Regional Campus Mobility Hub
Catalog

North Central Texas Council of Governments
March 2023

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The contents of this report reflect the views of the authors who are responsible for the opinions, findings, and conclusions presented herein. The contents do not necessarily reflect the views or policies of the Regional Transportation Council, NCTCOG, the Federal Highway Administration, the Texas Department of Transportation.

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01 How to Use the Catalog

University and college campuses represent a convergence of professionals, students, local residents, and commuters. These campus affiliates face a range of mobility needs that are not easily addressed by traditional mobility planning. Campuses experience unique travel behaviors that mirror class schedules, extracurricular campus activities, and daily living at and near campus facilities. Campus affiliates throughout the Dallas-Fort Worth metroplex–including students, faculty, staff, and visitors–build their lives around their campuses and need a diverse mix of mobility solutions and travel information to satisfy their need for quick, regional, and intra-campus mobility.

As such, transportation planners and campus officials in the metroplex cannot take a one-size fits all approach to campus mobility. The region must also consider the unique behaviors, demographics, land use environments, and policy contexts present when creating multimodal policy and investing in transit connectivity and mobility-rich campus environments.

Mobility hubs uniquely address key transportation barriers that campus affiliates experience, such as transit connectivity, first- and last-mile gaps to and from campus, access to mobility options, and awareness of real-time travel conditions through the co-location of multiple transportation modes. While mobility hubs can be found throughout the region's urban and suburban land use environments, the North Central Texas Council of Governments (NCTCOG) has identified a need for better coordination and expanded investment in mobility hubs at or near college and university campuses in the North Central Texas region. The region needs guidance, consistency, and smart strategies to get to ribbon cutting.

What is NCTCOG's Role in Campus Mobility Hubs?

NCTCOG views mobility hubs as a critical mobility framework to meet the diverse transportation needs of our region. Thoughtful hub planning and meaningful investment can result in positive mobility and community outcomes that extend well beyond the university and college campus boundary. These are regional mobility solutions that should be built, tested, and iterated. We are investing in their successful delivery. We see our staff and resources being used to:'

1. Convene partners and exchange knowledge
2. Support innovation in procurement
3. Guide planning, implementation, and ongoing operations for campus mobility hubs
4. Provide technical assistance
5. Fund transformative hub projects and services that align with the Catalog and other regional plans

What is the Regional Campus Mobility Hub Catalog?

The Regional Mobility Hub Catalog was developed to provide comprehensive technical assistance on planning strategies, kit of parts menu selection, design considerations, implementation strategies, funding opportunities and management techniques for hub locations in communities and at college and university campuses in the North Central Texas Region. Ultimately, this catalog will guide you and help achieve regional and local objectives for current and future mobility hubs.

Use the Catalog as a choose-your-own-adventure "how to" resource for hub planning and implementation. Read it in full or flip to a specific topic. We even have detailed technical reports to support the Catalog, located on the Campus Mobility Hub project website.

Who is this Catalog for?

The Catalog will be useful to most people on your implementation team. Primarily designed for practitioners, campus planners and administrators, city planners and engineers, and transit agency staff can reference the Catalog for in-the-weeds planning and implementation strategies. For most other readers, the Catalog is a primer tool. Your implementation team, including funders, vendors, and even real estate developers, might need to get up to speed on what campus mobility hubs are and why they are a sound investment. This is a useful selling point.

02 What are Campus Mobility Hubs?

A Regional Definition, Vision, and Objectives for Campus Mobility Hubs

Campus mobility hubs are the **physical and digital intersection** of mobility options, transportation information, campus life, and social interactions. Campus mobility hubs are **centralized points both on- and off-campus** where people have **on-demand access** to a range of shared mobility options and mobility storage solutions. They enable campus affiliates to access multiple transportation options and amenities that **support campus access or connections across modes**. Typically built on a **backbone of public transit and campus shuttles**, mobility hubs offer a **safe, comfortable, convenient, and accessible** space to seamlessly transfer across different mobility options.

NCTCOG and local stakeholders developed the above vision statement for campus mobility hubs, intended to guide development and planning. Consider developing a unique vision statement for your campus mobility hub that responds to the needs of your own campus and surrounding community.

Beyond that, developing concrete objectives that can be measured will lend more validity to your approach and streamline planning – consider developing objectives for campus mobility hubs unique to your campus. NCTCOG developed the following objectives for campus mobility hubs across the Dallas-Fort Worth region.

Campus Mobility Hubs Should...

be highly accessible, convenient, sustainable, and safe, with a wide array of amenities to complement the available mobility offerings

seamlessly tie-in to the fabric of the campus or community where they are located, both in terms of aesthetics and the amenities offered.

provide more than just a connection between transportation modes – they should be activated and comfortable enough to spend anywhere from a short stopover to a long stay

cater to the diverse mobility needs and abilities of students, faculty, staff, and visitors

What Do On- and Off-Campus Mobility Hubs Solve for?

Mobility hubs can be effective tools at helping solve several mobility problems on your campus.

Options and Independence

Access to mobility options is a common problem in the university context. This is particularly true on campuses with a high number of international students, who may not have a personal vehicle or may be coming from a place where public transportation is abundant and easy. While many students are experiencing independence for the first time in the university setting, they may lack access to a personal vehicle and often do not understand their mobility options.

Affordability

Affordability is another problem that mobility hubs can help solve – by providing low-cost and low-commitment mobility options, students and campus affiliates will have choices aside from owning a personal vehicle. Ultimately, car-centric culture has been a barrier to adopting and implementing new and different mobility offerings – through an efficient demonstration space, non-car modes and connections can be given wider validity.

Unlocking More Trips

While mobility hubs in the campus context will often be used to help replace personal vehicle trips with transit, shuttle, micromobility, bicycle, or other modal options between home and campus or within campus, there are other use cases that apply to mobility hubs on your campus. A network of mobility hubs, with a strong foundation of bicycle and pedestrian infrastructure connecting hubs, creates opportunities for students to diversify their trip types by making it easier to take non-educational trips between hubs – connecting the campus to the greater community through an offering of amenities and connections.

First/Last-Mile Campus Connections

Campus mobility hubs offer the opportunity to complete the first- or last-mile during a commute, when local transit doesn't quite get university affiliates to their ultimate destination. Mobility hubs connect affiliates to on- and off-campus destinations that may not be accessible without a personal vehicle.

Campus Deliveries

Whether you're a student or a student union shop owner, campus affiliates rely on reliable package delivery. Campus mobility hubs present an opportunity to simplify and reduce the impacts of on-campus deliveries.

Coordinated Mobility

Regional stakeholders flagged coordination and breaking down silos between agencies and entities as key elements for the successful development of a regional mobility hub network. Current efforts to prioritize mobility hubs as a mobility tool in the NCTCOG region vary throughout the region's published plans.

Better Walking and Biking Environments

The biggest barrier to widespread mobility hub implementation, however, is a lack of underlying bicycle and pedestrian infrastructure to serve as a foundation for mobility hub connectivity. Hub networks are viable and necessary in the region and funding opportunities are plentiful – especially from the federal government – but a comprehensive mobility hub network cannot be successful without a commitment to filling gaps in the bicycle and pedestrian network and creating quality connections.

The Campus Mobility Hub Typology

Different Hubs for Different Campuses

No two campus mobility hubs will be designed and operated the same. The features, access conditions, and use cases of each mobility hub on your campus depend on the type of campus, its mix of campus affiliates, its land use context, available multimodal network, and specific transportation needs of campus affiliates and adjacent neighborhoods. The Campus Mobility Hub Typology Framework below organizes how NCTCOG's mobility hub catalog, and the mobility hubs it will guide, can be best implemented within your campus and mobility network context. The process to develop the Campus Mobility Hubs Typology methodology is included in NCTCOG's Scenario Development and Evaluation Technical Report.

What Indicators Make Up the Campus Mobility Hub Typology?

The Campus Mobility Hub Typology Framework establishes six hub types – three for on-campus hubs and three for off-campus hubs – that reflect the diversity of campus conditions in the North Central Texas region. Every campus mobility hub is assigned a type that best captures the characteristics and needs of the area specific to that hub. Each hub type is designed to be flexible and cater to a diverse set of mobility needs. No two hubs of the same type will be alike. The table on the right describes the three factors and associated indicators used to build the typology.

Factor	Description	Indicators	Included in off-campus hub assessment	Included in on-campus hub assessment
Access	Mobility options to get to/ from hub	High-capacity transit	■	
		Park and ride	■	■
		Fixed-route transit	■	■
		Car share	■	
		Bike share	■	■
		Campus shuttle		■
		Bike parking		■
		Dedicated bike paths		■
Context	Surrounding (population/ demographic) characteristics of mobility hubs	Population density	■	
		Employment density	■	
		Mixed Use/Transit-Oriented Development	■	
		Other land uses	■	
		Next to student housing	■	■
		Next to classroom buildings		■
		Next to stadia/event centers		■
		Next to plazas/gathering spaces		■
Connections	Connectivity intensity and trip purpose of mobility hubs	Transit center / Transfer stop	■	
		Residential area	■	
		Other activity centers (recreation, shopping, etc.)	■	
		Access point		■
		Close to many amenities		■
		Close to one amenity		■

On-Campus Mobility Hubs

On-campus mobility hubs are found within the boundaries of your college or university. They connect commuters coming into campus or help campus residents and affiliates make short trips on campus or between campus and nearby destinations. The mobility and land use factors that inform on-campus hub amenities will vary from campus to campus – but overall, the context of on-campus hubs will relate to lower-capacity mobility access and campus land uses such as student housing and classrooms. On-campus hubs are divided into the following three typologies: Gateway Hubs, Park Once Hubs, and Residential Hubs.

Gateway Hubs

Gateway Hubs can be found on your campus near the main campus entrances or access points. Campus amenities, such as housing, classrooms, and public gathering places are nearby. Gateway Hubs are often integrated into signature public spaces and alongside a major landmark (e.g., gateway structure, fountain feature, statue, landscaped entryway, etc.). Mobility amenities offered at Gateway Hubs tend to focus on fixed-route transit, campus shuttles, significant pools of bike parking, bike share and micromobility parking, wayfinding, and other bicycle and pedestrian-related offerings. Campus gateways are often well-established, built out locations – as such, growth potential for the areas surrounding the Gateway Hub is static or minimal. Being located near the gateway to campus, these mobility hubs will ideally provide connections to multiple campus destinations and even nearby off-campus amenities.

Examples of Gateway Hubs can be found at Texas Christian University (TCU), Dallas College Cedar Valley, and University of Texas at Arlington (UTA). The graphic on the right shows the potential design and amenity opportunities of a sample Gateway Hub. See Page 28 for a map of all mobility hub locations.

Park Once Hubs

Park Once Hubs emphasize connecting campus affiliates who drive and park their car to other mobility options. Typically, these mobility hubs will be located away from the center of your campus and major campus amenities. Park Once Hubs center around a parking location that has access to fixed-route transit or a campus shuttle. Except where parking facilities are in built out areas of campus, the potential for growth at Park Once Hubs is high, in part due to the relative lack of density and amenities in the surrounding area. In addition to parking and transit access, these hubs should also offer access to bicycle amenities like bike parking and bike/scooter share. Park Once Hubs are intended to be situated near student housing, classrooms, and public spaces.

Examples of Park Once Hubs can be found at University of North Texas – Denton (UNT), University of Texas at Dallas (UTD), and Paul Quinn College. The graphic on the right shows the potential design and amenity opportunities of a sample Park Once Hub. See Page 28 for a map of all mobility hub locations.

Residential Hubs

Residential Hubs are located on your campus in close proximity to student housing. These hubs operate in both urban and suburban contexts, but the mix of mobility amenities is likely to be similar at Residential Hubs regardless of context. In an urban context, these hubs are typically in pedestrian-heavy locations with a low car presence, whereas in suburban context there is likely to be a lower pedestrian presence. Access to these hubs tends to focus on bike amenities, fixed-route transit, and campus shuttle, with connections to existing or new bike paths on adjacent streets. Two-way car share services serve as vital mobility options for car-free students that need to get off campus for errands, weekend activities, and more. While growth in the surrounding area is likely to be minimal to static, with land use context primarily consisting of residential housing and public spaces, campuses with redevelopment plans or with the ability to redevelop parking lots may see additional growth opportunities that will strengthen the Residential mobility hub.

Examples of Residential Hubs can be found at Southern Methodist University (SMU), Texas Women's University (TWU), and Dallas Baptist University. The graphic on the right shows the potential design and amenity opportunities of a sample Residential Hub. See Page 28 for a map of all mobility hub locations.

Off-Campus Mobility Hubs

Off-campus mobility hubs are located outside of the boundaries of your college and university campus, but typically within 2 miles of your campus. Despite this, they serve to connect campus affiliates between campus and off-campus demand generators or transit connections. Located away from the campus context, off-campus hubs offer a mix of campus affiliate and non-affiliate mobility use cases. Land use and mobility factors that commonly inform off-campus mobility hubs include proximity to high-capacity transit, population and employment density, and activity centers. Off-campus hubs are divided into the following three typologies: Urban Core Hubs, Suburban Core Hubs, and First/Last-Mile Hubs.

Urban Core Hubs

Urban Core Hubs are located within relatively dense, urban settings, and typically have direct access to high-capacity transit or major transit centers (within 2 miles) and a diverse mix of land uses. These mobility hubs are located in areas with high population and employment density, in a TOD-like setting, with access to mobility options or other urban amenities. Potential for growth is high in the area surrounding Urban Core Hubs. Urban Core Hubs complement the land uses in the area with context-sensitive mobility offerings and by providing space for users to relax, play, or comfortably wait for their next bus or train.

Examples of Urban Core Hubs can be found outside Southern Methodist University (SMU), UT Southwestern Medical Campus, and Dallas College - El Centro Campus. The graphic on the right shows the potential design and amenity opportunities of a sample Urban Core Hub. See Page 28 for a map of all mobility hub locations.

Suburban Commuter Hubs

Suburban Commuter Hubs are typically found in off-campus areas with low to moderate density and a residential land use focus. A TOD-like land use context may apply to the Suburban Commuter Hub, but the density of the surrounding context will be lower than in the Urban Core Hub. Like Urban Core Hubs, Suburban Commuter Hubs are best built on a backbone of transit, but the transit capacity may be lower than on transit that serves Urban Core Hubs. In terms of growth, the area surrounding a Suburban Commuter Hub is expected to be static to minimal. With less density than in Urban Core Hubs, there is more space to provide mobility options – Suburban Commuter Hubs can build mobility connections in your community for those who drive by dedicating space to parking infrastructure in the form of a surface lot or garage.

Examples of Suburban Commuter Hubs can be found outside University of Texas at Dallas (UTD), Dallas College North Lake, and UNT Dallas. The graphic on the right shows the potential design and amenity opportunities of a sample Suburban Commuter Hub. See Page 28 for a map of all mobility hub locations.

First/Last-Mile Hubs

First/Last-Mile Hubs are off-campus hubs that bridge the gap between the on-campus and off-campus setting. Typically found within a mile of the campus boundary, the land use context of these mobility hubs trends towards commercial activity. Potential for growth at First/Last-Mile Hubs is moderate, and highly dependent on the setting of each individual mobility hub. The mobility amenities provided at First/Last-Mile Hubs are designed to help make short-trips to access your campus setting, usually from an anchor transit service. These hubs include options like bike share and micromobility, fixed-route transit and shuttles, and a connection to nearby bicycle and pedestrian infrastructure.

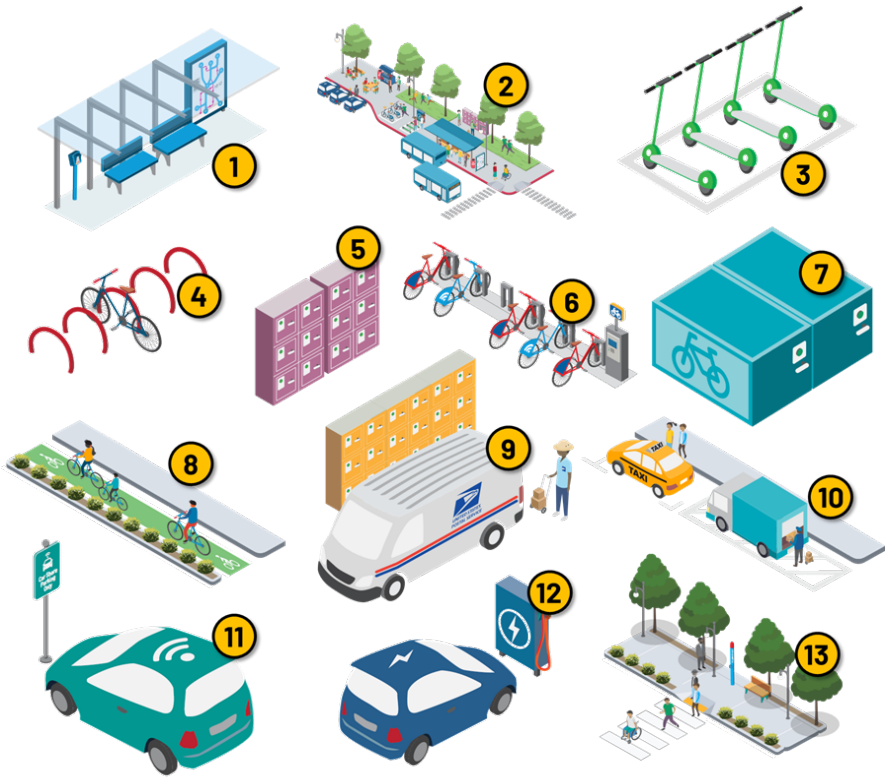
Examples of First/Last-Mile Hubs can be found outside Texas Woman's University (TWU), University of Texas at Dallas (UTD), and Texas A&M University – Commerce. The graphic on the right shows the potential design and amenity opportunities of a sample First/Last-Mile Hub. See Page 28 for a map of all mobility hub locations.

THE KIT OF PARTS

One of the first steps toward planning your mobility hub network involves understanding what elements are available to you. While this section includes a wide array of mobility hub amenities, there are always opportunities for additional elements to improve mobility connectivity and the commute experience. As you plan and design your mobility hub(s), use the shared mobility propensity tool on page 20 and affiliate engagement to guide what modes, services, and amenities to site and accommodate.

Included in the Kit of Parts are indicators that identify the relative amount of space and budget needed to accommodate each mobility hub amenity on your campus, which are intended to be useful if you have budget or space limitations.

Access and Mobility Amenities

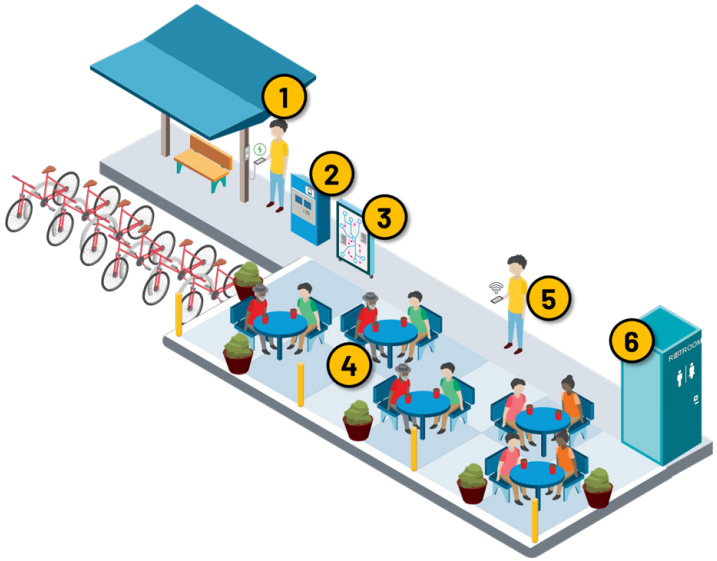


	The Kit of Parts	Budget	Space
1	Transit Shelter and Waiting Area	$	★★
2	Sidewalk Connectivity	$$-$$$	★-★★
3	Micromobility and Drop Zones	$	★
4	Short-Term Bike Parking/Bike Racks	$	★
5	End-of-trip Facilities (Showers and Lockers)	$$	★-★★★
6	Bike Share Stations	$$	★-★★
7	Long-Term Secure Bike Parking	$$	★-★★★
8	Bike Network Connectivity	$-$$$	★★-★★★
9	Parcel Lockers and Low-Emission Delivery	$$	★★
10	Loading Zones	$	★
11	Dedicated Car Share Parking	$	★
12	Charging Stations for Shared Vehicles and Micromobility	$	★
13	Safe Intersections	$	★★-★★★

Public Realm Amenities

	The Kit of Parts	Budget	Space
1	Pedestrian-Scale Lighting	$$	★
2	Permanent and Mobile Vending/Retail Space	$-$$$	★-★★★
3	Street Furniture	$-$$	★
4	Community-Driven Design Elements/ Tactical Urbanism	$	★-★★★
5	Green Space	$-$$	★★-★★★★

Customer Experience Amenities



	The Kit of Parts	Budget	Space
1	Public Device Charging Outlets	$-$$	★-★★★
2	Digital Mobility Payment for Transit and Shared Mobility	$$	★
3	Digital Screens for Booking and Trip Planning	$$	★
4	Place Programming	$-$$	★-★★★
5	Public Wi-Fi	$	★
6	Public Bathrooms	$$	★

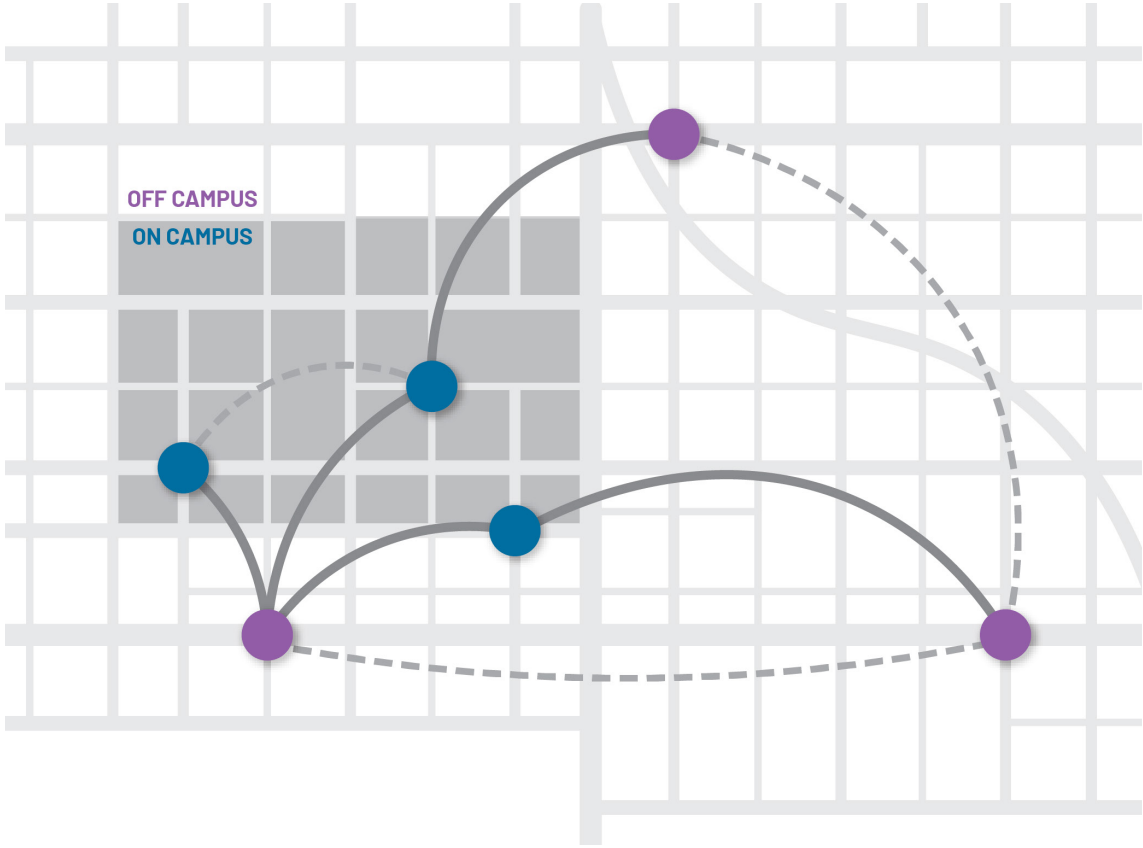
Information Amentities

The Kit of Parts	Budget	Space
1 Real-Time Travel Information	$	★★
2 Digital and Physical Wayfinding	$$-$$$	★-★★
3 Hub Area Maps, Amenity Information, and Bulletins	$	★

Infrastructure Category	Amenities	Cost Estimate	Applicable Hub Typology V = Vital R = Recommend O = Optional					
			Urban Core	Suburban Commuter	First/Last Mile	Gateway	Park-Once	Residential
Access & Mobility	Transit Shelter & Waiting Area	$$	V	V	V	V	V	V
	Sidewalk Connectivity	$$-$$$	V	V	V	V	V	V
	Safe Intersections	$$-$$$	V	V	V	V	V	V
	Short-Term Bike Parking/Bike Racks	$	V	V	V	V	V	V
	Bike Stations with End-of-Trip Facilities	$$	R	O	O	R	O	R
	Bike Share	$-$$	V	O	V	V	R	V
	Bike Network Connectivity	$-$$$	V	R	V	V	R	V
	Long- Term Secure Bike Parking	$$	V	V	V	V	V	V
	Micromobility Stations and Drop Zones	$	V	O	R	V	O	V
	Loading Zones	$	R	R	R	R	R	R
	Dedicated Car Share Parking	$	R	R	R	R	R	R
	EV Charging Stations for Shared Vehicles and Micromobility	$$	R	R	R	R	R	R
	Common Carrier Package Pickup and Other Efficient Delivery Services	$-$$	R	O	O	R	O	R
Public Realm	Pedestrian-Scale Lighting	$$	V	V	V	V	V	V
	Permanent and Mobile Vending/Retail Space	$-$$$	R	O	O	R	O	R
	Street Furniture	$-$$	R	O	R	R	O	R
	Community-Driven Design Elements/Tactical Urbanism	$	R	O	O	R	O	R
	Green Space	$-$$	R	O	O	R	O	R
Customer Experience	Digital Mobility Payment for Transit and Shared Mobility	$$	R	R	R	R	R	R
	Place Programming	$-$$	R	O	R	R	O	R
	Public Bathroom	$$	R	R	R	R	R	R
	Digital screens for booking and trip planning	$$	R	O	O	R	R	R
	Public Wi-Fi	$	R	O	O	R	O	R
	Public Device Charging Outlets	$	R	O	O	R	O	R
Information	Real-Time Travel Information	$-$$	V	V	V	V	V	V
	Digital and Physical Wayfinding	$$	V	V	V	V	V	V
	Hub Area Maps, Amenity Information, and Bulletins	$$	V	V	V	V	V	V

Implementing a network of hubs will help you address the North Central Texas region's multimodal access goals associated with Mobility 2045. These investments will also increase the resiliency of the transportation system as we move away from the global COVID-19 pandemic. A traveler's experience depends on the amenities, customer support, and mobility services offered at each hub. At its core, however, a mobility hub should support and reflect your campus or community's needs. There are a variety of hub network types that may occur in your campus or community.

- **Intra-campus connectivity** connects two or more mobility hubs within your campus and is especially important in campuses with a larger footprint. Hub amenities can be prioritized based on proximity to different campus land uses, including residence halls, classrooms, student unions, and stadia.
- **Campus to off-campus connections** via mobility hubs, especially for short trips, will help reduce dependence on the personal vehicle. These connections are also important for students who live on-campus who often lack a personal vehicle.
- **Inter-campus connections**, whether between two universities within the same system (e.g., UT Arlington and UT Dallas), between a campus and its satellite campus (e.g., UNT Denton and Discovery Park), or two campuses in the same city (e.g., UNT Denton and TWU) serve as an opportunity for branding and coordination between entities with similar goals.
- **Programmatic connections** are those that make connections between your college campus and various off-campus programs. These include student bussing from high schools to college campuses for dual credit courses, trade school access, and community access to and from sporting events or other large events, among others.

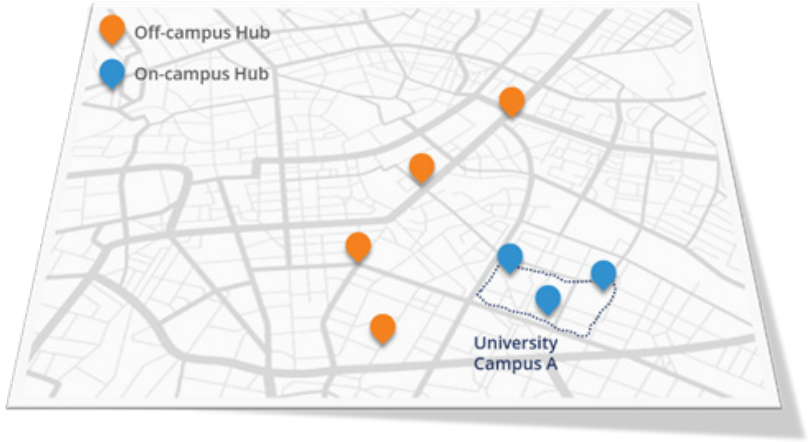


03 Locating Your Campus Hub

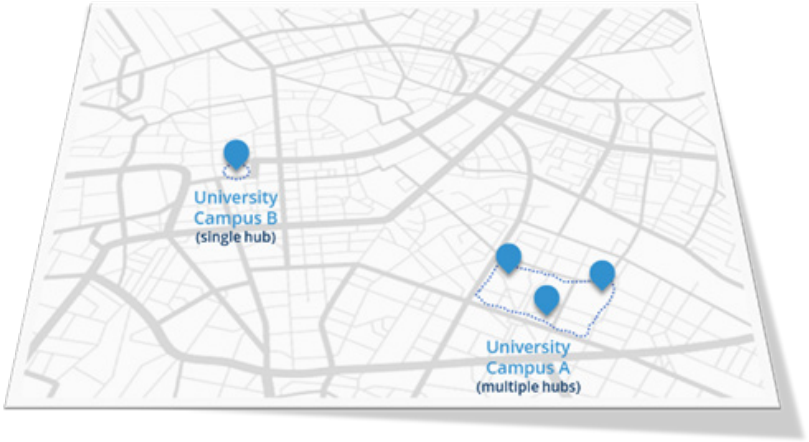
Where do Campus Mobility Hubs Operate Today?

Your university campus, as well as the community that surrounds it, is home to a variety of on- and off-campus mobility hub opportunities. Hub locations might not be branded as such, or might not be viewed by campus affiliates as places to gain access to mobility options. Yet, they operate today in varying states of functionality. The question is: where are there campus mobility hubs on your campus or in your community? The siting analyses described in NCTCOG's Scenario Development and Evaluation Technical Report identifies two dimensions influencing the specific mobility hub siting approach.

- **Location Dimension:** Hub locations are defined as either off-campus or on-campus hubs. Off-campus university hubs provide first- and last-mile connectivity to access regional transit and other services, while on-campus hubs are those within your university campus aimed at connecting university services efficiently and enhancing the accessibility of campus life by catering to the diverse mobility needs and abilities of students, faculty, staff, and visitors.
- **Number of Hubs Dimension:** Given its size and land use, your campus may require multiple on-campus mobility hubs to ensure efficient mobility and provide easy access to academic and administrative buildings, recreation areas, and housing, among other services within your campus's boundaries. Conversely, your campus might be comprised of just a few buildings (or a single building) and might require a single gateway hub to connect affiliates with the outside regional services.



Location dimension



Number of hubs on each campus dimension

The siting results show an approximate location where there is likely already an existing mobility hub or demand for one, but it is up to you to decide where the hub is ultimately located. The full siting results are available in an interactive map, located here. The siting results are summarized on Pages 23-28 with a map showing locations specific to UNT Denton.

What is NCTCOG's Methodology to Site Campus Mobility Hubs?

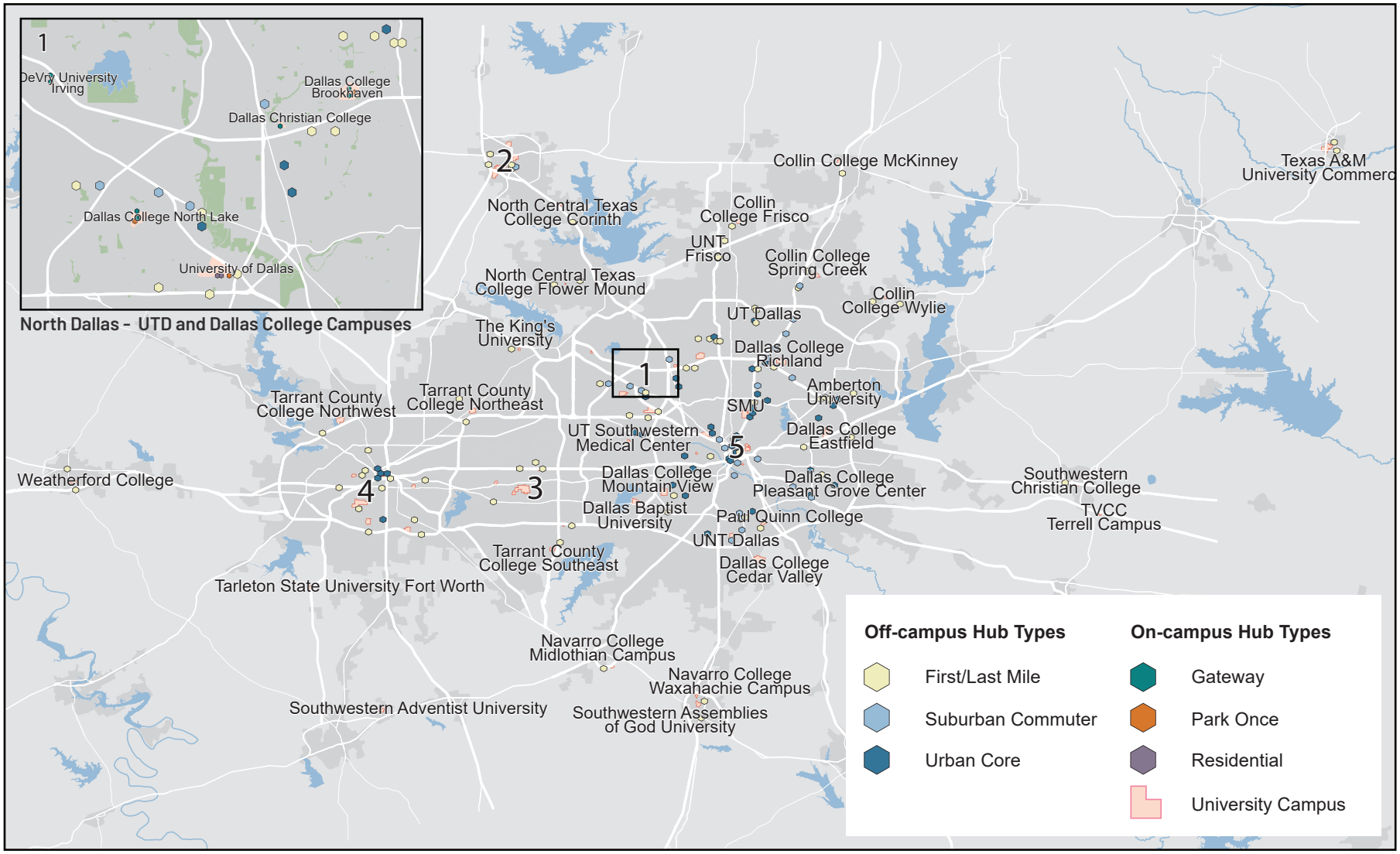
We've developed a unique methodology to determine where mobility hubs are already located on or near your campus and where existing mobility hubs can be enhanced with mobility infrastructure, services, campus life features, and new amenities. Context is key – our robust siting methodology reflects nuances like shared mobility propensity and existing supply, campus size, urban and suburban contexts, and differing levels of amenity availability. The full siting methodology is included in NCTCOG's Scenario Development and Evaluation Technical Report.

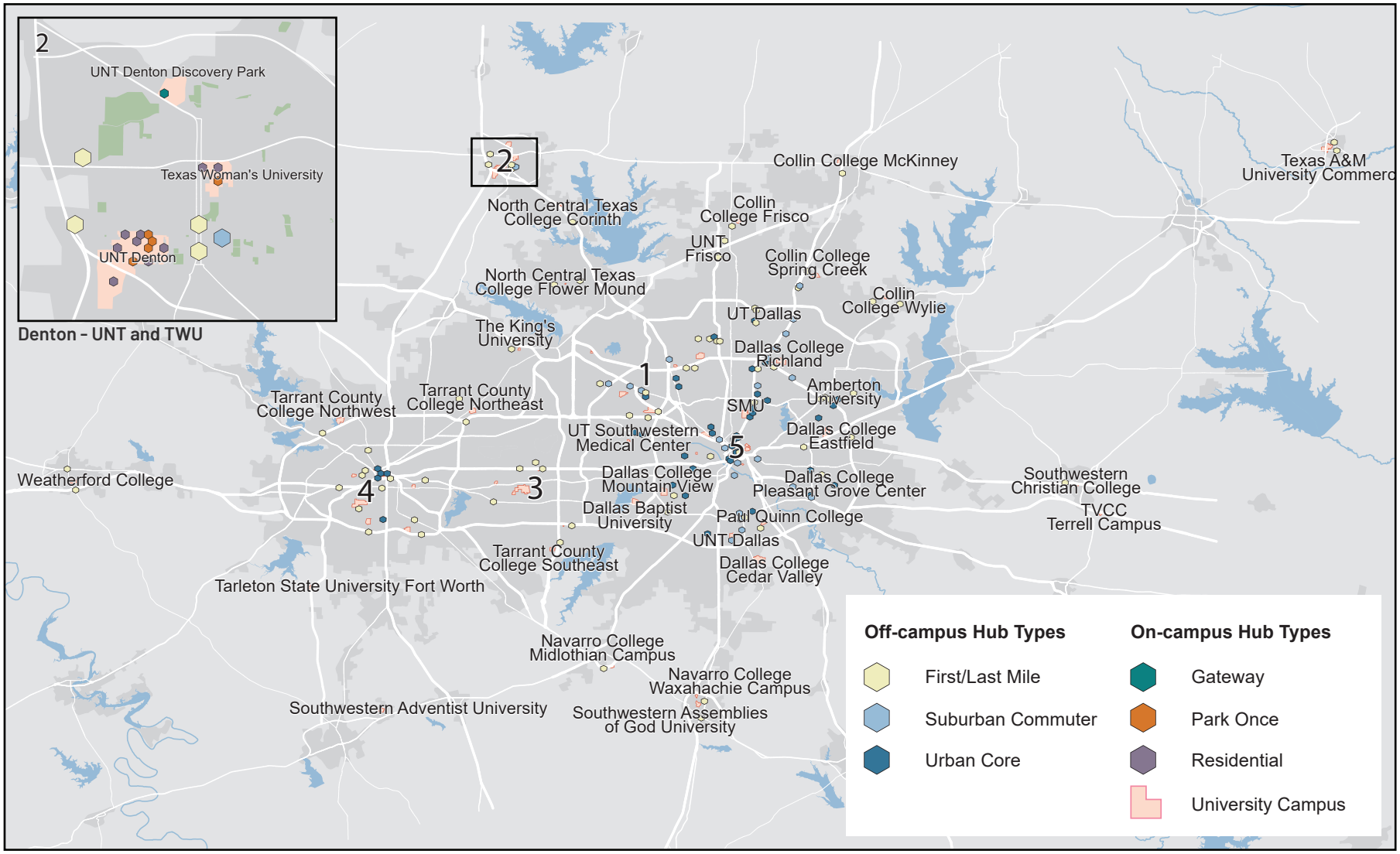
Many indicators factor into where campus mobility hubs are located:

- High-capacity transit stations (e.g., DART Light Rail or Trinity Railway Express stations)
- Transit Centers
- Park & rides and end-of-line termini
- Fixed-route transit stops with frequent service (i.e., 10-minute frequency or better)
- Bike share station
- Dedicated car share parking
- Major bus or campus shuttle stops
- Areas with highest concentration of bicycle cages and/or racks
- Bike share station
- Dedicated car share parking
- Pick-up/drop-off/kiss-and-ride locations
- Parking garages and lots (as places to convene mobility

The following campus trip generators were also considered as locations that create demand for mobility hubs:

- Student unions
- Activity/recreation centers
- Stadia/sports arenas
- Major libraries
- Relatively dense residence halls
- Primary campus gateways


1
DeVry University Irving
Dallas College Brookhaven
Dallas Christian College
Dallas College North Lake
University of Dallas
North Dallas - UTD and Dallas College Campuses
2
North Central Texas College Corinth
Collin College McKinney
Texas A&M University Commerc
Collin College Frisco
UNT Frisco
Collin College Spring Creek
North Central Texas College Flower Mound
Collin College Wylie
UT Dallas
The King's University
Dallas College Richland
1
Amberton University
Tarrant County College Northwest
Tarrant County College Northeast
SMU
UT Southwestern Medical Center
Dallas College Eastfield
5
Weatherford College
4
3
Dallas College Mountain View
Dallas College Pleasant Grove Center
Southwestern Christian College
Dallas Baptist University
Paul Quinn College
TVCC Terrell Campus
UNT Dallas
Tarrant County College Southeast
Dallas College Cedar Valley
Tarleton State University Fort Worth
Navarro College Midlothian Campus
Navarro College Waxahachie Campus
Southwestern Adventist University
Southwestern Assemblies of God University
Off-campus Hub Types
First/Last Mile
Suburban Commuter
Urban Core
On-campus Hub Types
Gateway
Park Once
Residential
University Campus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UNT Denton Discovery Park
Texas Woman's University
UNT Denton
Denton – UNT and TWU
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North Central Texas College Corinth
Collin College McKinney
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Collin College Frisco
UNT Frisco
Collin College Spring Creek
North Central Texas College Flower Mound
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SMU
UT Southwestern Medical Center
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Weatherford College
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Dallas College Mountain View
Dallas College Pleasant Grove Center
Southwestern Christian College
Dallas Baptist University
Paul Quinn College
TVCC Terrell Campus
UNT Dallas
Tarrant County College Southeast
Dallas College Cedar Valley
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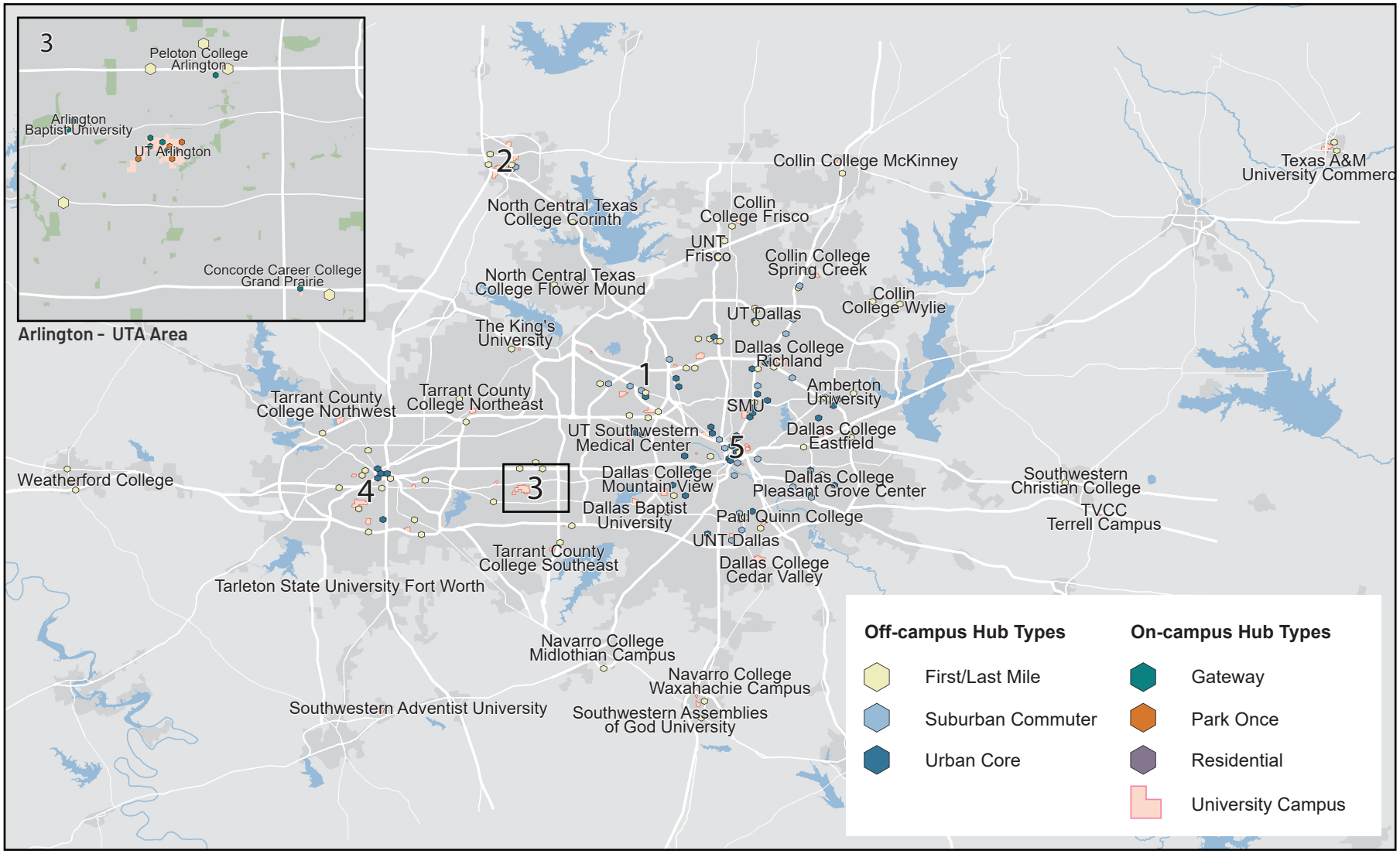
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Baptist University
UT Arlington
Concorde Career College
Grand Prairie
Arlington - UTA Area
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Christian College
Dallas Baptist
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Paul Quinn College
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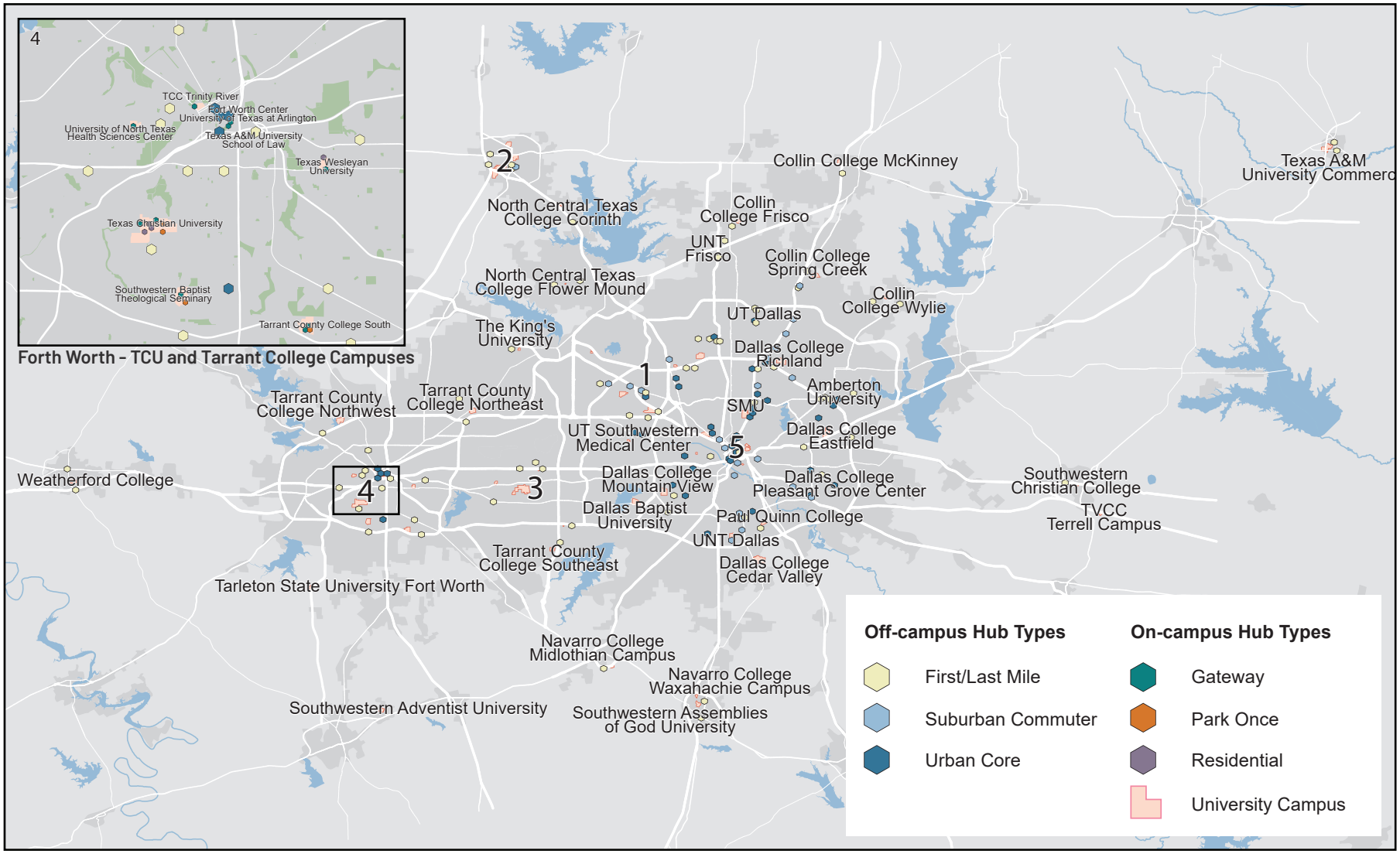
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University of Texas at Arlington
University of North Texas Health Sciences Center
Texas A&M University School of Law
Texas Wesleyan University
Texas Christian University
Southwestern Baptist Theological Seminary
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Collin College Frisco
UNT Frisco
Collin College Spring Creek
North Central Texas College Flower Mound
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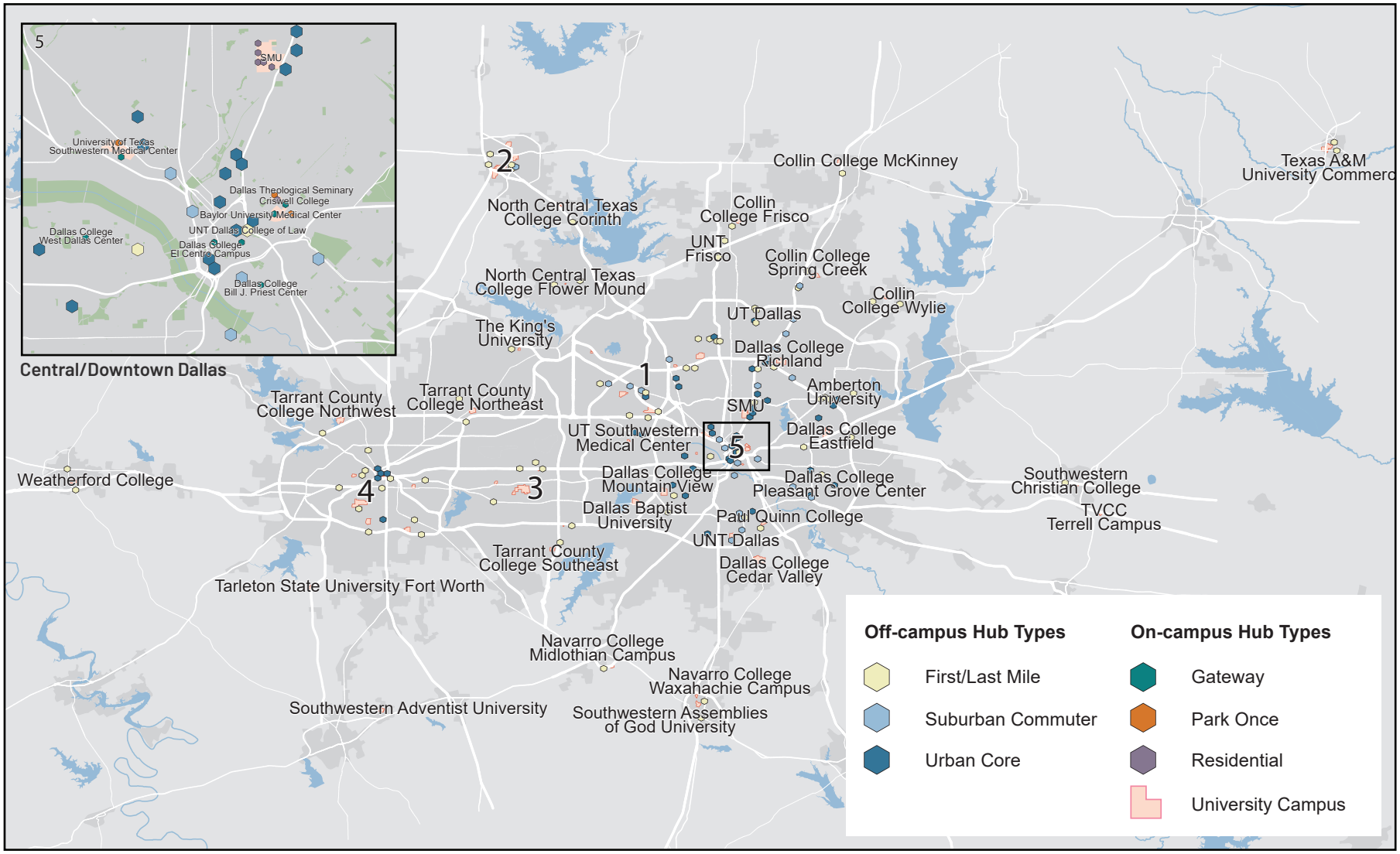
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SMU
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Dallas Theological Seminary
Criswell College
Baylor University Medical Center
UNT Dallas College of Law
Dallas College West Dallas Center
Dallas College El Centro Campus
Dallas College Bill J. Priest Center
Central/Downtown Dallas
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North Central Texas College Corinth
Collin College McKinney
Texas A&M University Commerc
Collin College Frisco
UNT Frisco
Collin College Spring Creek
North Central Texas College Flower Mound
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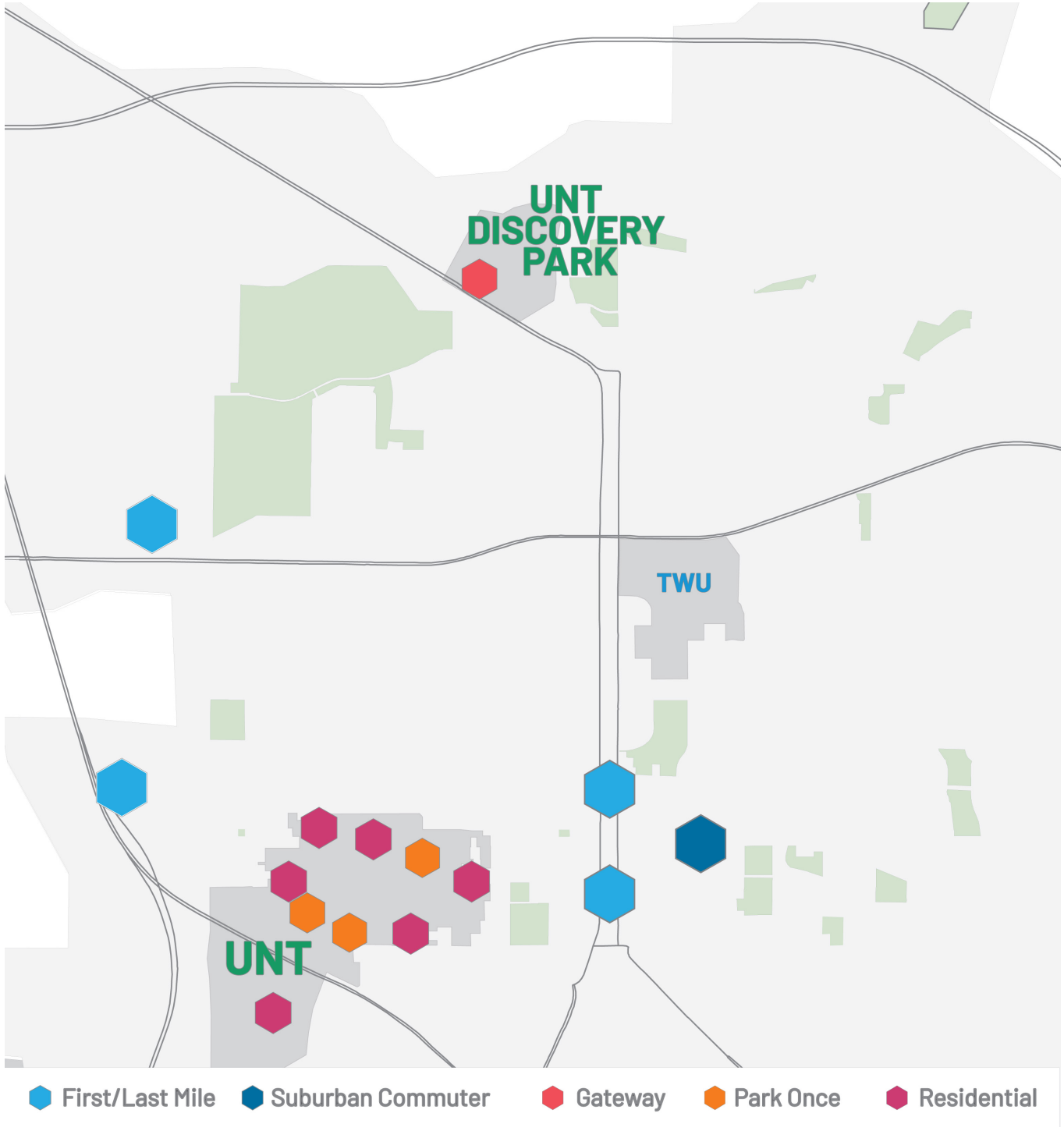
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PARK
TWU
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First/Last Mile
Suburban Commuter
Gateway
Park Once
Residential

04 Outfitting Your Campus Mobility Hub

Shared Mobility Propensity

Your university or college campus likely experiences different degrees of mobility demand from other campuses in the North Central Texas region. One of your first steps to determine the modes and services that should be accommodated at your mobility hub is to **understand the potential demand for different types of shared mobility and public transit services** at your university (e.g., bike share and scooter share, as well as car sharing and microtransit services). Shared micromobility, shared passenger mobility (also known as Mobility On-Demand, or MOD), and transit propensity indicate where mobility services are most viable at all campuses, but more specifically at mobility hub locations across the region. Shared mobility propensity can help implementers understand:

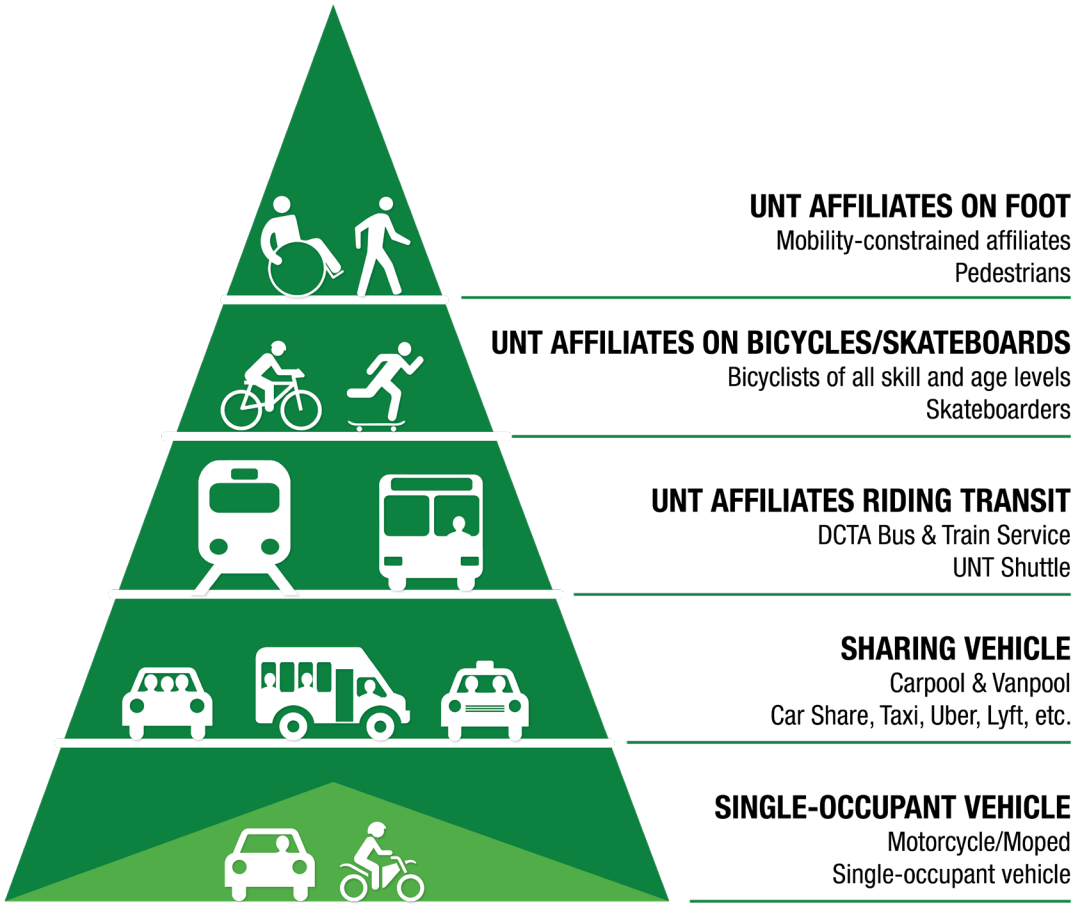
- Which services can thrive at their hub location(s) and may need to be procured or permitted, and
- Which services might not work without subsidy or other targeted policy and programmatic interventions that ensure sustainable operations.

This interactive dashboard presents the results of the three mobility propensity indices. A full discussion of each shared mobility propensity element can be found in NCTCOG's Campus Mobility Trends Report.

Siting Your Hub Amenities

Modal Hierarchy

Once you understand the mobility amenities at your disposal, and have a good sense of the physical footprint, operations requirements, and cost requirements of your mobility hub, you are ready to build out your mobility hub. When considering which mobility hub amenities to include and where to place them, start first by creating a modal hierarchy. A modal hierarchy is a framework that aligns university and greater community goals with how campus space is allocated and transportation projects are funded. The most valuable modes receive the higher share of funding and space. Standard modal hierarchies tend to include elements like walking, biking, transit, and public space near the top, with personal vehicles near the bottom. Developing such a framework can help you prioritize your mobility hub investments and hub amenity siting.

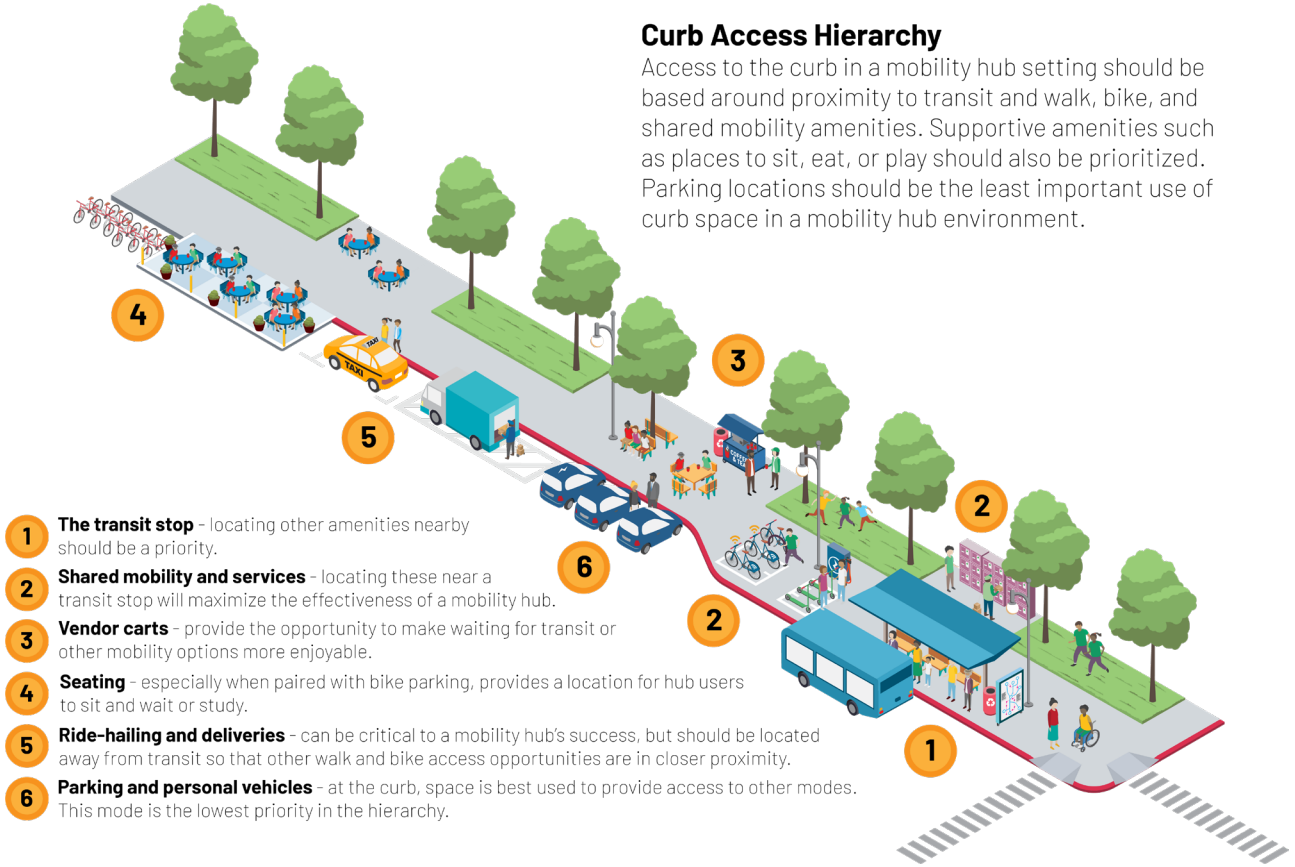


Curb Access Hierarchy

Campus curb space is the most sought after real estate on campuses. Thus, curb space should be allocated in a manner that supports the campus' unique mobility needs and access priorities. To do this, **adopt a curb access hierarchy** to organize and prioritize space at hubs—consistent with NCTCOG's Curb Management Regional Planning Guide and other frameworks like modal hierarchies. This will help you determine the highest and best use of limited curb space consistent with the mobility hub type and local needs.

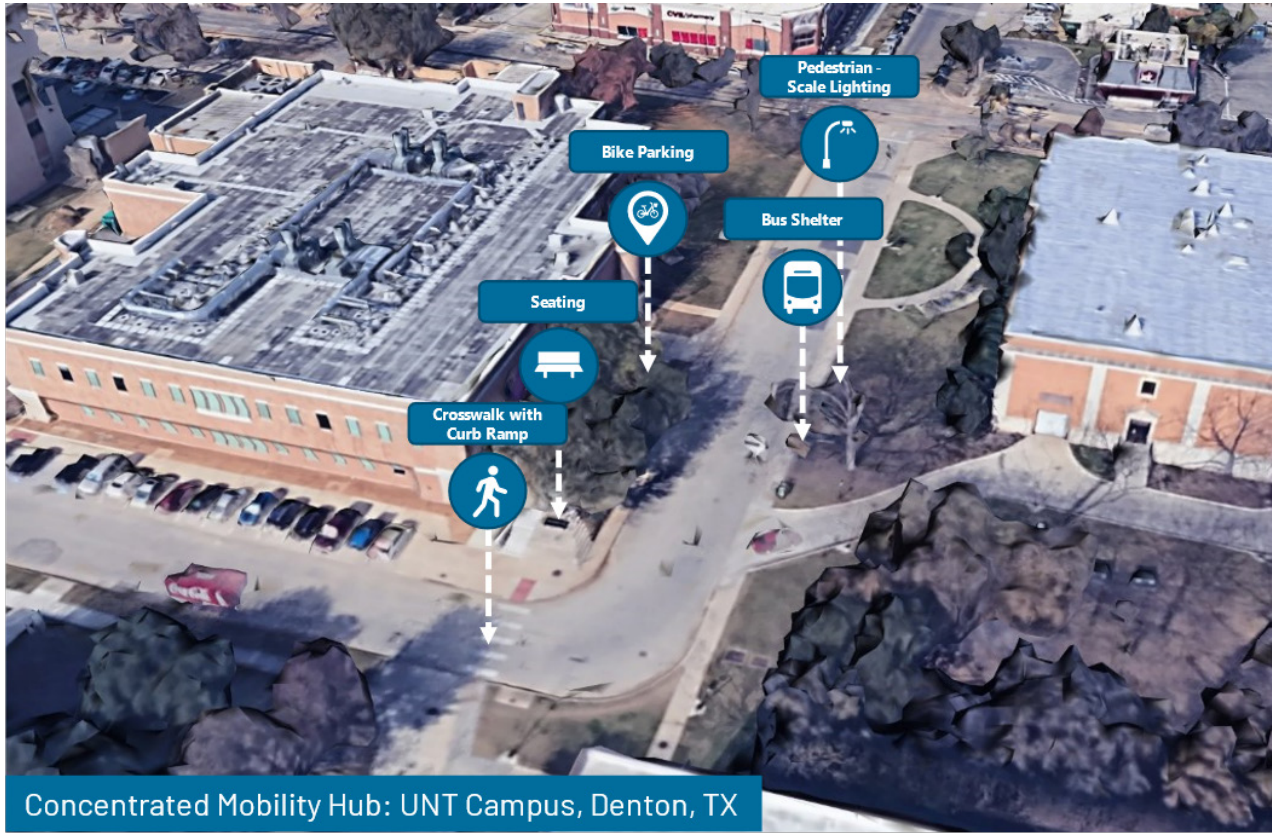
First, understand how much space your amenities will take up through the Kit of Parts section of this Catalog. The curb access hierarchy you create will allocate the most prime curb and facility locations for hub amenities that support people walking and rolling, biking, and taking transit and the most sustainable forms of shared mobility. Amenities that support these modes such as transit shelters and benches, pedestrian-scale lighting, and bike lanes and racks, should be at the base of the curb hierarchy. Space for parking and personal vehicles should rank last on the access hierarchy.

Given the amount of off-street parking at campuses in North Central Texas, you should consider repurposing existing curb parking at mobility hubs to support higher priority hub amenities. Ultimately, the mobility hub configuration should be reflective of the implementer's mobility values and center the movement of people rather than vehicles.



Concentrated vs Dispersed Amenities

Depending on a campus mobility hub's size and location, space can be an implementer's greatest asset or impediment. **Co-locating mobility hub amenities is a key challenge** where there is competition for sidewalk, curb, and other programmable space. Campus mobility hubs can be configured in two ways – concentrated or dispersed – for both on-campus and off-campus mobility hub types.



Concentrated Mobility Hub: UNT Campus, Denton, TX

A **concentrated mobility hub configuration** brings all hub amenities onto one site or within a single development. A concentrated mobility hub is a much more user-friendly and seamless experience given the mobility needs of the users are immediately present and accessible. A good rule of thumb for concentrated hub configurations on multiple properties is that all amenities are visible to the user, regardless of where they are located on the hub site. These self-contained hubs can be applied at a larger scale facility or at a smaller, more intersection or "neighborhood corner" scale with a select mix of amenities appropriate to the hub type. Notably, the nature of wayfinding at concentrated mobility hubs focuses on conveying how affiliates can connect between the hub and points of interest, instead of connecting the affiliate to mobility hub amenities.

Concentrated vs Dispersed Amenities

Dispersed Mobility Hub: Mockingbird Station, Dallas TX

A **dispersed hub configuration** is the alternative to a concentrated mobility hub in instances where facility space is limited, or the hub context does not support a fully integrated hub. Dispersed mobility hubs may host amenities spread across several blocks, focus amenities at various building entrances to a single point of interest (e.g., a student union), and have elements located across transit facilities or stops, nearby developments, and in the public right-of-way. Dispersed hubs may be located off- or on-campus in more urbanized parts of the region where competition for space is constrained, or in suburban locations where there is limited off-street property. While dispersed hubs present more complex operational, management, and performance measurement challenges, they allow for distributed responsibilities across multiple property owners. Whereas the management responsibility of a concentrated mobility hub falls on a single facility owner.

More Investment, More Benefits

Most if not all mobility hubs that are identified in the previous section are operating today at a basic level. Mobility hubs often are assembled unintentionally, without a dedicated commitment to investment, expansion, or more thoughtful integration. **But how does incremental investment improve the user experience and the ability to meet affiliate mobility needs?** This section describes the **Basic**, **Enhanced**, and **Seamless** investment levels that can guide mobility hub planning at your campus. This investment framework is an evaluation tool and a decision-making framework to help you understand amenity opportunities as you accrue funding for your mobility hub or hubs.

How to Evaluate Various Investment Scenarios

You should use the campus mobility hub investment scenario evaluation criteria as you think about the right mix of enhancements at your campus mobility hub(s). The scenario evaluation criteria, listed on Page 34, are based on:

- NCTCOG's vision and objectives for campus mobility hubs
- Mobility 2045 Plan goals
- The campus mobility hub typology framework outlined previously

The evaluation criteria are supported by a series of questions to help assess how investments change the hub experience, as well as key attributes that most likely affect each evaluation criterion. Use this evaluation framework to assess how each proposed amenity, service, infrastructure, and programming element will advance the indicators of well-functioning campus mobility hubs.

Each evaluation criterion is scored with a rating of Low, Medium, and High. In the scoring outcomes for each campus mobility hub, the darkest color indicates the "most likely" scoring result, the lighter color indicates a "possible" scoring result, and a white/grey coloring indicates a scoring result that is "not applicable." Each type was scored using the qualitative scoring factors across all three investment scenarios. In all cases, the

As you might guess, an increased level of investment tends to produce better results in the evaluation framework. However, an increased level of investment will not impact all hub types the same way. The impact of the five evaluation criteria – Amenity Versatility, Shared Mobility Integration, Transit Connectivity, Design Quality, and Benefit Cost Analysis – will vary based on contextual factors such as urban/suburban environment, the amount of space available, the underlying transit network, mobility policy, access to funding, and others. For example, Urban Core hubs are more likely to be situated near a dense transit network than other hub types, but also may have policy that is friendlier to shared mobility amenities. Therefore, an investment at an Urban Core hub site will likely go further in the Transit Connectivity and Shared Mobility Integration categories.

The following section provides scores across scenario evaluation criteria for a typical hub of each hub type. The actual score will vary from hub location to hub location. Consider the attributes of each evaluation criterion located in the table inset below when scoring your mobility hub.

Evaluation Criteria	Questions to Ask	Key Attributes Considered		
		Project Vision	Project Objectives	Mobility 2045
Amenity Versatility	How varied are the mobility options provided? Is there consideration for different levels of ability? Is there informational signage? How easy and convenient is it to transfer between modes?	• Physical and digital signage • Storage solutions • Multiple mobility options • Connections across Modes	• Flexible • Activated	• Available • Reliable
Shared Mobility Integration	How well are shared mobility options integrated with the mobility hub? Is there consideration for shared passenger pickups and drop-offs?	• On-demand access • Campus integration	• Context-sensitive design • Diverse mobility offerings	• Available
Transit Connectivity	Is the hub built on a backbone of existing/planned transit? Is on-demand transit available? Is there a connection to on-street facilities?	• Transit backbone • On-demand access	• Accessible	• Reliable
Design Quality	Does this hub feel safe and well-lit? Are there places at this hub that feel comfortable for a longer stay? Are there amenities to activate the space?	• Social • Comfortable • Safe • Centralized	• Convenient • Equitable • Sustainable • Context-appropriate design	• Economic vitality
Benefit Cost Analysis	How do the benefits of this campus mobility hub stack up against its costs?	• N/A	• N/A	• Sustainable revenue • Efficient • Economic vitality

Basic Investment

The **Basic** investment scenario assumes that only minor mobility hub amenities and core mobility options are built into the hub. The amenities included would support commuters and campus affiliates in connecting between transportation modes, but may lack amenities that support longer term stays, or have minimal technology integration.

	Amenity Versatility	Shared Mobility Integration	Transit Connectivity	Design Quality	BCA
Urban Core	Low / Medium	Low / Medium	Medium	Low / Medium	Low
Suburban Commuter	Low	Low	Low	Low / Medium	Low
First/Last Mile Hub	Low	Medium	Low	Low / Medium	Low
Gateway Hub	Low / Medium	Low / Medium	Low	Low	Low
Park-Once	Low	Low / Medium	Low	Low	Low
Residential Hub	Low / Medium	Low / Medium	Low	Low / Medium	Low

The Basic investment scenario tends to score low across campus hub types and evaluation criteria. A limited investment in campus mobility hubs will result in low to medium evaluation outcomes, resulting in minimal amenities, mobility integration, connectivity with transit, and overall design. A Basic investment in campus mobility hubs will work best in some contexts and at some university and college locations, but a mixture of investment scenarios across the local and regional mobility hub network is needed to meet the needs of commuters and campus affiliates alike.

Enhanced Investment

The **Enhanced** investment scenario features more foundational mobility supports that begin the cultural shift toward multimodal travel. The amenities offered at the mobility hub are more developed and of a wider variety than in the Basic investment scenario, including additional shared mobility options to meet diverse mobility needs. Transportation network infrastructure in the mobility hub area is fairly developed in the Enhanced investment scenario, but could be lacking key elements such as signage, separated bicycle facilities, or shared-use paths.

	Amenity Versatility	Shared Mobility Integration	Transit Connectivity	Design Quality	BCA
Urban Core	Medium	Medium	High	Medium	Medium
Suburban Commuter	Medium	Low	Medium	Medium	Medium
First/Last Mile Hub	Medium	Medium	Medium	Medium	Medium
Gateway Hub	Medium	Medium	Medium	Medium	Medium
Park-Once	Low	Low	Medium	Low	Medium
Residential Hub	Medium	Medium	Medium	Medium	Medium

Scores for the Enhanced investment scenario vary across evaluation criteria and campus hub types, primarily falling in the medium range. Campus mobility hubs in an Enhanced investment scenario will not have the full mobility and connectivity potential of those found in the Seamless investment, but will likely serve the needs of the average commuter and campus affiliate. With an Enhanced investment, there will be some user groups who will not be able to utilize all the amenities of mobility hubs, and may be excluded as a result.

Seamless Investment

The **Seamless** investment scenario contains a full array of mobility hub amenities and supportive transportation infrastructure, leading to transit orientation and lasting mode shift to shared mobility and active transportation. Mobility options are integrated physically and, to the extent possible, digitally. The specific amenities offered will vary by hub type, but a hub at the Seamless investment level will provide a full offering of amenities, infrastructure, information, urban design, and supportive transportation policy.

	Amenity Versatility	Shared Mobility Integration	Transit Connectivity	Design Quality	BCA
Urban Core	Low Medium **High**	Low Medium **High**	Low Medium **High**	Low **Medium** High	Low Medium **High**
Suburban Commuter	Low **Medium** High	Low **Medium** High	Low Medium **High**	Low **Medium** **High**	Low Medium **High**
First/Last Mile Hub	Low Medium **High**	Low Medium **High**	Low **Medium** High	Low **Medium** **High**	Low Medium **High**
Gateway Hub	Low **Medium** High	Low Medium **High**	Low **Medium** High	Low **Medium** **High**	Low Medium **High**
Park-Once	**Low** **Medium** High	**Low** **Medium** High	Low **Medium** **High**	Low **Medium** **High**	Low Medium **High**
Residential Hub	**Low** **Medium** High	**Low** **Medium** High	Low **Medium** **High**	Low Medium **High**	Low Medium **High**

A Seamless investment represents a full investment into amenities of the campus mobility hub and its surrounding area. Evaluation criteria scores fall on the high end, with most criteria across mobility hub types resulting in a most likely or possible "high" score. The intent of the Seamless investment scenario is to best meet the needs of the surrounding community and campus affiliates in alignment with the context of the area.

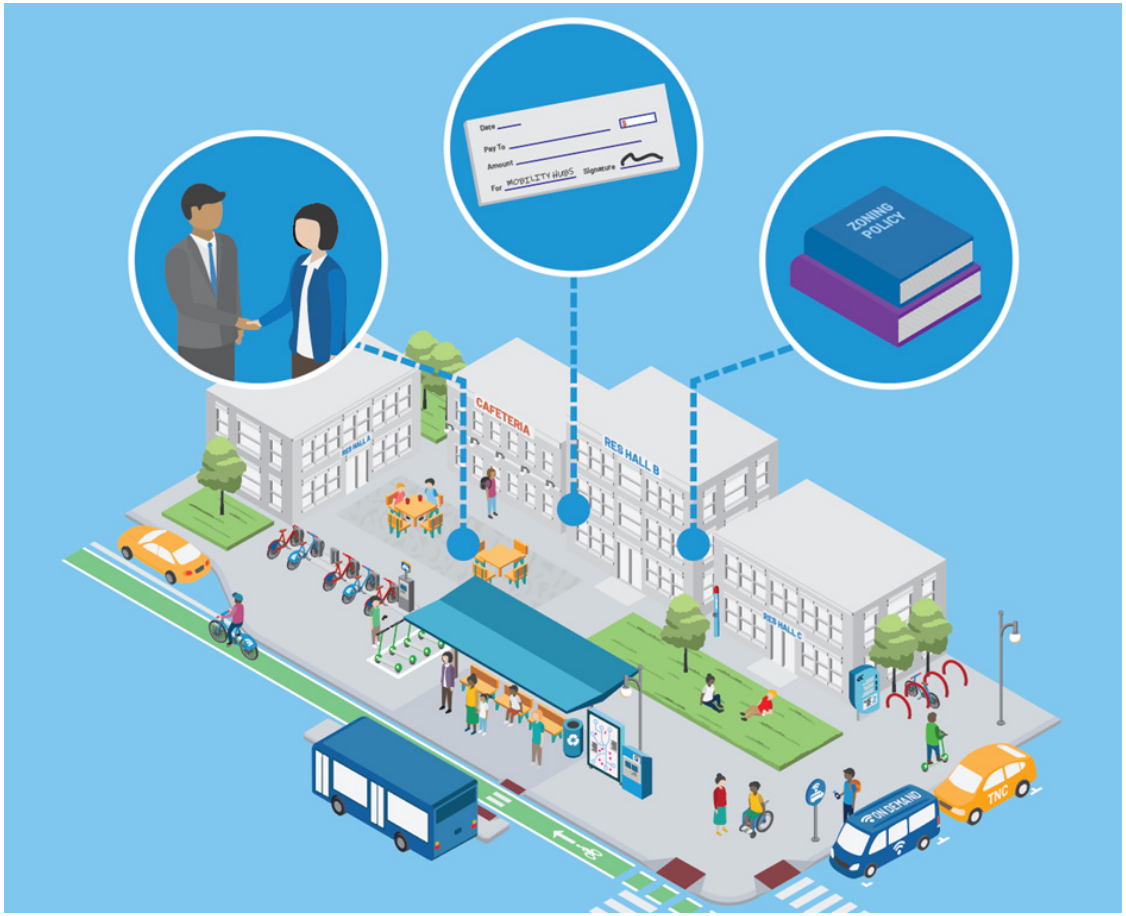
05 Funding Your Campus Mobility Hub

Funding a mobility hub is rarely a simple equation. Depending on the mobility needs being addressed and the services being integrated at each mobility hub, planning, design, implementation, installation, and turnkey costs could range between $150,000 and $5 million.* Major street reconstruction and pedestrian connections can drive costs even higher. However, most funding sources can only be used for specific mobility hub elements, such as capital improvements, operations and maintenance, planning and design, or community engagement.

Furthermore, mobility hubs are rarely built all at once since mobility needs, customer preferences, and technology change over time. The funding equation can be even less straightforward for hub locations that are not connected to frequent transit service or underserved by other shared mobility options.

You have three incremental "building blocks" at your disposal to fund your mobility hub project.

- Grants and Revenue Generation
- Partnerships
- Policy Tools



* Some examples include: Cutler Bay Average Mobility Hub Cost: $154,655, Denver RTD Mobility Hub: $800,000, UT Dallas Silver Line DART Mobility Hub: $2.5 million, Broward MPO Mobility Hub: $3.5 million, CDTA Gateway Mobility Hub: $5 million.

Funding Mobility Hubs Requires Strategy

In most cases, campuses and their partners will make concentrated investment for years before they achieve their built-out mobility hub vision. Campus mobility hub partners should build a long-term funding and partnerships plan for capital and operating investments for each hub element. Hub partners should always build site-specific and phased funding strategies that coordinate across a variety of partners, implementors, and eventual operators. Funding strategies should be practical and reflect the competitive nature of funding sources, while ensuring investments meet the needs of a variety of campus travelers and local stakeholders.

Likewise, town-and-gown funding coordination between campus, city, transit agency, business, and community partners is essential to successfully fund mobility hubs within the campus context. University and campus environments are a complex mix of institutional, City, state, and private property. Thus, developing mobility hubs might pull from multiple funding sources.

Campus Mobility Hub Funding Principles

Campus mobility hub partners should consider the following funding principles when identifying and securing hub funding:

- **Tap into low-cost hub investments**, testing new mobility and hub user experiences before making more permanent investments.
- **Embrace incrementalism,** building out your hub vision over time through continual improvement.
- **Prioritize equity and affordability**, ensuring that funding reduces mobility barriers and alleviates cost burdens for BIPOC, indebted, low-income, and foreign-born campus affliates.
- **Be opportunistic**, leveraging larger projects and capitalizing on new funding opportunities and partnerships that advance incremental improvement.
- **Lean into town-and-gown coordination**, aligning share objectives and building the case for collaborative funding applications across partners.

Town-and-gown coordination is important to accelerate and test new ideas, as government and campuses can be complementary when it comes to procurement. Campuses can often efficiently fund mobility elements and technologies that government cannot. This ethos should pervade the physical design, implementation experience, and funding strategy for on-campus and off-campus mobility hubs.

Grant Opportunities and Revenue Generation

While funding is competitive and requires deep coordination across partners, your campus mobility hub partners have a diversity of funding options at their disposal. Capital and operating costs can be supported by a range of funding sources, including campus funding sources, local sales tax funds, grant awards, economic development funding sources like community development block grants, foundation support, and more. However, you should assess considerations for long-term financial sustainability when considering implementation strategy. While many funding sources, particularly federal funding sources, are not eligible for university or college applicants, there are opportunities for partnerships between your academic institution, local governments, and transit agencies to apply for grant funding.

Federal Resources

You and your implementation partners have a growing number of federal grant opportunities from the US Department of Transportation (USDOT), Federal Highway Administration (FHWA), Federal Transit Administration (FTA), the Department of Energy (DOE) Office of Energy Efficiency and Renewable Energy (EERE), and the newly created Joint Office of Energy of Transportation. The Funding Strategies Report presents a detailed account of viable federal funding sources.

While federal sources expand the resources available to mobility hubs, you may find it more challenging to seek out this funding as many federal grants are competitive, have local match requirements, and require dedicated staff to manage grant administration and reporting requirements. Likewise, funding shortfalls across the country related to the COVID-19 pandemic have increased competition in federal grant processes.

New funding sources are cropping up that can support mobility hub amenities, integration, and electrification, among others. The newly created Joint Office of Energy and Transportation provides funding that could electrify mobility hubs by providing charging infrastructure or integrate electric mobility options such as EV car share, e-delivery, or electric micromobility charging docks.

What might increase your chances for award? Chances are, proposing Enhanced or Seamless levels of investment will ensure relatively competitive Benefit-Cost Analysis scoring in grant applications. NCTCOG has modeled a BCA process in the Funding Strategies Report.

Strategies like collaborative funding applications across many partners and cities are increasingly more common, and some federal funding programs—like the USDOT SMART program— strongly encourage collaborative submissions. Likewise, nesting mobility hub elements into larger project applications can also increase the competitiveness of projects. For example, building in mobility hubs into larger transit, highway, or street corridor projects can be attractive to application evaluators seeking to fund multimodal projects that establish connections well beyond the project boundaries. Additionally, demonstrating an intentional approach to address equity through community outreach often scores better on federal grant applications.

State Resources

State-level funding opportunities for mobility hub amenities and infrastructure are limited compared to federal and local opportunities. The vast majority of state funding through the Texas Department of Transportation (TxDOT) is allocated for tolled and non-tolled highways. However, TxDOT and the Texas Commission on Environmental Quality (TCEQ) offer funding programs eligible for mobility hub projects in Texas.

Foundation and Sponsor Opportunities

Campuses and other hub implementors can partner with non-profit and foundations to fund mobility hub projects. While most opportunities are competitive and funding awards are typically smaller than those from government funding sources, they often have fewer eligibility restrictions governing use of funds. Often, foundational and sponsor opportunities require applicants to be non-profit organizations and for funds to go primarily towards low- to moderate-income communities, but depending on your mobility hub location and partnership availability, these funding opportunities can go towards on-campus and off-campus mobility hubs. Campus mobility and affordability are an underfunded project type in non-profit and foundation circles.

Local foundations like the Dallas Foundation, Meadows Foundation, North Texas Community Foundation, Fikes Foundation, and Sid W. Richardson Foundation are well known for funding projects and programs that address regional issues that mobility hubs can solve, such as neighborhood infrastructure (e.g., transportation, broadband access, sidewalks, etc.), environmental sustainability, access to parks and recreation, racial equity and inclusion, affordability and eliminating poverty, public health, and more. The King Foundation offers community grants in Collin, Dallas, Denton, Rockwall, and Tarrant counties that support transportation improvements for aging populations. The Communities Foundation of Texas is unique in that they connect a range of civic and private funders to entities that need funding for impactful community ideas. This is an under-tapped resource to fund mobility hub and campus mobility investments focused on the needs of primarily low-income campus affiliates.

Local Resources

Local fees and tax revenue fund the majority of municipal transportation infrastructure and mobility improvements. Tax revenue can be used to fund a variety of hub investments, but fee revenue must recover costs related to program the administration, management, and regulation from which the fee is extracted. Examples of these types of funding sources that may be available to support off-campus mobility hub development include curb parking revenue, commercial parking taxes, ride-hail taxes, and shared micromobility permit fees. For example, Dallas's shared micromobility permit fee requires each permitted vendor to pay $35 per scooter per year, which supports the installation of new racks for bike and scooter parking and other related infrastructure.

An off-campus hub could be located near potential development sites. Affected off-campus mobility hub could benefit from **development requirements, impact fees, and Transportation Demand Management (TDM) requirements** that can support site-specific or even public benefit investment in mobility services and/or infrastructure to reduce reliance on single occupancy vehicle (SOV) travel. Consider working with these partners to integrate mobility hub elements into their TDM plan, which typically includes investments in a range of micromobility, transit, car share/carpooling, infrastructure, mobility information systems, and ridership incentives.

Many municipalities in the NCTCOG region have adopted **Capital Improvement Programs (CIPs)**, which detail the municipality's projection of major new construction and repair and rehabilitation projects over a typical timeline of five to six years. CIPs are typically reviewed and updated annually. Universities or municipalities can work with policymakers to include mobility hub infrastructure and amenity projects into the local CIP.

Campus Resources

Long-Term Improvements

Like municipalities, many larger university campuses in the North Central Texas region have established their own **Capital Improvement Programs (CIPs)**. To have a project included in a university's CIP, there is typically a minimum total project cost cutoff. Projects on the CIP are often primarily funded by the university's **Designated Funds** – revenue derived from student tuition. Consider the scale of your campus mobility hub project – projects within the CIP are often large-scale and with a long-term implementation timeline. Depending on the university's cost threshold for inclusion in the CIP and the scale of the mobility hub being considered, your project may or may not be included in the university CIP. Possible approaches to ensure mobility hub projects meet CIP cost thresholds are to integrate them into broader mobility or on-campus infrastructure projects (e.g., an element of a new building or parking structure), or, for campuses with multiple on-campus hubs, fund the entire hub network as a holistic mobility hub capital and operating program.

Funding can also come from bonds issued by the State of Texas. Some universities in the North Central Texas region are eligible for **Higher Education Fund (HEF) bonds**, which can be used to fund permanent improvements on university campuses, but rarely include transportation projects. **Tuition Revenue Bonds (TRBs)**, now known as **Capital Construction Assistance Project (CCAP) bonds** are bonds reimbursed by the State of Texas general revenue for public universities and colleges in the state of Texas to fund structures, facilities, roads, and related infrastructure on or for the campus. These bond sources are typically reserved for large

Short-Term Improvements

Campus mobility hubs may be able to source funding from some of the municipal funding sources listed previously, but funding for smaller on-campus infrastructure and mobility improvements are likely to primarily come from revenue generated by university parking and other transportation revenue – the scale of projects eligible to use this funding source will vary from university to university. Additionally, student tuition can include a "**Green Fee**," which is pooled funding allocated to support sustainability-related projects and initiatives on campus. Green Fees will be an attractive source of funding for mobility hub elements, infrastructure components, and short-term implementation. In the case of UNT's **We Mean Green Fund,** funding for projects is managed and approved by a student-led committee. Projects funded by the We Mean Green Fund typically have a budget of $20,000 or less, which can fund minor hub amenities like shelters and seating, micromobility parking, curb enhancements, and activation, among others. UT Arlington voted to establish its own **Green Fund** in Spring of 2022. This fund is proposed to fund programs that include bike racks, a Bike Barn, and bike repair stations, but any project that promotes sustainability is eligible to be funded.

Eligibility for funding mobility improvements varies from university to university. Often, improvements to parking and transportation infrastructure on university campuses are ineligible for state bond funds and must be funded through local revenue sources. On some universities, such as UNT and TWU, campus roadways are considered City right-of-way, and therefore a partnership with the local municipality is needed for any improvements to be constructed. Similarly, any transit or shuttle stops on UNT or TWU campuses must involve a partnership with the Denton County Transportation Authority (DCTA), and funding or implementing these improvements is out of the hands of the university alone. For universities with this type of relationship with the municipality, a Memorandum of Understanding can be established with the municipal agency to clarify funding responsibilities on campus roadways.

Generating New Revenue

One approach to apply local funding would be to establish or leverage an existing tax district, such as Tax Increment Financing (TIFs) or Community Benefit Districts (CBDs). TIFs redirect property tax revenues to fund infrastructure, other public facilities, and affordable housing. CBDs, also known as Public Improvement Districts (PIDs) in Texas, are tax districts established through a partnership between the City and the community that allow communities to raise money for local infrastructure investments and services.

The Green Fee program mentioned in the previous section is an attractive option for mobility funding. Green Fee funding comes from a small contribution from student tuition by semester. For example, the We Mean Green Fund at UNT and the Green Fund at UTA consist of a $5.00 contribution from student tuition. For schools with large enrollments, that money adds up quickly and can be used to fund a variety of mobility hub projects.

Three Metropolitan Transportation Authorities (MTAs) in the NCTCOG region — Dallas Area Rapid Transit (DART), Denton County Transportation Authority (DCTA), and Trinity Metro — have the authority to levy local sales taxes through a bond vote in order to fund transit improvements and maintenance, which can be used to strengthen the transit component of mobility hubs or provide access to an area via transit that did not have access prior.

Funding Matrix

The funding matrix on the following pages summarizes the funding options listed in this chapter and provides a viability rating for each funding source. Viability ratings were determined by university eligibility, the breadth of eligible mobility hub projects, the likelihood of securing funding, and the degree of regional and national competition:

Level	Agency	Opportunity	Eligible Mobility Hub Projects	University Eligible?	Viability
Federal	US DOT	INFRA Grants Program	Highway and freight related projects, e.g., off-campus bicycle and pedestrian infrastructure that intersects with highways, commuter rail line improvements that also host freight operations	No	●○○○○ [very competitive]
Federal	US DOT	SMART Grants Program	Technology and automation projects, e.g., traffic signal improvements, data usage sensors, online mobility dashboards	No	●●●●○ [very competitive]
Federal	US DOT	RAISE Grants Program	Transit projects, intermodal projects, roadway projects, e.g., transit integration, transit improvements, bicycle and pedestrian infrastructure, shared mobility infrastructure	Yes, with government partnership	●●●●○ [very competitive]
Federal	FHWA	CMAQ Program	Air quality improvement and traffic reduction projects, e.g., signal coordination, intersection improvements, park-and-ride facilities, bicycle and pedestrian infrastructure, transit improvements	No	●●●○○ [very competitive]
Federal	FHWA	ATTIMD Program	Technology and automation projects, e.g., digital wayfinding, transit information signage, shared mobility dashboards, shared mobility docks	Yes, with government partnership	●●●●○ [very competitive]
Federal	FHWA	STBG Program	Transportation alternative projects, e.g., bicycle and pedestrian infrastructure, transit connections, shared mobility infrastructure	No	●●●○○ [very competitive]
Federal	FTA	Public Transportation Innovation - 5312	Innovative transit projects, e.g., demand-responsive shuttles, digital signage, innovative transit integration	Yes	●●●●● [very competitive]
Federal	FTA	AoPP Program	Transit projects in disadvantaged communities, e.g., access improvements to mobility hubs, campus shuttle system, bus stop improvements, other transit improvements	Yes, university transportation systems in disadvantaged communities	●●●●○
Federal	FTA	AIM Program	Innovative and equitable transit projects, e.g., multimodal trip platforms, on-demand shuttle systems, real-time transit information	Yes, with government partnership	●●●●○
Federal	FTA	All Stations Accessibility Program	Rail transit accessibility projects, e.g., accessibility improvements at rail stations	No	●●○○○
Federal	FTA	Emerging Mobility Innovation Program	Innovative transit projects and rider experience improvement projects, e.g., transit service improvements, on-demand shuttle service and shared mobility integration, transit stop wayfinding improvements	Yes	●●●●○
Federal	FTA	Pilot Program for TOD Planning	Transit amenity projects that integrate with land use, e.g., benches and shelters, transit wayfinding, real-time transit information	Yes, in partnership with a transit agency if the university has land use authority	●●●●○
Federal	FTA	EPD Pilot Program	Capital transit project planning, e.g., planning improvements for mobility hubs in partnership with private entities	No	●●●○○
Federal	DOE	EERE Vehicle Technology Funds	Renewable energy planning projects, e.g., mobility hub connectivity improvements, EV charging deployment, community engagement	Yes	●●●○○
State	TxDOT	Rural Public Transportation Grant Program	Rural public transportation projects, e.g., transit service improvements, transit stop improvements, on-demand shuttle system creation	No	●●○○○

Level	Agency	Opportunity	Eligible Mobility Hub Projects	University Eligible?	Viability
State	TxDOT	Unified Transportation Program – TA	Transportation alternatives projects, e.g., bicycle and pedestrian infrastructure,	Yes	●●●●●
State	TCEQ	TERP: Governmental Alternative Fuel Fleet	New alternative fuel fleets: e.g., electric transit buses, electric shuttle systems, EV charging for electric fleets	No	●●○○○
Foundation	–	Local and National Foundation Grants	A range of services, amenities, and subsidies	Yes	●●●●○
Local	City gov't	Curb Parking Revenue	Any mobility hub infrastructure or amenity, unless there are local restrictions	Varies by local government	●●●●○
Local	City gov't	Commercial Parking Taxes	Any mobility hub infrastructure or amenity, unless there are local restrictions	Varies by local government	●●●○○
Local	City gov't	TNC/Ridehail Taxes	Any mobility hub infrastructure or amenity, unless there are local restrictions	Varies by local government	●○○○○ [regulatory barrier]
Local	City gov't	Shared Micromobility Permit Fees	Varies by jurisdiction, but eligible projects typically include limited bicycle and pedestrian infrastructure and amenities	Varies by local government	●●●○○
Local	City gov't	Development Requirements	Any mobility hub infrastructure or amenity, unless there are local restrictions	Varies by local government	●●●○○
Local	City gov't	Development Impact Fees	Any mobility hub infrastructure or amenity, unless there are local restrictions	Varies by local government	●●●○○
Local	City gov't	TDM Requirements	Any mobility hub infrastructure or amenity, unless there are local restrictions	Varies by local government	●●●●○
Local	City gov't	Capital Improvement Programs	Any mobility hub infrastructure or amenity, unless there are local restrictions	Varies by local government	●●●●○
Campus	–	Designated University Funds	Varies by university, but projects with auxiliary funding (e.g., parking) are often restricted	Yes	●●●○○
Campus	–	Higher Education Fund (HEF) Bonds	Varies by university, but projects with auxiliary funding (e.g., parking) are often restricted	Yes	●●●○○
Campus	–	Capital Construction Assistance Project Bonds (CCAP)	Varies by university, but projects with auxiliary funding (e.g., parking) are often restricted	Yes	●●●○○

Partnership Opportunities

Developing your mobility hub(s) can open the door to new partnership opportunities between campus facilities, local municipalities, transit providers, campus transportation service providers, private mobility vendors, and beyond in the NCTCOG jurisdiction. Innovative and effective partnerships are critical to ensure they are well-integrated and provide the transportation services to meet the needs of campus residents and visitors alike.

The Dallas-Fort Worth region contains a host of potential partners for your collaboration towards mobility hub implementation. A collaboration of public agencies and other local entities form the typical template for mobility hub implementation teams – but inviting the university campus as a core implementor brings in a much wider resource pool to your funding and implementation efforts.

As a recent example, Congress recently approved a $2.5 million earmark to establish a mobility hub at the DART Silver Line Station at the UT Dallas campus. One of the main takeaways from the process was the value in establishing a partnership between UT Dallas campus leadership, campus researchers, local agencies, and congressional legislators.

Town and Gown Partnerships

Universities and colleges play a large role in the communities where they are located. Some cities in the Dallas-Fort Worth region maintain a town and gown partnership with the local university, particularly in cities where the university influences a large proportion of the jobs, residents, and overall city culture. For universities, aligning priorities with the city in question is key to implementing a successful mobility hub or hub network through collaboration.

Many college towns have created agreements with the local university to hand off ownership and maintenance of the public roadways within the university campus, while many towns maintain ownership of the roadway right-of-way on campuses. For universities that do not control the roadway right-of-way but find that mobility hub implementation would be easier if they did – consider developing a memorandum of understanding (MOU) with the municipality to transfer ownership and maintenance of certain public spaces intended for your campus mobility hub.

Town and gown partnerships can be extended to create specific partnerships between the university campus and the city's downtown area. Many downtowns of cities large and small have organizations or associations intended to manage, preserve, and guide the efforts of the local downtown area. For cities that have downtowns and universities adjacent or with overlapping goals, consider establishing a partnership between the downtown association and university.

UNT and the City of Denton have a symbiotic relationship considering the university's size and stake in the overall community. It is in both entities' self-interest to align priorities through partnerships.

Image from UNT Digital Library

Campus Transportation, Parking, and Transit Partnerships

Campus and public transportation providers are the nexus of campus mobility hubs. From early planning to daily management of a campus mobility hub, developing campus transportation and public transportation provider partnerships are critical to the hub's ability to provide seamless and convenient transportation options. Many federal funding opportunities require university campuses to partner with local governments or transit agencies – these partnerships can be crucial to achieving funding and implementation.

Innovation Districts

Campuses are a hot spot for innovative thinking and creativity. Campus mobility hubs are a natural fit to demonstrate and test innovative mobility solutions and approaches to the transit user experience. Establishing a campus mobility hub, or an entire campus, as a mobility innovation district can demonstrate new technology and business models while showcasing how mobility bolsters neighborhood and campus economies. Innovation districts can be co-created through public-private partnerships and can be achieved through a holistic mobility approach that includes experimentation in policy and with new mobility services, electrification infrastructure, and innovative services. Innovation districts offer an opportunity to test transportation options and adapt based upon need. Even signaling to public and private mobility providers the intent to partner, align on common problem statements, and pave the way for permitted operation will generate partner interest. Innovation districts are often backed by a combination of public funders, institutional interests, philanthropists, and industry. Recent examples of innovation districts can be found at the AllianceTexas Mobility Innovation Zone in Fort Worth and Washington, DC's recently launched Mobility innovation District in the Southwest Business District.

Research Programs

Mobility hubs can be exciting proving grounds to better understand emerging mobility technologies, travel behavior, mobility needs, civic engagement, public health, and beyond. The opportunities to gain new mobility insights and knowledge can be captured through academic partners including University Transportation Centers (UTCs), campus transportation offices, university professors and researchers, student organizations, and other academic partners. The Dallas-Fort Worth metroplex is home to a wide variety of research programs, including programs and efforts, including the UT Arlington Sustainable Mobility and Resilient Transportation (SMART) Research Lab, UT Dallas North Texas Center for Mobility Technology, and UT Dallas Center for Smart Mobility (COSMO). Additionally, non-profit research organizations interested in relevant topics such as Robert Wood Johnson Foundation and the Knight Foundation can be strategic partners to push forward campus mobility hub goals.

Pilots/Demonstrations

Pilot programs and demonstrations provide an opportunity to test out new ideas to see if they work before committing to fully scaled implementation – a kind of "try before you buy" option. In the campus mobility hub context, pilots can range from testing out mobility hub locations to amenities and technologies. Pilot programs should be paired with an engagement strategy to document how well the pilot is working towards its intention and goal. These pilots can provide an opportunity to build buy-in from potential partners and the community and expand access to funding. Mobility hubs with documented pilot success are also more attractive on grant applications. In additional piloting specific mobility options, like shared micromobility options, campuses can partner with vendors that offer coordinated, modular, and branded mobility hub solutions (see below from the City of Los Angeles' mobility hub program).

Mobility Consortia

A collection of public and private partners can work together to form a new entity aimed at providing mobility hub services and amenities, and in some cases (like the FTA EPD Pilot Program noted in the Funding Strategies Report), are required for federal funding. For example, a mobility consortium can be developed to invite, encourage, and support private mobility providers to serve first- and last-mile connections to and from mobility hubs and major demand centers with the intention of reducing drive-alone trips. The Mobility Consortium can work to bring together micromobility services and charging stations, microtransit*, car share, integrated booking and payments, and data platforms to support public transit reaching to and from campuses. Additionally, universities can take advantages of existing working groups, such as the North Texas Innovation Alliance, to coordinate on mobility hub planning, collaborate, and to share experiences.

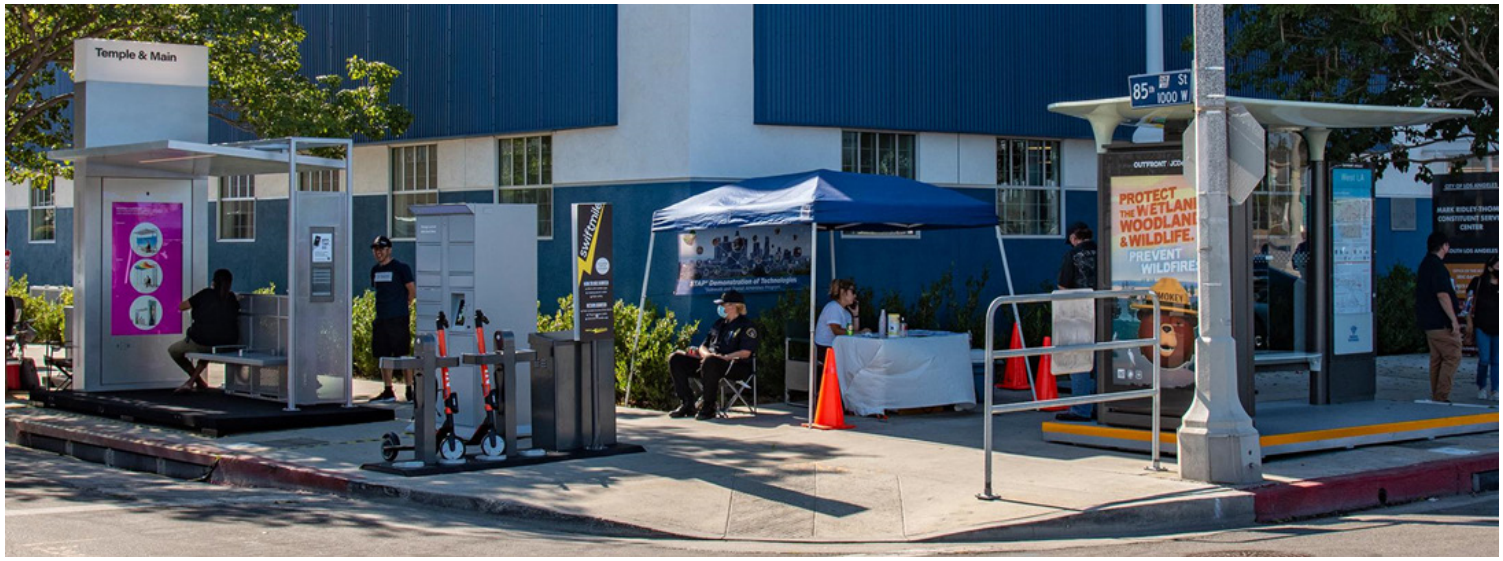


Image from City of Los Angeles

Transportation Management Association/Organization

A Transportation Management Association (TMA) can be formed as a non-profit organization responsible for coordinating and managing mobility programs and improvements on behalf of local government, private and public employers, and business districts. TMAs can work to centralize and execute the mobility hub's mission to ensure coordinated access and connections across the area's transit and shared mobility services. The North Central Texas region is home to a handful of TMAs – mobility institutions that have the capacity to support mobility hub development, delivery, and ongoing management.

* Microtransit: shared transit in smaller-scale vehicles (from cars up to shuttles) that is often on-demand and supplied by a transit agency.

TMAs have traditionally served as commute coordinators, mobility managers, and central clearinghouses for transportation-related education. However, TMAs can expand their mission to ensure integrated connections and high-quality access to diverse transit and shared mobility services at mobility hubs, particularly on university campuses. TMAs could support or lead mobility hub vendor management, operations, maintenance, and performance measurement at hubs within their service area, in partnership with local city agencies, universities, and transit providers. Many of the North Central Texas campuses (such as UNT, UT Arlington, UTD, UNT Dallas, TCU, and SMU, among others) are ideal candidates for a TMA given their robust local economy outside of the campus boundaries. Even smaller campuses have opportunities for TMA partnerships, such as Dallas College – Cedar Valley Campus which is within the Southern Dallas County Inland Port TMA.

Shared Mobility Providers

Cities across the North Central Texas region have built mobility partnerships with shared mobility providers to expand mobility options and connect people to and from transit. Car share and third-party transit services are the primary shared mobility services offered in the North Central Texas region today, but shared micromobility services have existed in the DFW region in the past and are likely to come back in the future. Cities, universities, and transit agencies can leverage assets, public resources, and funding to operate new services and invest infrastructure to meet public mobility objectives.

Cities like Dallas, Fort Worth, Arlington, and Denton have built partnerships with private mobility companies like Zipcar and Via, testing new regulations, innovative service agreements, and more efficient uses of public right-of-way while expanding mobility options throughout neighborhoods. Micromobility service companies such as Bird and Lime are not currently present in the region, but there remains an opportunity for future partnerships. Mobility hubs are a natural place to convene, house, and market these permitted or contracted services. But more mobility should not be at the expense of better integration at mobility hubs.

Car share services are currently offered at some NCTCOG-region universities, such as Zipcar at UT Dallas.

Image from UT Dallas

Campus Art/Design Partnerships

Whether through student-led initiatives in the classroom or funded research by faculty and graduate students, forging partnerships with university campus art, design, architecture, and planning departments can prove fruitful for implementing campus mobility hubs. Art and design department partnerships provide the opportunity to align branding opportunities with the overall design of the hub. The Cities of Minneapolis and Detroit, for example, have integrated art into mobility hub amenities that have helped create a sense of place, identity, and recognition.

Architecture departments can likewise be great resources for mobility hub concepts, layouts, placement, and integration with existing buildings and public spaces. Recently, UT Arlington architecture students collaborated with Dallas Area Rapid Transit (DART) to redesign and rebuild its transit shelters as part of a studio design class.

Planning departments, perhaps the most applicable university partnership to help create the transportation programming at mobility hubs, can take ownership of a whole host of implementation components of a campus mobility hub.

The Storm Drain Artscape competition for UNT students created a partnership between the university and student body to provide public art on campus. Students chosen to participate received $500 from the school's Green Fund. A similar approach can be used for mobility hub implementation.

Image from UNT We Mean Green Fund

Research Partnerships

As you go through your planning process, universities are constantly using their campus as a learning lab. Mobility hubs can be a learning aid by putting into practice what is taught in the classroom. Mobility hubs in the university setting can go beyond practical mobility tools – they can act as demonstration spaces for students learning about urban planning and multimodal transportation. University Transportation Centers (UTCs) and other research centers on campus can be a great source for innovation and collaboration in mobility hub planning. Student- and researcher-led work can be immensely useful to support your hub planning and implementation in terms of identifying needed mobility connections, projecting future year demand patterns, and tying demographic statistics to various transportation indicators, among others. Additionally, university research programs can take part in the performance monitoring component of campus mobility hubs.

Policy Opportunities

Opportunities to fund and implement mobility hubs can be made possible by ensuring that plans, policies, and new development at all levels across the DFW region incorporate mobility hub goals and provide the critical policy levers to make implementation possible.

Integrate into Transportation Plans

Mobility hub goals and planning should be incorporated into short-, mid-, and long-term transportation master plans, like NCTCOG's Mobility 2045. Each of these plans offer an opportunity to include a mobility hub typology, design guidance, and siting recommendations. Explicitly defining mobility hubs in the regional transportation plan can be the first domino to fall in addressing and supporting mobility hubs across the DFW area. Campus partners should also work to include mobility hub plans into their campus transportation planning documents.

Integrate into Walking and Biking Plans

Connected and comfortable walking and biking facilities are integral to providing access to and from mobility hubs. Similar to general transportation plans, mobility hub locations should be integrated into walking and biking network planning to ensure mobility hub access. Access to mobility hubs can even be used as a priority metric for funding facility improvements.

Consider Mobility Hub Zoning Overlays

Zoning is one of the more powerful tools to support public transportation and mobility hub implementation. A mobility hub zoning overlay is a tool to require through code curb, parking, and transportation demand management priorities within new development requirements. Working in collaboration with city partners, a mobility hub overlay can require specific mobility hub features for new or refitted developments in planned mobility hub locations.

Align with Transit Oriented Development

While not explicitly addressed within current DFW-area Transit Oriented Development plans (such as DART's TOD Policy and Guidelines), mobility hubs are an extension of transit oriented development (TOD) and should be incorporated as such. TOD plans offer the opportunity to plan and design mobility hub amenities tailored to specific neighborhood and station needs and better meet mobility needs.

Build into Transportation Demand Management

Mobility hubs should be considered a key Transportation Demand Management (TDM) tool for the DFW area, as they offer mobility solutions to offset single occupancy vehicle trips. A regional mobility hub program should be incorporated into the Travel Demand Management program offerings at NCTCOG, including integrating into NCTCOG's Try Parking It - Get Rewards for Greener Trips program. In collaboration with other city partners, mobility hub amenities (both physical and programmatic) can be incorporated into TDM requirements for new building and permits.

06 How to Implement Your Campus Mobility Hub

Key Implementation Factors

Campus mobility hubs present more complex user needs, operating environments, configurations, and governance structures than your typical mobility hub outside of the university and college campus context. Managing complexities at the onset of your campus mobility hub planning process will only increase the chances of harmonization, partnership, and successful implementation. But where do you start? Campus mobility hub implementers (or implementation teams) should factor the following seven considerations when planning, designing, and implementing a hub or mobility hub network.

Governance and Operating Considerations

Some of the most critical questions you should be asking yourself on your way to mobility hub implementation are "Who is leading implementation?" and "Who owns the project?". At hub locations that require a high degree of orchestration between modes, services, and programming, you also might ask "Who is coordinating the space to ensure success?".

In this study, campus mobility hubs are proposed across a number of different host sites – university campuses, public right-of-way, private property, and transit stops, among others. The location of your mobility hub and the services being integrated will drive governance and operating considerations. The following governance types are supported with an example from the University of Texas at Dallas (UT Dallas), which was made possible through a collaboration and partnership between the university and DART.

Campus-Led implementation sees the university or college as the primary property manager and lead decision-maker. This governance model is the best fit to pursue for on-campus mobility hubs, particularly when integrated with a campus building, public space, parking facility, or shuttle stop. Partnerships with other implementors and facilitators are likely to be needed, especially if there are hub elements located on City right-of-way, transit facilities, or private property, but the university should lead planning and project coordination.

The Transit Agency-Led approach focuses on mobility integration and coordination at bus stops and other transit facilities, like rail stations and park-and-rides. Mobility hubs with high-capacity transit are best led by a partnership between the municipality and transit agency. The Transit Agency-Led approach can apply on your university campus as well, particularly when your university's shuttle system is managed by the local transit agency or other fixed-route transit services operate on campus property.

The **City Agency-Led** approach focuses on mobility hub investments and coordination within the public right-of-way and/or on City-owned properties, like parking lots, underutilized parcels, parks and more. In most cases, local municipalities would own and manage all or a portion of a mobility hub with amenities at the curb or on City-owned sidewalks, at both on- and -off campus mobility hubs.

The Storm Drain Artscape competition for UNT students created a partnership between the university and student body to provide public art on campus. Students chosen to participate received $500 from the school's Green Fund. A similar approach can be used for mobility hub implementation.

Image from UNT We Mean Green Fund

Multi-Campus Partnerships are needed for select cases where a mobility hub or mobility hub network requires coordination between multiple universities. This can occur when two campuses are nearby and a mobility hub network plans to span to or near both campuses in the same city (e.g., UNT and TWU). This type of partnership is also needed for a mobility hub network that exists between a campus and its satellite campus facilities (e.g., UNT Health Sciences, TCU School of Medicine, UT Dallas Innovation Quarter, etc.), or between two universities in the same system (e.g., UNT Denton and UNT Frisco).

Private Property Partners should lead hub implementation when a proposed mobility hub is either fully or partially contained on private property away from the university campus or public right-of-way. These mobility hub arrangements are uncommon and centered on mobility hub integration into new developments – particularly transit-oriented developments.

Guided by the award-winning UT Dallas North Campus Transit-Oriented Development Master Plan, Northside at UT Dallas is an ideal location and partner opportunity for a coordinated, but privately owned and operated mobility hub that serves as a resident and business mobility amenity.

Image from Northside

Adapting Hubs as Conditions Change

Mobility hubs are testing grounds. Their planning and implementation should be dynamic and flexible to change as they are continually tested, evaluated, and updated. The COVID-19 era has taught us that the conditions we plan for in a moment can change quickly as much as they can change steadily over time. We are in a critical moment where we have experienced travel behavior changes and a shift in shared mobility demand due to the COVID-19 pandemic. These shifts will likely continue and have the potential to impact campuses and the region at large. While we anticipate the Dallas-Fort Worth region to continue to grow, campus growth in some cases may level off or decline as higher education models (such as remote learning) change. At other campuses, in-person education, research, and programming may continue to grow. Mobility hubs on your campus should adapt to changes in travel need, the way people move, and how campuses grow over time.

Southern Methodist University (SMU) currently has large sections under construction. Mobility hubs can be implemented through coordination with ongoing campus evolution.

Image from Google Earth

Mobility hubs do not have to be fully built out at once; rather implementation can be phased over time. An incremental approach that starts with strategic pilot installations can gain support over time and be tested to ensure the amenities are meeting campus affiliate mobility needs. Like campuses, mobility hubs are dynamic environments that can respond to student research and emerging technologies. Taking a temporary and tactical demonstration approach to implementation gives hubs the chance to pilot what works and learn from what doesn't. Pilot installations that expand and adjust over time can take advantage of existing project construction or phasing, short-term or time limited funds, student research or class projects, and help fill smaller community needs.

Centering Equity in Planning and Design

Campus mobility hubs promise convenient, reliable, and sustainable transportation for all. To ensure that promise truly reaches all, equity and community engagement must be centered at all stages of your hub design and implementation. Campuses serve a wide range of people with varying transportation needs, abilities, and disadvantages. Mobility hubs should offer amenities for everyone that use them, but have a targeted focus on mobility support and community infrastructure for:

- **BIPOC Affiliates:** This includes Black, Indigenous, and People of Color (BIPOC) campus affiliates that have historically been excluded from campus and broader infrastructure and transportation policy decision-making processes. Mobility hubs should uplift not harm these communities, reflecting their needs and cultures in their design and operation.
- **Low-Income Affiliates:** Transportation is often an expensive burden for student groups living at or below the poverty line. Mobility hubs should offer transportation options that are financially accessible and convenient to those who need transportation support the most.
- **People with Varying Abilities:** Campus stakeholders that rely on transit and other transportation options should be able to access mobility hubs despite physical and cognitive disabilities. Hearing their experiences is critical to mobility hub access and convenience for all.
- **Women, Non-Binary, and Transgender Affiliates:** Gender identity can impact travel behaviors and peoples' experience using campus mobility hubs. Understanding these nuances is important to ensure mobility hubs meet the travel needs of campus affiliates and make people feel safe.
- **Younger and Older Campus Users:** Campuses serve people beyond the typical college-aged student. Mobility hubs should serve people of all ages, in terms of physical, experiential, and cognitive design.
- **Non-English Speakers and Immigrant Communities:** NCTCOG-area campuses and the region at large are home to people of diverse cultures and origins of birth. University mobility hubs should reflect the communities that they serve, be responsive to cultural needs, and accessible to people with limited-English proficiency.

To center equity, you should thoughtfully and meaningfully engage these communities and commit to human-centered design throughout the planning and designing of mobility hubs. There are three types of opportunities that can be incorporated into mobility hub implementation to ensure community co-creation and uplift – programs, processes, and hub features.

Mobility and Campus Life Programs – A program is a set of activities that provide or support a service. Programs are also ways to express a campus access policy. Best practice programming includes:

- Tailor community engagement, mobility services, and hub programs to target audiences, ensuring accessibility, inclusivity, affordability, and ease of use (particularly for international and non-native English speakers).
- Create programs that are active and engaging where campus affiliates can interact first-hand with different service and mobility options, such as group rides or training programs. This is an effective way to understand barriers and bolster confidence in using services.
- Host multiple informal learning sessions led by trusted student groups and community organizations about shared mobility platforms and new campus transportation technologies used in hub pilots.
- Partner with a diverse group of student and advocacy groups representing BIPOC, LGBTQ+, international students and individuals with varying physical and cognitive abilities who can speak to their mobility needs.

Processes – An action or behavior that could include approaches to engagement, program and pilot development, or the role of community partners in the planning process. Examples of best practice processes include:

- Set aside a healthy budget for a needs assessment and other logistical needs for engagement such as survey translations, surveyor training, and food and childcare at in-person community events.
- Integrate representatives from student and campus advocacy groups representing BIPOC, LGBTQ+, international students and varying abilities throughout the project, from scoping to recommendations development, to ensure investments and programming reflect community needs.
- Ground your work with equity principles co-created with affiliate partners that identify as one or more of the protected groups listed above.
- Conduct equity analyses, potentially in partnership with in-house researchers and/or students, to understand the disproportionate impacts on the communities of concern mentioned above. Evaluate whether the benefits address issues across multiple sectors and whether it creates positive impacts across multiple aspects of affiliate lives.
- Designate student ambassadors to create a sense of community ownership and to cement their role as future disseminators of information.
- Ensure trusted liaisons, such as student body presidents, have a visible leadership role to expand engagement and participation from the broad range of campus affiliates.

Hub Features – Digital or physical infrastructure implemented within a mobility hub. Best practices for equitable hub features include:

- Select technology platforms that offer flexibility or customization to align with program and campus affiliate needs.
- Provide alternative payment methods such as cash or a loadable transit card and explore new financial solutions that help individuals, especially younger students, build credit.
- Ensure high-quality equipment is made available to campus affiliates to try and experience its potential benefits.
- Work with providers and partners to incorporate equitable pricing for mobility services.

- Incorporate modular furniture that can serve multiple purposes including seating, gathering areas, enclosing micromobility parking, and creating a buffer between hub users and vehicular movement. Observations of temporary furniture can help understand what and where features can be permanently placed.
- Co-create culturally appropriate wayfinding signage that directs hub users to community assets within an accessible walking or biking/rolling distance.
- Hire student artists to enhance hub aesthetics.
- Work with community members of varying abilities to ensure signage and mobility hub features account for all user experiences.
- Explore digital light projections and other non-traditional media as signage to enhance accessibility.

Branding Your Mobility Hubs

Campus affiliates should be able to easily identify a mobility hub on your campus and comprehend that the hub is where transportation options and information can be found. University campuses are often underscored by their branding – by extending that branding to campus mobility hubs, campus planners can create a sense of place for their affiliates (e.g., the forthcoming Bronco Mobility Hub at California State Polytechnic University at Pomona). Mobility hubs deserve a sense of arrival and a clear articulation of the hub environment. University branding and wayfinding at mobility hubs establish those easily identifiable spaces where transportation options and information can be found. The mobility hub experience on your campus should deliver more of a message than ease of mobility. Rather, mobility hubs on your campus should be experienced as vibrant and inclusive public spaces that reflect and enhance the identity and cultures of the campus or communities that they serve.

Consistent branding and design across your campus hub locations is important to establish both a sense of a place at the hub and consistency for the customer. The look and feel of a branded hub is an identity, a gateway signal, and a clear explanation of services by visual and other sensory cues.

Mobility hub branding and design guidelines should:

- Be recognizable from a distance, acting as a landmark or beacon for a concentration of expected mobility resources and opportunities
- Provide a predictable expectation that hub features at any given location across the region are the same or similar as a hub in another area
- Help users navigate to and within a hub, with appropriate wayfinding, orientation, and informational signage
- Signal to travelers how to use hub elements if they are unfamiliar with certain available options

Consistency across hubs at varying campuses and in different parts of the region informs travelers that each mobility hub is part of a larger network that can be used to connect people to their destinations. The larger the mobility hub network becomes, the better people will recognize the hubs and the higher the usage of transit and non-car travel opportunities will be. The reliability and routine in encountering and using them can grow over time. Consistent branding can present as a challenge across campuses with defined branding (i.e., UTA Maverick branding, UNT green, etc.). However, partners can be brought into the branding design. Their campus branding should be pulled into the mobility hub network branding and can act as part of the mobility hub place identifier.

UT Arlington uses its Maverick branding on its campus shuttles and other university assets. Incorporating a similar branding technique for campus mobility hubs will help them stand out and tie-in their identity with the university.

Image from UT Arlington

Ideally, mobility hubs on your campus should have a consistent naming convention that is regionally relevant and recognizable. At a minimum, a branded name should signal that hubs help people move and connect with community. Regardless of implementation partner, this core message should be consistent for all materials – branding, talking points, website, and printed materials.

Wayfinding is an important extension of mobility hub branding. Wayfinding at mobility hubs should be natural to the visitor and frequent customer alike and provide a seamless experience for every trip, regardless of how someone arrives or departs the hub area, and regardless of a passenger's age, ability, knowledge of, or comfort with the campus and region's transportation network. Wayfinding at your mobility hubs should provide orientation, navigation, and information at the right moments and can do this by adhering to the following guidelines:

Complete – Users get the information they need, organized in a hierarchical order easy to process, understand, and remember.

Eye-Catching – Useful and well-located, signs should not be distracting, overbearing, or block paths of movement. Signs should be mounted within natural sight lines where people expect them.

Clear – Signs should be easy to understand, with simplified language and typography and iconography that is comfortable, legible, and readable.

Compassionate – The design should be for a broad audience, allowing people of all backgrounds, English-speaking ability, and reading levels to navigate using the signage.

An example of UNT green branding from a campus sustainability initiative

Image from UNT We Mean Green Fund

Managing Demand

Providing new shared mobility services, building better transfers, and improving customer information alone cannot reverse the Dallas-Fort Worth region's and campus -goer's established driving behavior even when neatly packaged as a network of mobility hubs. If driving remains the most convenient option to access campus, then people will not change their behavior. In the absence of thoughtful parking, curb, and transportation demand management (TDM) strategies across campuses, it will be difficult to achieve the outcomes and targets you set for your mobility hubs. All mobility hub partners should have active TDM measures, good parking management policies, pricing, and other access management tools alongside mobility hub investments. These are foundational to the success of the mobility hubs and critical to incentivize and nudge people to shift modes and create new daily mobility habits.

In addition to mobility hub amenities like unlocking new shared mobility options and bike parking, consider leading the charge in developing and implementing best practice TDM policies and programs and campus parking management. These include but are not limited to:

- Pricing parking to ensure some parking is available and debt-service costs for off-street facilities are covered by user fees.
- Daily campus parking charges rather than a single up-front charge as an effective way to send more direct price signals that reduce parking demand during peak periods as parking supplies get more constrained.
- Parking restrictions for first- and second-year students to increase exposure to alternative mobility options among those newest to campus.
- Parking cash out incentives that offer a payout for not driving to work or using a designated parking space.
- Universal transit pass programs provide unlimited rides on local transit routes for free, or at a reduced rate for university affiliates.
- Campus mobility/commuter counseling that provides personalized travel plans based on each person's individual circumstances.
- Increasing campus housing to reduce aggregate miles travelled and center mobility hub amenities at housing facilities.

The University of Texas at San Antonio partners with the local transit agency to offer a universal transit pass (also known as a U-Pass) to all students and employees for free unlimited transit use.

Image from UTSA

Managing Hub Performance

Tracking performance, monitoring operations, maintaining mobility elements, and iterating on hub design is essential to the success of a hub. Consider establishing and tracking performance measures to help track progress toward the mobility hub outcomes at individual locations and the hub network level. Mobility hub performance measurement systems should measure the spectrum of mobility and community outcomes that local communities, transit agencies, and campuses seek to achieve.

While mobility hub performance measurement should consist of a mix of quantitative and qualitative data sources, data standards can simplify measurement and offer a mix of real-time and historic looks at performance. Work with your mobility hub partners to establish a data platform and dashboard where performance measures are regularly reported and visualized. This platform should be accessible to all relevant decision-makers and hub managers. The implementing agency will largely depend on the location and scale of the mobility hub or hubs – agencies who monitor hub performance will likely exist primarily at the city, transit agency, and MPO level. While the exact stakeholders who track mobility hub performance will vary, there is an opportunity to partner with in-house university researchers and students to analyze hub outputs for on-campus mobility hubs.

Quantitative and qualitative metrics can vary by hub, or by hub typology, to align with specific problems in that location. There are also several key performance indicators (KPI) that you should collect both prior-to-installation and routinely post-installation at every hub in the network. Establishing thresholds and standards at each hub type can help decide when you should transition from pilot installations to permanent investment or when to expand mobility offerings. Understanding hub performance helps evaluate which hub elements are more impactful under which conditions and can provide you with guidance on how to refine the design, implementation, and management of your hubs.

Collect and analyze your KPIs and other metrics on an annual basis, at minimum, and quarterly for more responsive evaluation and iteration. A 3-month survey can determine key design fixes to better help your mobility hubs address local mobility problems. A 12-month study can evaluate changes in behavior or travel patterns for hub area residents and employees. By reporting the same data over time, patterns can emerge of how hubs mature and how hub performance may diverge based on type or in different sections of the region. These patterns can highlight priority hubs that require investment or redesign. Decision thresholds for KPIs can be set for when a hub design should be reevaluated in greater detail.

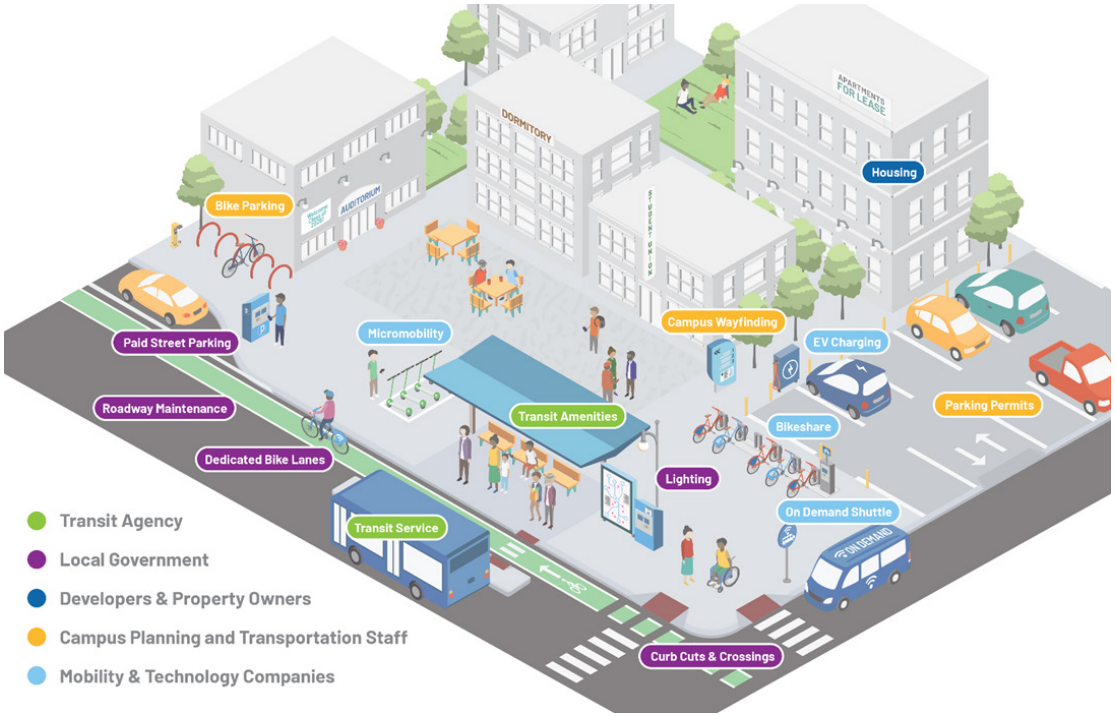
Performance measures should be tied to established mobility hub goals and outcomes and reflect the evaluation framework. For best results, segment your performance metrics by the type of campus affiliate. Partnering with campus researchers to support performance monitoring can strengthen the university's role in mobility hub implementation. The following are a sampling of key performance measures.

- # of daily transit boardings and alightings
- # of new transit transfers at hubs
- Bike share, scooter share, and car share average trip distance/trip duration for trips starting or ending at the mobility hub
- # of average daily and peak microtransit and shuttle boardings and alightings
- # of TNC pickups and drop-offs
- Average daily bike parking utilization
- Arrival mode share to hub
- Average access distance (miles) of hub user
- EV charger utilization (average daily vehicles charged) and charge time
- Peak hour pedestrian counts
- # conflicts between vehicles, pedestrians, and cyclists
- Age-, racial-, and income-diversity of hub users and surrounding community
- % of budget spent on transportation
- Average household vehicle ownership
- Average amount of time spent at Hub
- Performance of hub amenities
- Impact on surrounding businesses (if applicable)

BUILDING YOUR IMPLEMENTATION TEAM

Campus mobility hubs will rarely be owned, maintained, and serviced by just one entity – mobility hub planning and implementation requires constant collaboration and leveraging skills, authority, and capacity across a broad range of partners. Each one of your mobility hub projects might have a team of campus, public agency, private sector, community, university, and mobility provider partners.

Early in the planning process, your mobility hub's project lead(s) should convene its team of ongoing partners to clearly determine pre- and post-implementation roles, responsibilities, and expectations. Regardless of their role before or after implementation, partners should be engaged throughout the process. While some partners would satisfy multiple roles, it takes a multi-disciplinary team to plan, design, implement, and manage a mobility hub. From here, you can build out a governance and management plan for each mobility hub project.



Make It Formal

In order to set roles and expectations, consider developing a memorandum of understanding (MOU) among implementation partners. The Downtown Seattle Association developed a public space management agreement in 2015 that can be used as a template for your own implementation partnership efforts.

Beyond a MOU, your implementation team can assemble a more formal contractual relationship that lays out expectations for funding in exchange for mobility services, infrastructure, maintenance, or other components of mobility hub implementation. For an example of a formalized agreement for mobility hub services, see New York City's parking lot concession RFP, issued in 2020.

The following table summarizes some of the implementation team stakeholders and their potential roles in mobility hub implementation.

Stakeholders	Implementation Roles												
	Conveners/ Facilitation	Hub Network Managers	Pilot and Project Managers	Planning and Design Leads	Policy Leads	Funders	Implementers	Property Hosts	Hub Site Managers/ Operators	Mobility Providers	Maintenance Leads	Site Programming Leads	
FHWA/FTA													
TxDOT													
NCTCOG				Guidance	Guidance		Guidance						
County TOD/ Transportation Planners													
City Planners							Lead/Co-lead						
Public Agency Program Managers							Lead/Co-lead						
Local Transit Agencies							Lead/Co-lead						
Private Mobility Providers												Co-lead	E.g., Via
University Parking and Transportation Administrators							Lead/Co-lead			Select campuses			
Technology Vendors													

Stakeholders	Implementation Roles												
	Conveners/ Facilitation	Hub Network Managers	Pilot and Project Managers	Planning and Design Leads	Policy Leads	Funders	Implementers	Property Hosts	Hub Site Managers/ Operators	Mobility Providers	Maintenance Leads	Site Programming Leads	
Developers/ Property Owners							On-site/ Curb amenities						
Parking Operators							On-site/ parking structures					Lead/Co-lead	
Mobility Operations Staff													
Neighborhood Associations				Particip-ation									
Community-based Organizations				Particip-ation									
Place-based Organizations (e.g., Housing Authorities, Development Corporations, etc.)				Co-lead									
Contracted Professional Services													
University/ College Researchers													

Opportunities for Procurement Innovation

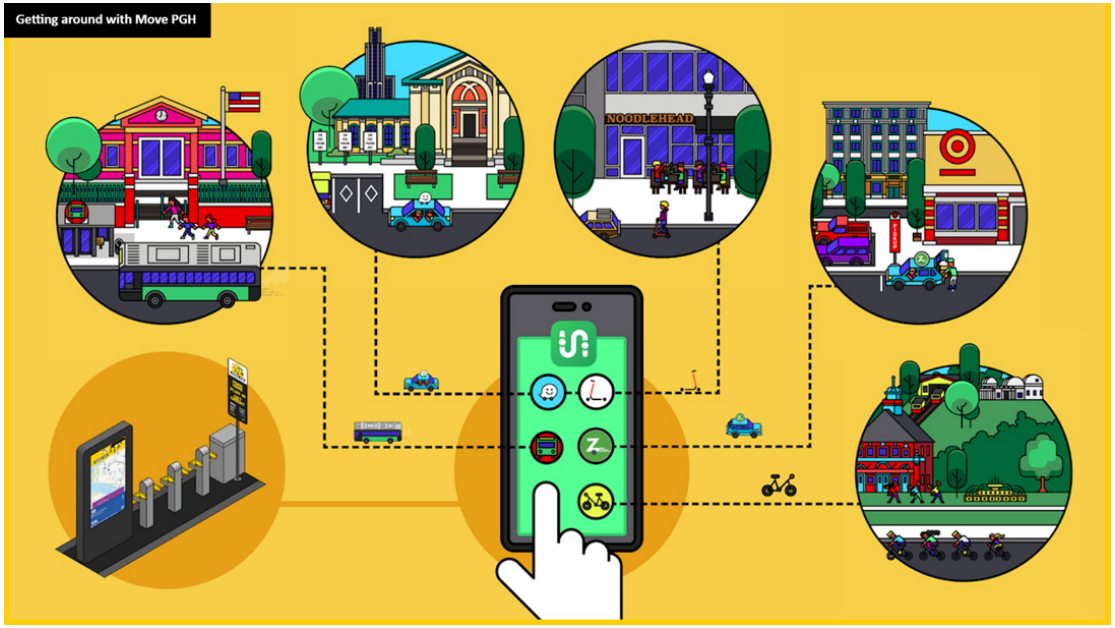
Typically, procurement for transportation services is solicited through a bid, via a Request for Proposals (RFP), Request for Qualifications (RFQ), or Request for Information (RFI). This section contains opportunities for alternative procurement methods to secure implementation services for your mobility hub program.

Mobility Concessions

A concession model is an agreement between a public authority and an organization or private company to grant funding in exchange for maintenance and operations of a public space. In this case, the concessionaire could be required to provide public space management, routine cleaning, and other maintenance services. A maintenance concession model can also grant exclusive and long-term rights to advertise in public spaces in exchange for some combination of public infrastructure like digital information panels, modernized transit shelters, wayfinding, and public art, among other amenities. The capital investment and maintenance at mobility hubs could be funded by the revenue generated from a controlled advertisement program.

Move PGH is a pilot program that provides low-cost shared mobility options at mobility hubs in Pittsburgh, PA. The program allows users to rent transportation services through the same app that they use to access transit tickets.

The Los Angeles Department of Transportation (LADOT), in implementing their mobility hub program, allowed for white labeled and templatized hub amenities, as well as mobility hubs to be sponsored by private entities.



Getting around with Move PGH

Image from Move PGH

The Los Angeles Department of Transportation (LADOT), in implementing their mobility hub program, allowed for white labeled and templatized hub amenities, as well as mobility hubs to be sponsored by private entities.

Mobility Challenges

You can organize and market "challenges" that clearly articulate the mobility needs, problems, and opportunities at your campus or community, and put out a call to innovation and residency options to deliver mobility services, innovative infrastructure, and digital/technological solutions that support the development and programming of mobility hubs (including mobility payment solutions, mobility rewards platforms, and more). The key to a successful challenge is to build a true partnership with winning challenge proposers, clarify the objectives and boundaries for action or investment, and market a value-add to the "challenger(s)" (e.g., provide research, marketing, and showcase opportunities).

Hub Benches

On-call or bench contracts allow for flexible selection among qualified vendors and organizations. Forming a bench of different professional firms for mobility hub implementation and management is one agency-led approach to procurement. City, county, or regional agencies can release a RFP, RFQ, or RFI that seeks to establish an on-call contract with a group of hub planners, implementors, or managers. After a bench is selected to receive the on-call contract, rotating members of the bench can apply for funding to plan, implement, or manage mobility hubs on a task-by-task or hub-by-hub basis through smaller procurements exclusive to the bench of firms. This type of contract opportunity typically seeks General Planning Consultant (GPC) or General Engineering Consultant (GEC) services, and is released at intervals of a few years, depending on the agency. For example, Dallas Area Rapid Transit (DART) releases a GPC RFP every five years.

Unsolicited Proposals

A vendor with an innovative idea for mobility hub implementation can submit an unsolicited proposal to a public local, state, or federal agency to receive funding in exchange for providing transportation services. This application is not in response to any government-initiated solicitation. This procurement method follows the same format as an application in response to an RFP, RFQ, or RFI, and contains primarily a description of the product or services, the period and location of performance, and the estimated cost of services. Contracts awarded in response to an unsolicited proposal tend to be in response to proposals that have an innovative and practical emphasis to add value to an existing program or proposed program. Your campus administration would need to amend your procurement rules and regulations to enable receiving and potentially funding unsolicited proposals.

Implementation Pathways

Hub implementation pathways and tools range from strategic long-term planning to opportunistic action. The pathway to implementing your project will likely differ from hub to hub or campus to campus.

The mobility hubs you design and build should evolve over time to best represent the dynamic campus environments, neighborhoods, and people they are meant to serve. Fully realizing a mobility hub plan can take time and the design will iterate over time as new capital projects, grant funding opportunities, development projects, newly enacted local policies, campus budget timelines, and new transportation services affect a location. Pathways can work in tandem at a single location, utilizing an incremental and iterative approach to building out a community or university's vision for a hub. Some hubs might take one implementation pathway to make initial enhancements (e.g., piloting) and then use a second pathway to formalize or modify the hub's amenities (e.g., enhancements through zoning code implementation).

Pathway 1: Retrofits and Incremental Layering

Mobility hubs are currently operating throughout the Dallas-Fort Worth region at bus stops, shuttle stops, and on university campuses. Retrofitting your existing mobility hub (e.g., a bus or shuttle stop area) to include additional mobility features and community amenities beyond the anchor transportation services is a typical implementation pathway. Retrofitted hubs typically take two forms:

- **Layering:** Strategic restructuring of space and offerings. This is an incremental and tactical approach to certain retrofit projects, wedging amenities into identified underutilized spaces at existing stations, stops, parking facilities, plazas, and more.
- **Revamping:** Major service and infrastructure investment. Revamp retrofits are often longer implementation efforts programmed into capital improvement cycles or with grant funds.

Reallocating the function of your hub spaces may require coordination and partnership across public agencies or university services, especially when on-street or sidewalk space is reprogrammed to a new function. This includes making the financial trade off to reduce paid or permitted parking to enable and manage new loading, dedicated docking, and communal sitting, resting, or dining space. At more dispersed hub locations, your hub implementers can find peripheral spaces one or two blocks from the hub anchor point to wedge in additional hub features, connected with thoughtful site design and wayfinding.

Another form of a retrofit is priority lane improvements. You should identify critical gaps in the bike and transit network and new connections during your planning stage and target them for investment. Your hub implementers can also reprioritize street space to extend bike lanes and add transit only lanes at the doorstep of mobility hubs. On campuses with heavy pedestrian traffic, consider converting campus roadways to pedestrian-only thoroughfares or woonerfs to help provide access to hubs.

Pathway 2: Piloting and Demonstrations

Your campus mobility hubs should be flexible and should adapt to surrounding conditions. In this pathway, the level of investment scales up over time – starting with low-cost and temporary testing before making more significant retrofits. Mobility hub elements can be piloted to test the long-term viability of shared mobility modes, new features considered for inclusion, wayfinding practices, pop-up retail and parklets, and more.

Regional pilot programs have cropped up around the country in recent years. The City of Minneapolis held mobility hub pilot programs in both 2019 and 2020 that led to long-term mobility hub implementation. The 2019 initiative introduced locals to the mobility hub concept over a three-month This demonstration pathway can help you learn about how community and campus programming or activation techniques may work across similar locations or hub types and to investigate specific features that will work to fill gaps in access or address your local contextual needs. Your mobility hub implementers should consider summer weather demonstrations in different parts of the region, such as by providing shade in innovative ways through partnership with local artists. period, and the 2020 pilot program expanded upon the previous year's program through lessons learned. In 2021, the Metropolitan Transportation Commission (MTC) in California's Bay Area initiated a mobility hub pilot program. Mobility hub locations were identified through a siting analysis, with the identified locations given priority as pilot locations. The application for participation lists the three objectives for the pilot as connected mobility, climate action, and equitable mobility. An entity such as NCTCOG could lead a similar effort using outcomes from this study.

Demonstrations also expand access to funding, implementation, and operating capacity, especially when they involve multiple partnerships. Semi-permanent features should be applied in phases, with routine evaluation to regularly rethink configurations, operating procedures, or even mobility provider regulations. Elements can be scaled or enhanced over time to ensure seamless improvements and positive hub performance over the long-term.

Pathway 3: Project and Development Integration

Your campus hub design and construction can be integrated with other capital projects or designed and planned locally as part of high-capacity transit expansion, campus shuttle planning, and station area planning. The routine cycle of street reconstruction and redesign projects can be opportune times for you to install and maintain mobility hub amenities. You can also use existing public outreach channels associated with planned projects to evaluate the community's appetite for mobility solutions. Similarly, having access to student emails as an outreach tool can help elicit feedback on proposed campus hub projects and related needs. Through partnership, transit agencies, universities, and cities can spur network connectivity by implementing mobility hubs at select transit stations or campus shuttle stops as they are redeveloped or improved. Consider how city- or university-owned assets such as curbs can be used in a collaborative way with transit-agency property to make a hub successful. Mobility hubs proposed at stations along transit investment or expansion routes should be designed to complement the existing or proposed services, as well as provide flexibility for the future as station areas evolve.

Mobility hub elements installed through existing or ongoing projects and plans are unlikely to have the benefit of being required by code or ordinance but can add additional benefits and return on investment for developers and municipalities. Any mobility hub features you add through integration at infrastructure projects, campus expansion plans, or new developments can act as a selling point to future residents, campus affiliates, and the community or public agencies by bringing added value and showcasing the projects' willingness to meet your community and campus needs by going above and beyond requirements.

Pathway 4: Long-Term Programming

One common avenue for mobility hub implementation is including long-term mobility hub infrastructure in your campus or city Capital Improvement Plans (CIPs). This pathway is reserved for mobility hub amenities and access that are fixed and may include integration with campus buildings or the greater transportation network. Typically, projects in CIPs have a minimum cost threshold to be included, which varies from campus to campus and community to community. But generally, CIP projects are reserved for efforts beyond the pilot stage of mobility hub implementation.

CIPs are often one component of long-range campus plans enacted periodically by universities. Campus mobility hubs implemented through long-range campus plans are often intended to be large-scale, part of a mobility hub network, and can require coordination across multiple departments, and potentially, public agencies. Some universities contain roadways that are controlled and operated by the local municipality – if your university falls into this category, you would need to coordinate closely with the local municipality to implement long-term mobility hubs.

NCTCOG has assembled a policy bundle that contains policies reflective of mode shift, equity, and environmental stewardship goals. Adopting a portion of these policies could be a crucial stepping stone towards mobility hub development for areas with a gap in policy that supports alternative transportation solutions. In particular, policies related to air quality, equity and environmental justice, operations, safety, security, roadways, sustainable development, and transit would be especially impactful to your mobility hub planning efforts. Oregon Metro in the Portland, OR region uses similar policy bundles and are aligning mobility hub programming and emerging mobility investments to the places that have adopted foundational policies.

Phasing Considerations

Your implementation timeline will depend largely on stakeholder coordination. For single hubs or small networks, implementation timelines are likely shorter than a full-scale hub network with a wider range of stakeholders involved. Consider public agency and university budget cycles when developing your phasing strategy and estimating your hub implementation timeline. In some cases, legislation is required to deliver some mobility hub elements, such as expanded transit services, micromobility or other shared mobility policy, large capital improvements, or elements that require bond funding.

Mobility hub projects and individual elements can be implemented along many different timelines depending on your funding, changing mobility needs and demands, availability of leveraging opportunities, and more. The primary phasing considerations include:

Test and Iterate Now: This approach involves implementing mobility hub elements through tactical means rather than by breaking ground or moving curbs. Through demonstrations and piloting, you can install quickly and receive rapid feedback on what works and what needs adjustments. Ultimately, a demonstration approach can lead to efficiencies in design by gaining an early understanding of what makes your mobility hub successful within the local context.

Integrate Building Blocks and Opportunities: This approach requires more involvement and multi-partner coordination than the previous two. Not all mobility hub elements would come online at the same time. Rather, each mobility hub would be considered separately and implemented incrementally. Pursuing this approach would require a larger general funding strategy for each element in the proposed mobility hub, as well as a prioritization plan for when new funding becomes available.

Bank and Stage: Your campus or properties adjacent to your campus may have empty or otherwise underutilized lots or parcels. Consider using these spaces to temporarily stage mobility hub elements while the space is not being used. If the mobility hub is enough of a success, an agreement can be made between your campus and the future developer to build a permanent foundation for the mobility hub when the parcel is eventually redeveloped.

Build at Once: Unlike the previous approach, this strategy envisions a fully built-out mobility hub that is implemented all at once. A mobility hub that is planned from the outset can ease implementation by aligning timelines for multiple different elements into one overall project. Your mobility hub will need to be planned and entirely funded through grants or CIP funding, or otherwise integrated into an infrastructure project or development.

Sample Implementation Timelines

The following lays out potential timelines for various categories of mobility hub planning and implementation. Many of these implementation timelines can occur concurrently to one another, as long as an implementation element in one category is not reliant on the implementation of an element in another. In all cases, piloting can rapidly accelerate the implementation timeline and pave a path for formalization quicker than more traditional project delivery timelines.

- **Parking Management** involves changing parking policy at the university or city level and can include changes to the permit parking structure at universities, parking costs and coordination at cities, and how the physical space of parking surfaces is used as part of a mobility hub. Pursuit of these changes can involve pilot projects, a university-wide election for policy changes, and/or a parking study to gain support of decision makers. A timeline for changes to parking management is estimated at **one to two years**.
- **Wayfinding and Placemaking Elements** require design and coordination through avenues such as planning studies, student initiatives, and university design competitions, among others. Placemaking elements such as benches, lighting, and vendor carts can vary in terms of implementation timeline. Overall, the timeline for implementation of these elements is estimated at **one to two years**.
- **Short-Term Pilot Projects** can vary widely by the type of service being piloted, but typical pilots might include first and last mile service pilots (such as on-demand transit), bicycle and pedestrian infrastructure pilots, dockless micromobility policy and service pilots, and/or carshare pilots, among others. Timeline will primarily depend on the buy-in from city staff or campus administration and coordination with vendors and other public agencies. This timeline is estimated at **less than one year**.
- **Technology Amenities** include a large selection of mobility hub offerings, and some amenities under this umbrella can have an extended timeline. For example, making changes to how transit fare is paid, such as moving the payment station off-board of the transit vehicle, can be a lengthy process. Other technology integration can be relatively short term, such as implementing real-time transit information or parcel lockers. Therefore, the timeline for implementation of technology is estimated at **one to four years**.
- **Bicycle and Pedestrian Infrastructure**, especially within the wider transportation network, is typically a lengthy implementation activity. Bond elections, Capital Improvement Program (CIP) inclusion, and other coordination activities can take years, not to mention the planning design, and construction involved in these improvements. Some implementation efforts are on the shorter end of the timeline, such as restriping a roadway to offer protected bike lanes and implementing bike racks. The timeline for implementation of typical bicycle and pedestrian infrastructure is estimated at three to five years. Tactical, short-term implementation of bicycle and pedestrian infrastructure is one avenue to reduce the implementation timeline and pilot new infrastructure. For this implementation method, the timeline is estimated at **less than one year**.
- **Transit Expansion** is the mobility hub element on this list that will likely take the longest to implement. This effort includes political coordination, budgeting/fundraising or bond elections, planning, construction, and coordination among many different groups. For smaller service expansion such as new stops along an existing bus route or coordinating new shuttle stops within the university context, the timeline could be short term. But this category also includes construction and implementation of new commuter rail lines and all the coordination that goes into that effort. The timeline for transit expansion is estimated at **two to ten years**.