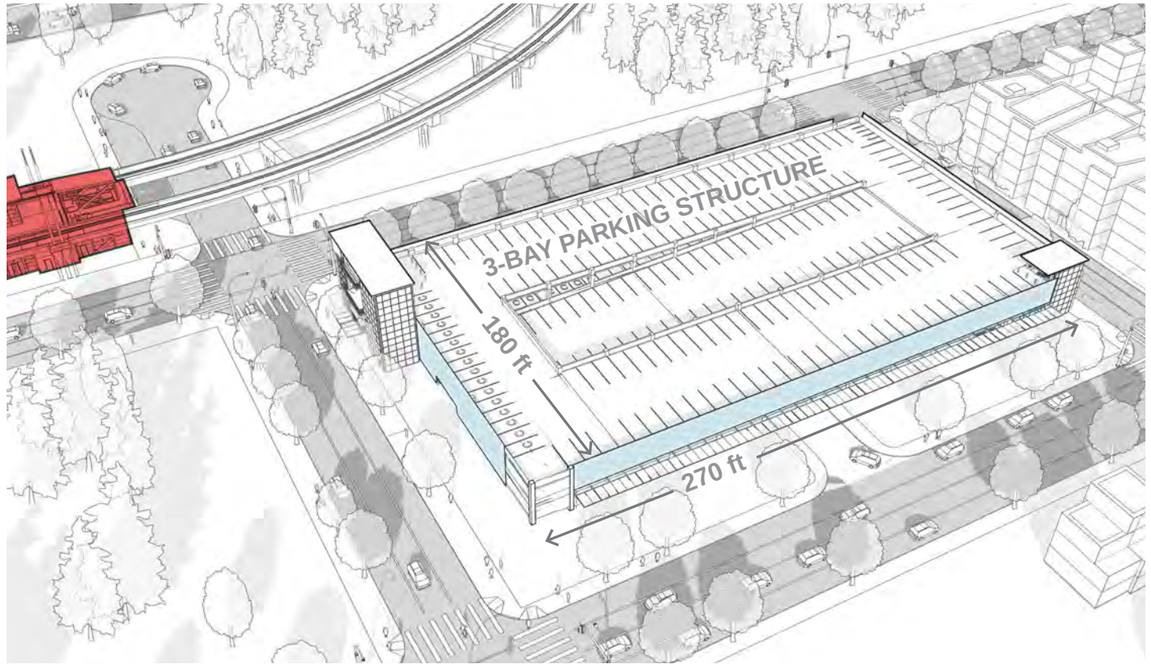


Figure iii for 4.5.3.A - Stand-alone, 3-bay parking garage structure

Figure iv for 4.5.3.A - Stand-alone, 3-bay parking garage at Star Lake on the FWLE

B. Parking garage above a bus layover and charging facility

To shorten the dead-heading distance of buses, it can be desirable to locate the layover and charging facility within a few blocks of the station where they enter into service. To maximize the efficient use of land a transit parking garage may be vertically integrated above the bus facility.

C. Housing / commercial over a ground level bus layover and charging facility

Similarly, in transit rich areas (emergent or Established Urban) it may be possible to co-locate housing vertically above a bus facility serving an electrified fleet. Securing the land and development entitlement prior to the arrival of the light rail station will be key to making this type of integrated development feasible.

D. Temporary Surface Parking Lot (convertible to future uses)

With similar width requirements (120' and 180') to the parking garages, temporary surface lots can fill a short-term need for private vehicle access until first mile-last mile alternatives are made available and denser uses fill in, making walking, biking, and taking transit to the station easier. These lots should be buffered with landscaping, manage heat island effects, have Dark Sky compliant light fixtures, have a stormwater runoff and treatment plan, and manage the visual impacts of parking to support station environment goals. They may support temporary pop-up uses and be part of a larger station area open space program.

For integrated garage and mixed-use/residential/or commercial wrap refer to Section 4.5.4 Partner/Developer-Delivered Parking

Figure i for 4.5.3.B - Vertically Integrated Parking Garage over a Bus Layover Facility at Redmond Technology Center

Figure i for 4.5.3.D - Tsawassen Mills surface parking lot with green stormwater infrastructure

Figure ii for 4.5.3.D - City of Langley surface parking lot with green stormwater infrastructure

4.5.4

Partner / Developer-Delivered Parking

JOINT DEVELOPMENT OF PARKING WITH COMPATIBLE DEVELOPMENT IS ESSENTIAL TO CREATING A VITAL STATION ENVIRONMENT

Parking is a resource for passengers using the transit system. When it is not being uses by transit passengers, is a resource that can be shared with adjacent compatible development in the station area. The design and location of parking can leverage compatible development that supports the passenger experience by intensifying development, promoting a mix of uses, and supporting ground level uses that create active public spaces that connect with the station. Planning and design of parking in a station areas should take into account opportunities to share parking across multiple compatible land uses so as to optimize parking supply and development capacity.

All parking must conform with section 4.5.3 Off-street Bus Facilities and Parking Considerations.

There are two types of Partner/Developer-Delivered Parking which can contribute to creation of compatible development in which parking agreements maybe formed:

A. Wrapped or horizontally integrated parking garage

B. Stacked or vertically integrated parking garages

TABLE 4.5.4

Partner/Developer-Delivered Parking

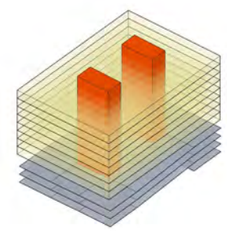
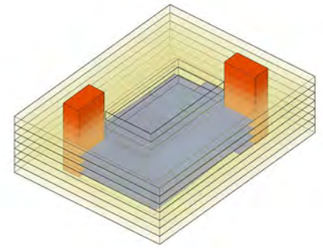
	VERTICALLY INTEGRATED PARKING GARAGE	HORIZONTALLY INTEGRATED PARKING GARAGE
		
JOINT DEVELOPMENT INTEGRATION	Typically is integrated as a parking podium with development (such as housing) above. Commercial uses could also be provided on the ground floor	If structured-parking is required or desired by private development, it can be adjacent and wrapped with residential or commercial uses to make it compatible with a walkable neighborhood.
VEHICLE ENTRY, VERTICAL CIRCULATION/PEDESTRIAN ACCESS, AND RELATIONSHIP TO STATION ENTRANCE	Provide 1 vehicle entry egress for every 500 spaces. Locate entry as far as practicable form the transit station. Do not provide garage access across major pedestrian accessways.	Provide 1 vehicle entry egress for every 500 spaces. Locate entry as far as practicable form the transit station. Do not provide garage access across major pedestrian accessways.
JOINT USES	Commercial, such as retail, can be provided on the ground floor. Entrances to overbuilding can also be provided on the ground floor. Residential or commercial uses can be provided above shared parking podium.	Residential or commercial uses can be wrapped around parking structures. » Residential wrap dimension - 40 ft min for single loaded corridor » Commercial wrap dimensions - 30 ft min for retail depth
JOINT USE GUIDELINES	» Maximize the use of ground-floor retail to enable active vibrant spaces, activate the street and station, and encourage ‘eyes on the street’ security and safety. » Orient retail and commercial spaces toward streets, plaza, station areas, and other public spaces when wrapping parking structures and other development	

Table 4.5.4 - Partner/Developer-Delivered Parking

05 Evaluation Framework

5.0 Evaluation Framework

Figure i for 5.0 - West Seattle to Ballard Forum Meeting

The Sound Transit Design Guidelines Evaluation Matrix includes a series of questions designed to show conformanance and identify elements of the station and station environment design that are not meeting, meeting, or exceeding the criteria that are set forth in this manual.

As the goal of this matrix is to establish conformance with these criteria, any elements that are found to not meet the design guidelines must be carefully considered and reviewed with Sound Transit. In most instances this shall require redesign from the design team in order to meet these guidelines and in rare instances Sound Transit may decide to allow an exception.

5.1 PROJECT TYPES

PROJECT TYPES	✓	SECTION NUMBER	SECTION TITLE	NOTES BY SOUND TRANSIT REVIEWER
Planning and Development of a new alignment or extension (through 100% design)				
	✓	3	Stations	
	✓	4	Station Environment	
AHJ Station Area Plans				
	✓	4.1	Station Environment Typologies	
	✓	4.2	Urban Form and Station Siting	
	✓	4.3	Access and Approach	
	✓	4.4	Public Realm and Plazas	
Public Plazas by Others in the Station Context				
	✓	4.4.3	AHJ Public Plazas	
System Access Improvements				
	✓	4.3	Access and Approach	
Sound Transit TOD Properties				
	✓	4.5.1	Equitable TOD	
	✓	4.2.7	Active Urban Edge	
	✓	4.4.1	Station Frontages and Setbacks	
	✓	4.4.4	Activated Ground Plane	
	✓	4.4.5	Landscape Integration	
Adjacent TOD Properties				
	✓	4.2.7	Active Urban Edge	
	✓	4.4.1	Station Frontages and Setbacks	
	✓	4.4.4	Activated Ground Plane	
	✓	4.4.5	Landscape Integration	
Parking Facilities				
	✓	4.5.3	Off-Street Bus Facilities and Parking Considerations	
	✓	4.5.4	Partner/Developer - Delivered Parking	
Joint Development Properties				
	✓	4.5.2	Joint Development of Stations	

5.2 STATIONS			
CORRESPONDING SECTION	**RESPONSE**	**COMMENTS**	**ACTION**
3.1 Station Form			
Identify Station Type (elevated, below-grade, or at-grade; center- or side-loaded platforms):			
How many Required Station Entrances (see section 4.2.2) are there?			
Will this be an Event Station (see section 3.2.2.B)?			

METRIC	ASSESSMENT					
	RATING					
CORRESPONDING SECTION	*(Sound Transit Reviewer to complete)* **Required for Submission**	**Satisfies Guidelines**	**Does Not Satisfy Guidelines**	**Ranking Between 1 and 10, with 10 being the highest or best**	**COMMENTS**	**ACTION**
3.2 Station Design Principles						
In service of Simple, Seamless, and Intuitive						
3.2.1 Station Identity						
A System: Describe how the proposed project creates a recognization Sound Transit Station for both a first-time user and an everyday commuter. How do the entrances, canopies, walls and ceilings, lighting strategies comply with the system requirements?						
B Neighborhood: How are the placemaking strategies relevant to the community surrounding the station?						
3.2.2 Navigation and Wayfinding						
A Passenger Flow: Provide ridership projections for peak periods, passenger flow models, and calculations for the Level of Service expected at all the points of constraint (i.e. entrances, vertical circulation, platforms, exits).						
B Event Stations: If the answer to the 3.1.3 was yes, describe strategies that will be used to manage surge events.						
C Decision Points: On each plan level, map out where primary decision points will occur. Demonstrate that a sequence from one point to another can be made without interruption.						
D Transparency and Sightlines: Indicate primary pedestrian desire lines leading to the station from various modes of transit and the larger public realm. Show how visibility into the station and along vertical circulation routes are improved through the thoughtful arrangement of elements and the use of transparent materials.						
E Other Wayfinding Strategies: Show how primary pedestrian routes, especially from the paratransit drop-off and pick-up zones to elevators, are easily accessible, direct, and logical locating tactile paving and the components of the audio visual messaging system. Provide a signage plan that complies with the Signage Manual requirements.						

METRIC		ASSESSMENT					
CORRESPONDING SECTION		RATING				COMMENTS	ACTION
		(Sound Transit Reviewer to complete) **Required for Submission**	**Satisfies Guidelines**	**Does Not Satisfy Guidelines**	**Ranking Between 1 and 10, with 10 being the highest or best**		
3.2.3 Spatial Legibility							
A	Unity with a Hierarchy of Elements: Explain how the major elements of the station work together in harmony to create an overall whole. Which elements are standardized and which ones are customized?						
B	Express Movement: How does the geometry of the station elements work together to express the flows of trains and people in and out of the station?						
C	Groundedness and Lightness: Describe which elements are grounding and which elements are floating. How do they contrast with each other and how are they detailed to read distinctly?						
3.3 Station Elements							
Station Elements must meet all of the requirements of this section and the corresponding sections in the Design Criteria Manual. Please note any proposed deviations from the requirements and how they would enhance the Station Design Principles above							
3.4 Resiliency							
3.4.1 Passenger Journey Resiliency Measures							
A	Passenger Flow: Provide ridership projections for peak periods, passenger flow models, and calculations for the Level of Service expected at all the points of constraint (i.e. entrances, vertical circulation, platforms, exits).						
3.4.2 Station Resiliency Measures							
A	Decision Points: On each plan level, map out where primary decision points will occur. Demonstrate that a sequence from one point to another can be made without interruption.						
B	Life Cycle Costs and Assessments: Using a Sound Transit- approved tool and/or methodology, perform a Life Cycle Assessment and describe how the station design works to reduce both operational and embodied carbon. Describe the thought process behind and trade-offs made between first costs and long-term durability.						
C	Green Buildings and Infrastructure: Provide a completed Sound Transit Sustainability Checklist, LEED Scorecard for the Station Design, and documentation to demonstrate compliances with any other project specific sustainability goals.						

5.3 STATION ENVIRONMENTS			
CORRESPONDING SECTION	**RESPONSE**	**COMMENTS**	**ACTION**
4.1 Resiliency			
Identify the Station Area Land Use Type (Established, Emergent, or Single-Use)			
Identify the Station Access Type (Walk, Bike, and Roll; Multimodal; Auto-Dominant)			
Are there any planned station area improvements that may affect the type designations above. If yes, please describe.			

METRIC	ASSESSMENT					
	RATING					
CORRESPONDING SECTION	*(Sound Transit Reviewer to complete)* **Required for Submission**	**Satisfies Guidelines**	**Does Not Satisfy Guidelines**	**Ranking Between 1 and 10, with 10 being the highest or best**	**COMMENTS**	**ACTION**
4.2 Urban Form and Station Siting						
4.2.1 Site Stations to Create or Preserve Land Use Efficiency						
4.2.2 Minimum Number of Required Station Entrances						
4.2.3 Multifunctional Street Network						
4.2.4 Urban Walkable Scale						
4.2.5 Minimum Right-of-Way Dimensions for an Elevated Station						
4.2.6 Block Fragments and Urban Infill						
4.2.7 Active Urban Edge						
4.3 Access and Approach Design Guidelines						
4.3.1 General Station Area Access Guidelines:						
Provide direct, clear connections to/from station entrances and other modes of travel						
Minimize conflicts to ensure safe access for all modes of travel						
4.3.2 Guidelines Specific to Access Type (select only one of the Station Access Types listed below):						
A. Walk-Bike Access Stations						
B. Multimodal Access Stations						
C. Auto Access Stations						

METRIC		ASSESSMENT					
CORRESPONDING SECTION		RATING				COMMENTS	ACTION
		(Sound Transit Reviewer to complete) **Required for Submission**	Satisfies Guidelines	Does Not Satisfy Guidelines	Ranking Between 1 and 10, with 10 being the highest or best		
4.4 Public Realm and Plazas							
4.4.1 Station Frontages and Setbacks							
4.4.2 Transit Plazas by Sound Transit							
4.4.3 Public Plazas by Others							
4.4.4 Activated Ground Plane							
4.4.5 Landscape Integration							
4.4.6 Utilities							
4.5 ETOD, Joint Development at Stations, and Parking Facilities							
4.5.1 Equitable TOD							
A	If site is suitable for housing, planning includes affordable housing						
B	The project includes permanently affordable housing at a variety of income levels						
C	Efforts have been made at the jurisdictional level to improve incentives for affordable housing						
D	Integrates community services into the project						
E	Creates ground-floor retail serving transit passengers and/or residents						
F	Supports small businesses offering living wage employment						
G	Parking requirements are reduced to reflect the transit investment						
4.5.2 Joint Development at Stations							
A	General Guidelines						
B	Configuration of Additional Entrance Elements						
C	Joint Development Types and Guidelines Specific to Type						
4.5.3 Parking Garage Structures, Off-street Bus Facilities							
A	Stand-alone parking garage structure						
B	Parking garage above a bus layover facility						
C	Housing/Commercial over a ground level bus layover and charging facility						
D	Temporary surface parking log (convertible to future uses)						
4.5.4 Partner / Developer Delivered Parking							
A	A Wrapped (or Horizontally Integrated) Parking Garage						
B	A Stacked (or Vertically Integrated) Parking Garage						

Appendices

Appendices

Appendix A

Glossary

Air Rights: The right to use and develop the space above the land property without interference by others

Design Principles: Applied to the elements of design, they create order and harmony in a composition. [For reference, in visual terms, these principles may comprise: contrast, balance (linear, radial, using tension etc.), emphasis, proportion, scale, hierarchy, repetition, rhythm, pattern, alignment, negative space, movement, variety, and unity.]

Event Stations: Certain stations located near major event spaces (hosting regular events with a seating capacity of over 5,000 people within a ¼ mile radius of the station).

Entrances:

- **Required Entrance** – As determined by the Station Context Matrix and additional criteria in section 4.2.2, this is an entrance that the design team must include in the station and must conform to the design requirements of section 3.3.5.
- **Secondary Sound Transit-Controlled Entrance** – As determined by the Station Context Matrix and additional criteria in section 4.2.2, this is an entrance that the design team may study the feasibility of and Sound Transit may choose to include in the station.
- **Additional Entrance** – An entrance provided by adjacent joint development or nonsystem occupancy. It may not be counted towards emergency egress calculations and special considerations shall be necessary.

Experiential Goals for the Passenger Journey (Passenger Goals): The passenger journey should be simple, seamless, intuitive, and resilient.

Five Fundamental Service Goals (Performance-based): A transit experience that is dependable, safe, clean, and available with informed riders.

Guidelines: Qualitative, on a sliding scale of meeting the objective, proposers generally provide a narrative to Sound Transit as to how they are being met; allows for some flexibility in an overall arrangement of elements to allow for trade-offs and a hierarchy of design decision-making.

Metrics: A method of measuring something.

Navigation: The specific means by which people find their way, including route navigation, landmark navigation, and map navigation; navigational tools – specific aids to help people find their way to a destination beyond their range of vision.

Objectives: Specific, measurable strategies or implementation steps to attain the identified goals.

- We have an objective to improve the metrics on the service goals by 5% per year.
- We have an objective to decrease the amount of turns a passenger must take to exit a station to make the experience more seamless.

Overbuilding: To build over or on top of; to cover or surmount with a building or structure.

Passenger Experience: The comprehensive set of impressions formed and emotions felt by a passenger during their journey.

Passenger Journey: The passenger-planned steps from trip planning to execution to arrival that a passenger undertakes to get from one place to another, encompassing all the decisions one makes and experiences one has along the way.

Passenger Journey Sequence: The Sound Transit-planned order of the steps from a passenger's location onto the train and then on to a destination. The steps include passing through the station environment to the entrance of departure station, ticketing, the fare paid zone, vertical transportation to the platform, onto the train, and then through the reverse order of these steps to the exit of the arrival station.

Performance metrics: Figures and data representative of an organization's actions, abilities, and overall quality.

- One method of creating performance metrics would be to undertake surveys or reviews by passengers of whether Sound Transit is meeting its Service Goals.

Principle: A fundamental truth or proposition that serves as the foundation for a system of belief or behavior or for a chain of reasoning.

Standards (or Criteria): Pass/fail; a required level of quality or attainment; the specificity may not allow as much flexibility in the approach to attaining a goal as guidelines could.

Station Design Principles: A set of considerations created to govern the overall form and visual appearance of a station lending the entire system some coherence.

Station Environment: The area of a 10-minute walkshed, or approximately a half-mile radius, around a station (station area), the access pathways and travel modes connecting to the station (station access), and the immediate 1-2 blocks adjacent to the station entrance, including the public realm and joint development (station context).

The 7 Universal Design Principles: Developed in 1997 by a working group of architects, product designers, engineers and environmental design researchers, led by the late Ronald Mace in the North Carolina State University, they are: Equitable Use, Flexibility in Use, Simple and Intuitive Use, Perceptible Information, Tolerance for Error, Low Physical Effort, and Size and Space Approach and Use.

Touchpoints: A point of contact or interaction, especially between Sound Transit and its passengers. These could include a planning or scheduling app; messages from Sound Transit; signage, system maps, the TVMs; the functionality of the escalators and elevators; the waiting experience on the platform; train itself.

Type: A category having common characteristics.

- Station types, land use types, station access types, joint development types

Typologies: Study of or analysis or classification based on types or categories

- Land Use Types
- Station Access Types

Wayfinding: An umbrella term which includes the various means by which people not only navigate but also orient themselves in their environments; planning and decision-making component of navigation; synchronous human/social wayfinding as influenced by the actions of other people; tactile wayfinding; supportive architectural elements (changes in finish colors from neutral to bright).

Intuitive wayfinding: Spatial problem solving through the effective creation of a strong mental map that capitalizes on innate decision-making heuristics. For passengers, that would mean taking the widest, most improved path; having visible destinations; and using other orientation cues such as sunlight. The opposite would be navigation via signage or waypoints.

Appendix B

Universal Design Principles

In 1997, Ronald Mace led a working group of architects, product designers, engineers, and environmental design researchers at North Carolina State University to come up with a set of seven principles for Universal Design.

Since then, various organizations from transit agencies to local governments to web designers have interpreted these principles for their organizations' needs. At Sound Transit, these principles complement and overlap with Sound Transit's Passenger Experience Goals of simple, seamless, intuitive, resilient and with the Station Design Principles. They are especially useful to review in early design phases during the persona workshops.

The seven principles of Universal Design are:

EQUITABLE USE

the design is useful and appealing to people with diverse abilities. It provides the same means and provisions for safety and security, either identical or equivalent to, for all users and avoids segregating or stigmatizing.

FLEXIBILITY IN USE

the design accommodates a wide range of individual preferences and abilities, such as: providing choice in methods of use, right or left-hand access, facilitating a user's accuracy and precision, or adaptability to a user's pace.

SIMPLE AND INTUITIVE USE

the design is easy to understand, regardless of a user's experience, knowledge, language skills, or cognitive ability. Unnecessary complexity has been eliminated, a wide range of literary and language skills has been accommodated, information is arranged consistently with its importance, and the design is consistent with user expectations and intuition.

PERCEPTIBLE INFORMATION

the design communicates necessary information effectively to the user, regardless of ambient conditions or the user's sensory abilities. It provides redundant presentation of essential information (audio, visual, tactile), it provides adequate contrast between essential information and surroundings, it maximizes legibility, differentiates elements in a way that can be described (i.e. make it easy to give directions), and provides compatibility with devices or techniques used by people with sensory limitations.

TOLERANCE FOR ERROR

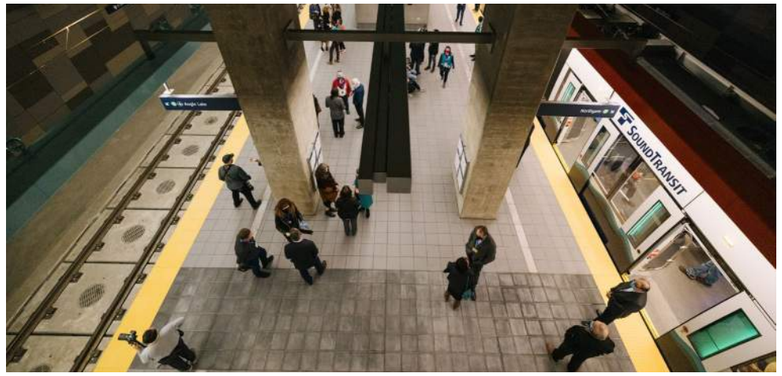
the design minimizes hazards and adverse consequences of accidental or unintended actions. It arranges elements to minimize hazards and errors (emphasizes essential/ accessible elements, while eliminating/ isolating hazards), provides warnings or hazards/errors, provides fail safes, and discourages unconscious action in tasks that require vigilance.

LOW PHYSICAL EFFORT

the design can be used efficiently and comfortably with a minimum of fatigue. It allows users to maintain a neutral body position, use reasonable operating force, and minimizes repetitive actions and/or sustained physical effort.

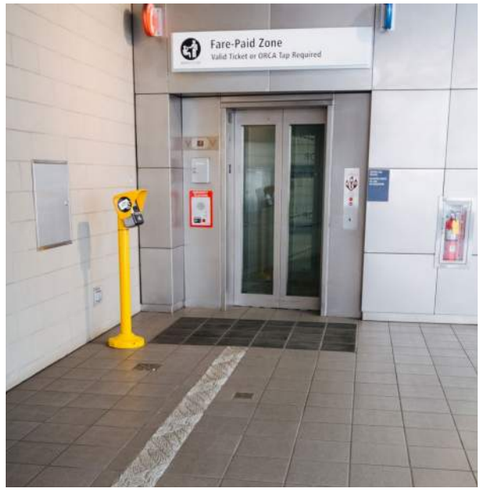
SIZE AND SPACE FOR APPROACH AND USE

appropriate space and size is provided for approach, reach, manipulation, and use regardless of the user's body size, posture or mobility. For any seated or standing user, provide a clear site line to important elements, provide components within a comfortable reach, accommodate variations in hand/grip size, provide adequate space for assistance devices or personal assistance.



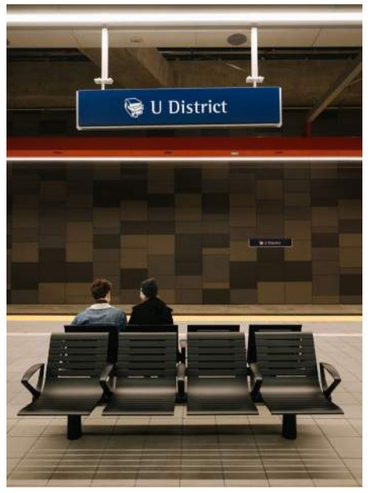
Tactile pathways at train boarding and length of platform

Simple and intuitive signage



A tacticle pathway and graphic, icon-based signage

Hand holds and leaning rails on a light rail vehicle provide comfort and assistance to passengers



Seating gives passengers an opportunity to rest and wait comfortably

Domed tiles delineate edge of platform

Domed tiles delineate edge of platform

Appendix C.1

CASE STUDY #1

Prefabrication & Mass Timber: Richmond-Brighouse Station

Figure i Hoisting prefabricated elements into place

Four stations in along the SkyTrain Canada Line in Richmond, BC demonstrate the success of modularity, prefabrication and the use of mass timber in canopy design. The photo is taken during the installation of custom modular timber steel panels. These panels were comprised of nail-laminated 2x4 members that fit into a frame of steel channel sections. The hybrid panels were factory prefabricated, shipped to site and installed by crane. This efficiency allowed for a 110-day schedule savings.

By introducing modularity into station concepts the possibility arises for; off-site prefabrication in a shop-controlled environment, a simple kit of parts approach that provides a consistent, repeatable design which supports a cohesive station language, systems integration, and potentially expedites construction. In the Richmond-Brighouse Station shown here electrical and communication systems were housed within the panels. While challenges remain when pulling cable in the field integrating the systems within the structure provides the opportunity to minimize exposed services which can detract from the beauty of the structure.

The use of wood in canopies and elements out of the touch zone creates a regionally appropriate, warm, welcoming environment. Additionally mass timber is locally sourced, durable and a sustainable building material with significant carbon sequestration benefits.

Location

Vancouver, BC

Relevancy

Prefabrication Methodology

Mass Timber

Design Principle: System Identity

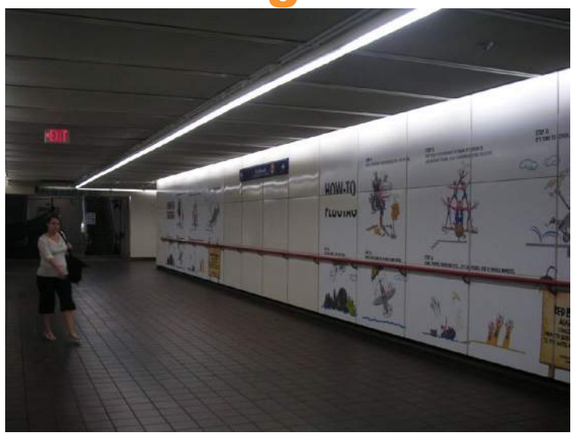
Appendix C.2

CASE STUDY #2

Qualitative Lighting Criteria: Canada and Evergreen Lines

Horizontal Illuminance 30 fc

Figure i Vancouver Community College Station, ground level concourse ticket area. Even with lighter colored floors, the overall space can feel dimmer than it really is if other surfaces aren't lit.



Horizontal Illuminance 8.6 fc

Figure ii Granville Station, final passage to platform 2. Dark finishes, especially on the floors, can cause the space to be perceived as darker than it really is.

Horizontal Illuminance 10 fc

Figure iii Vertical circulation to the platform at the Oakridge - 41st Avenue Station on the Canada Line. Even illumination, including on vertical surfaces combined with lighter-colored materials reduce the amount of glare and harsh shadows, lending a sense of overall visibility and security.

Galina Zbrizher IALD LC of Total Lighting Solutions has won awards for her work on both the Canada Line (the 2010 IALD Energy and Environmental Design Award) and the Evergreen Line (the 2017 IES Vision Award for for Merit + Excellence for Interior Lighting Design).

Her lighting design involved a critical assessment of existing guidelines and requirements, a shift to better understanding the perceptions of transit passengers of their surroundings, and a simple, scalable solution that could be used throughout a line with stations designed by numerous different architects.

"One key to the updated guidelines Zbrizher developed specifically for the Canada Line stations is the illumination of vertical surfaces—lighting the walls to reap the multiplier effects those brightened surfaces produce in extending the boundaries of a space. The goal this time around was to light the people, not the floors, to provide an enhanced sense of security for riders."

- Bradford McKee, Architect Magazine

Qualitative lighting design and perception psychology became more important than the quantity of foot candles on the floor. The lighting design for Canada Line transcends the code requirements for energy efficiency and public safety in rapid transit stations to transform these transport facilities into a warm, enjoyable and inviting urban space.

For further reading, please see:

Light Speed | Architect Magazine

https://promoteratheart.com/wp-content/uploads/2017/05/Evergreen-Line-IESBC-AWARDS.pdf

Location

Vancouver, CA

Relevancy

Lighting

Materials

Design Principles: Grounded and Lightness

Appendix C

CASE STUDY #3

Passenger Oriented Retail: Turnstyle Underground Market

Architecture Outfit used a variety of lighting, color, signage, and paving strategies to create a coherent yet vibrant space below 8th Avenue. The uplighting and bespoke storefronts which extend upward between each girder help make a formerly oppressive tunnel feel light and airy.

Turnstyle Undergrounder Market is a 27,000 SF retail cluster in the busy Columbus Circle station in New York City. The market is located outside of the fare-paid zone and is primarily food service businesses, most of which are “grab and go” style shops. It currently includes:

- 39 eateries, shops, and pop-ups
- 19 food vendors
- 10 retail stores
- 10 kiosks

The market is run by a private operator (Cadence-Property) with a 30-year master lease, who put capital investments into the space (demolition, new utilities, storefronts and walls, lighting, mechanical, restrooms etc.) before finding individual retailer tenants. The market operator has found that small businesses tend to prefer shorter leases, and structures its leases to use profit sharing rather than flat rents, which means that retailers are less concerned about rent increases at the end of each lease term.

Although rents are lower than similar retail space at street level, the market still generates a revenue of over $1.25 million annually for the MTA. The MTA and market operator encourage independent, local businesses to rent its retail spaces, and local businesses appreciate the lower rents they can get from in-station retail as opposed to street-facing retail. However, the MTA does not provide a rent discount to small businesses. One food vendor, a sushi vendor, made over $100,000 per month in revenue (pre-COVID).

Location

59th Street - Columbus Circle Station, New York, NY

Relevancy

Passenger Amenities

Transfer Stations

Activation & Security

Emergent Urban Transformation: The Spring District

Figure i New multi-functional street network, landscaping, and tech offices in the Spring District

Figure ii New market-rate and affordable housing. Some buildings exceed the typical 5-over-2 height limits by using a hybrid light gauge steel structural system.

Figure iii 2014-02-01 The Spring District prior to the arrival of light rail and new development, with large blocks and low density.

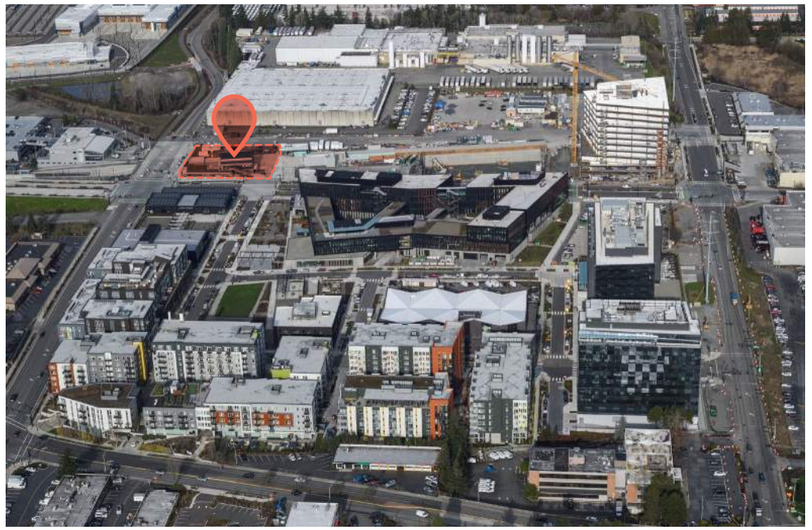


Figure iv 2022-01-28 The Spring District increasing density, block porosity and uses with the arrival of light rail.

The Spring District is an example of an Emergent Urban land use type with a Walk, Bike, and Roll access type located in the urban center of the Bel-Red neighborhood. It is a 36-acre, 16-block site rezoned to allow for up to 150' tall buildings. It is pursuing LEED for Neighborhood Development to guide its sustainability goals and striving to successfully integrate work, live, and play to create the "heart of the East Side".

Prior to the arrival of light rail and new development, the Spring District is a Safeway distribution site in a low density industrial zone with large blocks. With the arrival of the light rail, density is increasing with mixed-uses of predominantly office buildings and planned growth in residential density. The new blocks are short with narrow roadways (limited to 2-lanes) that are tree-lined, along with wide sidewalks that have dedicated spaces for a landscaped buffer and furniture zone, providing protection from the street.

The light rail station is centrally located in the Spring District, between 120th and 124th Avenues NE. The entrance to this open-air station, which has two side platforms and located below street level, has direct and clear connections to the principal pedestrian street with wide sidewalks and a separated bicycle facility. The protected bicycle facility connects to the Eastrail bicycle network, with a hub for cyclists built adjacent to the station, providing facilities such as bike storage, showers, and locker room. The Spring District will also connect to the region by incorporating rapid transit connections to downtown Seattle, Bellevue, and Redmond in 2023. A bus rapid transit stop is a quarter-mile walk from the station. In addition, to accommodate occasional auto access type, pick-up/drop-off curb space has been incorporated along 120th Avenue NE near the station entrance.

To provide a more engaging pedestrian experience and the necessary amenities for a work, live, and play hub, the new buildings within the Spring District are featuring a diverse mix of local independent shops at the ground level. To further support a pedestrian scaled neighborhood and a vibrant living environment, a variety of open spaces for active play, quiet solitude, and gatherings can be found throughout the blocks. These open spaces also act as homage to the larger Eastside network of walking trails and pedestrian corridors.

Location

Bellevue, WA

Relevancy

Emergent Urban Type

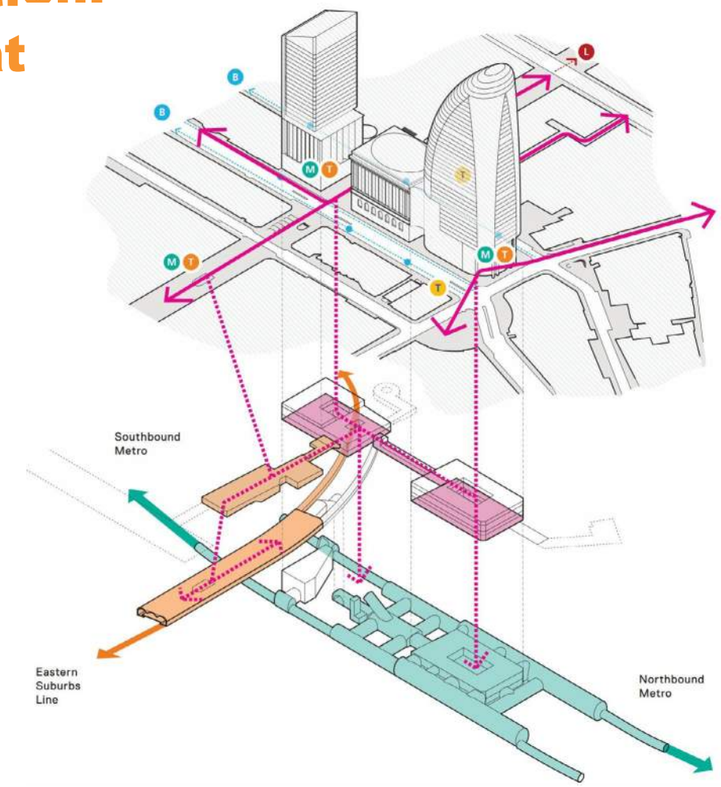
Walkable Urban Scale

Multifunctional Street Network

Appendix C

CASE STUDY #5

Vertical Integration: Martin Place Stat



Sydney Metro's new Martin Place Station is being built by a private developer, Macquarie Group (the world's largest infrastructure asset manager), who is simultaneously constructing a new commercial development directly above the station. The station itself is over 80 feet below ground level and is located in Sydney's Central Business District.

Sydney Metro will retain ownership of the underground station once complete and has sold the air rights above the station to the developer. The revenue from the air rights sale has covered a significant portion of the station construction costs. The new development will seamlessly integrate with the station and surrounding neighborhood by providing public realm improvements and pedestrian tunnels to connect to the surrounding area.

The pedestrian tunnels will include public art displays, enticing pedestrians in to both the station and the retail center. Riders will walk past the retail offerings on their way into the station, which will likely encourage purchases and raise retail revenue and rents in addition to providing rider convenience.

Location

Sydney, Australia

Relevancy

Mixed-Use Joint Development

Below-Grade Stations

Retail

Clockwise from the upper left: Figure i Public Walkway, Figure ii Pedestrian links from stations to street-level desire lines, Figure iii Section showing vertical transportation oriented in the direction of travel, Figure iv Atrium with open spaces extending to the platform level 88' below grade.

Appendix D

Recommended / Required Access Design Features

General Guidance

The design features and guidance provided are elements organized in three separate "realms" - Pedestrian, Curbside, and Vehicle. These are representative of definitive areas directly adjacent to the station. Graphical representations of these realms are intended to help tailor the guidelines in this document. In certain cases, the realms blend with one another, and specific design elements that may apply to both are cataloged in the most representative realm.

"Recommended" value is a general recommendation for the station type and not meant to replace the overall minimum or maximum value provided. Minimums or maximums may be used in any station type in appropriate contexts.

Sources cited represent the most applicable source used as guidance for one or more of the measurements (minimum, maximum, recommended). Engineering judgment was used to develop detailed minimum, maximum, recommended, based on the accompanying descriptions of station type.

Notes

- Mostly in the curb zone, we expect there to be variation in the recommended dimension by station type*
- *Note that when we say "type" we mean the combined access+land use type in the 3x3 matrix
- Where variation occurs, propose alternative dimensions by station type and explain why in terms of passenger experience

Appendix D.1

Pedestrian

TABLE D.1
Access Design Feature Dimensions - Pedestrian

ACCESS DESIGN ELEMENT	DESCRIPTION	SOURCE	RECOMMENDED	VARIANCE (IF APPLICABLE)		
				WALK BIKE ROLL	MULTIMODAL	AUTO
Frontage Zone	When pedestrian zone fronts a building face, wall, fence, or other continuous vertical element	Seattle Right-of-Way Improvements Manual, Chapter 3, Section 3.2	6'			
Sidewalk width (clear path/ throughway)	Pedestrian paths include all pathways in station area (including parking lots and edges of stations)	Seattle Right-of-Way Improvements Manual, Chapter 3, Section 3.2	8'			
Furniture/landscape zone	Area between the curb face of the street and the front edge of the sidewalk clear path/throughway	Seattle Right-of-Way Improvements Manual, Chapter 3, Section 3.2	6'			
Shared use path	For a two-way bike and pedestrian shared-use path	Guide for the Development of Bicycle Facilities, Chapter 5, Section 5.2.1	12'	Narrower allowed if path integrated at station with adjacent sidewalks or other pedestrian amenities (e.g. plaza)		
Sidewalk level bikeway	A bikeway at sidewalk level with buffer between bikeway and pedestrian throughway, or curb	Seattle Right-of-Way Improvements Manual, Chapter 3, Section 3.8	"6' One way/12' Two-way + 2' buffer"	"5' min. one-way/10' min two-way 3' buffer if curbside adjacent to on-street parking "		
Landscaped buffer	Either curbside between travel way and pedestrian/off-street bike infrastructure, or as a buffer between pedestrian and bicycle infrastructure within the pedestrian realm.	Seattle Right-of-Way Improvements Manual, Chapter 3, Section 3.2	6'	Recommended buffer allows for full landscaping, utility placement, and other street furnishings.		
Transit boarding area width	8' width provides clear space to deploy wheelchair ramp. May include clear path of travel, however there should be consideration to provide additional clear path space in congested areas	NACTO Transit Street Design Guide	10'			
Transit boarding area length	*Minimum length should be the length of the largest sized bus in fleet expected to use the stop, non-inclusive of pull-in and pull-out clearance	NACTO Transit Street Design Guide	*			
Clear Zone	Defined as the face of curb to any raised elements	Seattle Right-of-Way Improvements Manual	1.5'			
Curb radius, standard	Recommended (10'): Smaller radii slow turning speeds and reduce pedestrian crossing distance	NACTO Urban Street Design Guide	10'	Context sensitive variances to allow for bus turns in constrained streets when applying minimum lane widths		
Crosswalk width	Wider crosswalks may be appropriate at locations with higher pedestrian volumes.	Seattle Right-of-Way Improvements Manual, Chapter 3, Section 3.8	10'	15'		

Figure i for E.1 - Table E.1 - Access Design Feature Dimensions - Pedestrian

Appendix D.2

Curbside

TABLE D.2
Access Design Feature Dimensions - Curbside

ACCESS DESIGN ELEMENT	DESCRIPTION	SOURCE	RECOMMENDED	VARIANCE (IF APPLICABLE)		
				WALK BIKE ROLL	MULTIMODAL	AUTO
Painted Bikeway, curbside, exclusive of gutter pan [travel way]	5 feet minimum adjacent to a curb or an 8 feet minimum parking lane. 6 feet minimum when adjacent to 7 feet parking lane or where there is high parking turnover	Seattle Right-of-Way Improvements Manual	6'			
Buffered Bikeway, buffer width [painted buffer, no parking/loading adjacent]	Recommend flexible delineators as deterrent for vehicles entering or parking in bikeway or buffer zone.	FHWA Separated Bikeway Planning and Design Guide, Chapter 5 (May 2015)	2'			
Protected Bikeway, in-street with raised buffer, curbside	Widths of 7' and greater are preferred as they allow for passing or side-by-side riding. Additional care should be taken with wider lanes such that the separated bike lane is not mistaken for an additional motor vehicle lane.	FHWA Separated Bikeway Planning and Design Guide, Chapter 5 (May 2015)	7' + 3' buffer			
Transit boarding island width	An accessible boarding area, typically 8 feet wide by 5 feet long, must be provided to permit boarding maneuvers by a person using a wheelchair (ADA Std. 810.2.2). Consider wider width if shelters are provided on island. If leaning rails or fence are installed along the accessible boarding area, the total island width usually must be increased to 9 feet. Max represents width of boarding island if stops are on both sides of island.	NACTO Transit Street Design Guide, Seattle Right-of-Way Improvements Manual	10'	8' allowed in constrained spaces		
On-street parking/loading stall width (distance from face of curb), standard parallel	Any buffers between parking and bicycle facilities should be counted beginning at 8' from the curb where parking exists.	NACTO Urban Street Design Guide	8'	7' min.		
On-street parking/loading stall width (distance from face of curb), standard perpendicular	Travel lane assumed to be parking aisle	The Dimensions of Parking, ULI, 5th Edition	18'			
On-street parking/loading stall width (distance from face of curb), 45 degree angled	Travel lane assumed to be parking aisle	The Dimensions of Parking, ULI, 5th Edition	17'-7"			
Parking/loading stall length, standard	*20' if between 2 other parking stalls or obstructions, 18' otherwise		18' / 20'	"20' if between two other stalls, 18' otherwise"		
Street intersection/access/driveway angle (degrees)		NCHRP Report 500, Volume 12	90 deg			

Figure i for E.2 - Table E.2 - Access Design Feature Dimensions - Curbside

TABLE D.3
Access Design Feature Dimensions - Auto

ACCESS DESIGN ELEMENT	DESCRIPTION	SOURCE	RECOMMENDED	VARIANCE (IF APPLICABLE)		
				WALK BIKE ROLL	MULTIMODAL	AUTO
Travel way		NACTO Urban Street Design Guide	10'	"11' (to accommodate two-way bus flow with curbside constraints, e.g. a 22' curb to curb width) 9' minimum allowed for turn pockets or two-way left turn lane"		
Limited access street (width)	Depending on needs, alley can allow for vehicle access with as little as 8' for a travel lane	NACTO Urban Street Design Guide	20'	"Narrower allowed for one-way or for limited access streets **Check alternative streets for frontage access when considering fire access design"**		
Median island	Assumes median necessary for adequate pedestrian crossing refuge waiting area and landscaping opportunities	NACTO Urban Street Design Guide	8'	Narrower medians acceptable if constraints are present, however consultation on specific planting opportunities should be conducted.		
Advance stop bar setback from crosswalk	For stop bars more than 20 feet from the intersection to allow for large vehicle or transit turns, install Stop Here on Red (MUTCD R10-6), and STOP pavement marking.	NACTO Urban Street Design Guide	10'			
Distance between legal crossings	*Crossing locations should follow pedestrian desire lines based on station context and layout. Distance can be below min. in station areas where desire lines would warrant (as low as 50')	NACTO Urban Street Design Guide	*120'			
Speed limit, City street abutting station area		NACTO Urban Street Design Guide	20 mph			
Speed limit, City street internal to station area		NACTO Urban Street Design Guide	10 mph			

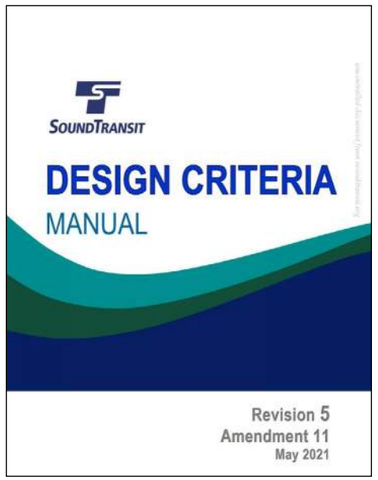
Figure i for E.3 - Table E.3 - Access Design Feature Dimensions - Auto

Appendix E

Reference Documents

Design Criteria Manual

The Sound Transit Design Criteria Manual, often referred to as the "DCM" is a technical comprehensive guide to all of the design requirements to complete a station. This document is directed towards engineers, architects, and contractors for the station, track, parking garages, and required support infrastructure needed for these projects.



Standard Specifications

Sound Transit Standard Specifications are the required sections of product performance requirements and acceptable materials that are to be provided in stations. These are typically included in a station project manual as part of the contract documents.

System Access Implementation Plan

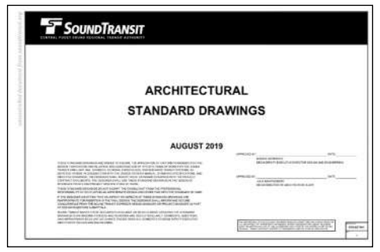
System Access Strategic Plan funds access improvements for Sound Transit stations and facilities including non-motorized access, bicycle parking and facilities, bus transit access and expanded drop-off/pick-up as needed.

The System Expansion Implementation Plan

This provides a timeline, map, and team structures for the major capital projects in ST3, along with a list of partnering agreements and a concurrency matrix. These schedules have since been updated with the Realignment Plan.

Architectural Standard Drawings

Sound Transit Standard Drawings provide typical detailed drawings that relate to station and track alignment construction for architects, engineers, and designers to reference during the station design and construction process.



Transit Oriented Development (TOD) Program

The most up-to-date information about Sound Transit's TOD program can be found in their quarterly reports.

Sustainability Plan - 2019 Update

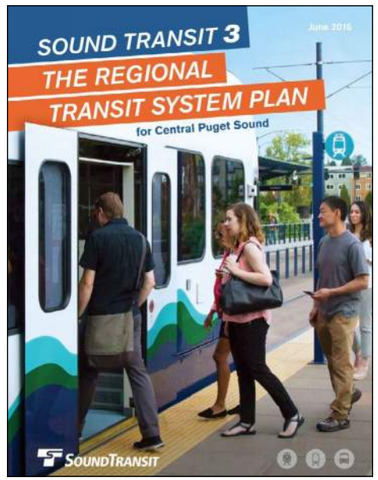
The Sustainability Plan explains Sound Transit's long and short term vision and sets priorities to remain a regional and national sustainability leader.

Customer Signage Design Manual

Sound Transit's Customer Design Manual illustrates the signage strategy throughout the entire system including Light Rail, Bus, and Sounder signage. Detailed drawings are included of each sign type, typical support details, and recommended placement to optimize passenger experience. An updated version is in progress.

Sound Transit 3 The Regional Transit System Plan

Describes the current plans for the third phase of planning for Link Light Rail projects, extensions to the existing Bus Rapid Transit Program, and Sounder. The Link will be expanded to the north up to Everett, west to Ballard and West Seattle, east to Redmond, south Kirkland and Issaquah, and south to Federal Way and Tacoma.



Board Policies

Resolutions adopted by the Sound Transit Board to reinforce regional plans and system policies:

- Resolution No. R2018-10: Adopting an Equitable Transit Oriented Development Policy
- Resolution No. R2013-03: System Access Policy
- Resolution No. R2010-21: Sound Transit Public Art Policy
- Resolution No. R2007-12: Establishing a Sound Transit Sustainability Initiative

Appendix F

Passenger Experience Tables

Table F.1 Passenger Experience During Normal Operation

		Steps	Definition of Function	Passenger Experience Definition (Emotions)	Basic Decisions	Reference
Origin Station		01 Station Environment	This is the area outside the Station Entrance which leads passengers to access the Link light rail system. This space could include other transit modes, pick up/drop off, paratransit, bike circulation, automobile circulation, parking, additional plaza, and Transit Oriented Development. This also refers to land and street network beyond the station, defined by the 10-minute or greater walkshed, under the jurisdiction of the local land use authority. It can also be a development for integrated station entrance.	Passengers should feel certain that they can find and be guided to the station entrance to ride Link light rail. Crowd management will also typically happen in the station area, if needed.	Primary: Orient oneself, regardless of mode used to access the station environment, and identify the station entrance. Secondary: Payment for transfer from other mode of transportation (Sounder, parking, bike piking etc.), circulation route to entrance	See Section 4
		02 Station Entrance	This is the entry point for passengers to enter the Link light rail system owned and operated by Sound Transit. It is the entry threshold of the station structure.	Passengers should feel certain that they have arrived at the right Link light rail station with the right line. Passengers should feel confident that this is the station access that will take them to the Link light rail system. Ideally, Passengers can see into the station and identify their next decision point, adding to their confidence. Dependability of service should be reinforced at this point in the journey.	Passengers Primary: stop at ticketing or continue towards the platform. If the passengers need fare/tickets, they will be identifying the ticketing area. If they are continuing to the platform, they will be identifying (vertical) circulation. Secondary: Determine when the next train is arriving to determine if they need to hurry or can take their time. This is a key point for providing real-time information / service alerts. Passengers may look for a restroom at this point.	See Section 3
		03 Unpaid Area (Include Ticketing)	This is the area between the Station entrance and the fare validation threshold. This is also the area passengers can learn what station they can journey to within the Link system. This is the area where passengers can purchase their choice of fare to journey on the Link light rail, and/or reload their ORCA card.	Passengers should feel informed on the choice of fare offered to them. Passengers should be confident in using the Ticket Vending Machine and feel safe completing the transaction for their fare. Passengers should experience fairness while queuing for the Ticket Vending Machine. Passengers can also experience options of retail that enhance their journey in this area if retail is offered at the station. Crowd management will also typically happen in the unpaid area.	Passengers decide on their destinations within the Link light rail system and what form of tickets to be purchased (if they haven't already). Passengers may also choose to reload their ORCA card.	See Section 3
		04 Fare Validation Threshold	This is a distinct threshold where passengers will cross and know that they have entered an area where fare is required. This is also where passengers can validate their fare, by tapping on, if using ORCA.	Passengers should feel confirmed and at ease that they have paid the fare and feel calm journeying past the Fare Validation Threshold and into the paid area of the station.	Passengers understand they must pay to enter by "tapping on" with their ORCA card at this threshold, or by having a paid paper or electronic ticket on their person.	See Section 3

Table F.1 (continued)
Passenger Experience During Normal Operation

		Steps	Definition of Function	Passenger Experience Definition (Emotions)	Basic Decisions	Reference
Origin Station	Paid Area	05 To Platform	This may include horizontal and/or vertical circulation that will bring the passengers from the Fare Validation Threshold to the platform.	Passengers should approach their Link light rail platform at ease and be informed and feel confident that the horizontal and vertical circulation are available to them to get to the correct platform.	Passengers decide which direction and method/circulation path to take to reach the appropriate platform for their relevant train. Passengers may look for a restroom (if available) at this point.	See Section 3
		06 At Platform	This is an area for passengers to wait for their train.	Passengers should feel informed, calm, and confident that they have arrived at the correct platform for their Link light rail line towards their destination station or transfer station. Passengers should feel comfortable and safe while waiting. Passengers should be informed of the estimated arrival time of their train and trust that the information is correct. Dependability of service should be reinforced at this point in the journey.	Passengers decide which train to board to get to their destination.	See Section 3
		07 On Board Link	This is the Link light rail vehicle that transports passengers from one station to other stations.	Passengers should feel confident that they have boarded the right Link light rail line towards their destination station or transfer station. Passengers should feel comfortable and safe while riding. Passengers should be informed on the progress of the Link light rail line that they are on and feel confident when to deboard.	Passengers must decide when to deboard. Should a service disruption occur, tools to allow for resiliency should be available (technology).	

Table F.1 (continued)
Passenger Experience During Normal Operation

		Steps	Definition of Function	Passenger Experience Definition (Emotions)	Basic Decisions	Reference
Link to Link Transfer	Paid Area	08 At Platform	This is the area where passengers deboard the Link light rail vehicle and arrive at the platform.	Passengers should feel confident that they are along the correct path to the next platform for their connecting train. Passengers should not experience any fare validation when proceeding to their connecting Link light rail vehicle.	Passengers must decide to deboard and orient themselves.	See Section 3
		09 To Platform	This may include horizontal and/or vertical circulation that will bring the passengers from the platform where they deboard the train to the platform for their connecting train to continue their journey on Link light rail. There may be instances where passengers will not experience this sequence if they are transferring on the same platform because two lines of Link light rail are serving the same platform.	Passengers should flow towards their connecting Link light rail platform easily. They should be informed and feel confident that any horizontal and vertical circulation are available to them to get to the correct platform.	Passengers decide which direction and method/circulation path to take to reach the appropriate platform for their relevant train. Passengers may look for a restroom (if available) at this point.	See Section 3
		10 At Platform	This is an area for passengers to wait for their connecting train to arrive for them to board.	Passengers should feel confident that they are on the correct platform for their connecting Link light rail line towards their destination station or next transfer station. Passengers should feel comfortable and safe while waiting. Passengers should be informed of the estimated arrival time of their train and trust that the information is correct. Dependability of service should be reinforced at this point in the journey. Passengers may want to sit down with their belongings and wait for their train to arrive.	Passengers decide which train to board to get to their destination.	See Section 3

Table F.1 (continued)
Passenger Experience During Normal Operation

		Steps	Definition of Function	Passenger Experience Definition (Emotions)	Basic Decisions	Reference
	Paid Area	**11 On Board Link**	This is the Link light rail vehicle that transports passengers from one station to other stations	Passengers should feel confident that they have boarded the correct Link light rail line towards their destination station or transfer station. Passengers should feel comfortable and safe while riding. Passengers should be informed on the progression of the Link light rail line that they are on and feel confident when to deboard.	Passengers track the stations progressing and decide which station to deboard. Should a service disruption occur, tools to allow for resiliency should be available (technology).	
		12 At Platform	This is the area where passengers deboard the Link light rail vehicle and arrive at the platform.	Passengers should feel confident that they have deboarded at their destination station and that they can easily find the correct exit from the station. Passengers should feel be informed of the path of exiting based on their destination.	Passengers must orient themselves, and choose a station exit. Depending on the tunnel or elevated station with connected concourse, passengers may choose a station exit at the concourse.	See Section 3
Destination Station	**Paid Area**	**13 Exit Platform**	For elevated and tunnel stations, this may include horizontal and/or vertical circulation that will bring the passengers from the platform where they deboard the Link light rail train towards the station exit.	Passengers should flow towards the station exit that will bring them towards their destination. Passengers should feel informed about the choice of all destinations and exits available and feel able to choose the exit that will bring them towards their destination. Passengers should understand whether and how to validate their fare before reaching the exit to the fare paid zone.	Passengers decide which direction and method/circulation path to take to reach the appropriate station exit. Alternatively, they may still be trying to choose a station exit at this stage of their journey.	See Section 3

Table F.1 (continued)
Passenger Experience During Normal Operation

		Steps	Definition of Function	Passenger Experience Definition (Emotions)	Basic Decisions	
Destination Station		**14 Fare Validation Threshold**	This is a distinct threshold where passengers cross and I know that they have exited from the paid area where fare is required. This is also where passengers can pay the correct fare by tapping off if using ORCA card.	Passengers should feel confident about their action required (if any) to exit the fare paid zone based on their form of payment of fare. Passengers should feel confident that the correct fare has been calculated on their electronic payment.	Passengers decide whether they need to "tap off" with their ORCA cards.	See Section 3
		15 Unpaid Area	This is the area between the fare validation threshold and the station exit. This is the area where passengers can reload their ORCA card.	Passengers should feel informed about the choice of exits available and feel empowered to choose the exit that will bring them towards their destination. Passengers can also experience options of retail that enhance their journey in this area if retail is offered at the station. Crowd management will also typically happen in the unpaid area.	Passengers choose the appropriate exit and leave the station towards their destination.	See Section 3
		16 Station Exit	This is the exit point for passengers to leave the Link light rail system owned and operated by Sound Transit.	Passengers should feel confident that this is the station exit that will take them towards their destination. Passengers can also experience options of retail that enhance their journey in this area, if retail is offered at the station.	Passengers decide which direction to take to get to the exit closest to their destination.	See Section 3
		17 Station Environment	This is the area outside the Station Entrance which leads passengers to their destinations or next mode of transportation that will bring them to their final destinations. Portions of this environment are owned by Sound Transit.	For passengers continuing their journey towards their destination using a different mode of connecting transportation, the passengers should feel guided and flow easily to access that mode of transportation. Passengers should feel informed of estimated arrival of connecting transit. Passengers should feel comfortable and safe while waiting for their connection. Crowd management will also typically happen in the station area, if needed. Passengers should be able to orient themselves in the environment easily, so they know how to get to their destination.	Primary: orienting oneself to location of final destination or connecting transit. Payment for mode transfer or waiting to make a connection. Passengers will want to be informed of scheduled arrival of connecting transit.	See Section 4

Table F.2
Passenger Experience During Normal Daily Shut Down

		Steps	Passenger Experience Definition (Emotions)	Basic Decisions	Reference
		01 Station Environment			
Origin Station		02 Station Entrance	Passengers should be aware of the barricade that blocks them from entering the station, providing certainty the station is closed. Passengers should be informed of the normal operating hours including first/last train information.	Passengers must decide on an alternative mode of travel.	See Section 3
		03 Unpaid Area (include Ticketing)			
		04 Fare Validation Threshold			
	Paid Area	05 To Platform			
		06 At Platform			
		07 On Board Link			
Link to Link Transfer		08 At Platform			
		09 To Platform			
		10 At Platform			
		11 On Board Link			
		12 At Platform			
Destination Station		13 Exit Platform			
		14 Fare Validation Threshold			
		15 unpaid area			
		16 Exit Station			
		17 Station Environment			

Table F.3.1
Surge Events

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
		01 Station Environment	Passengers should experience orderly crowd management and fairness while queuing to get into the Station entrance.	Primary: Orient oneself, regardless of mode used to access the station environment, and identify the station entrance. Secondary: Payment for mode transfer (bus, parking, etc.), circulation route to entrance	Passengers should feel confident they will find the entrance to the station and either purchase fare at a TVM or use mobile ticket. Passengers should feel safe, even if station is crowded. Passengers should be informed if surge is due to a service interruption.	Passengers will need to decide if they should enter the station or find alternate transportation. If they proceed, they should be able to purchase fare, find conveyance to the platform
Origin Station		**02 Station Entrance**	Passengers should experience metering of passenger flow and encounter with ST personnel. Passengers should feel that Sound Transit has the situation under control. Passengers should be informed about how long it will take before they get to the platform and board a train.	Key decision point at which Passengers must decide what to do: Primary: stop at ticketing or continue onto the platform. If the passengers need fare/tickets, they will be identifying the ticketing area. If they are continuing to the platform, they will be identifying (vertical) circulation. If metering is in effect, real-time information provides confirmation of train frequency and informs passengers of service alerts. Passengers may look for a restroom at this point.	Passengers should feel safe navigating their way through the station and purchasing fare. Passengers should feel confident they will be able to complete their trip. Passengers should be informed about the delay/interruption. If long delay, passengers should be informed of alternate transportation.	Passengers will need to decide if they will wait for the train or seek alternate transportation.
		03 Unpaid Area (Include Ticketing)	Passengers should not experience any blockage by other passengers queuing to purchase a ticket from the TVM. During crowding events, Ticket Vending Machines can create a secondary queue. The area should allow for traffic to flow while waiting at TVM or while at the TVM making a transaction. Passengers should feel informed that they can use mobile ticketing instead of waiting at a TVM.	Passengers decide on their destinations within the Link light rail system and what form of tickets to be purchased. Passengers may also choose to pause and reload their ORCA card.	Passengers should feel confident that they are at the right queue for TVM or for platform. Passengers should not experience any blockage by other passengers queuing to purchase a ticket from the TVM. Passengers should feel informed that they can use mobile ticketing instead of waiting at a TVM.	Passengers will need to decide whether to wait at a Ticketing machine or use the mobile ticketing app.
		04 Fare Validation Threshold	Passengers should be given information about electronic ticketing so they can bypass the TVMs if desired. Passengers with ORCA may experience queues at card readers which often block the path of ticket holders. Passengers should be informed that tap on is only needed with ORCA and not paper tickets.	Passengers understand they must pay to enter by “tapping on” with their ORCA card at this threshold, or by having a paid paper or electronic ticket on their person. If the train is at the station, some will decide to just get on the train without fare.	Once at the card reader, ORCA users are confident. Non-ORCA may be confused and try to tape their ticket. Passengers should understand that ORCA cards require a tap, while tickets do not. Passengers may experience queue at the threshold.	Passengers decide whether they need to wait in line to tap, or if they can proceed into the paid area with their ticket.

Table F.3.1 (continued)
Surge Events

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
Origin Station	**Paid Area**	**05 To Platform**	Passengers should experience smooth flow while using horizontal circulation and/or vertical circulation to arrive at the platform. During crowding events, escalators may change directions or be turned off due to capacity/safety issues. During those times security will be present to direct passengers.	Passengers decide which direction and method/circulation path to take to reach the appropriate platform for their relevant train. Passengers may look for a restroom (if available) at this point.	Passengers should feel confident they will arrive at the correct platform	Passengers will need to decide which platform to get to their destination.
		06 At Platform	Passengers should experience Level of Service D or better crowding while waiting for the light rail train.	Passengers decide which train to board to get to their destination.	Passengers may experience crowding at platform. Passengers with mobility challenges should feel confident they will be able to board for priority seating.	Passengers decide which train to board to get to their destination.
		07 On Board Link	Passengers should feel that, though crowded, the trains are safe.	Passengers must decide when to deboard. Should a service disruption occur, tools to allow for resiliency should be available (technology).	Passengers may experience crowding.	Passengers must decide when to deboard. Tools to allow for resiliency should be available (technology).
Link to Link Transfer		**08 At Platform**	Passengers may experience crowding at platform.	Passengers must decide to deboard and orient themselves.	Passengers may experience crowding at platform.	Passengers must decide to deboard and orient themselves.
		09 To Platform	Passengers may experience crowding and queue on their way to the platform for their connecting Link light rail. Passengers may experience metering along their path.	Passengers decide which direction and method/circulation path to take to reach the appropriate platform for their relevant train. Passengers may look for a restroom (if available) at this point.	Passengers may experience crowding and queue on their way to the platform for their connecting Link light rail.	Passengers decide which direction and method/circulation path to take to reach the appropriate platform for their relevant train. Passengers may look for a restroom (if available) at this point.
		10 At Platform	Passengers may experience crowding at platform.	Passengers decide which train to board to get to their destination.	Passengers may experience crowding at platform.	Passengers decide which train to board to get to their destination.
		11 On Board Link	Passengers may experience crowding.	Passengers decide when to deboard. Should a service disruption occur, tools to allow for resiliency should be available (technology).	Passengers may experience crowding. Passengers should be able to deboard.	Passengers decide when to deboard. Tools to allow for resiliency should be available (technology).

Table F.3.1 (continued)
Surge Events

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
Destination Station	Paid Area	**12 At Platform**	Passengers may experience crowding at platform.	Passengers must orient themselves, and choose a station exit. Depending on the tunnel or elevated station with connected concourse, passengers may choose a station exit at the concourse.	Passengers may experience crowding at platform.	Passengers must orient themselves, and choose a station exit. Depending on the tunnel or elevated station with connected concourse, passengers may choose a station exit at the concourse.
		13 Exit Platform	Passengers should be able to exit the platform prior to the next arrival of Link light rail train.	Passengers decide which direction and method/circulation path to take to reach the appropriate station exit. Alternatively, they may still be trying to choose a station exit at this state of their journey.	Passengers should be able to exit the platform prior to the next arrival of Link light rail train.	Passengers decide which direction and method/circulation path to take to reach the appropriate station exit. Alternatively, they may still be trying to choose a station exit at this state of their journey.
		14 Fare Validation Threshold	Passengers may experience queue at the threshold.	Passengers decide whether they need to “tap off” with their ORCA cards.	Passengers may experience queue at the threshold.	Passengers decide whether they need to “tap off” with their ORCA cards.
		15 unpaid area	Passengers may experience crowding.	Passengers choose the appropriate exit and leave the station towards their destination.	Passengers may experience crowding.	Passengers choose the appropriate exit and leave the station towards their destination.
		16 Exit Station	Passengers may be directed to a different exit due to temporary exit closure for entrance only during passenger flow management.	Passengers decide which direction to take to get to the exit closest to their destination.	Passengers may experience crowding.	Passengers decide which direction to take to get to the exit closest to their destination.
		17 Station Environment	Passengers should be able to exit the station environment without blocking by the entry queue.			

Table F.3.2
Single Tracking

		Steps	Planned		Unplanned	
			Passenger Experience Definition (Emotions)	Basic Decisions	Passenger Experience Definition (Emotions)	Basic Decisions
		01 Station Environment				
Origin Station		02 Station Entrance				
		03 Unpaid Area (Include Ticketing)	Passengers should be informed about the delay of the Link light rail network prior to entering the fare validation.	Passengers to decide whether to journey on the Link light rail system or not.	Passengers should be informed about the delay of Link light rail via email/text alerts or station announcements	Determine if they will wait for the next train or take alternate transportation.
		04 Fare Validation Threshold				
	Paid Area	05 To Platform	Passengers should feel confident to flow to the correct platform to wait for their Link light rail that will bring them to their destination.	Passengers should be informed which platform is in service.	Passengers should feel informed about which platform is in service.	Determine which platform is in service
		06 At Platform	Passengers should feel certain that they have arrived at the platform and be able to identify and board the Link light rail line towards their destination station or transfer station with confidence. Passengers to feel informed about the amount of time added to their typical journey.	*Passengers will need to know both northbound and southbound trains will stop on the same platform at the impacted stations. Must be careful to board the correct train.	Passengers should feel confident they will board the correct train that will take them to their destination.	*Passengers should be informed that both northbound and southbound trains will stop on the same platform at the impacted stations. Must be careful to board the correct train.
		07 On Board Link	Passengers should feel informed regarding the side of the train that doors will open on, which may differ from typical operation	Passengers should feel confident they are headed towards their destination.	Passengers should feel informed regarding the side of the train that doors will open on, which may differ from typical operation	Passenger should feel confident they are headed towards their destination.
Link to Link Transfer		08 At Platform	Passengers should have similar experience in navigating to exit the platform to their connecting train that will bring them to their destination.	Passengers will need to know both northbound and southbound trains will stop on the same platform at the impacted stations. Must be careful to board the correct train.	Passengers should be informed about the single tracking and which platform is in service.	*Passengers should be informed that both northbound and southbound trains will stop on the same platform at the impacted stations. Must be careful to board the correct train.
		09 To Platform	Passengers should feel confident they are headed to the correct platform to wait for their Link light rail that will bring them to their destination.	Passengers should be informed which platform is in service.	Passengers should feel informed about which platform is in service.	Determine which platform is in service

Table F.3.2 (continued)
Single Tracking

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
Link to LInk Transfer	Paid Area	**10 At Platform**	Passengers should feel certain that they have arrived at the platform and be able to identify and board the Link light rail line towards their destination station or transfer station with confidence. Passengers to feel informed about the amount of time added to their typical journey.	Passengers will need to know both northbound and southbound trains will stop on the same platform at the impacted stations. Must be careful to board the correct train.	Passengers should be informed about the single tracking and which platform is in service.	Passengers will need to know both northbound and southbound trains will stop on the same platform at the impacted stations. Must be careful to board the correct train.
		11 On Board Link	Passengers should feel informed regarding the side of the train that doors will open on, which may differ from typical operation	Passengers should feel confident they are headed towards their destination.	Passengers should feel informed regarding the side of the train that doors will open on, which may differ from typical operation	Passengers should feel confident they are headed towards their destination.
Destination Station		**12 At Platform**	Passengers should have similar experience in navigating to exit the platform	Passengers will need to be aware they may be deboarding on the opposite platform.	Passengers should feel confident they have arrived at their destination.	Passengers will need to be aware they may be deboarding on the opposite platform.
		13 Exit Platform				
		14 Fare Validation Threshold				
		15 Unpaid Area				
		16 Exit Station				
		17 Station Environment				

Table F.3.3
Disruption of Light Rail Service (with Light Rail Service Substitution)

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
		01 Station Environment				
Origin Station		**02 Station Entrance**	For station that is closed, passengers should experience the barricade that blocks them from entering the station, providing certainty the station is closed. Passengers should be informed about service disruption, with alternate transportation options (such as a service substitute) to continue their journey. For station that is still in service, passengers should be informed about the special service arrangement so that they can decide whether to continue the journey with Link or not. Some expectation of delay to travel (aka added travel time) and duration of disruption (when available) should be given to ensure passengers feel informed about their options.	For station that is closed, passengers to decide whether to ride the service substitute or not. For station that is still in service, passengers to decide whether to enter the station to continue their journey on Link light rail system or not.	Passengers should be informed about service disruption, with alternate transportation options (such as a service substitute) to continue their journey. Some expectation of delay to travel (aka added travel time) should be given to ensure passengers feel informed about their options.	Passenger to decide whether to enter the station to continue their journey on Link light rail system or not.
		03 Unpaid Area (Include Ticketing)	For station that is still in service, passengers should be informed about the availability of and delay to the remaining Link light rail system available to them prior to entering the Fare Paid Zone.	Passengers to decide whether to journey on the Link light rail system or not.	Passengers should be informed about the availability and delay of the remaining Link light rail system available to them prior to entering the Fare Paid Zone.	Passengers to decide whether to journey on the Link light rail system or not.
		04 Fare Validation Threshold		Passengers to decide whether to pay the fare to continue their journey on Link light rail system or not.		Passengers to decide whether to pay the fare to continue their journey on Link light rail system or not.
	Paid Area	**05 To Platform**	This may include horizontal and/or vertical circulation that will bring the passengers from the Fare Validation Threshold to the platform.	Passengers should approach their Link light rail platform at ease and be informed and feel confident that the horizontal and vertical circulation are available to them to get to the correct platform.	This may include horizontal and/or vertical circulation that will bring the passengers from the Fare Validation Threshold to the platform.	Once the passengers get the rider alert or PA announcement passengers to decide whether to journey on the Link light rail system or not.
		06 At Platform	For station that is still in service, passengers should be informed about the special service arrangement.	Passengers should feel confident they will be able to arrive at their destination.	Passengers should be informed about the disruption of their usual journey sequence under normal operation and be informed how to ride the substitute service, and/or informed of the delay to service	Once the passengers get the rider alert or PA announcement, passengers to decide whether to journey on the Link light rail system or not.

Table F.3.3 (continued)
Disruption of Light Rail Service (with Light Rail Service Substitution)

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
	Paid Area	**07 On Board Link**	Rider alerts will be posted onboard informing passengers about the special service arrangement.	Passengers will continue to their destination.	Passengers should be informed of the unplanned disruption to service and resulting delay. If a particular station is not in service, notice will be given at least 2 stations prior unless the passengers boarded at the end of line or the incident is less than two stations away.	Passengers to decide whether to deboard and connect to alternate transit service.
Link to LInk Transfer		**08 At Platform**				
		09 To Platform				
		10 At Platform				
		11 On Board Link				
Destination Station		**12 At Platform**				
		13 Exit Platform				
		14 Fare Validation Threshold				
		15 Unpaid Area				
		16 Exit Station	Passengers would exit a station that is still in service, and should be informed about the special service arrangement on the system so that they can decide whether to trip chain on Link later or not. Some expectation of delay to travel (aka added travel time) and duration of disruption (when available) should be given to ensure passengers feel informed about their options.	Passenger will continue to the bus bridge or exit the station	Passengers should be informed about the alternative mode of public transportation or substitution of service available to them to inform their diversion of their journey.	If passengers decide to deboard Link, they transfer to an alternate mode.
		17 Station Environment	Alternate service stop should be located close to the station, ideally with clear site lines from the station entrance/exit to ensure passengers feel confident transferring from Link to the alternate mode.	Passengers will need to decide which Link Shuttle they should board.	Alternate service stop should be located close to the station, ideally with clear site lines from the station entrance/exit to ensure passengers feel confident transferring from Link to the alternate mode.	Passengers will need to decide which Link Shuttle they should board.

Table F.3.4
Planned or Unplanned Scenario: Station Closure

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
		01 Station Environment				
Origin Station		**02 Station Entrance**	For station that is closed, passengers should experience the barricade that blocks them from entering the station, providing certainty the station is closed. Passengers should be informed about service disruption, with alternate transportation options (such as a service substitute) to continue their journey. For station that is still in service, passengers should be informed about the station that is closed so that they can decide if their journey is affected and whether to continue the journey with Link or not. Some expectation of delay to travel (aka added travel time) should be given to ensure passengers feel informed about their options.	Passengers will need to decide to continue their journey or take the appropriate optional transportation	Passengers should be informed of the closed station(s) and provided options to complete their journey.	Passengers will need to decide to continue their journey or take the appropriate optional transportation
		03 Unpaid Area (Include Ticketing)				
		04 Fare Validation Threshold				
	Paid Area	**05 To Platform**				
		06 At Platform				
		07 On Board Link	Passengers should be informed of the planned station closure and that the train will skip serving this station, at least 2 stations prior to the closed station.	Passengers will deboard at open stations	Passengers should be informed of the unplanned station closure and that the train will skip serving this station, at least 2 stations prior to the closed station.	Passengers will deboard at open stations and follow directions to alternate Transportation to closed stations

Table F.3.4 (continued)
Planned or Unplanned Scenario: Station Closure

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
Link to Link Transfer	Paid Area	08 At Platform				
		09 To Platform				
		10 At Platform				
		11 On Board Link				
Destination Station		12 At Platform				
		13 Exit Platform				
		14 Fare Validation Threshold				
		15 Unpaid Area				
		16 Exit Station	Passengers should be able to exit the station while experiencing a barricade that blocked entering passengers. Passengers should be informed about the alternative mode of public transportation or substitution of service available to them to inform their diversion of their journey.	Passengers will deboard at open stations and follow directions to alternate Transportation to closed stations	Passengers should be able to exit the station while experiencing a barricade that blocked entering passengers. Passengers should be informed about the alternative mode of public transportation or substitution of service available to them to inform their diversion of their journey.	Passengers will deboard at open stations and follow directions to alternate Transportation to closed stations
		17 Station Environment	Passenger needs to get reorientated at the station since Link shuttle may drop off in unfamiliar location. Passengers should feel confident when they arrive at their destination – will they connect to Link, Regular scheduled bus, or be able to navigate to their normal stop at the station.	Passengers need to get reorientated at the station since Link shuttle may drop off in unfamiliar location.		

Table F.3.5
Planned or Unplanned Scenario: Vertical Conveyance (Escalator/Elevator) Outage

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
		01 Station Environment			Passengers should be informed when vertical conveyances are out of service and alternate conveyances. If no alternate conveyance, passenger should be provided information about alternate transportation. If there isn't an alternate vertical conveyance, this may mean taking a train a stop in the opposite direction to access the desired platform to continue on their journey.	Passengers will need to decide to continue their journey or take the appropriate optional transportation
Origin Station		**02 Station Entrance**			Passengers should feel confident they will be able to find alternate vertical conveyances. If no alternate conveyance, passenger should be provided information about alternate transportation.	Passengers will need to decide to continue their journey or take the appropriate optional transportation
		03 Unpaid Area (Include Ticketing)			Passengers should feel confident they can purchase their fare at or near vertical conveyances.	Passengers will need to decide before purchasing fare to continue their journey or take the appropriate optional transportation
		04 Fare Validation Threshold			Passengers should feel confident they will have a card reader available.	
	Paid Area	**05 To Platform**	Passengers should be informed and guided to use other available mode(s) of vertical circulation (e.g., stairs or alternate elevator/escalator location) Passengers should feel confident to flow to the correct platform and wait for their Link light rail that will bring them to their destination.	Passengers must choose an alternate circulation path through the station.	Passengers should be informed to use other available mode(s) of vertical circulation (e.g., stairs or alternate elevator/escalator location) Passengers should feel confident to flow to the correct platform and wait for their Link light rail that will bring them to their destination.	
		06 At Platform			Passengers should feel confident they have arrived at the correct platform	

Table F.3.5 (continued)
Planned or Unplanned Scenario: Vertical Conveyance (Escalator/Elevator) Outage

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
	Paid Area	**07 On Board Link**	Passengers should be informed while riding on the Link light rail and provided with suggestions for alternative route if using the stair is not an option for the passengers, at least 2 stations in advance of the disruption.	Passengers with mobility challenges (assistive device, luggage, stroller) may choose to deboard and connect to an alternate transit service, or deboard at an alternate station.	Passengers should be informed while riding on the Link light rail and provided with suggestions for alternative route if using the stair is not an option for the passengers, at least 2 stations in advance of the disruption.	
Link to LInk Transfer	Paid Area	**08 At Platform**			Passengers should be informed while on the platform and provided with suggestions for alternative route if using the stair is not an option for the passengers. They should be informed about which station has the disruption and options to complete their journey	
Link to LInk Transfer	Paid Area	**09 To Platform**	Passengers should be informed and guided to use other available mode(s) of vertical circulation (e.g., stairs) Passengers should feel confident to flow to the correct platform and wait for their Link light rail that will bring them to their destination.	Passengers with mobility challenges (assistive device, luggage, stroller) may choose to use an alternate transit service, or board at an alternate station.	Passengers should be informed and guided to use other available mode(s) of vertical circulation (e.g., stairs) Passengers should feel confident to flow to the correct platform and wait for their Link light rail that will bring them to their destination.	
Link to LInk Transfer	Paid Area	**10 At Platform**			Passengers should be informed while on the platform and provided with suggestions for alternative route if using the stair is not an option for the passengers. They should be informed about which station has the disruption and options to complete their journey	
	Paid Area	**11 On Board Link**			Passengers should be informed while riding on the Link light rail and provided with suggestions for alternative route if using the stair is not an option for the passengers, at least 2 stations in advance of the disruption.	

Table F.3.5 (continued)
Planned or Unplanned Scenario: Vertical Conveyance (Escalator/Elevator) Outage

			Planned		Unplanned	
		Steps	**Passenger Experience Definition (Emotions)**	**Basic Decisions**	**Passenger Experience Definition (Emotions)**	**Basic Decisions**
Destination Station	**Paid Area**	**12 At Platform**			Passengers should be informed of alternate conveyances at the stations as well as other solutions (I.e.: take the train to the next station and return on the other platform)	
		13 Exit Platform	Passengers should be informed and guided to use other available mode(s) of vertical circulation (e.g., stairs). Passengers should feel certain that they can get to the station exits.		Passengers should be informed and guided to use other available mode(s) of vertical circulation (e.g., stairs). Passengers should feel certain that they can get to the station exits.	
		14 Fare Validation Threshold			Passengers should feel confident they will have a card reader available.	
		15 Unpaid Area				
		16 Exit Station			Passengers should feel confident they are able to reach their final destination	
		17 Station Environment				

Passengers wait to board the train at University Street Station

Acknowledgements

Sound Transit:

Multiple Sound Transit departments and groups contributed to the development of this document including:

- **Passenger Experience**: Accessibility, Wayfinding and Signage
- **Design Engineering and Construction Management**: Architecture & Art, Link Extension Project Teams
- **Operations**: Operations Assurance, Facilities
- **Planning, Environment and Project Development:** Land Use Planning and Development, Planning and Integration, Environmental Affairs and Sustainability
- **Portfolio Services Office**: Engineering

A ZGF Architects LLP team created all of the graphics, diagrams, and pages layouts. All text and content was researched, drafted, copyedited, and refined in coordination with the Sound Transit team.

Nelson Nygaard aided in the Station Access and Approach guidelines.

Hatch Consulting provided research and content for the Retail and Joint Development sections, and has ensured 508 compliance.

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Heidi Bullinga: Figure xi for 3.3.1; Figure i and ii for 3.3.3; Figures i and iii for 3.3.5.C; Figure i and iv for 3.3.10; Figures i for 3.3.11; Figure ii for 3.3.13; Figure iii for 3.3.14; Figure i for 4.4.4; Figure ii for 4.5.2, Figure i and ii Case Study #4

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Johnston Architects: Figure ii and iii for 3.2.1, Capitol Hill Library and Maple Valley Library

KPFF: Figure ii for 4.5.3.A

Danielle Lirette: Figure i for 4.5.2.

Andrew Latreille: Figure ii for 3.2.2D, Lincoln Station by Perkins&Will Architects

LMN: Figure iii for 3.1.3, Rendering East Main Station; Figure i for 3.3 and Figure i for 3.3.9, Rendering Lynnwood Link station

Hiroko Masuike: Figure i for 2.3.4.C.v

Sydney Metro and Macquarie Group: Figures i - iv for 4.5.2, Case Study #5 images; Martin Place Station by Grimshaw Architects

Metropolitan Transportation Authority of the State of New York: Figure iv for 3.3.11

Musson Cattell Mackey Partnership: Figure i for 4.5

Mutual Materials: Figure x and xi for 3.3.1

Nathan Pachal: Figures i and ii for 4.5.3.D

Nelson Nygaard: Table 4.1.3

Dave Pearce: Figure iii for 4.5.2

Perkins&Will: Figure iii 3.2.3.A, One of three stations within TransLink's Canada Line Richmond segment

Rolluda Architects: Figure ii for 3.1.3, Rendering 185th St Station

Wright Runstad: Figures iii, iv for Case Study #4

Douglas A. Salin: Figure iii Case Study #2

Gregg Shupe: Figure ii for 4.5.2.C, Avenir Apartments by ICON Architecture

Smiloden Digital Technology: Figure iii for 4.5.2.C

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Ellen Forney: Figure i for 3.2.2.D. Capitol Hill Station, “Crossed Pinkies.”

Kate Sweeney: Figure iii for 3.1.1.; Figure iii for 3.3.16. Redmond Technology Center Station, “Apollonian Gasket.”

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