IMPLEMENTATION STRATEGIES

NCTCOG Intermodal Transportation Hubs for Colleges and Universities Study

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01 Introduction

Mobility hub implementation in the campus context is a recent proposition for university and college administrators and their partners. While cities and transit agencies across the United States are rapidly planning, implementing, and iterating mobility hubs in more typical urban and suburban environments, the methods and conditions by which university and college campuses implement hubs—and even build mobility hub partnerships — will differ slightly.

In any context, the path to mobility hub implementation will depend on the unique conditions at each hub location. There is no tried and tested formula. Available space, ownership issues and conflicts, baseline infrastructure and mobility services, and the underlying policy environment are just a few of the considerations when determining the appropriate implementation strategy for your hub.

This Implementation Strategies report offers a comprehensive set of mobility hub implementation tactics for universities, colleges, and their partners to choose from. NCTCOG hopes that campuses across the region and their transportation agency, private mobility provider, and landowner partners will use this menu of delivery tools to advance mobility hubs from concept and planning to implementation and management. Within this report, NCTCOG offers new campus mobility hub implementation guidance that is tailored to your needs. The report will help you:

- Investigate key implementation factors ranging from who owns hub implementation to how to adapt hub features as campuses grow and meet the shifting demands of post-COVID campus life;
- Build and organize an interdisciplinary and accountable implementation team;
- Find your path to implementation;
- Leverage partnership opportunities that can lead to full build out or incremental enhancements; and
- Identify opportunities for innovation in the way hub projects and supportive mobility services and technologies are procured and delivered.

While this report is intended to be used as an a la carte menu of implementation options, some of the methods herein — such as building an implementation team, mapping out implementation phasing, and determining governance structure early — should be adopted as a matter of standard operating procedure.

02 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 a 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 examples from the University of Texas at Dallas (UT Dallas):

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.

Implementation at on-campus mobility hubs, such as those centered on UT Dallas' Comet Cab and Comet Cruiser stops, would be led, owned, and managed by UT Dallas.

Image from UT Dallas

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 university campuses as well, particularly when the university's shuttle system is managed by the local transit agency or other fixed-route transit services operate on campus property.

Off-campus mobility hubs at major transit facilities, such as the DART UT Dallas/Synergy Park Silver Line Station, would be owned and managed by the transit property owner in partnership with the local municipality, campus, and station-area developers.

Image from DART

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.

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).

Connecting primary UT Dallas on-campus mobility hubs with a mobility hub at The IQ at UT Dallas—an innovation partnership between the City of Richardson and UT Dallas—would require coordinated implementation, management, and operation by multiple UT Dallas facility managers. However, campus mobility hub elements located on City public right-of-way, including amenities sited on the sidewalk and along the curb, would be owned and operated by the City of Richardson.

Image from Cushman & Wakefield

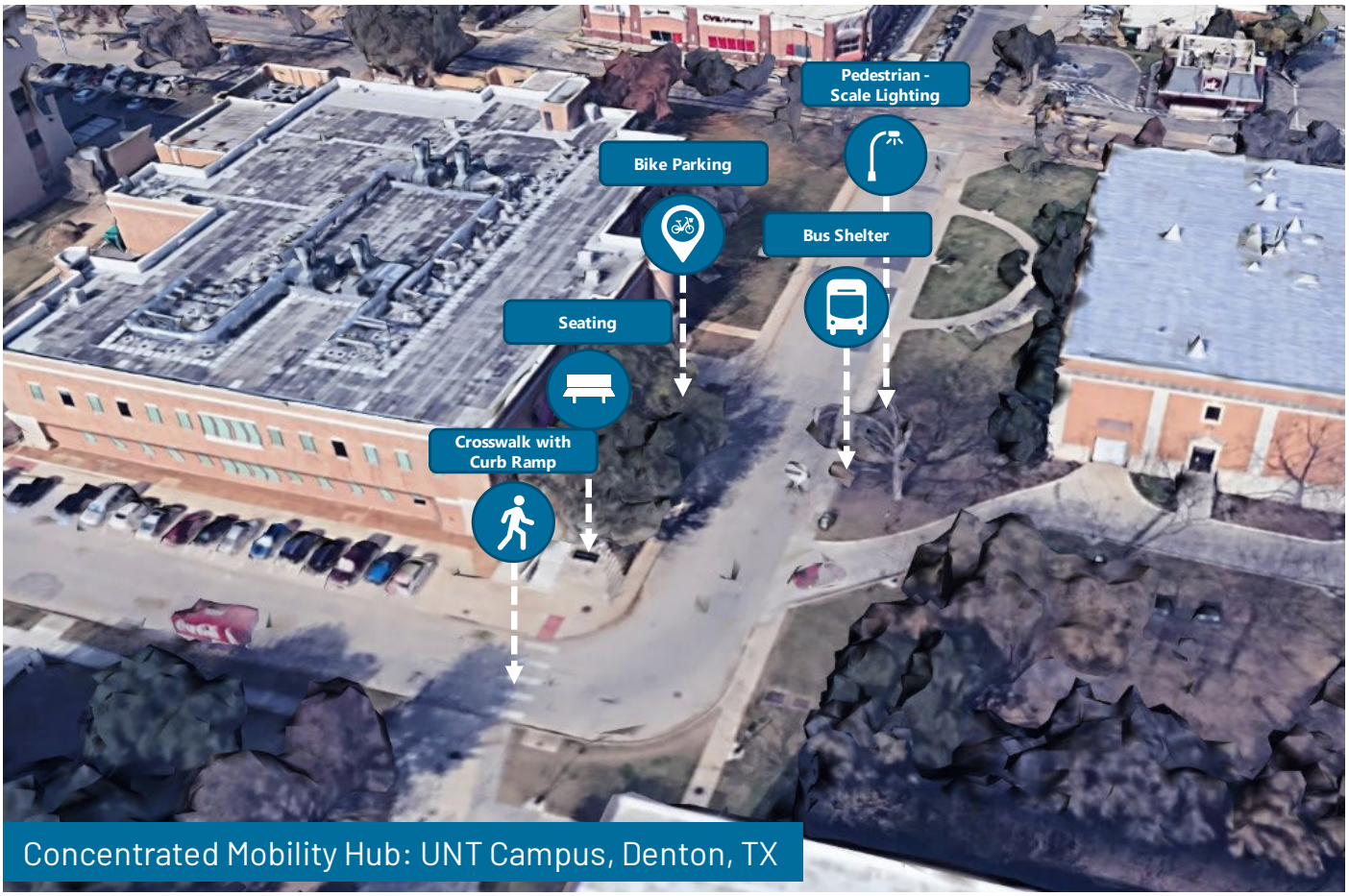
Private Property Partners should lead hub implementation when a proposed mobility hub is either fully or partially contained on private property away from the university campus or public right-of-way. These mobility hub arrangements are uncommon and centered on mobility hub integration into new developments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

Concentrated Versus Dispersed Hub Amenities

Depending on a campus mobility hub's 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.

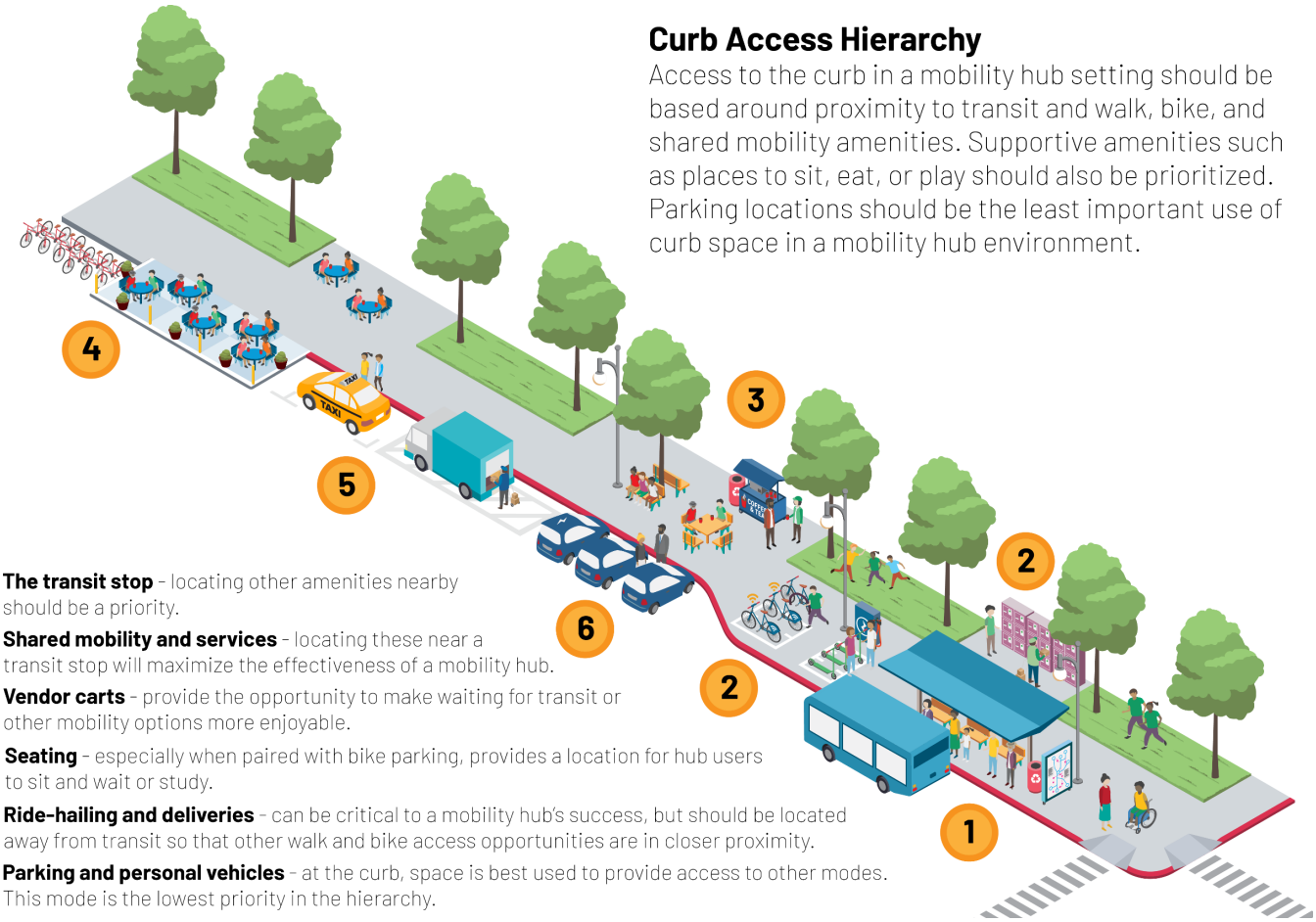
A **dispersed hub configuration** is the alternative to a concentrated mobility hub in instances where facility space is limited, or the hub context does not support a fully integrated hub. Dispersed mobility hubs may host amenities spread across several blocks, focus amenities at various building entrances 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.

Dispersed Mobility Hub: Mockingbird Station, Dallas TX

Whether concentrated or dispersed, curb space should be allocated in a manner that supports the campus' unique mobility needs and access priorities. To do this, implementers should adopt a basic framework to organize and prioritize space at hubs—consistent with NCTCOG's Curb Management Regional Planning Guide. A curb prioritization framework specific to campus mobility hub implementation will help determine the highest and best use of limited curb space dependent on the mobility hub type and local needs.

Curb Access Hierarchy

Access to the curb in a mobility hub setting should be based around proximity to transit and walk, bike, and shared mobility amenities. Supportive amenities such as places to sit, eat, or play should also be prioritized. Parking locations should be the least important use of curb space in a mobility hub environment.



1. **The transit stop** - locating other amenities nearby should be a priority.
2. **Shared mobility and services** - locating these near a transit stop will maximize the effectiveness of a mobility hub.
3. **Vendor carts** - provide the opportunity to make waiting for transit or other mobility options more enjoyable.
4. **Seating** - especially when paired with bike parking, provides a location for hub users to sit and wait or study.
5. **Ride-hailing and deliveries** - can be critical to a mobility hub's success, but should be located away from transit so that other walk and bike access opportunities are in closer proximity.
6. **Parking and personal vehicles** - at the curb, space is best used to provide access to other modes. This mode is the lowest priority in the hierarchy.

The mobility hub access hierarchy should 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 the base of the curb hierarchy. Space for parking and personal vehicles should rank last among the mobility hub access hierarchy. Curb space already allocated to parking and personal vehicles should be repurposed to support other amenities (transit lanes, bike lanes, passenger and commercial loading, etc.) when curb space is limited. Ultimately, the mobility hub configuration should be reflective of the implementer's mobility values and center the movement of people rather than vehicles.

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 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. Similar to 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 the 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, implementers must 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.

Establishing Branded Mobility Hubs

Campus affiliates should be able to easily identify a mobility hub 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 should deliver more of a message than ease of mobility. Rather, campus mobility hubs 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 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

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

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.

Ideally, mobility hubs 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.

An example of UNT green branding from a campus sustainability initiative
Image from UNT We Mean Green Fund

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 campuses' and region's transportation network. Wayfinding at 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.

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 -goers' 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 set for the 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, campus partners can lead the charge in developing and implementing best practice TDM policies and programs and campus parking management. These include but are not limited to:

Better Pricing for Parking

Best practice approaches for managing campus parking demand begin with two, primary demand-management objectives:

1. Ensure that all parking costs, including debt-service costs for off-street facilities, are covered by user fees.
2. Price parking to maintain availability – setting rates relative to levels of demand, typically with a goal of keeping demand in line with capacities at each facility.

Daily Campus Parking Charges

Studies have shown that campus affiliates are more sensitive to small recurring fees and charges than larger and less-frequent ones. As such, daily parking charges rather than semester long up-front charge might be an effective

way to send more direct price signals that reduce parking demand during peak periods as parking supplies get more constrained. Daily parking charges should apply across most campus parking facilities.

First- and Second-Year Parking Restrictions

Many campuses have adopted the practice of preventing some students (typically, freshmen and sophomores within a certain age range) from access to on-campus parking. This not only directly reduces campus parking demand, but also increases exposure to alternative mobility options among those newest to campus. This sort of temporary exposure has proven an effective strategy for increasing long-term interest in alternative modes, especially in environments with effective and appealing non-driving mobility options that extend beyond the campus core.

Parking Cashout

To better incentivize faculty, staff, and campus employees, they receive a payout for not driving to work or using a designated parking space.

Universal Transit Pass

Universal transit pass programs provide unlimited rides on local transit routes for free, or at a reduced rate for university affiliates. This universal pass should cover fares across all transit agencies and campus transportation providers for those commuting across the region and to different campuses.

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

Campus Commuter Counseling

Often, commuters find themselves driving to work out of force of habit, and do not take advantage of available non-driving alternatives because they are not aware of them, their benefits, or of how to use them. Commuter counseling on campus would fill this knowledge gap by providing personalized travel plans based on each person's individual circumstances.

Increase Campus Housing

Increasing campus housing reduces aggregate miles travelled to campus destinations and brings more campus commuters within range of walking, cycling, and use of campus shuttle systems. This is particularly applicable to the suburban campuses where many students have expressed a desire for closer housing.

Managing Hub Performance

Tracking performance, monitoring operations, maintaining mobility elements, and iterating on hub design is essential to the success of a hub. Establishing and tracking performance measures 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. Mobility hub partners should work together 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 should be collected 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 to 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 guides implementors on how to refine the design, implementation, and management of the hubs.

KPIs and other metrics should be collected and analyzed 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 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 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)[1]

[1] Can potentially be measured through foot traffic counts or sales revenue/tax changes after hub implementation.

03 Orienting Towards Implementation

Implementation does not always have to be in the form of a brand new, fully built mobility hub. An incremental approach that starts small with a strategic pilot installation can gain support over time for certain elements, such as adopting new curb management techniques or demonstrating emerging transportation modes. The temporary and tactical nature of demonstration installations can allow for quicker implementation than more permanent and robust mobility hubs. Pilot installations that expand and adjust over time can take advantage of existing project construction or phasing, short-term or time limited funds, and help fill smaller, more niche community needs. When building your initial hub design, you should factor in elements that can be scaled or enhanced over time to ensure seamless improvements and positive hub performance over the long-term.

Mobility hub planning processes and procedures can vary depending on the size and number of mobility hubs being implemented, the level of technology and land use integration, and the availability of emerging mobility technologies. Coordination across all involved implementation partners is key to a successful mobility hub. Many transportation services that are needed for mobility hub implementation must be procured by local public agencies – a process that invites additional private stakeholders into an overall team. Knowing who to invite to the table and their clear roles will be a valuable component of your implementation process.

Building an 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 mobility hub project will have a team of public agency, private sector, community, university, and mobility provider partners.

Early in the planning process, the 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.

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

IMPLEMENTATION STRATEGIES

North Central Texas Council of Governments

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	Performance Monitoring
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 Transportation
University Parking and Transportation Administrators							Lead/Co-lead			Select campuses			
Technology Vendors													
Developers/ Property Owners							On-site/ Curb amenities						
Parking Operators							On-site/ parking structures					Lead/Co-lead	
Mobility Operations Staff													
Neighborhood Associations				Particip-ation									

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Community-based Organizations				Particip-ation									
Place-based Organizations (e.g., Housing Authorities, Development Corporations, etc.)				Co-lead									
Contracted Professional Services													
University/ College Researchers													

***Shaded boxes indicate implementation involvement**

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).

Methods for Campus Integration

The following section describes some common pathways to 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 of an 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 hub spaces may require coordination and partnership across public agencies or university services, especially when reprogrammed on-street or sidewalk space 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, 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. Critical gaps in the bike and transit network and new connections should be identified during planning and targeted for investment. 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, conversion of campus roadways to pedestrian-only thoroughfares or woonerfs can help provide access to hubs.

Pathway 2: Piloting and Demonstrations

Campus mobility hubs should be flexible and adapt to surrounding conditions. The level of investment should scale 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 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.

The demonstration pathway can help the region learn about how community and campus programming or activation techniques may work in similar locations or hub types and to investigate specific features that will work to fill gaps in access or address local contextual needs. 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.

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

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 mobility hub amenity installation and maintenance. The existing public outreach channels associated with planned projects can be used 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. 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. Implementation partners will need to think about 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. Mobility hub features added 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 community and campus needs by going above and beyond requirements.

Pathway 4: Long-Term Programming

Including long-term mobility hub infrastructure in campus and city Capital Improvement Plans (CIPs) is a common avenue for mobility hub implementation. 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 – universities that fall into this category 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.

Leveraging Tools and Partnership Opportunities

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 implementation efforts. 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.

Town and Gown Partnerships

Universities and colleges play a large role in some of 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.

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

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.

TMA Partnerships

Transportation Management Associations (TMAs) are non-profit organizations formed to coordinate and manage mobility programs and access improvements on behalf of private and public employers, business districts, and local governments. TMAs have traditionally served as commute coordinators, mobility managers, and central clearinghouses for transportation-related education.

The North Central Texas region is home to a handful of TMAs[2] – mobility institutions that have the capacity to support mobility hub development, delivery, and ongoing management. TMAs can expand their mission to ensure

[2] Downtown Dallas, Inc. in Dallas, Southern Dallas County Inland Port TMA in Dallas and other southern Dallas County cities, Downtown Fort Worth, Inc. in Fort Worth, and LegacyConnect in Plano.

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.

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.

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

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.

Cities, universities, and transit agencies should collaborate with mobility service providers on regulations and operating requirements to ensure permitted mobility services integrate into mobility hubs throughout the region. The region should test new types of infrastructure, information systems, and digital tools with shared mobility vendors – especially at mobility hubs. In exchange, the region should offer multi-year license agreements to partners committed to integration in exchange for new mobility investments. Mobility hub implementers should provide clear expectations for the performance, operation, and management of shared mobility partners at mobility hubs.

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.

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

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.

Research Partnerships

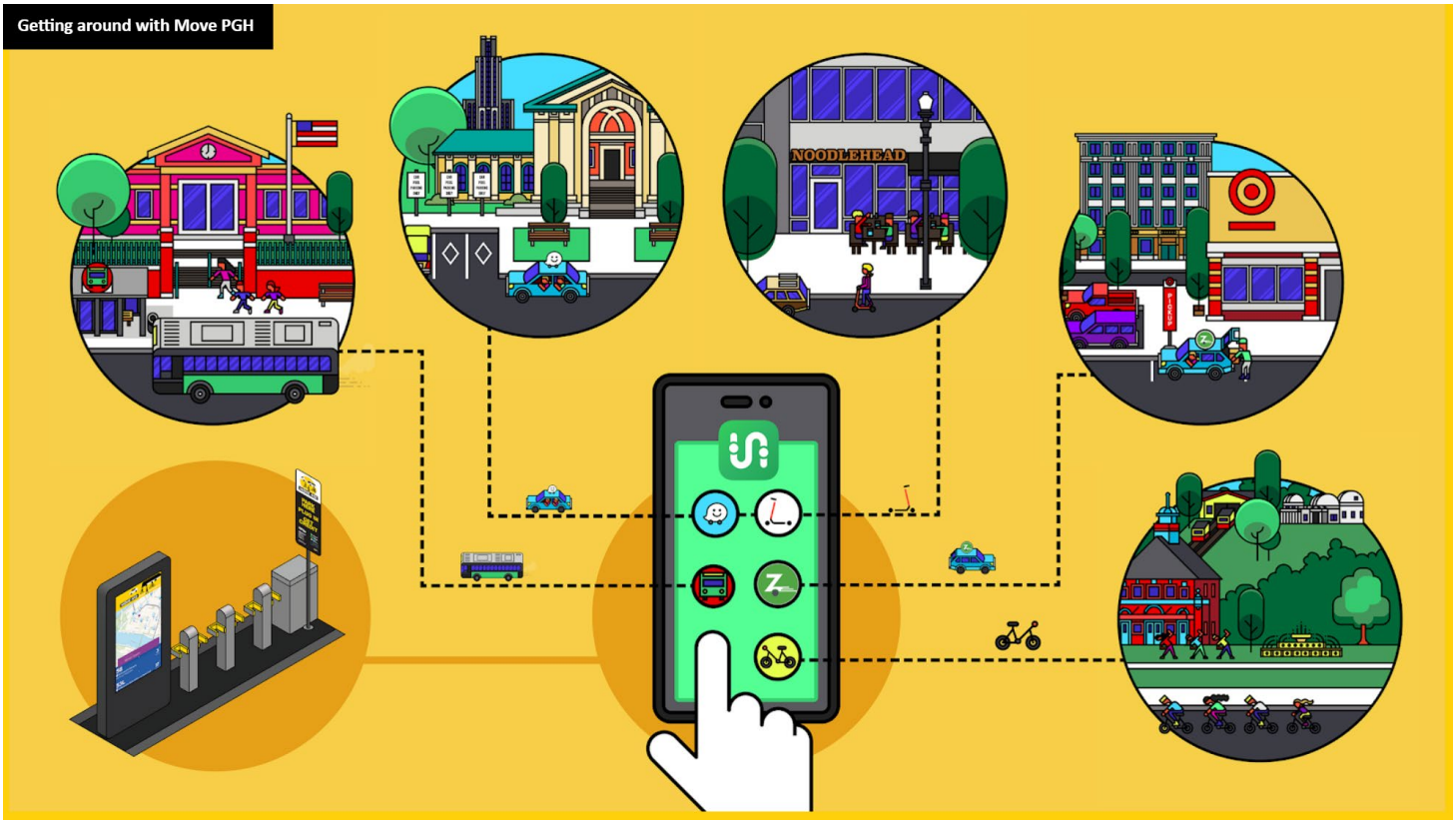
As you go through your planning process, universities are constantly using their campus as a learning lab. University Transportation Centers (UTCs) and other research centers on campus can be a great source for innovation and collaboration in mobility hub planning. Student- and researcher-led work can be immensely useful to support 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.

Shelby Frank, a graduate student at UNT Denton, conducted a bike infrastructure assessment in the City of Denton in 2022 to examine gaps in bicycle infrastructure and where they overlap with instances of cycling collisions. If this work had been part of the attempt to implement a local mobility hub network, the infrastructure assessment could have helped identify mobility hub locations and opportunities for bicycle network expansion. Shelby's work is a prime example of the outcome opportunities of partnerships between universities and mobility hub implementors.

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



Move PGH in Pittsburgh allows users to rent shared mobility services and purchase transit tickets in the same mobile app.
Image from Move PGH

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.

Mobility Challenges

Universities and colleges can organize and market "challenges" that clearly articulate the mobility needs, problems, and opportunities at a campus, 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. Campus administrations would need to amend their procurement rules and regulations to enable receiving and potentially funding unsolicited proposals.

Phasing Considerations

The timeline for implementing a single mobility hub or mobility network will depend largely on the coordination needed between the stakeholders – for single hubs or small networks, the timeline for implementation is likely shorter than a full-scale hub network with a wider range of stakeholders involved. Public agency and university budget cycles should be considered when estimating 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 will require bond funding. This section provides an example timeline and phasing considerations for your mobility hub project.

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**.

Phasing Considerations

Mobility hub projects and individual elements can be implemented along many different timelines depending on 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, there can be quick installation and 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 a mobility hub successful within the local context.
- **Bank and Stage:** Some campuses or properties adjacent to campuses have empty or otherwise underutilized lots or parcels. There is the opportunity to use 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 with the future developer or campus to build a permanent foundation for the mobility hub when the parcel is eventually redeveloped.
- **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.
- **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. The mobility hub will need to be planned and entirely funded through grants or CIP funding, or otherwise integrated into an infrastructure project or development.