UNIVERSITY OF UTAH CAMPUS MOBILITY HUB STUDY

(CONDENSED VERSION)

THE UNIVERSITY OF UTAH

WASATCH FRONT REGIONAL COUNCIL

VA U.S. Department of Veterans Affairs

UTA

UDOT Keeping Utah Moving

SALT LAKE CITY

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ZIONS PUBLIC FINANCE

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01

EXISTING CONDITIONS

"I think these mobility hubs will be great to encourage people to use public transit."

- MOBILITY HUB SURVEY PARTICIPANT

CHAPTER NUMBERING HAS NOT BEEN MODIFIED FROM THE FULL REPORT FOR EASE OF MOVING BETWEEN THE CONDENSED AND FULL REPORT VERSIONS

Executive Summary

The purpose of the condensed University of Utah Campus Mobility Hub Study is to provide a synopsis of the full University of Utah Campus Mobility Hub Study. For complete information please refer to the full report. This study is meant to develop optimal locations for the siting of mobility hubs on or around campus. The intent of the hubs is to encourage mode shift through hub proximity to destinations and services, connectivity and seamless transfers, user-friendly programming and wayfinding, and increased safety and security by implementing pedestrian priority and placemaking elements.

This condensed study gives an abridged version of the full report and focuses on the general background, best practices, methods used, and results of the study.
The full study reviews existing conditions and previous studies and analyzes those studies with collected data from public engagement and other sources to select preferred locations for the mobility hubs. It also associates the best practices and emerging trends with applicable case studies are outlined.

Conceptual designs for the preferred locations were created with tailored site specific program elements. These concepts are intented to help stakeholders visualize how the preferred hub sites could be developed. The information gathered for the existing conditions, best practices and emerging trends, case studies, public engagement, site selection and program development, preferred locations, concept designs, and funding and schedule are delineated in the chapters of this study.

Background

This chapter provides a review of existing conditions that played a role in identifying locations for a future mobility hub. The University of Utah's campus is approximately 1,500 acres and is split into four sections: Main Campus, Health Sciences, Research Park, and Fort Douglas. The University is the largest employer in the State and has an additional 32,000 undergraduate and graduate student body of which only 15% live on campus. The Research Park employs an additional 15,000 people. The University Hospital, Huntsman Cancer Institute, and Primary Children's Hospital also receive thousands of patients and visitors each day. Adjacent to the campus is the Veterans Administration (VA) campus, which comprises approximately 80 acres and had more than 600,000 out-patient visits in the last year. The VA Campus is comprised of the Veterans Affairs Hospital, the US Department of Veterans Affairs, and other support services and facilities. The campus supports United States Veterans and their families. These populations contribute to the multimodal traffic arriving to and departing from the study area each day.

Existing Conditions

The University has four main campus areas: Main Campus, Health Sciences, Research Park, and Fort Douglas **as shown on Attachment B in the appendix of the full report.**

1. Main Campus

Main Campus serves as a gateway to the University and includes primary academic buildings. The area is bound by North Campus Drive, South Campus Drive, University Street, and Mario Capecchi Drive. TRAX Light Rail serves this campus along South Campus Drive and Mario Capecchi Drive at the Stadium TRAX Station, South Campus TRAX Station, Fort Douglas TRAX Station, and Medical Center TRAX Station. Students, faculty, and staff are regular commuters for Main Campus. Some surface parking lots and parking structures for vehicle commuters do not connect with established pathways, forcing pedestrians and bicyclists to navigate areas without designated sidewalks.

2. Health Sciences Campus

The Health Sciences Campus is made up of the University Hospital, Huntsman Cancer Center, Primary Children's Hospital, and Medical School buildings. This area is bounded by North Medical Drive, South Medical Drive, Mario Capecchi Drive, and Bonneville Shoreline Trail. The TRAX Light Rail serves the Medical Center TRAX Station on Mario Capecchi Drive. Health Sciences Campus serves the public, students, faculty, and staff. This campus, however, lacks clear pedestrian pathways. Most on campus pedestrian movements are served by underground connections or bridges between buildings.

3. Research Park Campus

Research Park incorporates research facilities, housing, and businesses, along with a few University Buildings such as the School of Dentistry and the University Orthopedic Center. The campus is bound by Red Butte Creek, Foothill Drive, Sunnyside Avenue, and Bonneville Shoreline Trail. Commuters for this campus are

nogoonjade.mn/school/university-of-utah/

predominately employees and students. All roadways in Research Park Campus provide only one sidewalk, with bus and shuttle services provided on both sides of the roadway. Some surface parking lots, parking structures, and bicycle lanes for commuters do not connect with established pathways, forcing pedestrians and bicyclists to navigate these areas without sufficient designated pathways creating dangerous conditions. Research Park has no direct service from TRAX light rail, but is served by UTA bus routes and University Shuttles.

4. Fort Douglas

Fort Douglas comprises of student housing, University departments, and part of the U.S. Army Reserve. The campus area lies east of Mario Capecchi Drive and north of Wakara Way. Commuters for this campus include military, students, faculty, and staff. TRAX Light Rail serves Fort Douglas at the Fort Douglas TRAX Station located at the southern end of Mario Capecchi Drive. Only one bus station serves this campus. The campus is mainly accessed by private vehicles.

In addition to the four campuses listed above, another important area adjacent to the University is the George E. Wahlen Department of Veterans Affairs Medical Center (VA Campus) located south of Main Campus on Foothill Drive. This facility serves veterans, students, faculty, staff, and a variety of Salt Lake City residents. Since there are limited parking spaces at the medical center, most employees park in the Fort Douglas Campus and Sunnyside Park area and use the shuttle services. Transportation to the VA Campus is serviced by TRAX, bus, and VA shuttles.

Modes of Transportation

The campuses are surrounded by regional roadways that convey most of the trips generated in these areas. The campuses serve as a destination to students, the University faculty, and a variety of Salt Lake City residents that work at the Health Sciences or Research Park campuses. Additionally, the Health Sciences and VA Campuses are heavily visited. A variety of transportation modes were identified in the study area.

a) Private Vehicles

Currently, single-occupant vehicles are the most common mode of transportation to get to the study area. Main vehicular access roads are 100 South, North Campus Drive, 1300 East, Guardsman, Foothill Drive, and South Campus Drive. Much of the vehicular traffic to the study area each day arrives via Foothill Blvd, 500 South, North Campus Drive/100 South, and South Campus Drive. Traffic counts on each of these roadways are significant.

b) University Owned and Operated Buses/Shuttles

The University operates several campus shuttles that circulate the campus on six different routes; however, there is currently no coordination between the TRAX and shuttle services. The Blue and Red shuttle services have the highest ridership, serving the outermost areas of the Main Campus and Health Sciences Campus and along Central Campus Drive. The campus shuttle system is free for users.

attheu.utah.edu

c) Utah Transit Authority

The Utah Transit Authority (UTA), provides several modes of public transportation for the University, including buses, Light Rail TRAX, Vanpool, and Carpool. Several buses run through the University area as well as the TRAX Red line (Light Rail), which runs between the University and South Jordan through the downtown area.
Riders can transfer downtown to the Frontrunner Commuter Rail, which runs north/south through the Salt Lake Valley from Ogden to Provo. They can also transfer to the TRAX Green or Blue lines that run to West Valley, the Salt Lake City International Airport, or Draper. TRAX Light Rail serves the southern end of the Main Campus along South Campus Drive and runs north to the intersection of Mario Capecchi Drive and North Medical Drive to serve the Health Sciences Campus. Currently, there are four main TRAX Stations on the University campus: Stadium, South Campus, Fort Douglas, and the Medical Center TRAX Station. The utilization of these stations has largely been determined by the campus topography. Because the Health Sciences Center is the highest area of the University and the Stadium TRAX Station is the lowest area, most students arrive at South Campus TRAX Station and depart downhill at the Stadium TRAX Station. Students and staff can use their University IDs to ride UTA buses, TRAX, and Frontrunner.

d) Shared Mobility

Shared mobility refers to a range of transportation modes that are shared among users. Over the course of just a few years, cities across the country have seen a dramatic change in the shared mobility landscape as non-profit organizations and for-profit companies have leveraged technology and current trends in mobility preferences to give people a wide array of shared mobility options. These modal options include bikesharing, scootersharing, carsharing, peer-to-peer ridesharing, on-demand services, and microtransit.

This has resulted in an increase in options available for making short trips and more alternatives to the car, which aligns with many cities' goals, including Salt Lake City. However, a bi-product of these new mobility trends is the increased competition for space on streets and sidewalks and subsequent conflicts between road and sidewalk users. Shared mobility offerings in the Salt Lake region have significantly expanded in the last decade. From the formation of the City's GREENbike bike share system in 2011, shared mobility offerings have grown to include dockless bike share, dockless e-scooter and ride share fleets. Currently, shared mobility users in Salt Lake City have the choice of GREENbikes, Lime, Bird, Spin, Razor, Avail, Lyft, Uber, Enterprise, and Turo. GREENbike stations are limited to the downtown area and do not currently provide reasonable connections to the campuses. E-scooters are not currently permitted to establish drop-off hubs on the University campus, but scooters are often found on and around campus, left by users. **See Attachment D in the appendix of the full report for GREENbike stations in Salt Lake City.**

e) Biking

In addition to the bike share programs mentioned above, biking to and from campus is an ever increasing mode. The University, in accordance with the 2011 University of Utah Bicycle Master Plan, is increasing the amount of bike and multi-use paths on and around campus. Salt Lake City is also increasing the amount of delineated paths around the campus following their 2015 Salt Lake City Pedestrian & Bicycle Master Plan These paths are making biking to, within, and from the campus easier.

f) Walking

Walking is a fundamental means of travel, particularly in a campus environment. Walking includes travel by foot, as well as the use of personal accessibility devices, such as wheelchairs, electric mobility chairs, and walkers.

02

BEST PRACTICES & EMERGING TRENDS

"The options for protected bicycle lanes to the medical school area are inadequate. As a bicyclist, I have to bike out of my way in order to get safely to the medical school campus."

- MOBILITY HUB SURVEY PARTICIPANT

CHAPTER NUMBERING HAS NOT BEEN MODIFIED FROM THE FULL REPORT FOR EASE OF MOVING BETWEEN THE CONDENSED AND FULL REPORT VERSIONS

Introduction

Mobility Hubs are a new and evolving concept in the United States, and best practices surrounding their planning, design, and operation are still largely being defined within the transportation industry. Research related to the outcomes and efficacy of varying approaches is limited, leaving case studies, local context, and creative problem solving to guide much of the planning and design process. This chapter outlines emerging mobility hub trends relevant to the University Utah Mobility Hub Study and are based on case studies, transit research, and academic and professional organization journal articles and studies. For complete information please refer to the full report.

Emerging Trends

Mobility hubs are a response to six major shifts in urban transportation trends.

1. **More Choices:** In addition to biking, walking, driving, and taking transit, many people have access to on-demand services such as private-for-hire rides (like taxis, Uber, and Lyft), scooter share, bike share, carsharing, and microtransit shuttles.

2. **New Players:** New business models have increased the role of the private sector in transportation and changed the nature of services operating in the public right-of-way.

3. **Behavior Change:** Trip-planning services are changing the way people make decisions about routes, mode, and cost to travel.

4. **Electrification:** Global trends toward electrification of vehicles, combined with locally-adopted goals for reduced greenhouse gas emissions, has increased demand for electric charging options as part of public infrastructure.

5. **E-Commerce:** E-commerce is reducing personal trips to retail stores and restaurants and exponentially increasing the volume of urban delivery and courier trips occurring.

6. **Curb Space Demand:** There is increasing demand for curb space for elements like transit services, rideshare, pick-up and drop off, walkways, bikeways, and freight delivery.

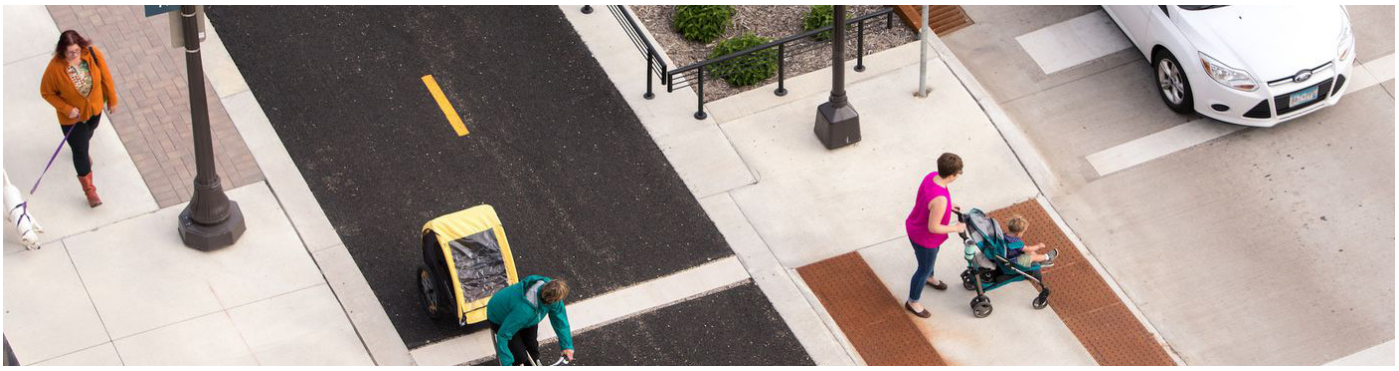
What is Mobility?

Mobility refers to the way people get around, whether that is walking, bicycling, transit, driving, or some other mode. Planning for mobility provides a way to think about transportation systems as a whole with a focus on both how people move and where they are going. Mobility planning includes consideration for the ways in which modal choices interact and how people interface with these systems. While mobility does include use of personal vehicles, mobility planning prioritizes choice, redundancy in the transportation system, and opportunities to reduce single-occupancy vehicle trips. Current and emerging trends are reshaping how we think about those priorities, including **New Mobility** and **Shared Mobility**.

While multimodal trips are most often thought of as walking or riding a bicycle to a transit stop or carpool pick up, New Mobility and Shared Mobility add a range of new options for how people get around, including new combinations that support multimodal trips. Organizing these options and helping people connect to them can improve utility of the system, and one method of accomplishing this is through implementation of mobility hubs.

cyclingutah.com

TYPES OF SHARED MOBILITY	
BIKE SHARING	Provides users with on-demand access to bicycles at a variety of pickup and drop-off locations for one-way (point-to-point) or round-trip travel. Bikesharing systems can be further categorized by their operational models: station-based, dockless, and hybrid.
CAR SHARING	Offers members access to vehicles by joining an organization that provides and maintains a fleet of cars and/or light trucks. These vehicles may be located within neighborhoods, public transit stations, employment centers, universities, etc. The carsharing organization typically provides insurance, gasoline, parking, and maintenance. Members who join a carsharing organization typically pay a fee each time they use a vehicle (SAE International, 2018) (Shaheen et. al., 2016a) (Cohen & Shaheen, 2016).
SCOOTER SHARING	Allows individuals access to scooters by joining an organization that maintains a fleet of scooters at various locations. Scooter sharing models can include a variety of motorized and non-motorized scooter types. The scooter service provider typically provides gasoline or charge (in the case of motorized scooters), maintenance, and may include parking as part of the service. Users typically pay a fee each time they use a scooter. Trips can be roundtrip or one way.
SHUTTLES	Shared vehicles (typically vans or buses) that connect passengers from a common origin or destination to public transit, retail, hospitality, or employment centers. Shuttles are typically operated by professional drivers, and many provide complimentary services to the passengers
TAXI SERVICE	Provide prearranged and on-demand transportation services for compensation through a negotiated price, zone pricing, or taximeter (either traditional or GPS-based). Passengers can schedule trips in advance (booked through a phone dispatch, website, or smartphone app), street hail (by raising a hand on the street, standing at a taxi stand, or specified loading zone), or e-Hail (by dispatching a driver on-demand using a smartphone app).
RIDE SHARING	Defined as the formal or informal sharing of rides between drivers and passengers with similar origin-destination pairings. Ridesharing includes vanpooling, which consists of 7 to 15 passengers who share the cost of a van and operating expenses, and may share driving responsibility.
COURIER NETWORK SERVICES (CNS)	Also referred to as flexible goods delivery, CNS provides for-hire delivery services for monetary compensation via an online application or platform (such as a website or smartphone app) to connect couriers using their personal vehicles, bicycles, or scooters with freight.
MICROTRANSIT	Privately or publicly operated, technology-enabled transit service that typically uses multi-passenger/ pooled shuttles or vans to provide on-demand or fixed-schedule services with either dynamic or fixed routing.
PERSONAL VEHICLE SHARING	Defined as the sharing of privately-owned vehicles, where companies broker transactions between vehicle hosts and guests by providing the organizational resources needed to make the exchange possible (e.g., technology, customer support, driver and motor vehicle safety certification, auto insurance, etc.).
TRANSPORTATION NETWORK COMPANIES (TNCs)	Also known as ridesourcing and ridehailing, TNCs provide prearranged and on-demand transportation services for compensation in which drivers and passengers connect via digital applications. Digital applications are typically used for booking, electronic payment, and ratings.
AUTONOMOUS VEHICLES (AV)	AV are vehicles that can operate with varying levels of operation control without driver input. The National Highway Traffic Safety Administration created a scale of automation for vehicles that allows drivers to know specifically how autonomous their vehicles are from '0' (no automation) to '5' (fully automated with no human interaction needed).
PERSONAL AIR VEHICLE (PAV)	Also referred to as passenger drone, this emerging mode of transportation is still in its infancy but is likely to further shape mobility and development patterns in the coming decades. PAVs provide another form of autonomous vehicle while taking up no space in the typical right-of-way. In order for these vehicles to operate, greater regulation on routes and right-of-way designation is needed.



curbed.com

What is a Mobility Hub?

Mobility hubs are "a central location for a variety of transport related services and amenities and strategic vehicle storage spaces to make it more convenient to combine modes within one trip" (Barth 2019). Mobility hubs most often prioritize transit connection, but not all mobility hubs are directly co-located with transit. In practice, mobility hubs develop as a collection of elements that make it easier to access the shared and active mobility network. These elements can be mixed and matched to create a hyperlocal transportation terminal that is customized for the location.

Mobility hubs are one tool to support the following objectives:

1. Increase access and convenience of multiple modes of transportation while supporting reduced single occupancy vehicle trips:

Mobility hubs are places that enable multimodal trips. Put simply, they allow visitors to arrive via one mode and depart another. Consolidating mobility options at mobility hub sites increases the convenience and practicality of choosing modes other than personal vehicles. While a segment of the trip may still utilize a single-occupancy vehicle trip in a personal vehicle, the additional mode or modes chosen for the remainder of the trip are self-powered or shared trips. The benefits of increased access can mean fewer drive alone trips and reduced vehicle miles traveled, reduced congestion, and recognition of the inequities in our transportation systems. Reducing single occupancy or personal vehicle trips also helps us to reduce greenhouse gas emissions and improve air quality while also creating a more balanced transportation system better serving those unable or uninterested in driving a personal vehicle.

2. Create a more seamless, desirable experience for transit linked trips:

Consistent with improved access and convenience, mobility hubs can create a more seamless experience with increased options for multimodal trips. Transfers can contribute to the time, planning, and resources necessary to complete a transit trip. Transferring between transit systems or lines is often cited as the biggest reason for travelers to either give up on riding transit or avoid the choice to take transit altogether. This can be because of the time added to the trip, complications of managing multiple fares or a transfer pass or unfamiliarity with the transit network.

A mobility hub co-locates several mode opportunities in one place, increasing the choices users have to fine tune the efficiency of their trip. A well-designed mobility hub and transportation network can also provide integrated payment options and real time transit information. The provision of additional shared mobility options at transit facilities can improve customer experience by reducing wait times associated with transfers, and increasing trip flexibility and reliability through the provision of on-demand app-based services.

3. Manage private mobility services to align with local goals:

Local governments are working to accommodate and partner with private mobility services which are different than the public mobility services of the past. Mobility hubs can help align the interests of the public and private sectors in partnerships to enable or regulate mobility options. While contracts and permits are the primary tools available to local jurisdictions for regulating shared mobility service providers, mobility hub planning offers an opportunity for designing specific areas for shared fleet parking, charging or pick up and drop off areas. Cities can require private mobility services to use mobility hubs as well as control

access to the mobility hubs and therefore incentivize or enforce city goals and policies. Moving private mobility services to mobility hubs may alleviate pressure on existing congested curbs or extend ridership access for equity concerns. Mobility hubs may also offer amenities desirable by the private mobility services like EV charging station, staff support for assisting unbanked riders to access services or ADA accessible infrastructure. Finally, private mobility providers whose business and operations model more closely match the goals and priorities of public stakeholders may be offered priority access to mobility hub sites.

4. Improve safety of mobility access

Mobility hubs organize the spaces for standing and stopping as well as parking and storage for various modes of transportation. Organizing these elements improves the functionality and safety of public space for all users, including those walking, using mobility assistance devices, biking, awaiting transit, and using shared mobility options.

The concentration of investment at mobility hub sites can work to achieve a variety of other objectives simultaneously, including:

- Urban design improvements, through the provision of public art, landscaping, lighting, and other amenities

mapc.org

- Transportation system enhancements, through the expansion of mobility options accessible to travelers
- Community development, through services and events available at mobility hub sites
- Economic development, by creating a vibrant space for locating businesses with increased traffic throughout the day
- Climate resilience and sustainability, through the installation of solar panels, energy storage infrastructure, and weather shelters
- Additionally, mobility hubs provide the opportunity to provide facility improvements for a diversity of modes and users simultaneously.

altaplanning.com

What Do Mobility Hubs Look Like?

Mobility Hub Components

Mobility hubs may include a variety of elements to support different trip types. The combination and range of elements will vary based on the collection of modes and services available at each mobility hub location. The following image provides an example of common mobility hub elements and their applicability based on hub context and scale:
These elements require physical and digital infrastructure to support the range of options available with clear organization to facilitate user decision making and navigation of the space.

Considerations for Site Selection & Mobility Hub Design

To achieve the objectives outlined in the previous section, mobility hubs must be carefully sited and designed to support multimodal trips and improve the utility of shared mode options.

At minimum, mobility hub siting and design should feature:

- **Multimodal transfer opportunities with transit as the backbone service:** Transportation amenities and services at the site should integrated transit with shared mobility options such as bike share, scooter share, car share, or ridehailing.
- **Flexible design:** Spaces within Mobility Hubs should be flexible spaces to accommodate a variety of uses including: parking, active loading and unloading, seating, conversing, public art, vendor fairs, mobile markets, or Farmers Markets. The businesses and technologies of new mobility are ever changing and require a flexible urban design for low-cost, fast-changing, responsive space.
- **Enhanced urban design features and services that create a more comfortable and stimulating environment for mobility hub users:** These features and services could include lighting, security cameras, public art, landscaping, seating, food carts, and more.

MOBILITY HUB ELEMENTS

	LEVEL 1: CONVENTIONAL BUS STOP	LEVEL 2: DISTRICT/TOWN CENTER MOBILITY HUB	LEVEL 3: FIXED GUIDEWAY MOBILITY HUB	LEVEL 4: MAJOR MOBILITY HUB
Bus Stop	●	●	●	●
Fixed Guideway Transit Stop (BRT, LRT, or Heavy Rail)			●	●
Transit Ticket Kiosks			○	●
Seating	● *	●	●	●
Shelter/Shade Structure	● *	●	●	●
Indoor Waiting Area			○	●
Scootershare Parking	○ *	○	●	●
Bikeshare Parking	○ *	○	●	●
Short Term Bike Parking	● *	●	●	●
Long Term Bike Parking			○	●
Personal Vehicle Parking			○	
Carshare		○	●	○
Electric Vehicle Charging		○	●	○
TNC Drop Off/Pick Up		○	●	●
Wayfinding	○	●	●	●
Real-Time Information		○	●	●
Wifi Hub		○	●	●
Water Fountains		○	●	●
Restrooms			●	●
Sidewalks	●	●	●	●
Safe Pedestrian Crossings	●	●	●	●
Dedicated Bike Infrastructure	○	○	●	●
Active Public Space			○	○
Convenience Retail			○	○

+ Possibilities also include gyms/showers, convenience day care, package delivery, etc

○ Recommended
● Required
* At high ridership locations

- **Careful consideration of equity opportunities and challenges:** Mobility hub project teams must examine sidewalk, bike lane, and transit connectivity from historically underserved neighborhoods to mobility hub sites. Including infrastructure upgrades in the surrounding area may improve the ease and safety of low-income riders accessing mobility hub services. Additionally, project teams should consider how low-income and unbanked riders will access services present at the site. Including cash payment options and working with service providers to reduce or remove fines for low income riders reduces barrier to entry for many living within underserved communities.

In addition to siting and design, mobility hubs require features that are not part of the built infrastructure. **They rely upon a partnership of transportation services and programmatic alignment by the transportation services at that hub.** Done well, this allows for seamless transfers between modes with schedule alignments and universal fare payment options. Without coordinated operations at the core of the transportation system, a mobility hub cannot operate to its fullest ability.

Mobility Hub Best Practices

The following section outlines common themes emerging from review of mobility hub examples, existing literature, and emerging trends and practices. Limited research has been conducted to evaluate the effectiveness of strategies applied to built/operating mobility hubs. Additionally, local land use and transportation context substantially influences each mobility hub. The fast change of pace within the shared mobility and emerging technologies industry is presenting new opportunities/considerations for mobility hubs on an almost weekly basis. Within this dynamic landscape, the following have emerged as common themes when planning and designing mobility hubs:

1. **Cohesive, Human-scale Design:** When considering what differentiates a mobility hub from any other bus stop or station that may have a bike share station or shuttle pick-up nearby, the critical feature is cohesive and intentional design that connects multiple modes to one another and puts the needs of the individual traveler first. Thoughtful detail in design creates an experience that nudges travelers toward a preferred mode, when multiple options are provided, and this nudge is ultimately what enables a mobility hub to achieve performance targets and help in advancing transportation system goals.

www.pps.org

2. **Curbside Management:** Active loading and unloading are key components of a mobility hub, requiring a complex mix of transit and private mobility services. Organizing a safe and efficient space for this activity is critical for a successful mobility hub. Mobility hub design can help organize transportation amenities so they conflict less and offer safe pedestrian access.

3. **Parking for Desired Modes:** Availability of parking can serve existing demand, as well as induce demand. Cities and agencies are aligning mobility hub parking accommodations with local policy and transportation performance goals. This often means designing sites to accommodate and incentivize sustainable transportation options — such as modes that are electric-powered, low-or no-emission, human-powered, multi-passenger, and, in some cases, operated as a shared fleet. This can be achieved through a diversity of strategies, such as providing secure short-term and long-term parking for bicycles and boards, offering discounted or priority parking passes to carpoolers, placing electric charging infrastructure in highly visible locations, and limiting the availability of parking for personal, single-occupant, non-electric cars.

4. **Public Space (Placemaking):** Creating a comfortable and enjoyable public space through the installation of public art, landscaping, seating, lighting, and other pedestrian amenities will help activate mobility hub sites and create an environment for people to gather or linger.

5. **Retail & Amenities:** On-site or adjacent retail opportunities would also help activate mobility hub spaces. The presence of small coffee shops, food carts, or other user-serving businesses may reduce further trips, attract users to the site, and provide opportunities to enjoy the site while awaiting or deboarding transit. This can also serve to provide healthy food access in a food desert, or solve other equity issues in an area.

6. **Programming & Operations:** Beyond the physical infrastructure of the site, programming and operations decisions can improve the traveler experience and directly align with travel demand management (TDM) efforts. Ambassadors and integrated payment options are two examples.

   Multimodal Transit Cards can address the inconvenience of payment transactions, which is a significant barrier to transit use and multimodal trip linking. A single payment system or card that can pay for parking, fares on buses, trains, ferries, ride-sharing companies, and micro-mobiilty rentals may help reduce this inconvenience and encourage people to use multiple modes for a single trip.

7. **Wayfinding & User Information:** Enhanced wayfinding at and around the mobility hub sites should help direct users to the transportation services they need and key destinations they may wish to access. Additionally, real-time transit signage should give riders an estimate of when they should expect buses or rail vehicles to arrive. Nimble, digital signage and information kiosks can assist travelers with mobility planning, shared payment opportunities, and provide opportunity for other evolving applications as they emerge.

8. **First Mile/Last Mile Access:** Mobility hub projects may benefit from enhancements to sidewalk, bike lane, or transit connectivity to the site. These improvements include intersection design and should be packaged into the mobility hub project itself or pursued through separate near-term planning initiatives.

9. **Electrification:** Charging considerations for mobility hubs has increasingly included micromobility devices and electric bus options. New players in the private sector are creating micromobility docking stations that can be used to charge bikes or scooters (or potentially other e-devices) whether shared fleets or personal. They also create designated places for more organized parking of micromobility devices. Some cities are also exploring how hub charging infrastructure could provide publicly available charging of electric wheelchairs or electric mobility chairs to provide a new amenity for community members with disabilities.

10. **Urban Freight & Micro-Distribution:** Providing package distribution options, such as Amazon Lockers, could be a convenient amenity for riders utilizing mobility hubs. If well utilized, micro-distribution of urban freight to mobility hub sites may reduce VMT associated with online shopping trends. This is another rapidly changing and evolving sector, best practices include flexible spaces capable of accommodating many different types of deliveries, like drones or large trucks, depending on the location and scale of the mobility hub.

11. **Universal Access and ADA-compliant Accessibility (including non-English languages, paratransit access, adaptive programs, etc.):** Project teams should dedicate time and attention to examining the ADA-compliant accessibility of the mobility hub itself, in addition to the ADA-compliant accessibility of infrastructure leading to the site. Additionally, mobility hub sites should have space dedicated to wheelchair accessible vehicles and paratransit access. If community partnerships exist to offer micromobility programs for persons with disabilities, mobility hubs provide a natural location for community members to access them. This could adaptive bike share rental programs (such as three-wheeled hand cycles, recumbent cycles, and side-by-side tandem bikes), adaptive e-scooter share programs, and other expand transportation options for riders with mobility limitations. Charging infrastructure that allows persons with disabilities to re-power their personal electric wheelchairs or mobility devices is another consideration.

    Services at the mobility hub sites should offer accommodation for non-English speakers. Printed materials, wayfinding signage, and shared mobility apps should, at minimum, provide translations in English and Spanish.

05

SITE SELECTION & PROGRAM DEVELOPMENT

"I think 200 South would be great for connecting to neighborhoods like The Avenues or Federal Heights where normal bus service isn't great. It would also be nice to have a quick way to get downtown for lunches or errands without having to use a car."

- MOBILITY HUB SURVEY PARTICIPANT

CHAPTER NUMBERING HAS NOT BEEN MODIFIED FROM THE FULL REPORT FOR EASE OF MOVING BETWEEN THE CONDENSED AND FULL REPORT VERSIONS

Introduction

This chapter identifies sites that are viable for development as a mobility hub, and sets forth the general process administered to establish and refine the mobility hub locations. (The specific items considered for the qualitative and quantitative analysis can be found in the full report.) The principles guiding mobility hub placement and typologies are also addressed. For complete information please refer to the full report.

Locating a Mobility Hub

Where do mobility hubs belong?

The Study partners have identified mobility hubs as a transportation system element that has the potential to advance goals related to mode share and congestion management, if developed and implemented strategically. The Mobility Hub Typology provides a framework for the early process of defining the mobility hub concept and illustrating its relationship to the study area's land use and transportation context. This relationship is rooted in an understanding that:

Transportation choice is influenced by:

- Land use density
- Multimodal transportation network density, including transit density and service level
- Density of destinations
- Community demographics and individuals' ability to access transportation options
- A range of policy and programmatic structures already in place in the study area (such as cost of parking, shared mobility service areas, and transportation demand management activities)

Mobility hub development is influenced by:

- Space within the public right-of-way
- Land use zoning (permitted uses)
- Availability and cost of parcels outside of the right-of-way
- Land owners
- Site constraints
- Scale of hub site design/intended programming
- Existing/prior investments in infrastructure (such as TRAX stations)

Planning & Siting Process

Mobility hub siting and planning must account for this range of factors. Success is contingent on identifying feasible locations for mobility hub investment that are also appropriately located to support transportation choice and advance locally-determined goals. While a Mobility Hub Typology does not identify these locations, it provides the foundation for how to identify those locations and how to program and design identified sites to best suit the area's varied contexts. The following section explains further how the Mobility Hub Typology fits within a planning and siting process.

An outcomes-driven approach to siting mobility hubs

STEP 1 — QUANTITATIVE ANALYSIS

A Suitability Analysis maps for the factors identified as influencing transportation choice to determine areas most suited for clustering transportation choices. The step is focused on measuring need and demand.

STEP 2 — TYPOLOGY

A Mobility Hub Typology is a tool for determining the type and scale of the mobility hub that would serve suitable areas based on anticipated demand and context.

STEP 3 — QUALITATIVE ANALYSIS

Building on the quantitative analysis, a Prioritization and Feasibility Analysis establishes criteria to further narrow areas of suitability based on alignment with goals and implementation considerations for candidate sites (such as available right-of-way, potential land acquisition or potential land-owner partnerships, and permitted uses).

STEP 4 — SITE DESIGN & PROGRAMMING

A conceptual design is crafted to fit within a selected site and reflect the appropriate mobility hub type. This step includes such details as access routes, ingress/egress, transit operational needs (e.g. number of bus bays, layover facilities, or similar), micromobility operational needs (e.g. parking capacity, payment kiosks, loading/unloading for rebalancing vehicles, or similar)

Quantitative Analysis

Methods

The quantitative mobility hub analysis measures relative demand for a mobility hub using four major inputs:

- **Origins** and **Destinations** – defined as work places, residences and activity centers
- **Transit Access** – defined as boardings and alightings at light rail stops, bus stops and campus shuttle stops
- **Active Transportation** – defined as bicycle and pedestrian network density, observed activity

These four inputs were used to create a hexagon-based heat map that indicates areas suitable for development of a mobility hub. Details of the analysis factors, data sources, and scoring methods are shown in the table on the following page. This table also shows a recommended weighting for each factor. This weighting reflects each criterion's expected influence in mobility hub performance. The screening analysis resulted in a heat map used to identify eight preliminary sites. These sites were assigned a tier based on their development timeline.

Tiered Hub Designations

- **Tier 1** are hub locations that have the capacity to be developed or redeveloped currently or near term (0 – 5 years).
- **Tier 2** are hub locations that have the capacity to be developed or redeveloped mid term (5 – 10 years)
- **Tier 3** are hub locations that have the capacity to be developed or redeveloped long term (10+ years).

Research Park Mobility Hub Quantitative Analysis

Executing a quantitative analysis for the siting of mobility hubs encountered some unique challenges in Research Park. Research Park is currently a predominantly auto-dependent development. This stems from many factors due to the era in which Research Park was planned and developed including ample vehicular parking, homogeneous zoning, limited biking and walking infrastructure, and limited transit options. Research Park is currently undergoing a master planning process which seeks to change its auto-dependent character into a rich, walkable district. However, the transportation and land use changes specified in the master plan will take time to implement.

While the intent of this study is to identify mobility hub sites, design improvements, and construct new infrastructure within approximately five years, Research Park will likely require more time before its land use and transportation infrastructure has evolved to fully support and leverage mobility hub investments. To account for this future substantial change in conditions, the Planning Team ran the future Research Park land use program through the "Origins and Destinations" analysis specified in the quantitative analysis. Transit access and active transportation inputs were not included given the uncertain nature and location of future improvements. This analysis demonstrated that given implementation of planned land use changes in Research Park, areas of high mobility hub suitability will develop over time. See page 40 for the Research Park Future Origins and Destinations Suitability.

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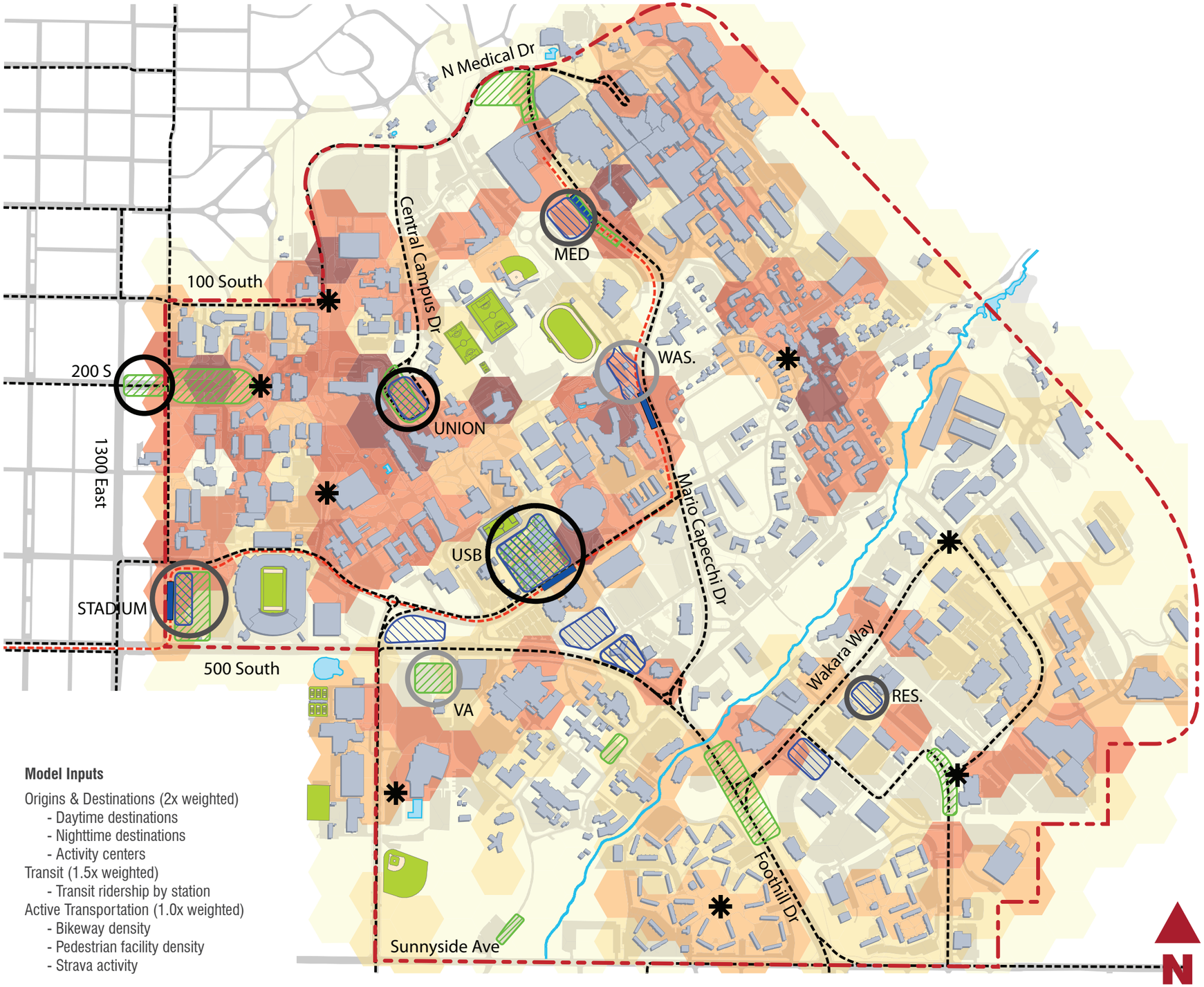
Composite Suitability Map for Mobility Hub Siting

Legend

- Higher Demand
- Lower Demand
- Stakeholder/Design Team Sites
- Existing Conditions Report Locations
- Micro Hub Locations
- Light Rail Line
- Light Rail Stations
- Bus Routes
- Tier 1 Hub
- Tier 2 Hub
- Tier 3 Hub

Potential Hub Summary

USB.	277,270 sf	6.4 ac
200 S	42,448 sf	0.9 ac
UNION	161,692 sf	3.7 ac
STADIUM	64,638 sf	1.5 ac
VA	72,458 sf	1.6 ac
WAS.	54,298 sf	1.3 ac
MED.	47,126 sf	1.1 ac
RES.	38,940 sf	0.9 ac



Model Inputs

Origins & Destinations (2x weighted)
- Daytime destinations
- Nighttime destinations
- Activity centers

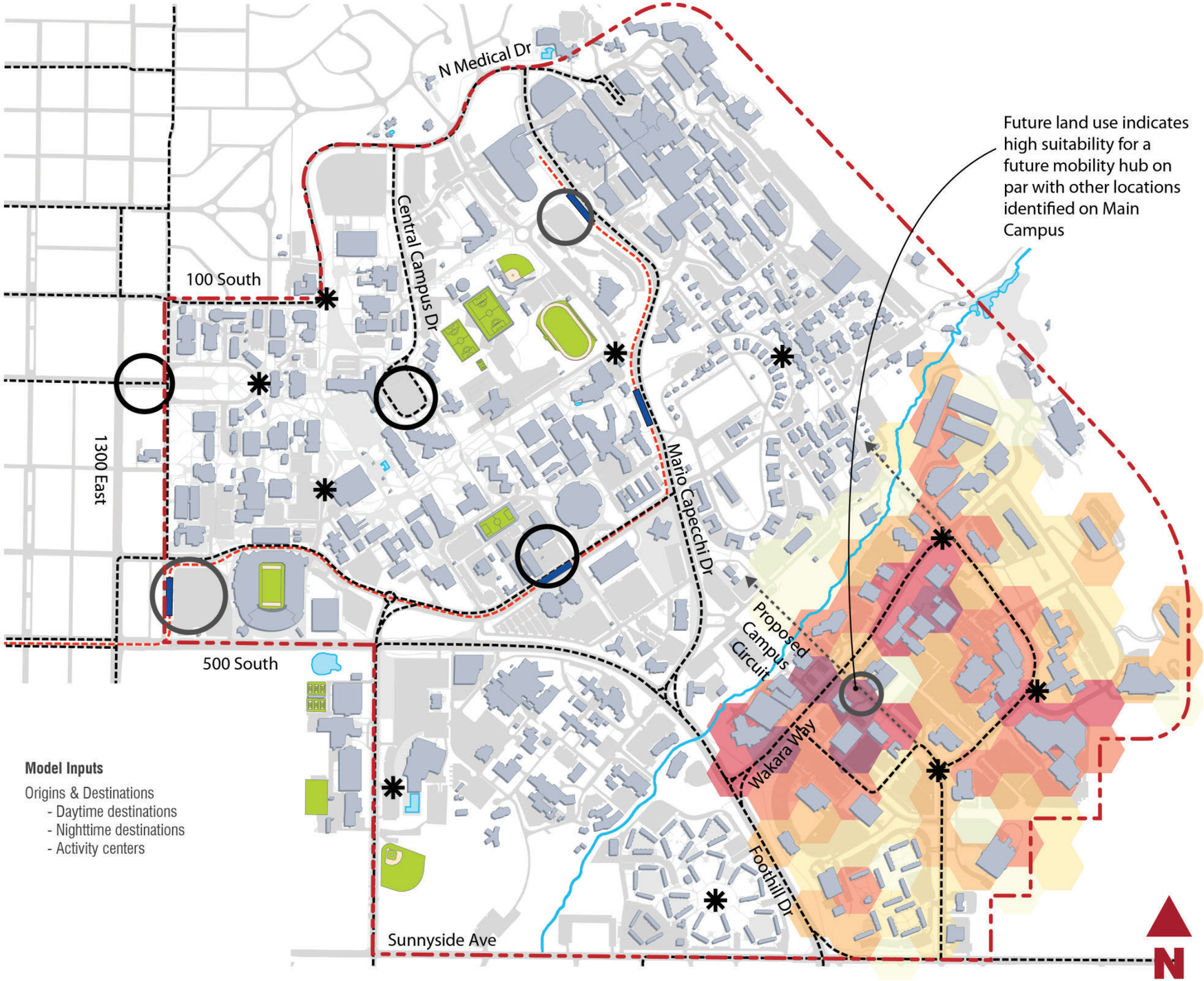
Transit (1.5x weighted)
- Transit ridership by station

Active Transportation (1.0x weighted)
- Bikeway density
- Pedestrian facility density
- Strava activity

University of Utah Research Park Future Land Use Mobility Hub Suitability

Legend

- Higher Demand
- Lower Demand
- 1/4 Mile Walkshed (5 min walk)
- Light Rail Line
- Light Rail Stations
- Bus Routes
- Large Hub
- Medium Hub
- Small Hub
- Micro Hub Locations



Model Inputs

Origins & Destinations
- Daytime destinations
- Nighttime destinations
- Activity centers

Mobility Hub Typologies

Mobility Hub typologies provide a foundation for identifying potential hub locations and for programing and designing selected sites to best suit the context. It includes three primary types: Large Hub, Small Hub, and Micro Hub. For each hub type, the collection of elements that allow the site to support seamless mobility connections are categorized in the following four ways:

- **Transit and Trip-making** includes design elements that support dynamic movements to and from the mobility hub site, including boarding and alighting for transit, pick-up and drop-off zones, and wayfinding and trip-planning signage. The common thread of this category is the fluidity of the action, occurring by the second and minute, with a high value for efficiency of movement and safe access to/from various modes.

- **Parking & Charging** includes design elements for stationary vehicles, whether parking personal vehicles, shared cars, shared micromobility devices, or electric vehicles that are accessing charging infrastructure. This zone is characterized by an end of trip action for the vehicle or device, whether short-term or long-term, and whether or not it is the end of trip for the individual.

- **Priority Access** includes design elements for human-scale travel to and from the site. This zone captures sidewalks, bike lanes, micromobility lanes, crossing treatments and similar investments that enable persons to safely and comfortably access the hub's other design elements.

- **Amenities** include complementary design elements that add value to the user's experience, but are not core to the function of using the site's transportation services. This could include public art, outdoor seating, complementary retail, shops, cafes, and restaurants, a playground, food cart pods, concierge services, and similar.

End-of-Line Bus Infrastructure Considerations

Adequate end-of-line infrastructure is an important consideration in providing frequent, efficient, and reliable bus service. While this infrastructure, including bus bays, layover areas, and restrooms, are not a required component of a successful mobility hub, they do offer opportunities for synergy with the goals of this plan.

In order to provide transit service upgrades as part of Salt Lake City's expanding Frequent Transit Network (FTN), UTA and SLC Transportation have expressed the need for adequate end-of-line infrastructure to improve the reliability of bus operations and allow for future service upgrades. These service upgrades would directly support the mode shift goals of the plan. End-of-line infrastructure also brings together multiple routes allowing for efficient transfers and opportunities to use transit to access more destinations. Finally, end-of-line facilities can also support campus shuttle operations while providing similar operational benefits.

Although there are numerous transit benefits to end-of-line facilities, there are associated impacts that need to be balanced with the needs and characteristics of each site. Potential impacts may include:

- Increased bus traffic and opportunities for conflicts with other modes
- Larger spatial requirements to accommodate turning movements and layovers
- Potential impacts to placemaking initiatives and pedestrian-friendly development

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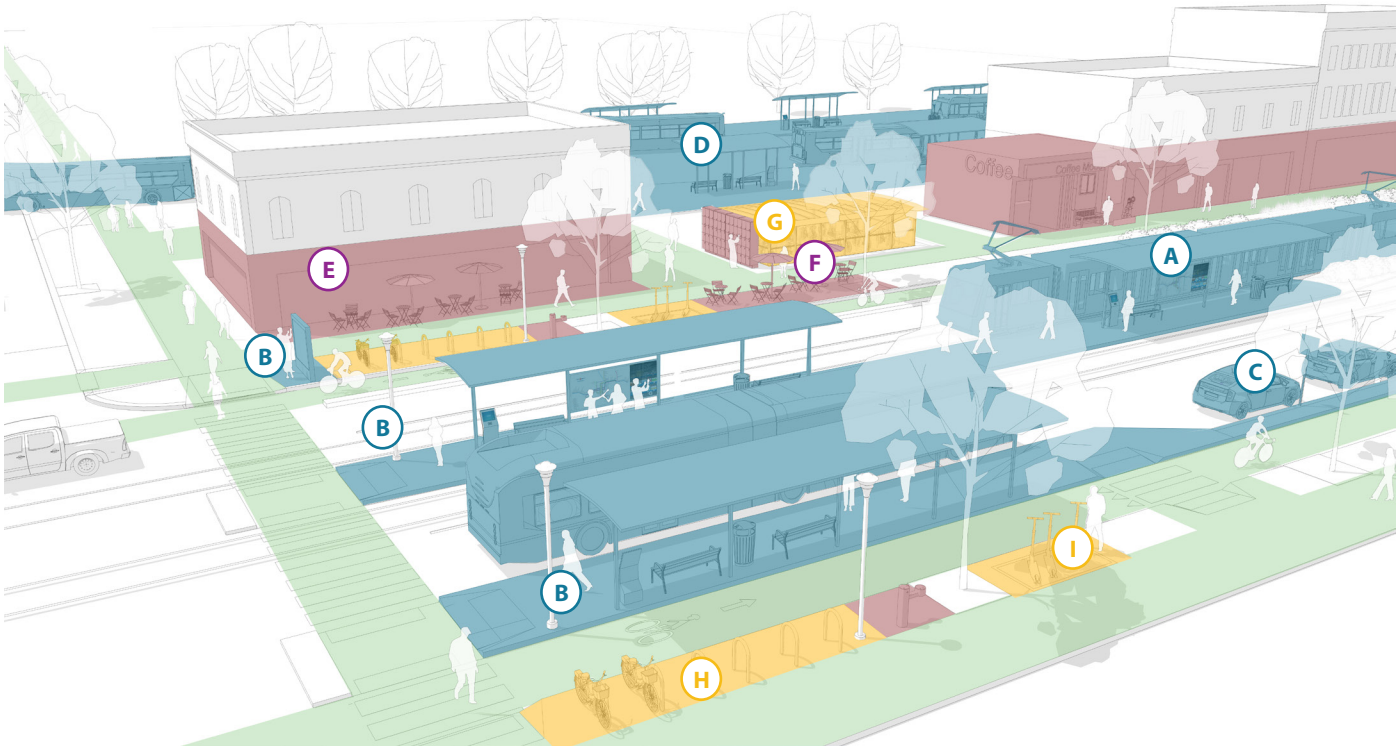
Mobility Hub Elements Matrix

	LARGE HUB	SMALL HUB	MICRO HUB
Bus and/or shuttle stop	●	●	●
Fixed guideway transit stop (BRT or LRT)	●	○	
Transit ticket kiosks	●	●	●
Seating	●	●	○
Shelter/Shade Structure	●	●	●
Indoor waiting area	●	○	
Bikeshare and scootershare parking	●	●	●
Short term bike parking	●	●	●
Long term bike parking	●	○	
Personal vehicle parking	○	○	
Carshare	○	●	○
Electric vehicle charging	○	●	○
TNC pick-up/drop-off	●	●	○
Wayfinding	●	●	●
Real-time information	●	●	●
Wifi hub	●	○	○
Water fountains	●	●	○
Restrooms	●	●	○
Sidewalks	●	●	●
Safe pedestrian crossings	●	●	●
Dedicated bike infrastructure	●	●	●
Active public space	●	○	○
Convenience retail	○	○	○
Possibilities also include gyms/showers, convenience day care, package delivery, etc.			

● Recommended ○ May be included



1. Large Mobility Hub

The Large Mobility Hub represents the largest of the three mobility hub types. It provides a vision of how mobility hubs could be assembled in highest demand areas where there is sufficient space and likely includes the widest variety of available modes. Mobility services extend beyond the right-of-way and are integrated with adjacent land uses.

Typical Application:

- TRAX Stations (high ridership)
- High frequency or high ridership bus route stops

Potential Design Features:

Transit & Trip Making Services

A. Light rail accessible boarding area

B. Trip planning information and ticket kiosks

C. Passenger pick-up and drop-off

D. End-of-line bus facilities, including accommodations for shuttle

Amenities

E. Retail space for businesses that support trip-chaining, such as bike shops, grocery/convenience stores, or coffee shops
   - Showers and lockers for bicyclists integrated into infill development

F. Features that enhance sense of place

Parking & Charging Services

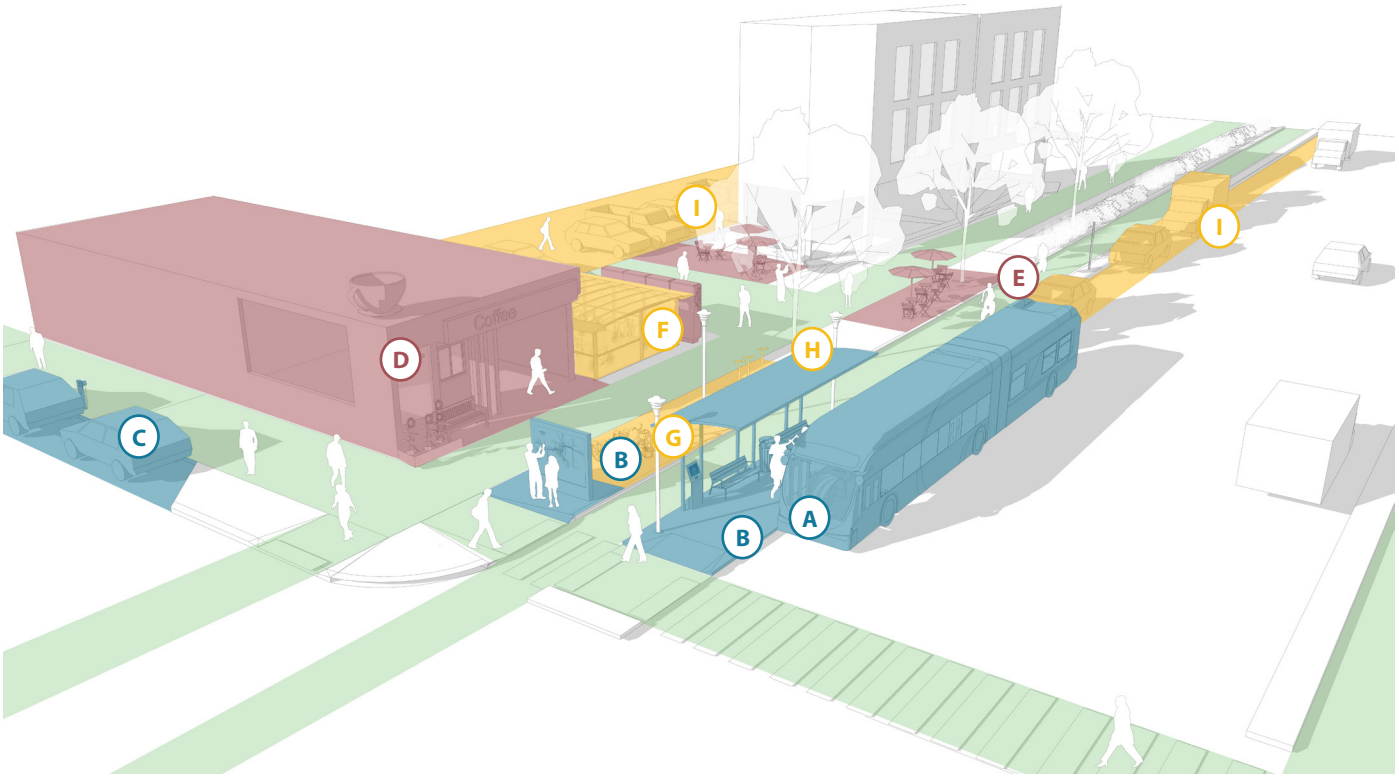
G. Expanded long-term bicycle storage facilities

H. Short term bike parking

I. Designated micromobility parking

Priority Areas

- Comfortable and continuous walkways
- Comfortable and continuous bikeways
- Safe and frequent road crossings for people walking and biking



2. Small Mobility Hub

Small Mobility Hubs demonstrate how new technology can make it more convenient to pair transit with active transportation modes. It shows how a high demand bus stop could be upgraded with additional features where space allows. Long term bike storage and prioritized vehicle parking help facilitate longer trips where users may not return for a day or more. This could be a place to accommodate autonomous vehicle pick-up and drop-off in the future as well as other new technologies that access campus.

Typical Application:

- TRAX stations (low to moderate ridership)
- High ridership bus route stops

Potential Design Features:

Transit & Trip Making Services

(A) Accessible boarding area (Bus or TRAX)

(B) Trip planning information that is accessible to all and ticket kiosks to facilitate pre-boarding payment

(C) Passenger pick-up and drop-off
- Smaller scale end-of-line bus facilities as needed

Amenities

(D) Retail space for businesses that support trip-chaining, such as bike shops, grocery/convenience stores, delivery lockers, or coffee shops

(E) Features that enhance sense of place like seating and lighting

Parking & Charging Services

(F) Expanded long-term bicycle storage facilities

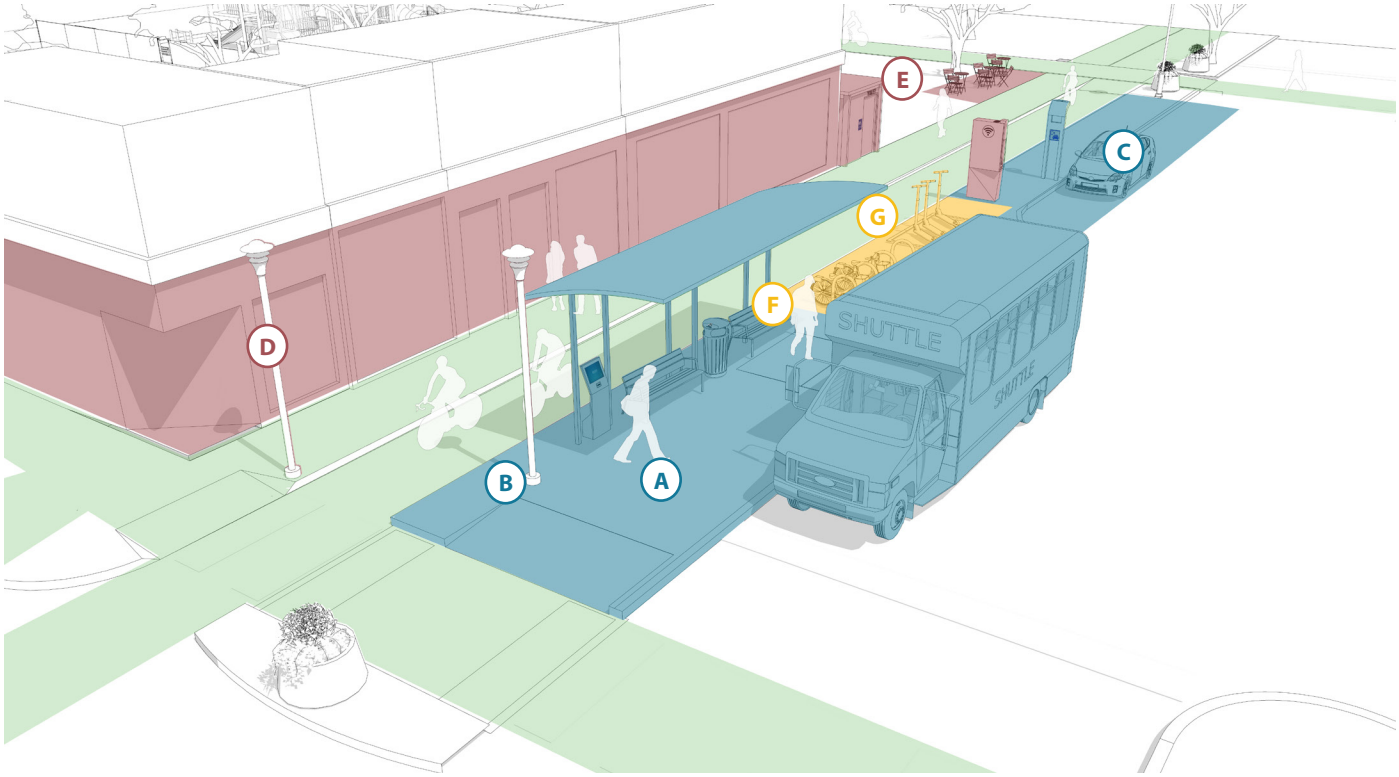
(G) Short term bike parking

(H) Designated micromobility parking

(I) Vehicle parking
- Preferential parking for carshare, carpool, guaranteed ride home
- Dynamic parking pricing for single-occupancy vehicles
- Electric vehicle charging stations

Priority Areas

- Comfortable and continuous walkways
- Comfortable and continuous bikeways
- Safe and frequent road crossings for people walking and biking



3. Micro Mobility Hub

The Micro Mobility Hub demonstrates how new technology can make it more convenient to pair shuttle or microtransit services with active transportation modes. It includes all of the features to support micro-mobility services plus campus shuttle services and accommodates vehicle pick-up/drop-off.

Typical Application:

- Trailheads
- Where an off-street trail intersects an on-street bikeway or pedestrian route
- Along collectors and arterials with low frequency bus service or no service
- At neighborhood centers with low frequency bus service or no service

Potential Design Features:

Transit & Trip Making Services

(A) Shuttle boarding platform

(B) Trip planning information that is accessible to all and ticket kiosks to facilitate pre-boarding payment

(C) Passenger pick-up and drop-off

Amenities

(D) Retail space for businesses that support trip-chaining, such as bike shops, grocery/convenience stores, or coffee shops

(E) Features that enhance sense of place

Parking & Charging Services

(F) Short term bike parking

(G) Designated micromobility parking

Priority Areas

- Comfortable and continuous walkways
- Comfortable and continuous bikeways
- Safe and frequent road crossings for people walking and biking

Qualitative Analysis

Following the quantitative analysis and development of the mobility hub typology, the qualitative analysis examines additional critical factors of potential mobility hub sites.

For each of the eight (8) potential sites, the project team identified the appropriate type of mobility hub for the location, the existing transit service available at the location, and the relative demand measured in the quantitative analysis. With these identifiers in mind, the project team examined each site based on the following considerations for viability and near-term readiness

- **Feasibility:** The level to which the site is able to accommodate the programming needs and circulation required to allow a mobility hub to function. This category also addresses the level to which existing site uses or buildings can be incorporated into the mobility hub, relocated, or removed.

- **Future Compatibility:** The level to which developing a mobility hub at that site would leverage or complement planned transportation investments at or near the site.

- **Transit Opportunities:** The level to which the site could accommodate an increase in transit service or operations.

- **Land Use and Urban Form:** The level to which the surrounding area currently offers, or is expected to offer in the future, complementary activities and amenities.

For each of the four categories, weighting is applied to ensure that categories with more questions (more point allocations) are not by default given more value. The weighting values serve to normalize the scoring based on the desired weighting by category (15% Feasibility, 25% Future Compatibility, 35% Transit Opportunities, 25% Land Use and Urban Form).

The qualitative analysis is one of several tools used to prioritize mobility hub site opportunities and is intended to be considered in tandem with the GIS suitability analysis, the results of a study area survey, and input from stakeholders.

Mobility hub sites were scored and adjusted through an iterative process by the Planning Team and the Steering Committee. A final group scoring process using an online survey tool resulted in narrowing the final candidate sites down to the following locations:

- South Campus
- Stadium
- Union
- 200 South
- Health Sciences
- Research Park

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06

PREFERRED LOCATIONS

"I think those are good locations and that people would be happy to have a place to lock their bikes, buy food, and have comfortable seating while they can see real-time travel information."

- MOBILITY HUB SURVEY PARTICIPANT

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Introduction

This chapter identifies the preferred mobility hub locations that were selected during the quantitative and qualitative analysis phase of the study. These sites cover critical nodes that intersect with the campus, existing public transportation routes, and key destinations in the study area. This chapter also displays the results of the qualitative analysis that was completed by the stakeholder group and project team for the preferred locations. For complete information please refer to the full report.

Preferred Locations

Each potential mobility hub site outlined in this study went through the same quantitative and qualitative analysis addressed in the previous chapter. The results of the qualitative analysis for the eight potential mobility hubs is shown below:

QUALITATITIVE ANALYSIS RESULTS

POTENTIAL LOCATION	SCORE
South Campus	75.47
Stadium	73.38
Union	73.80
200 South	72.54
Health Sciences Campus	70.88
Research Park Campus	67.55
Veteran Affairs Medical Center	45.03
Watsatch Drive	31.69

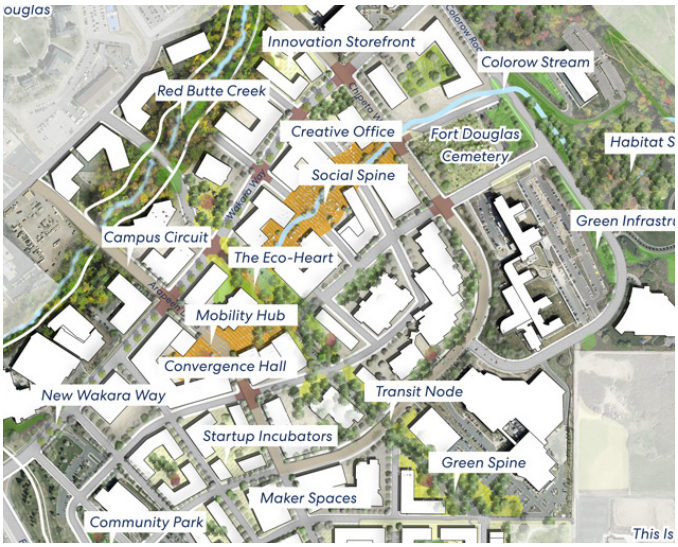
After the analysis was complete four scenarios were developed with the top performing mobility hub locations. These scenarios were assigned four locations each which distributed the potential mobility hubs in a way to best serve the needs of Salt Lake City, UTA, University Main Campus, University Heath Science Campus, University Research Park Campus, and the Veteran Affairs Medical Center.

The scenarios are as follows:

- **Scenario A:** Union, South Campus, Health Sciences, Research Park
- **Scenario B:** Union, Stadium, Health Sciences, Research Park
- **Scenario C:** 200 S., South Campus, Health Sciences, Research Park
- **Scenario D:** 200 S., Stadium, Health Sciences, Research Park

Scenario C was selected as it best covered the varying topographic regions of the study area, was in close proximity to key destinations, served end of line and through route needs for UTA and Campus Shuttles, and minimized overlap between potential locations. The map on the following page shows the preferred scenario with the potential footprint, proximity to public transportation and infrastructure, and 1/4 mile walkshed of the 200 South, South Campus, and Health Sciences mobility hub locations. These locations are meant to collectively fulfill the current and projected needs of the region in connection with University of Utah Main Campus, University of Utah Health Science Campus, and the George E. Wahlen Department of Veterans Affairs Medical Center.

The evaluation of the Research Park Mobility Hub location and program elements will be further addressed by the Research Park Master Plan. The quantitative and qualitative analysis in this study is only intended to give guidance on the general placement and programming of the future Research Park Mobility Hub. Final conceptual plans, program elements, and the preferred location will be addressed in that study.



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Mobility Hub Scenario C

North / South Bus

East/ West Bus

Bike / Micromobility

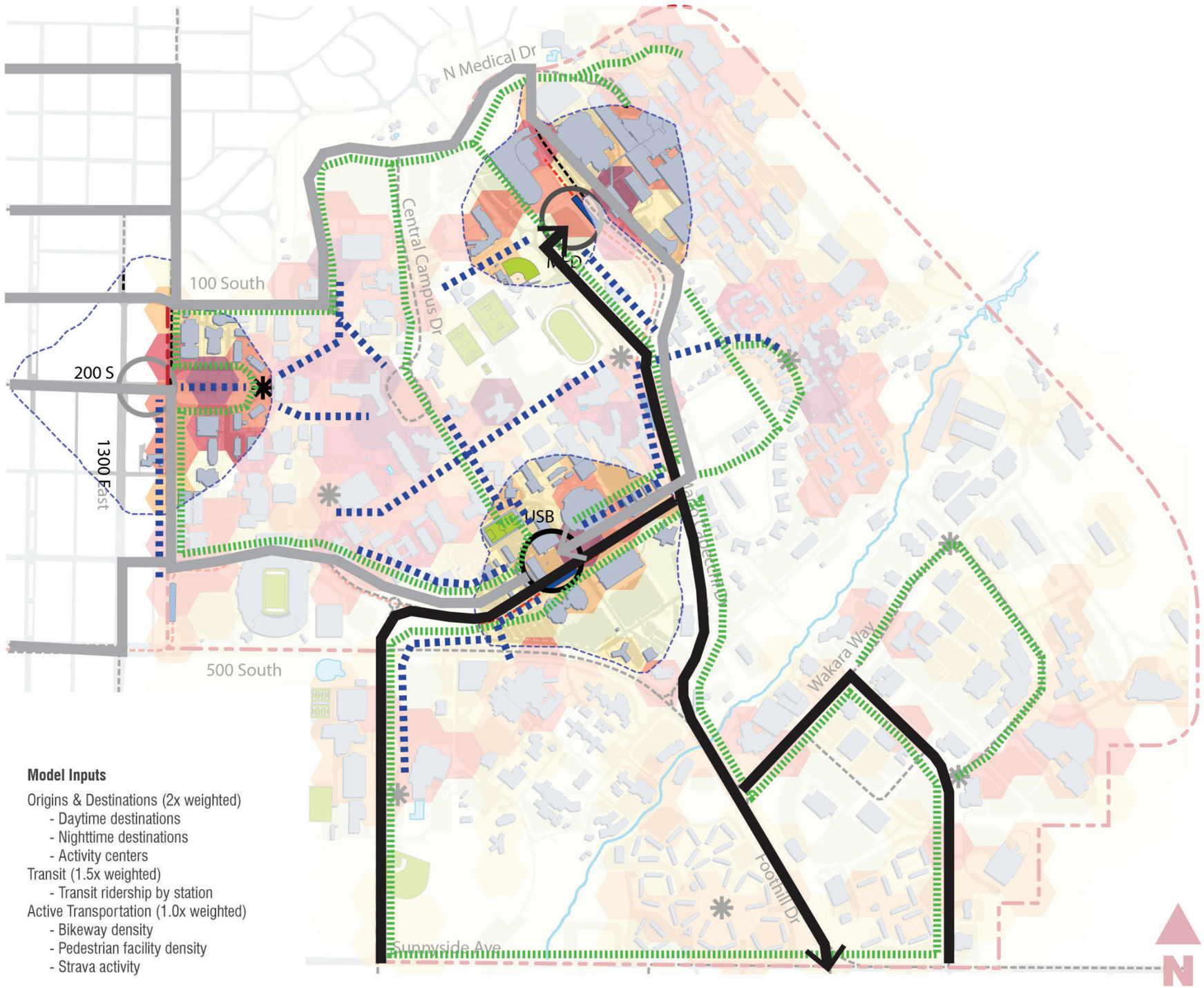
Campus Shuttle

- Qual. Hub Score (Cumulative): 208.8 (2nd)
- O+D Score within Walkshed: 278

- North / South Bus Routes EOL at Medical
- East / West Routes EOL at USB

Potential Hub Summary

USB.	80,200 sf	1.8 ac
200 S	42,448 sf	0.9 ac
UNION	161,692 sf	3.7 ac
STADIUM	129,200 sf	3.0 ac
MED.	47,126 sf	1.1 ac



Model Inputs

Origins & Destinations (2x weighted)
- Daytime destinations
- Nighttime destinations
- Activity centers

Transit (1.5x weighted)
- Transit ridership by station

Active Transportation (1.0x weighted)
- Bikeway density
- Pedestrian facility density
- Strava activity

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07

CONCEPT DESIGN

"I think this [Campus Mobility Hub] is a great idea! It would be nice if it was offered 24/7. I think that this would be a great step in making campus safer."

- MOBILITY HUB SURVEY PARTICIPANT

Introduction

This chapter addresses the process of the conceptual designs for each of the preferred locations and is broken into four subsections. The first subsection contains the concept design considerations used during this phase of the project. The following sections give an overview of each site with the prescribed program elements. These sections also contain the final concept plans, three perspective views, precedent images, and key iterations and phases for the concept. For complete information please refer to the full report.

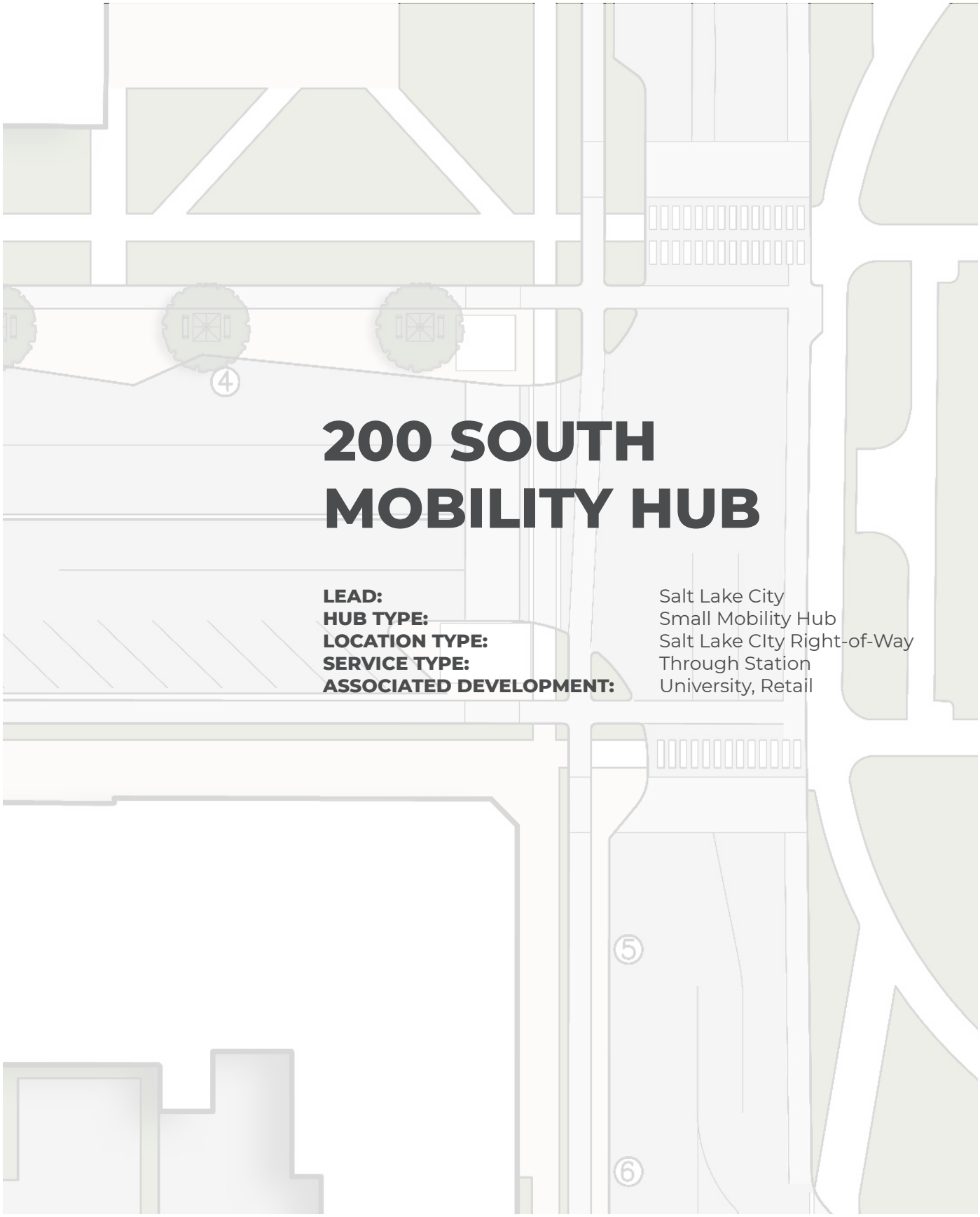
Concept Design Considerations

Before developing the concept plans for the mobility hub sites each location was categorized by:

- Available area
- End of line capability
- Hub type classification
- Walkshed
- Non-motorized modes of transportation access
- Motorized modes of transportation access
- Proximity to fixed public transit lines
- Existing and future land uses
- Topography
- Surrounding infrastructure
- Master Plans
- General feasibility
- Proximity to destinations
- Needed network improvements
- Likelihood to promote mode shift
- Existing and future capability of the sites to meet existing and projected demand needs both individually and cumulatively
- And stakeholder feedback.

Once the initial mobility hub's categorization was complete, program elements were established for each site based on mobility hub best practices and emerging trends and the 2015 UTA First/Last Mile Strategies Study. These program elements are intented to encourage mode shift through expanded multimodal transportation opportunities, seamless transfers, increased connectivity, integrated technology, pedestrian priority, wayfinding signage, placemaking, and heightened safety and security measures. Timing also played a critical role in the development of these sites making it necessary to model them to better understand future conditions and any essential phasing.

Initial concept designs were created and illustrative graphics developed to help stakeholder groups better visualize the sites and give appropriate feedback. Each site had several iterations and every new iteration underwent a vetting process which included internal and stakeholder review. This vetting process helped catch inconsistencies in the plan with preliminary considerations and general best practices. The results from this process can be seen on the following pages.



200 SOUTH MOBILITY HUB

LEAD:	Salt Lake City
HUB TYPE:	Small Mobility Hub
LOCATION TYPE:	Salt Lake CIty Right-of-Way
SERVICE TYPE:	Through Station
ASSOCIATED DEVELOPMENT:	University, Retail

Introduction

The 200 South Mobility Hub occupies the full right-of-way of 200 South between 1300 East and University Street. This hub is adjacent to the University of Utah's historic President's Circle and is intended to create an enhanced pedestrian environment with safety improvements and supportive multimodal opportunities. The hub's proximity to current retail development, the University, and existing public transit routes, makes it a great location for a mobility hub. The concept plan's design for this hub is consistent with all University, City, and Regional Plans.

Concept Plan Elements

The pedestrian and program elements incorporated into the 200 South Mobility Hub site are as follows:

- Protected Bike Lanes
- Curb Extensions & Bulb-outs
- Raised Intersection
- Pedestrian Scale Design Elements
- Seating
- Bike / Scooter Share Stations
- Pavement Reduction
- Increased Plaza Space
- Outdoor Dining Next to Retail
- Seven Bus/Shuttle Stops
- Pedestrian Shelters
- Additional Bike Paths
- Replaced Parking
- Flashing Beacons at Unsignalized Crossings
- Stop Signs
- Wayfinding Signage
- Real Time Transit Info
- Additional Landscaping
- Archway at 200 South and University Avenue

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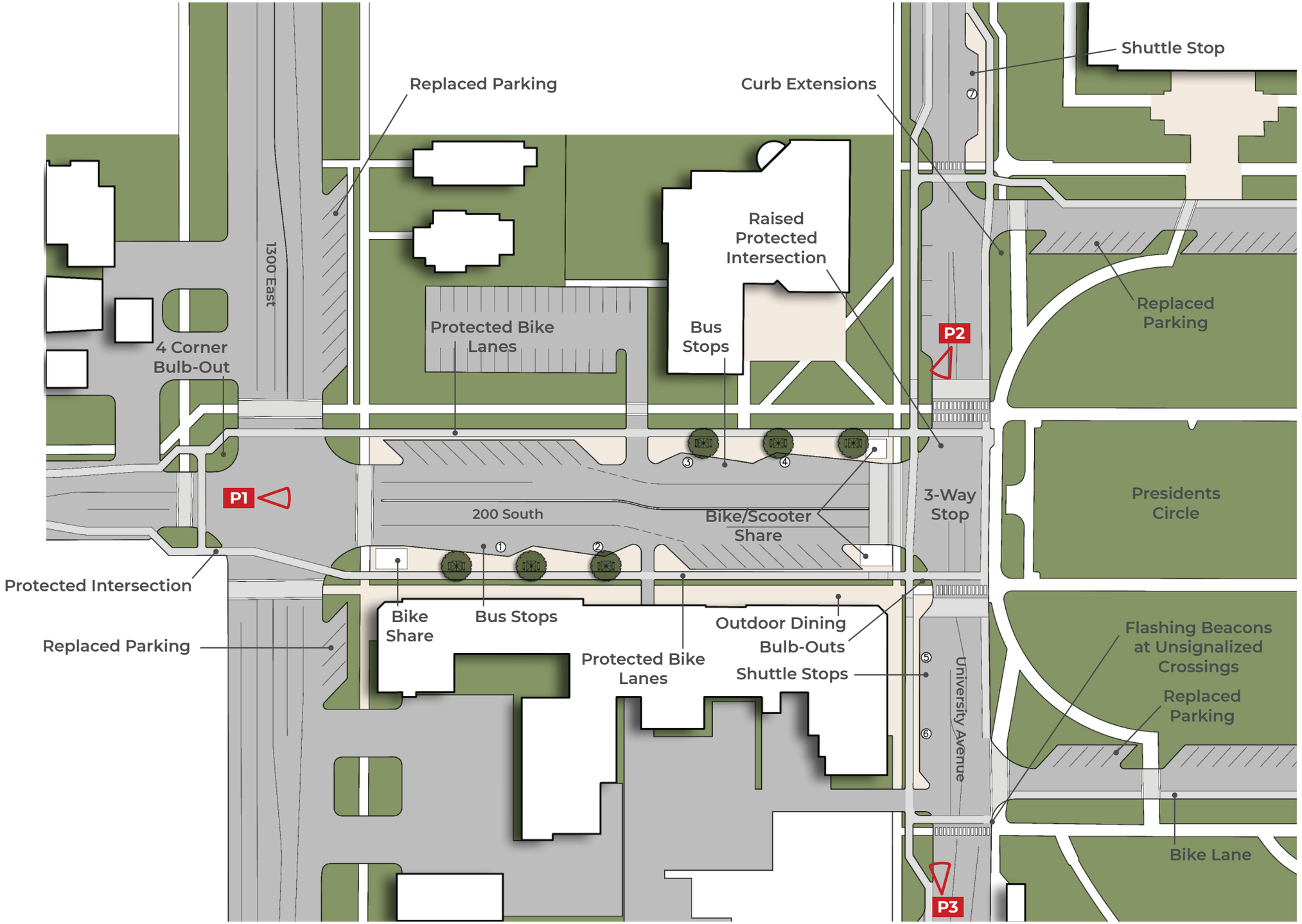
sltrib.com

sfbike.org

bostonbackbay.com

200 South Final Concept Plan



200 South

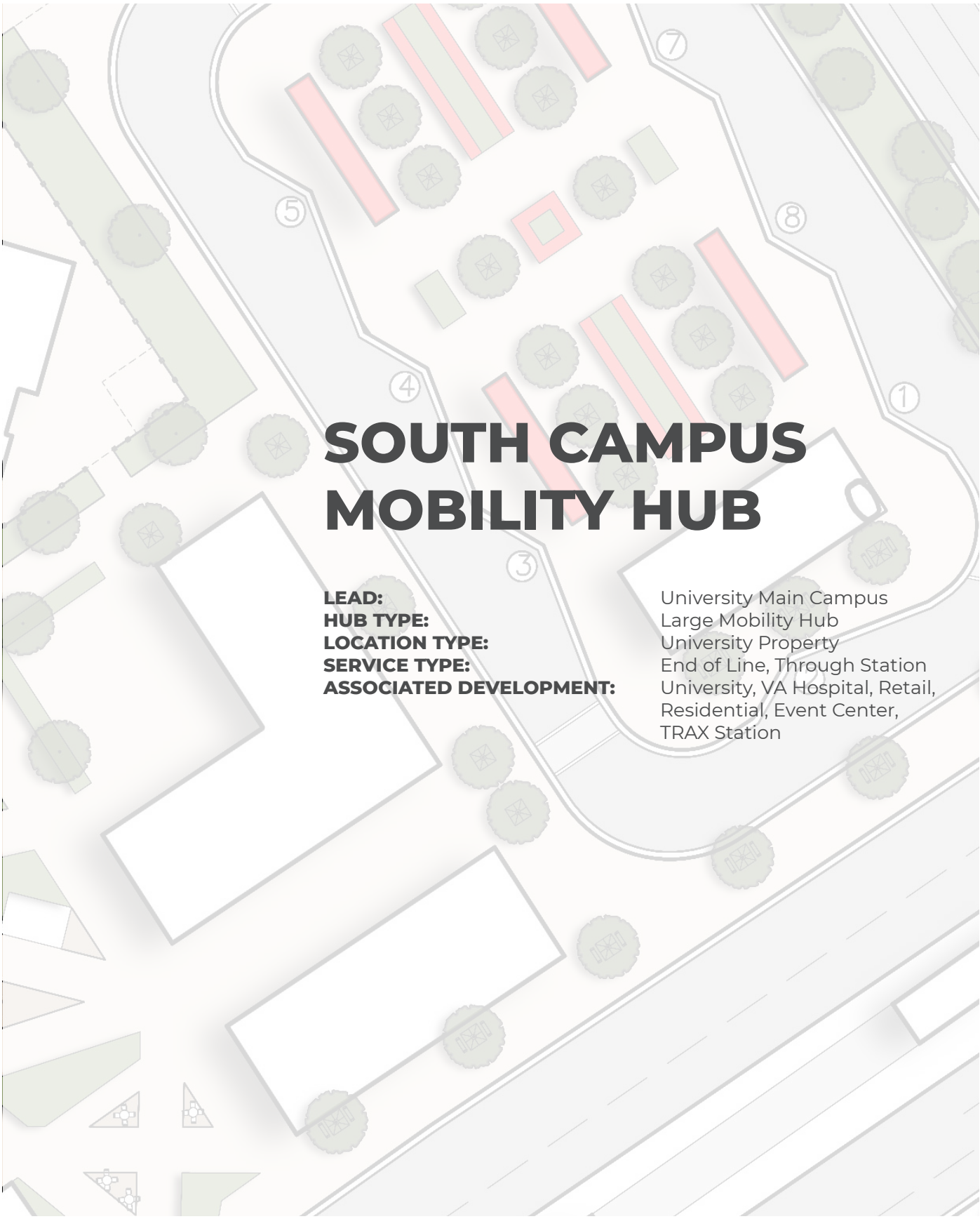
P1 LOOKING EAST TOWARDS PRESIDENTS CIRCLE

200 South

LOOKING SOUTHWEST TOWARDS 200 S. **P2**

200 South

P3 LOOKING NORTH TOWARDS 200 S.



SOUTH CAMPUS MOBILITY HUB

LEAD: University Main Campus
HUB TYPE: Large Mobility Hub
LOCATION TYPE: University Property
SERVICE TYPE: End of Line, Through Station
ASSOCIATED DEVELOPMENT: University, VA Hospital, Retail, Residential, Event Center, TRAX Station

Introduction

The South Campus Mobility Hub occupies a portion of the block containing the Turpin University Services Building (USB), and is bound by South Campus Drive and Campus Center Drive. This hub is adjacent to the Huntsman Center, South Campus TRAX Station, The Institute Building, and is in close proximity to the Veterans Affairs Medical Center. It will be developed in two phases to allow continued use of the USB in Phase one. Phase two will contain a range of retail services and dining options and have end of line services for UTA Buses and Campus Shuttles. The design incorporates the South Campus Walk concept by adding residential units, urban plaza space, retail shops, bike storage and a mid-block crossing from the TRAX station.

Concept Plan Elements

The pedestrian and program elements integrated into this mobility hub are as follows:

- Mid-Block Crossing on South Campus Dr
- Gateway Features & Wayfinding Signage
- Expanded Multi-Use Paths
- Urban Plazas & Various Themed Seating Areas
- Pedestrian Shelters with Charging Capabilities
- Pedestrian Scale Design & Placemaking Elements
- Dedicated Rideshare Location
- Bikeshare, & Scooter Share Stations
- Dedicated Bike Lanes
- Bike Shops, Parking, & Storage
- Dining and Retail Development
- Ten Bus/Shuttle Stops including an Electric Bus Charging Station
- Real Time Transit Info
- Addition of Left Turn Pocket on South Campus Dr
- Addition of Parking Garage with Connecting Pedestrian Bridge to Huntsman Center
- Adapted Network Design for Event Traffic
- Bus Layover Facility & Public Restrooms

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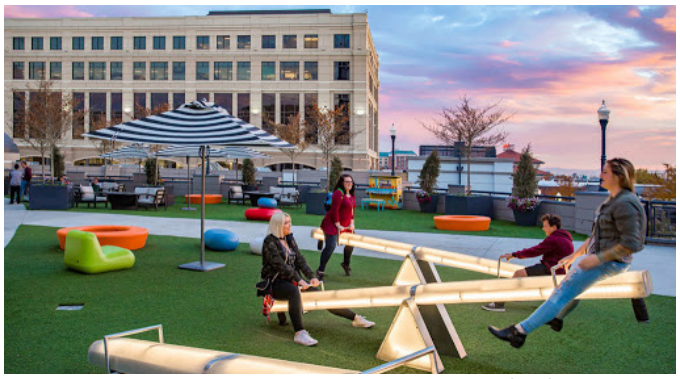

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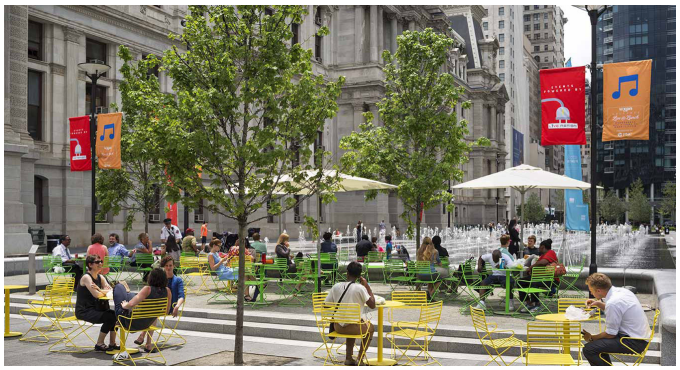

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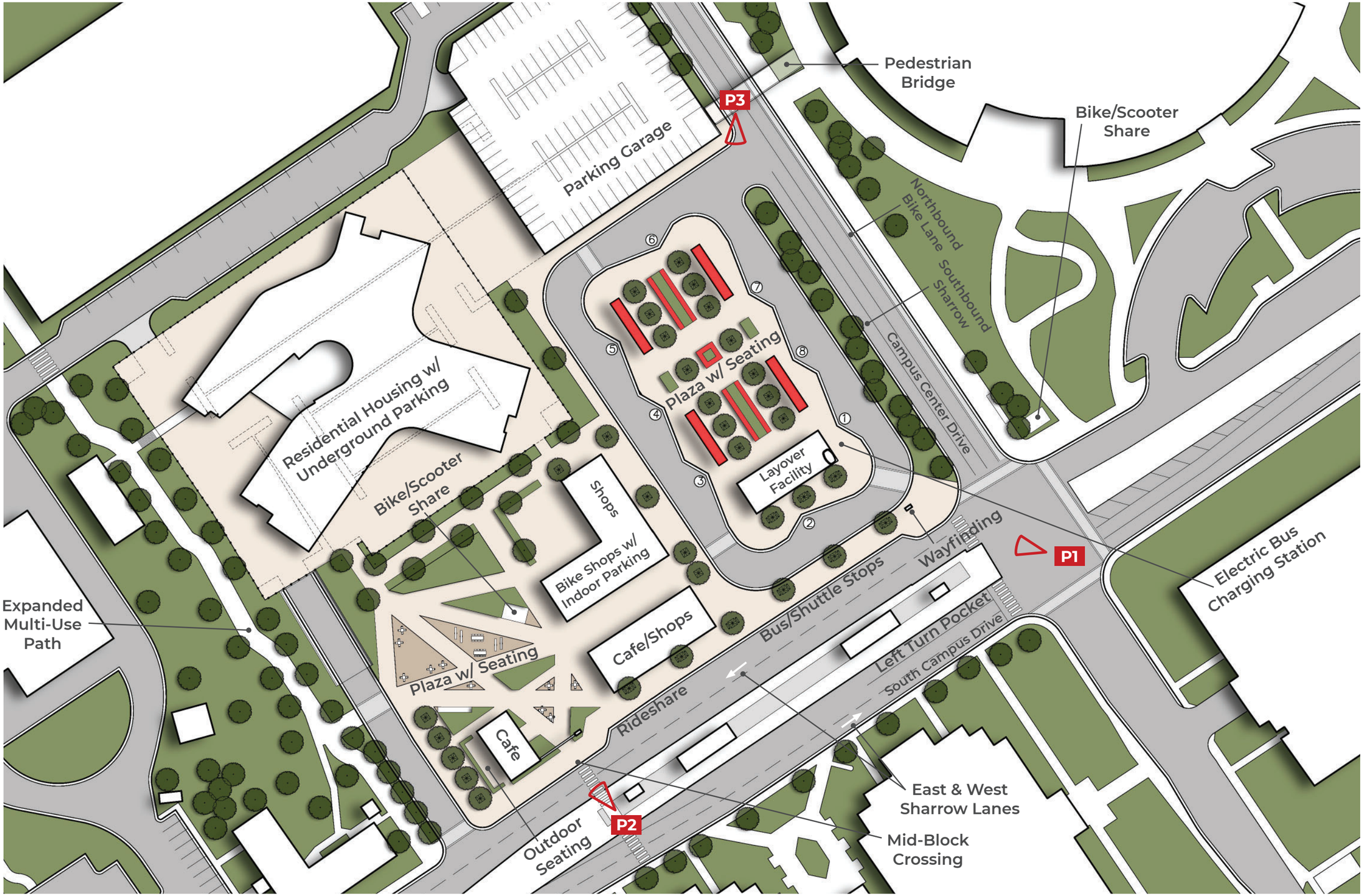
prospect.org

altaplanning.com

South Campus Final Concept Plan – Phase 2



South Campus

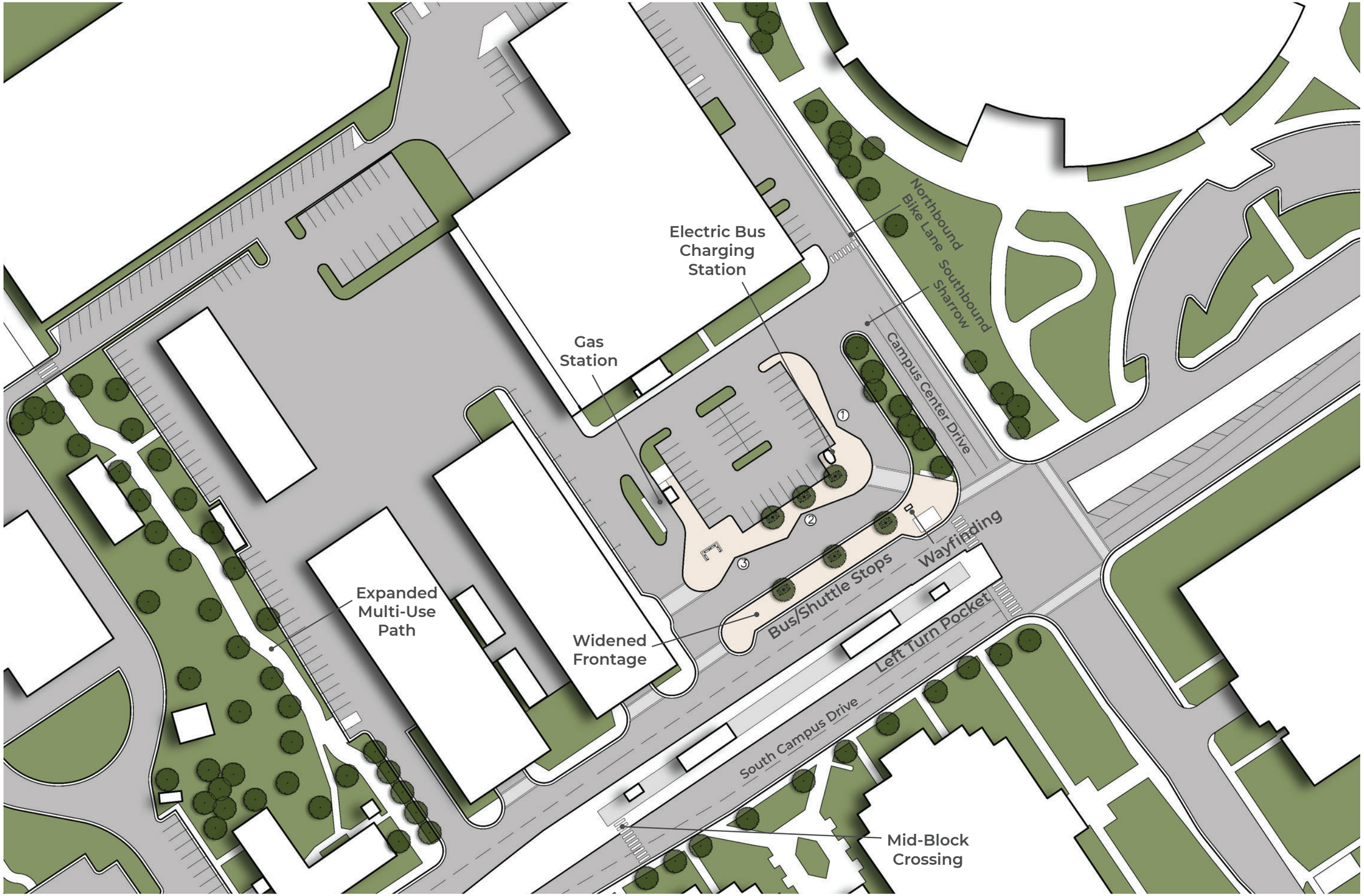
P1 LOOKING NORTHWEST TOWARD CAMPUS

LOOKING NORTHEAST TOWARDS THE JON M. HUNTSMAN CENTER P2

South Campus

P3 LOOKING SOUTHWEST TOWARD THE SOUTH CAMPUS TRAX STATION

South Campus Final Concept Plan – Phase 1



South Campus Iterative Concept Plan – Phase 2

HEALTH SCIENCES MOBILITY HUB

LEAD:	University Health Sciences
HUB TYPE:	Large Mobility Hub
LOCATION TYPE:	University Property
SERVICE TYPE:	End of Line
ASSOCIATED DEVELOPMENT:	University, University Medical Center, TRAX Station

Introduction

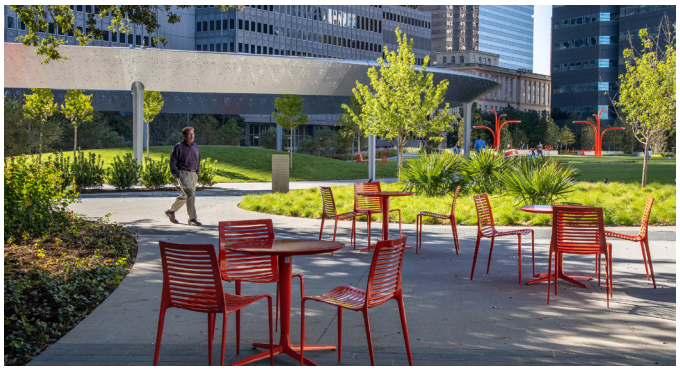
The Health Sciences Mobility Hub will be located just South of the future Helix building in the north east corner of the existing parking lot. This hub will be part of the Health Sciences Campus and is adjacent to the Medical Center TRAX Station. It will preserve the existing electrical facility, ADA path and grove of trees on its south east corner as well as allow full loading access to the future Helix building. A cafe and pedestrian crossing will be part of that future building, and the mobility hub will be developed in a way to integrate those services. The Health Sciences Mobility Hub will contain end of line services for UTA Buses and Campus Shuttles. The design incorporates the concepts for all existing master plans.

Concept Plan Elements

The pedestrian and program elements integrated into this mobility hub are as follows:

- Wayfinding Signage & Pedestrian Shelters
- Expanded Multi-Use Path
- Urban Plazas & Themed Seating Areas
- Pedestrian Scale Design & Placemaking Elements
- Dedicated Rideshare Location
- Bikeshare & Scooter Share Stations
- Bike Parking, Storage, & Stairway Runnels
- Pedestrian Bridge
- Eight Bus/Shuttle Stops
- Preservation of Existing ADA Path, Tree Grove, & Electrical Facility Needs
- Real Time Transit Info
- Bus Layover Facility & Public Restrooms

phillymag.como



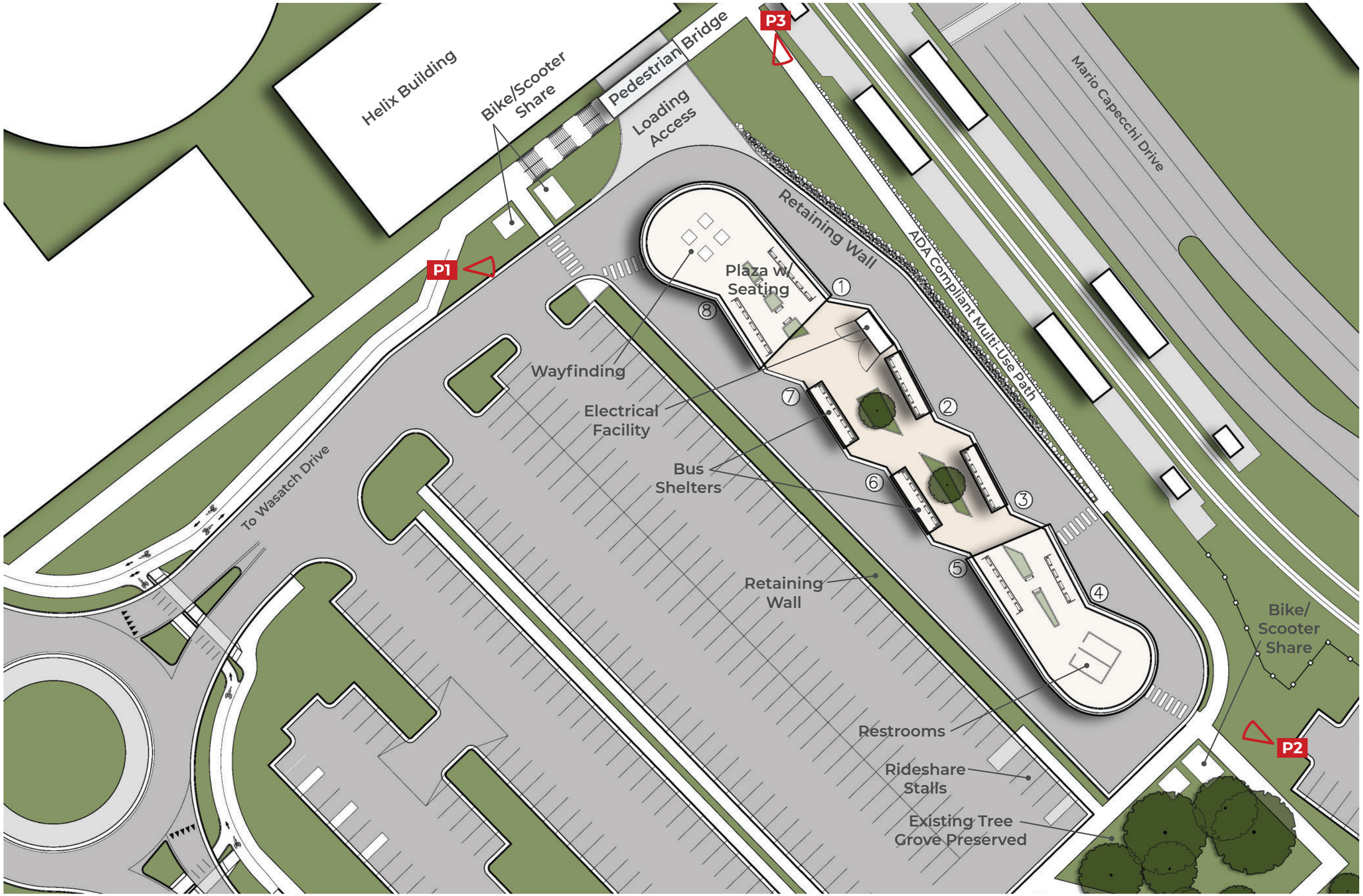
swagroup.com

archdaily.com

drivenxdesign.com

dewitt-associates.com

Health Sciences Campus Final Concept Plan



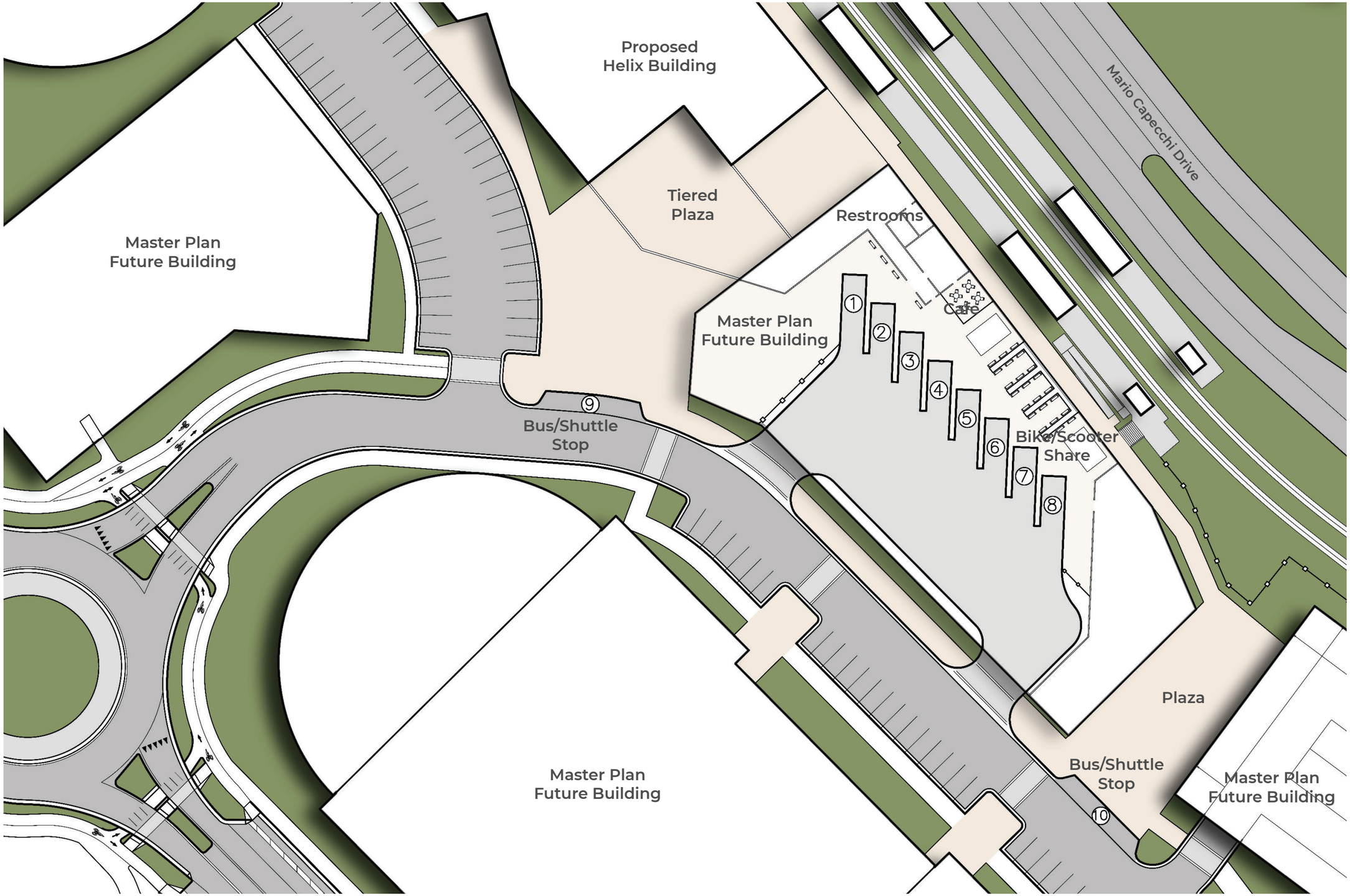
P1 LOOKING SOUTHEAST TOWARDS THE UNIVERSITY MEDICAL CENTER TRAX STATION

LOOKING NORTH TOWARDS THE PRIMARY CHILDRENS OUTPATIENT SERVICES P2

Health Sciences Campus

P3 LOOKING SOUTHWEST TOWARDS CAMPUS

Health Sciences Campus Iterative Concept Plan



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08

FUNDING & SCHEDULE

"Having a comfortable place to sit and read or relax between modes of transportation would make such a big difference and would encourage more people to drive less often."

- MOBILITY HUB SURVEY PARTICIPANT

CHAPTER NUMBERING HAS NOT BEEN MODIFIED FROM THE FULL REPORT FOR EASE OF MOVING BETWEEN THE CONDENSED AND FULL REPORT VERSIONS

Introduction

This condensed chapter details the market analysis and site specific uses for the study. The market analysis specifically addresses office, retail, and residential uses as accessories to mobility hub development and general funding avenues. The costs for development are covered in the full report. For complete information please refer to the full report.

Market Analysis

Key Highlights for Office Use

- Market remains fairly healthy for office, particularly in more established locations with strong connections and visibility characteristics
- Rent premiums exist in urban markets (similar to the University of Utah) for covered parking. Current rent levels do not justify covered parking costs without a subsidy
- Required rates of return for office in the University of Utah area — 18 – 22%
- Current achievable rents and required rates of return suggest some feasibility. Increased feasibility for preleased or partial preleased buildings
- Minimal incentive to build speculative product at present in the Salt Lake market, including the University of Utah submarket
- Presence of mass transit options has shown a 3–5% value increase over competitive, non-served sites

Key Highlights for Residential Use

- Strong absorption in current market
- Covered parking is not entirely financially feasible (profit margin is too slim to attract development in most cases)
- In the surrounding University of Utah submarket, some rent premiums are evident for covered parking for stacked rentals
- Current value/cost relationship shows adequate profit for good quality, mid-rise residential development
- Nominal rent premiums for properties within 1/4 mile of mass transit options

Key Highlights for Retail Use

- Significant concern about retail going forward with pending high vacancies and notable trend changes in shopping patterns
- Nearly all communities are overbuilt on a per capita basis
- University areas are not immune to market-wide retail weakness
- Rents do not currently justify costs — gap exists between value and costs for small-scale retail additions to the mobility hub area
- Required profit (as compared to total costs) needs to be near 20 percent or greater. Current cost/value analysis shows near or below 15 percent.

buildipedia.com

www.marriott.com

Retail Conditions in Salt Lake — 2019/2020 (Pre-COVID-19):

- Doing well — Grocery stores, automobile services, eateries, "experience" stores, convenience stores
- Faring poorly — Clothing stores, toy stores, jewelry stores, department stores, anything struggling with competing with online shopping

What are Retailers Doing to Adjust? (Pre-COVID-19):

- Concept stores — Opportunities for customers to have experiences that are not replicated online
- Distribution stores — Stores which allow for drop-off deliveries from online services — results in quicker shipping times and reduced costs
- Eateries are adapting to Uber Eats and other delivery services — ultimately leading to reduced table space and a greater need for pick-up capacities

Retailers want the following:

- Strong traffic counts — multiple points of access
- Growing population counts in 0.5, 1.0, 3.0-mile radii, or, in student-scenarios, consistent presence of students year round
- Daytime populations — typically requires an office presence or major educational facility
- Destination locations — customer draws (parks, stadiums, entertainment options, college, etc.)
- Retailers are looking more closely at which demographics are more likely to online shop, and are looking for areas which support traditional retail activity

University of Utah Area Retail

- Most neighborhoods and communities are built to 20–30 square feet of retail space per capita
  - Developers and brokers indicate that the market should be closer to 15 square feet per capita. This is due to:
    - Changing retail shopping trends (online, delivery, etc.)
    - Persistent vacancy rates near or in excess of 10%
    - Big box woes
- If eateries can stay open, their use trends suggest healthy demand for future years, particularly for well-accessed locations
- Significant need to focus on retail at key nodes, allowing for re-purposing of underperforming retail at secondary sites

Highest and Best Use

The reasonably probable and legal use of vacant land or an improved property that is physically possible, appropriately supported, financially feasible, and that results in the highest value

The Four Criteria that Highest and Best Use Must Consider are:

Office

The highest and best use analysis for office construction considers current market activity, including achievable rents, vacancy rates, operating expenses, construction and land costs, and required rates of return and profit allowances. Rental rates and construction costs are influenced by amount of available parking, type of parking (covered or surface), exposure and visibility of the structure, proximity to transportation connections, and desirability of immediate surroundings.

The scenario shown on the following page highlights office development of a mid-rise building of 75,000 square feet with surface parking. The required rate of return range is noted currently from roughly 17-22 percent. The proposed scenario notes a possible range of 10-18 percent, indicating that near-term development could be possible, although the anticipated range is at or below the market standard. If the market improves, or construction costs decline, office construction will become more feasible.

Financial incentives could also be considered to encourage office development. This may include a Community Redevelopment Area, a Public Infrastructure District, reduced impact fees, partial pre-leasing of the building by the City or University (to offset risk). Furthermore, risk is partially mitigated (and thereby returns increased) if pre-leasing activity results in a minimal stabilization period for an office property.

Retail

The highest and best use analysis for retail construction considers current market activity (2Q 2020), including achievable rents, vacancy rates, operating expenses, construction and land costs, and required rates of return and profit allowances. Rental rates and construction costs are influenced by the amount of available parking, exposure and visibility of the structure, proximity to transportation connections, desirability of immediate surroundings, and demographics of the surrounding area (population densities, traffic counts, incomes, etc.).

The scenario shown on the following page highlights retail development of a small building of 5,000 square feet with surface parking. The required rate of return range is noted currently from roughly 18-25 percent. The proposed scenario notes a possible range of 7-15 percent, indicating that near-term development is unlikely for notable retail use. If the market improves, or construction costs decline, retail construction may become more feasible. Presently, most investors are somewhat pessimistic about retail market conditions going forward. As noted previously, retail is generally overbuilt and changing consumer trends are exacerbating the excess space in the market. Key retail locations should continue to thrive, while secondary locations with reduced visibility and exposure may suffer for an extended period. Highest and best use conclusions do not suggest much retail, if any, for most sites.

Financial incentives could also be considered to encourage retail development and help to partially bridge the gap between value and costs. This may include a Community Redevelopment Area, a Public Infrastructure District, and reduced impact fees.

bdcnetwork.com

abacusarchitects.com

Residential

The highest and best use analysis for residential construction considers current market activity, including achievable rents, vacancy rates, operating expenses, construction and land costs, and required rates of return and profit allowances. Rental rates and construction costs are influenced by quality and design of the residences, the type of parking (covered or surface), provided amenities, proximity to support services and transportation connections, and desirability of immediate surroundings.

The scenario shown on the following page highlights residential development of a mid-rise building of 100 units with surface parking. The required rate of return range for residential product in the present market (2Q 2020) is noted from roughly 15-20 percent. The proposed scenario, as shown on the next page, notes a possible range of 12-21 percent, indicating that near-term development is likely. The residential market has remained healthy in key markets.

Financial incentives are likely not needed to further encourage residential development. If covered parking is to be pursued, or specific design standards that notably increase costs, then gaps may exist in value that do not permit for near-term construction. Consequently, economic development tools could be utilized for specific residential development needs.

Highest and Best Use Conclusion

The study area has few limitations for physical and legal possibilities. Financially feasibility considers which possible uses would generate a profit, while the maximally productive use finalizes that use which creates the greatest return to the land.

As shown on accompanying spreadsheets, office, retail, and residential use are all financially feasible in that anticipated value exceeds proposed costs. However, profit margins are limited in some scenarios such that development would not be pursued.

Changes in layout, design, construction quality, parking amenities, etc., could be pursued to increase profitability.

The following table shows currently required rates of return for various property types, as compared to returns associated with proposed development in the study area.

USE TYPE	REQUIRED PROFIT RANGE (UNIVERSITY SUBMARKET)	ANTICIPATED RANGE IN STUDY AE (ACTUAL CONSTRUCTION)	LIKELY TO BE PURSUED IN NEAR TERM?
Office	17-22%	10-18%	Possible
Residential (Multi-Family)	15-20%	12-21%	Yes
Retail	18-25%	7-15%	Unlikely

Site Specific Uses & Costs

Health Sciences Mobility Hub Concept Plan

- **Proposed Use** – This site will primarily include surface parking with landscaping, bathroom facilities, and minimal other improvements.

- **Likely Costs** – Surface parking lot costs will likely be near $3,500 per space. This is inclusive of all hard and soft costs and considers a site relatively graded and ready for near-term construction. It additionally includes costs for some surrounding landscaping and hardscape improvements. Bathrooms and rest facilities will range significantly dependent upon buildout and finishes, but will likely be in excess of $150,000

- **Funding** – Funding could be pursued through traditional financing means, or, through grants available for transportation related improvements. Additional information regarding grants is presented in following pages.

200 South Mobility Hub Concept Plan

- **Proposed Use** – This site will include some intersection changes and minimal landscape and hardscape improvements for the bulb-outs, curb extensions, and bus and shuttle stop areas.

- **Likely Costs** – Costs are likely to be relatively minimal for this study area.

- **Funding** – Funding could be pursued through traditional financing means, or, through grants available for transportation related improvements. Additional information regarding grants is presented in the following pages.

South Campus Mobility Hub Concept Plan

- **Proposed Use** – The site may contain a variety of landscape and hardscape improvements, as well a potential of 14,000 square feet of commercial space and roughly 135 residential units in a stacked-flat design with above grade parking.

- **Likely Costs** – Construction costs of **retail space** will be highly dependent upon intended use and the requirements of that user type (i.e., restaurant space, gym, etc.). Additionally, costs will increase with smaller suite spaces versus larger areas, but the market will better respond to flexibility of suite sizes. Most suites should be below 3,000 square feet to be competitive in the current market. Direct and indirect costs should sum to close to $130 a square foot for standard retail space with a warm shell buildout. Additional costs will include parking at $3,500 per space, land costs, and a required development profit to undertake the risk of development and stabilization. Overall, costs for retail space at south campus site are estimated at between $200 and $225 per square foot.

Construction costs of **apartments** will also consider the level of amenities and the desirability of interior finishes. For this analysis, a good quality and condition apartment complex was assumed, commensurate with newer product available in the local and regional market. Assumed rents (as shown previously) consider a desirable buildout with typical apartment amenities. Total costs, including direct and indirect costs, land, and parking, will likely be near $175 per square foot. This does not include a necessary profit to pursue development. The residential assumed cost is notably lower than retail, due primarily to the d ecreased overall parking needs for apartments in comparison to retail. As a result of lower costs of construction and superior market conditions, apartment construction is more feasible than retail in the present market.

- **Funding** – The apartment and retail spreadsheets presented previously show that the continued demand for residential makes it more feasible for funding and investment. Retail reveals a gap between costs and value that would require incentives or changes in market conditions in order to achieve market interest in development. Regarding incentives, Salt Lake City could pursue the creation of a Community Redevelopment Area (CRA), which would allow for tax increment financing. However, consider the make-up of the surrounding area, it is likely not a priority neighborhood for the Salt Lake City Redevelopment Agency.

A potential tool for funding the South Campus site is a Public Infrastructure District (PID). This recently created economic development tool is intended to allow for construction of uses that would otherwise not occur due to onerous initial infrastructure costs. An owner of the property is allowed to form a new taxing entity (the PID), and can bond based on the future tax revenue of the project.

www.beckershospitalreview.com

This structure permits a relative "offset" to some initial costs, thereby resulting in development that may not otherwise have been feasible. Considering the proposed infrastructure of the south campus site, a PID could be a valuable funding tool to result in a multi-use site.

- **Covered Parking** – Surface spaces are estimated to cost roughly $3,500 per stall, inclusive of all driveways, connector aisles, and with consideration for supporting landscaping. Covered parking costs are largely dependent upon the structure, soil conditions, and other considerations such as height, ground water tables, etc. A below-grade parking structure with upper (above-grade) level uses will typically run roughly $24,000 per space. If more than two-levels are to be constructed below grade, costs would increase. More expensive costs would be associated with a below grade parking structure if upper level building construction requires multiple elevator points and ventilation equipment. For a separate, above-grade, parking structure of two-stories, costs are currently noted at roughly $18,000 per space. This assumes no upper level construction, but rather just a two-story, stand-alone parking structure.

HUB LOCATION	COST ESTIMATE
200 South	$150,000
South Campus	$22,200,000
Health Sciences	$180,000

Implementation Schedule

Due to the various sizes and complexities of the proposed mobility hubs, the implementation of each hub will be done individually as funding becomes available and related projects are implemented. In addition to the previously outlined funding opportunities, it's recommended the development of the 200 South Mobility Hub and the Health Sciences Mobility Hub be in conjunction with proposed projects and planning documents.

The 200 South Mobility Hub should be planned and implemented with Salt Lake City's 200 South transportation improvements. The Health Sciences Mobility Hub should be developed in conjunction with the proposed 'Helix' building on the north end of the site. The first phase of the South Campus Mobility Hub could be developed in the short term,1-5 years as the improvement cost are relatively small.

The proposed construction with the second phase of the South Campus Mobility Hub is not overly significant in size or cost. We anticipate the largest hurdle to development of the site would be relocation of the services currently housed at this location. Once funding for those moves are secured, the development could occur in just a few years.

The office component would likely need to be 50-60 percent preleased (roughly 40,000 square feet) to be of interest to lenders in the current market, we suggest about a 6-12-month marketing/exposure period for that property until some vertical construction begins to take place.

Construction of a mid-rise office with separate, structured parking could be done in 12-18 months.

The retail is notably small, and once there are identified tenants (bike shop, café, etc.), construction could begin in the next six months. Total buildout-out would likely be near a year, and that would include individual interior finishes and stabilization. While the lending market for retail is going to be tenuous at best for the next while, it's less than a $1.5 million investment and won't cause much heartache with lenders. Consequently, the retail could move quickly.

We anticipate the multi-family will have strong lending support due to the product type and the specific location. It's a moderate-size investment, particularly with the below-grade parking. The multi-family could be funded in a few months (assuming that architectural and engineering was completed), with construction likely in excess of 12 months. Absorption for a 100-unit apartment complex at the South Campus location could realistically be done in six months, with a fair amount of initial, pent-up demand evidenced in the first month or two of leasing.

Securing transportation grants will require a study and some additional work, but this could realistically be done within the year. Funding from a CRA would take some time considering the process necessary with Salt Lake City and each of the taxing entities. Setting up a Public Infrastructure District could feasibly be done by the end of this year. That option would allow for relatively "quick" access to funding from issuing bonds.

It should be noted that the South Campus Mobility Hub is critical to the mobility network within the study area and should be considered a very high priority.

Grants

TIGER Grants (now BUILD Grants)

TIGER Grants, which were previously well known as Transportation Investment Generating Economic Recovery grants, have now been renamed to BUILD grants. BUILD stands for "Better Utilizing Investments to Leverage Development." BUILD grants have been funded by roughly $8.0 billion by the Department of Transportation (DOT) to invest in projects that "have a significant local or regional impact."

The eligibility requirements of BUILD allow project sponsors at the State and local levels to obtain funding for multi-modal, multi-jurisdictional projects that are more difficult to support through traditional DOT programs. BUILD can provide capital funding directly to any public entity, including municipalities, counties, port authorities, tribal governments, MPOs, or others in contrast to traditional Federal programs which provide funding to very specific groups of applicants (mostly State DOTs and transit agencies). This flexibility allows BUILD and its traditional partners at the State and local levels to work directly with a host of entities that own, operate, and maintain much of the transportation infrastructure, but otherwise cannot turn to the Federal government for support.

The BUILD program enables DOT to use a rigorous merit-based process to select projects with exceptional benefits, explore ways to deliver projects faster and save on construction costs, and make needed investments in America's infrastructure. For the study area, a cost-benefit analysis would be required, showing the financial impacts of providing increased and improved transportation connections versus the costs of construction.

skouttravel.com

attheu.utah.edu

STBG

The Surface Transportation Block Grant program (STBG) provides flexible funding that may be used by States and localities for projects to preserve and improve the conditions and performance on any Federal-aid highway, bridge and tunnel projects on any public road, pedestrian and bicycle infrastructure, and transit capital projects, including intercity bus terminals.

The Surface Transportation Program (STP) is one of the main sources of flexible funding available for transit or highway purposes. STP provides the greatest flexibility in the use of funds. These funds may be used (as capital funding) for public transportation capital improvements, car and vanpool projects, fringe and corridor parking facilities, bicycle and pedestrian facilities, and intercity or intracity bus terminals and bus facilities. As funding for planning, these funds can be used for surface transportation planning activities, wetland mitigation, transit research and development, and environmental analysis. Other eligible projects under STP include transit safety improvements and most transportation control measures.

TRZ

Transportation Reinvestment Zones (TRZ) are a tax-increment financing tool approved by the Utah State Legislature in the past few years. Their intent is to promote transit-oriented development and to help fund transportation-related projects through the capture of property tax increases associated with transportation improvements. The structure of a TRZ is very similar to that of a Community Redevelopment Area (CRA), and necessitates participation from the area taxing entities.

TTIF

The Transit Transportation Investment Fund (TTIF) is a potential funding vehicle for transportation capacity projects. Local governments and districts may nominate projects for consideration of prioritization of select projects. The projects required a 40% match from the local nominating entity, and have the following eligibility requirements:

- Public transit project that adds capacity to a public transit system within the state
- Ongoing funding plan for maintenance and operations of the project
- If the project would provide new fixed-guideway public transit service, the project mush be identified in Phase I of the appropriate Regional Transportation Plan or Long Range Plan
- Pedestrian or non-motorized transportation projects that provide connection to a public transit system

CMAQ/STP/TAP

The Congestion Mitigation and Air Quality (CMAQ) program, Surface Transportation Program (STP), and Transportation Alternatives Program (TAP) are administered by the Wasatch Front Regional Council and include roughly $35 million annually in federal transportation funding for local communities. CMAQ provides funding for transportation projects that improve air quality; STP is a programs for funding federal-aid highways and bridges, transit capital improvements and projects, and active transportation projects; and, TAP provides funding for the planning and construction of bicycle and pedestrian facilities.