



CONNECT Beyond

A Regional Mobility Initiative

Mobility Hub Framework

July 2021

Contents

- Purpose 1
- Introduction 1
 - What is a Mobility Hub? 2
- Role of Mobility Hubs in the CONNECT Beyond Region 2
- Applying Mobility Hubs in the CONNECT Beyond Region..... 7
- Mobility Hub Case Studies from North American Regions 9
 - Key Takeaways 9
 - Broward County, FL MPO 10
 - SANDAG (San Diego, CA) 11
 - Metrolinx (Toronto, ON)..... 12
 - Capital Metro (Austin, TX) 13
 - City of Minneapolis (Minneapolis, MN)..... 14
 - Research Triangle Park (RTP) (NC)..... 15
- Mobility Hub Typology for the CONNECT Beyond Region 16
 - CONNECT Beyond Typology 16
 - Amenities by Type 19
 - LEVEL 1: OPTIMIZED BUS STOPS..... 22
 - LEVEL 2: HIGH ACTIVITY CENTERS 24
 - LEVEL 3: REGIONAL CONNECTORS 26
- Framework for Mobility Hub Siting 28
- Recommended Next Steps 30

Figure 1. CONNECT Beyond study goals.....	2
Figure 2. Transit providers serving the CONNECT Beyond region	3
Figure 3. Urban transit Providers (left) intersect with but differ from Rural Transit Providers (right).....	3
Figure 4. CONNECT Beyond Layers of Total Mobility	4
Figure 5. Transit networks are changing as layers of mobility change.	4
Figure 6. Mobility hubs improve connections across existing roadway, transit, and greenway systems.	5
Figure 7. Mobility hub design prioritizes a safe, seamless and comfortable user experience.	6
Figure 8. Mobility hub elements include public and private transportation services and user amenities.....	7
Figure 9. relationship between the region’s layers of mobility and a network of mobility hubs.....	18
Figure 10. Mobility hub amenities matrix based on hub type	19
Figure 11. Neighborhood Node – Level 0 A - Rural Connector Hub	20
Figure 12. Neighborhood Node – Level 0 B - Community Connector Hub	21
Figure 13. Optimized bus stops – Level 1 A – Community Bus Stop.....	22
Figure 14. Optimized Bus Stop – Level 1 B – Metro Bus Stop.....	23
Figure 15. High Activity Center – Level 2 A – Community District Hub.....	24
Figure 16. High Activity Center – Level 2 B – Metro District hub.....	25
Figure 17. Regional Connector Hub – Level 3 A – Regional Hub.....	26
Figure 18. Regional Connector Hub – Level 3 B – Regional hub	27
Figure 19. Applications of CONNECT Beyond hubs based on Place Type	29
Table 1. Selected Case Studies	9

Purpose

The purpose of this memo is to document the work done to explain what is a mobility hub, how other peers use mobility hubs, how mobility hubs fit and support the CONNECT Beyond project, and where potential mobility hubs fit in the CONNECT Beyond region. This report articulates the role of mobility hubs within the specific context of the 12-county, two-state CONNECT Beyond region and illustrates likely applications of hubs now and in the future.

The CONNECT Beyond planning process sought stakeholder and service provider input to inform the mobility hub framework. This included:

- Technical Advisory Committee primarily comprised of rural transit providers
- Information and input related to current practices of rural transit providers in the region
- Identifying potential future Mobility Hubs and passenger transfer locations, using an interactive map

Introduction

Over the past two decades, the greater Charlotte metropolitan region has experienced unprecedented growth. Strategic public infrastructure investments such as the Blue Line light rail system and the Gold Line Streetcar in Charlotte, coupled with the region's diversified economic and industry base, have helped attract and retain a rich mixture of residents and workers. This has helped the region remain resilient through turbulent national economic cycles and most recently through the COVID-19 pandemic.

Transportation has been regularly identified by the region's residents as a top priority for regional leaders to address. With 1.4 million additional residents projected to arrive by 2045, or the equivalent of adding the total population of Raleigh to the region, community leaders realize that a variety of mobility options are needed to support and sustain travel within and through the region. As the Charlotte region continues to compete on the global stage, access to a safe, reliable, affordable and a well-connected transportation network using a variety of transportation modes is one of the most important means of ensuring equitable participation and benefits to social and economic prosperity.

The project included a review of other mobility solutions, strategies, and activities communities in the region may employ to advance regional mobility and will be addressed in future project efforts, a key effort for effective future mobility are mobility hubs. The CONNECT Beyond planning process made use of the latest information related to existing and future population, employment, and transportation conditions in the region and gathered input from jurisdictions and agencies in the region, as well as the general public. Coordinated by the Centralina Regional Council and the Metropolitan Transportation Commission, CONNECT Beyond is a regional mobility initiative to create a unified regional transit vision and plan. **Figure 1** provides an overview of the study goals.

CONNECT Beyond Study Goals

- Define a single, coordinated transit vision for the project study area that includes multiple transportation modes.
- Identify high-capacity transit corridors that build upon and complement the Charlotte Area Transit System (CATS) 2030 System Plan and other regional and local transportation plans.
- Strategize on key topics and methods for regional coordination that cross modes of transit as well as organizational and geographic boundaries.
- Develop action-oriented implementation approaches that support:
 - Improved mobility and access.
 - Effective, regionally coordinated transit investments.
 - Coordinated and resilient transit operations to meet the needs of a growing and changing region.
 - Environmentally sustainable investments and policies.
 - Advancement of equitable and community-driven improvements.

Figure 1. CONNECT Beyond study goals

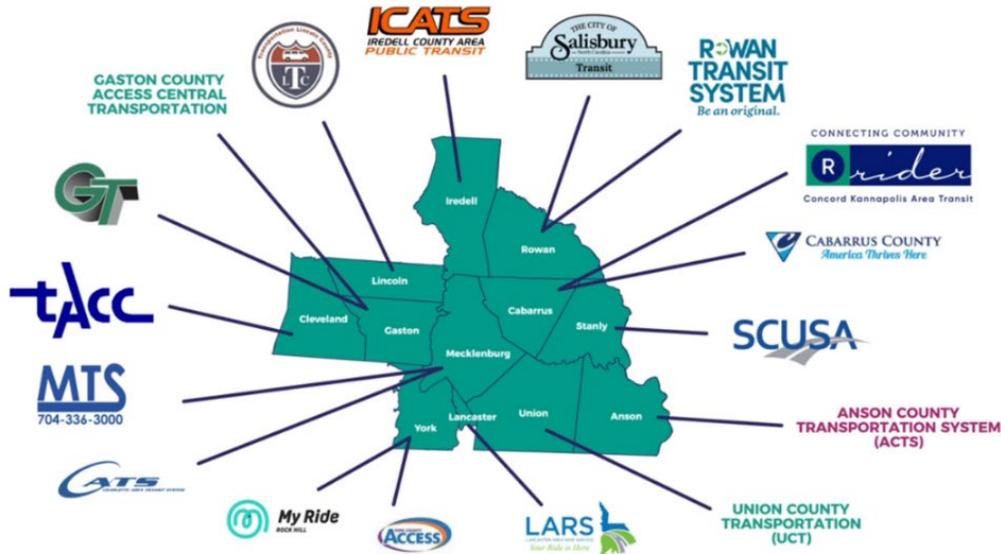
What is a Mobility Hub?

Mobility hubs are a tool for improving seamless transportation connections. A regional framework for mobility hub planning provides a resource for counties, MPOs, local jurisdictions, and partners agencies working toward a new transit future. Mobility hubs provide a range of integrated mobility services and supporting amenities and technologies to facilitate connections between destinations. There is no one-size-fits all design for a mobility hub, but rather they are scaled to reflect the unique context and needs of a particular area.

Role of Mobility Hubs in the CONNECT Beyond Region

Mobility hubs are places of connectivity where different travel options come together. The CONNECT Beyond study is identifying various layers of transit services and mobility, the mobility hubs will provide effective and safe places for connecting multimodal services for the current and future residents and visitors of our region. The two main factors determining the role of mobility hubs in the region are: 1) the need to connect services across different service providers and service contexts and 2) the integration of different “mobility layers” that make up the current and future regional transportation landscape.

Transit service in our region is operated by 17 different agencies across 12 counties (see **Figure 2**).



Urban and rural service providers access the same regional transportation infrastructure and must connect with one another to provide complete trips. The providers differ in the trips they serve and how community members access their service. **Figure 3** illustrates the various types of transit vehicles provided throughout the CONNECT Beyond region.



CONNECT Beyond is exploring the region’s future mobility landscape across five distinct layers of mobility options. These layers reflect current trends related to new and emerging transportation technology, such as bike share, e-scooters, carshare, autonomous shuttles, and mobility-as-a-service. **Figure 4** illustrates the layers of mobility for the CONNECT Beyond study. The layers of mobility include high capacity transit, local bus service, rural and community transportation services, as well as other new and emerging mobility services that

provide first and last mile connections for all users. Mobility hubs provide the connection point between these various modes and services.

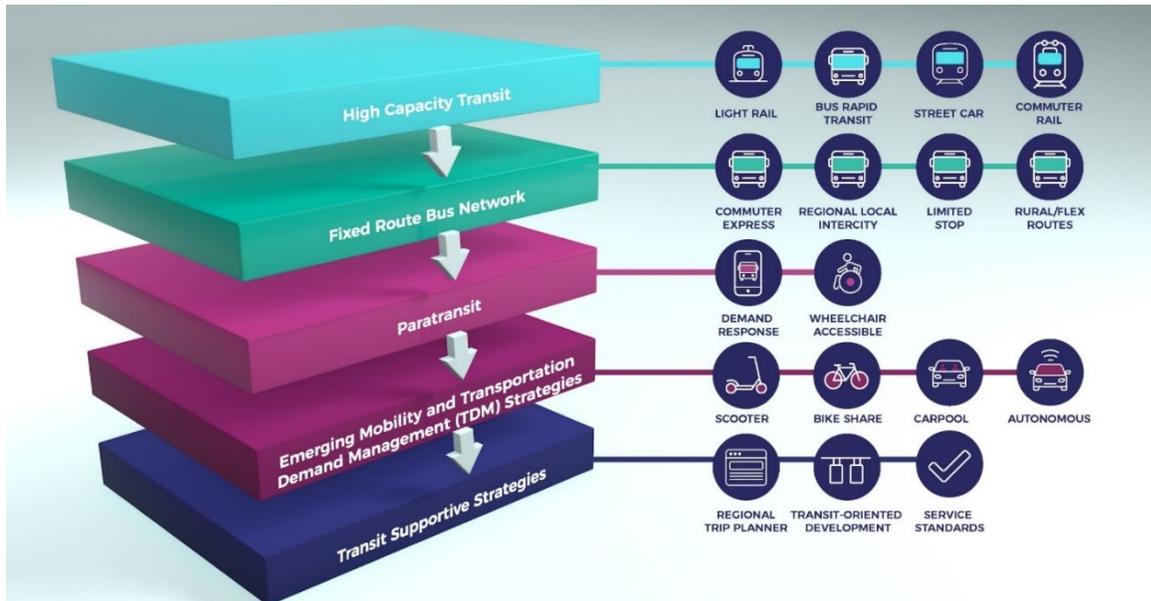
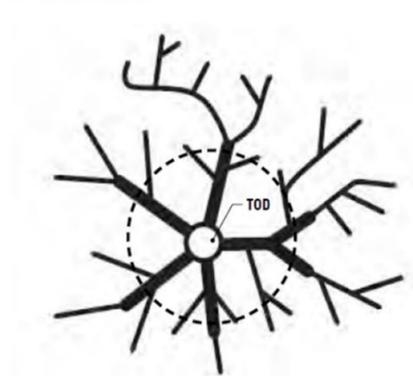


FIGURE 4. CONNECT BEYOND LAYERS OF TOTAL MOBILITY

TRADITIONAL TRANSIT NETWORKS

HUB AND SPOKE NETWORK



FUTURE TRANSIT NETWORKS

MOBILITY HUB NETWORK

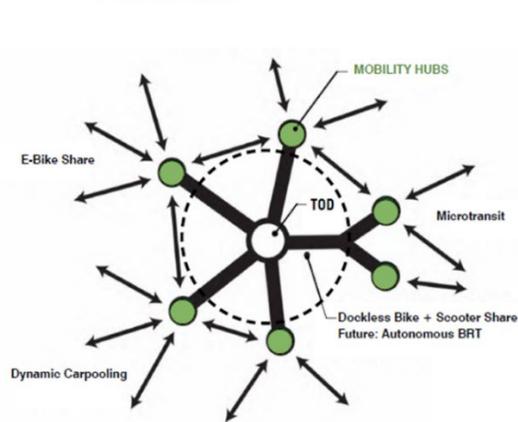


FIGURE 5. TRANSIT NETWORKS ARE CHANGING AS LAYERS OF MOBILITY CHANGE.

Mobility hubs are growing in popularity because they are an opportunity to concentrate services and promote more connected networks that make trip planning across multiple modes easy and convenient for both system users and operators. They also **strengthen connections between rural and urban areas, improving commute times and experiences and better connecting people to resources.**

Mobility hub networks leverage a region's existing multimodal transportation infrastructure, including greenway systems. This expands the reach of mobility services by connecting to a more dense and locally accessible network of routes.

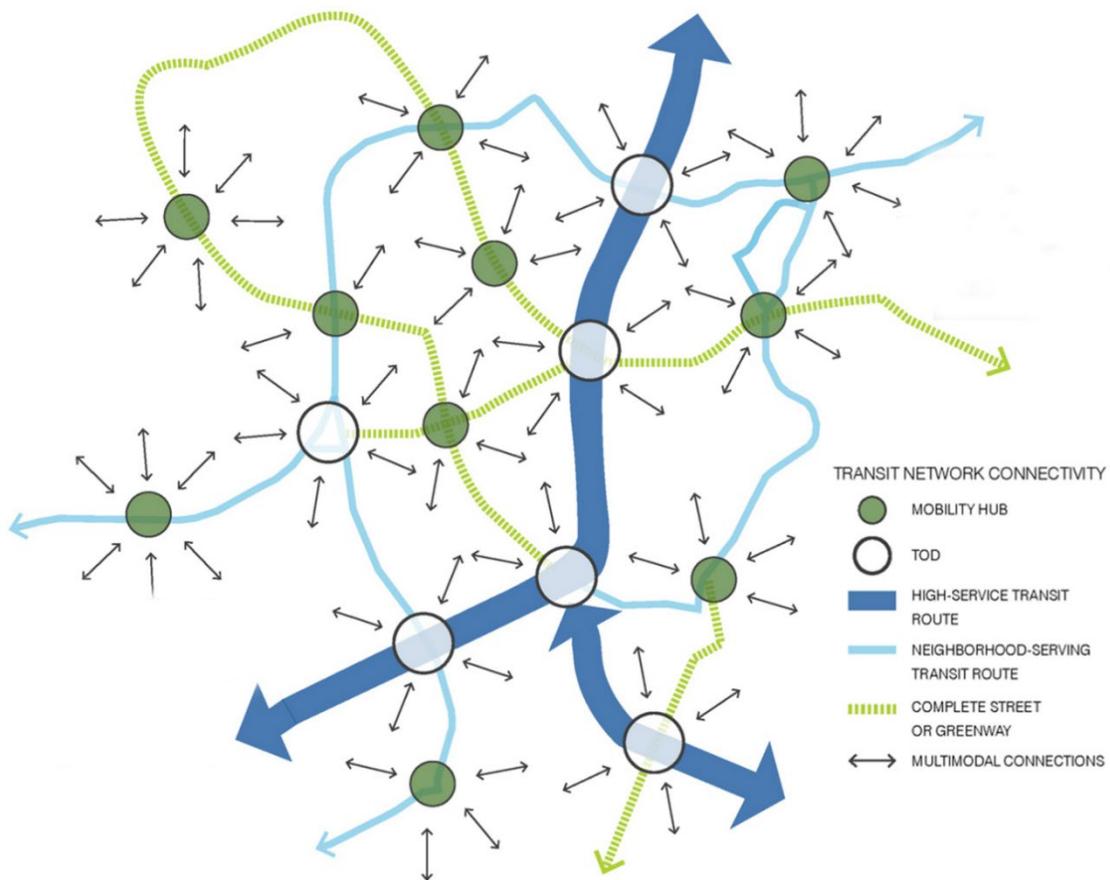


FIGURE 6. MOBILITY HUBS IMPROVE CONNECTIONS ACROSS EXISTING ROADWAY, TRANSIT, AND GREENWAY SYSTEMS.

Fundamentally, **every mobility hub should create a safe, seamless, and comfortable experience**. To do this, each location is expected **to, at minimum, include**:

- Access to two or more transportation services
- Biking and walking access to the site
- A sense of place and human-centered design
- Locally-relevant and context sensitive programming and amenities
- Fair and equitable access, including universal design
- Cohesive, intentional design
- Flexibility to adapt to evolving needs

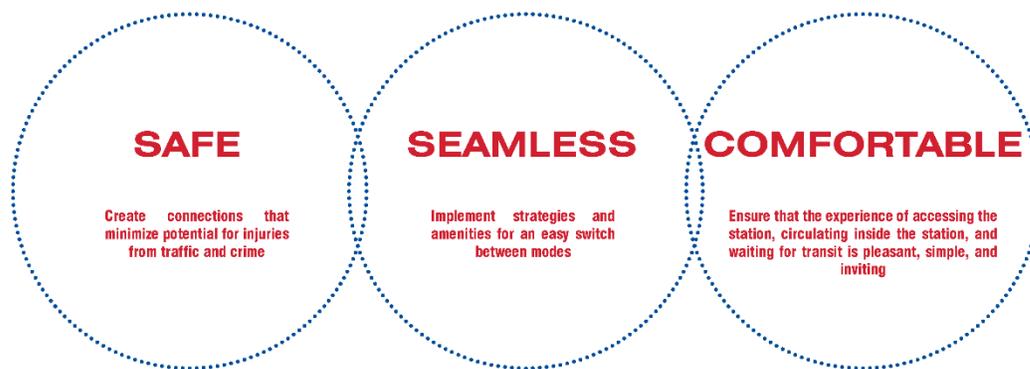


FIGURE 7. MOBILITY HUB DESIGN PRIORITIZES A SAFE, SEAMLESS AND COMFORTABLE USER EXPERIENCE.

Other elements that may be considered in mobility hub programming include:

- Designated pick-up and drop-off areas
- Parking for shared micromobility devices (like e-scooters or bike share)
- Prioritized parking for personal or shared electric vehicles, carshare vehicles, or permitted carpools/vanpools
- Multi-modal and multi-service payment/fare integration
- Digital information, such as dynamic wayfinding and real-time data feeds of transportation options
- Sustainable urban delivery options, such as parcel lockers and last-mile package hand-offs
- Electric charging infrastructure, for public transit vehicles and/or personal or shared cars, bikes, scooters, electric wheelchairs, and other vehicles
- Data collection technology, including real time air quality monitoring or curbside activity counts
- Community resources, such as meeting space, disaster response hubs, publicly accessible Wifi, and phone charging docking stations

Mobility hubs can be big or small. They are designed to perform differently in different contexts. A suite of hub elements can be mixed and matched to create a mobility hub that is customized for each location.

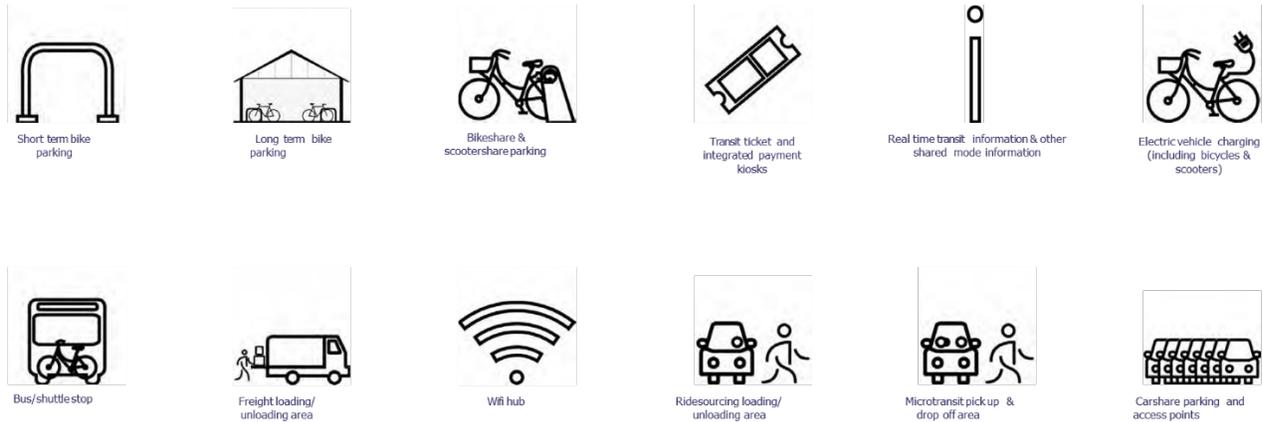


FIGURE 8. MOBILITY HUB ELEMENTS INCLUDE PUBLIC AND PRIVATE TRANSPORTATION SERVICES AND USER AMENITIES.

Applying Mobility Hubs in the CONNECT Beyond Region

Mobility hubs can be located and designed to fit the needs of the CONNECT Beyond region and each of its unique communities.

Primary applications for mobility hubs in the region are:

- Improving transit connections, including integration across multiple service providers
- Expanding first/last mile options for accessing transit, particularly high-capacity transit and rural to urban connections
- Increasing the convenience and availability of travel modes beyond the single-occupancy vehicle
- Enabling new transportation modes and services to fill gaps in transit-limited areas

Core concepts for the CONNECT Beyond mobility hub framework, based on the study's analysis of the regional characteristics and stakeholder input, are:

- Mobility hubs are not intended to serve all needs of all transportation system users. Hub locations are not a replacement for all transit stops, stations, pick-up/drop-off zones, micromobility parking, charging infrastructure hubs, or other existing and future investments. Rather, the Mobility Hub Typology illustrates the combination of elements that can be applied strategically in prioritized areas when gaps or barriers to seamless transportation occur.
- Mobility hubs are not static in place or time or scale. Mobility hub services, amenities, and site design features may evolve over time, particularly as new services become available or expand in reach and location.

- Each connecting junction in a transit network is unique. At each location, the user groups, service capacity, surrounding infrastructure, context of place, and physical site will vary. Despite these differences, they must progress together to contribute to a strong regional network.
- Connections to the region’s primary transportation corridors is a priority. Improved access to high-capacity, high-frequency routes is more likely to encourage multimodal travel and contribute to regional mobility than connections to neighborhood-serving routes with lower frequency.
- The local and regional active transport/greenway network is an important part of the mobility network for rural communities and small towns. Locally accessible infrastructure that supports low-cost transportation is essential for first/last mile access, providing connections to transit and other mobility services. A greenway that connects to a place where there is an interface with another mobility service could be a mobility hub.
- Mobility hubs will be most successful when offering more than a utilitarian place of transfer. At each location, identify mobility hub features that will add value for the site’s users and the surrounding community, whether elective vehicle charging, retail, new community space, or a Wi-Fi hub.

The mobility hub framework is rooted in CONNECT Beyond’s guidance for:

- **Community Character Types:** Mobility hubs are illustrated at varying scales to reflect the region’s varied land use contexts.
- **Rural to Urban Connections:** Mobility hubs improve access to the services making these connections.
- **High-Capacity Transit Corridors, Mobility Corridors, and Mobility Solutions:** Mobility hub features are aligned with the types of services proposed in each of these investment areas.
- **Improved Bus Networks:** Mobility hubs enhance transit stops and create physical points of connection that support improved administrative and digital connections across multiple service providers.
- **Travel Demand Management/Transportation Choices:** Mobility hubs incentivize low-impact transportation choices.
- **Transit-Supportive Development:** Mobility hubs create inviting places for people to access transit and mobility services while also enjoying convenient retail and commercial activity nearby; supporting a larger effort to attract new development with compatible land uses, in walkable communities.

Throughout the CONNECT Beyond public and stakeholder engagement process, numerous mobility hubs were identified. Although specific levels of mobility hubs were not identified, the locations shown in Figure X are meant to provide high-level guidance to communities within our region about where a mobility hub might be warranted. Additional study and analysis at the local level is necessary to better understand the type of mobility hub that is needed. Each community’s needs are different and the level of mobility hubs within our region should reflect that.

Mobility Hub Case Studies from North American Regions

The following case studies provide examples of how other North American metro regions, cities, or specific locations are implementing both pilot and permanent mobility hubs. Each region has unique goals for their mobility hubs, but ultimately, they all aim to improve access to a variety of transportation options throughout their community and/or region. Referencing these case studies can provide ideas for establishing goals, determining what challenges in the community need to be addressed, and how to go about selecting locations for mobility hubs.

TABLE 1. SELECTED CASE STUDIES

Peer Examples	Stage	Scope
Broward County, FL MPO	Planning, Design, Implementation	Metro Area
SANDAG (San Diego, CA)	Planning, Design	Regional
Metrolinx (Toronto, ON)	Planning, Design, Implementation	Metro Area
Austin, TX	Planning, Pilot	Site-specific
Minneapolis, MN	Planning, Pilot	Citywide
Research Triangle Park, NC	Planning, Design	Campus Area

Key Takeaways

- Mobility hub definitions commonly **include transit service as a core element**. Some give increased attention to a broad range of mobility options regardless of mode (SANDAG, Minneapolis)
- Agencies **identified multiple factors impacting equity** of mobility hub performance
- Agencies used **different methodologies for deciding where to locate mobility hubs** including metrics related to transit service, land use, demographics, existing and future development.
- **Urban, Suburban, Ex Urban, Rural applications:** Connecting people within a city vs between cities; Different amenities depending on land use, density, population, number of jobs, transportation options.
- Shift in thinking from just transit/vehicle connections to **Complete Streets/Complete Networks approach**, with focus on human-powered connections (Broward MPO and RTP); shift SOV trips to travel options (Minneapolis); connecting low-income households, seniors, and minority residents with the region’s jobs (SANDAG); ability to pivot to incorporate emerging transportation technology, such as autonomous vehicles (SANDAG).

Broward County, FL MPO

Stage: Planning, Design, Implementation

Scope: Metro Area

*“Mobility Hubs are locations **where people meet transit** and are classified by the expected transit use and **surrounding land use.**”*

- Broward County 2035 Long Range Transportation Plan

Key Themes/Goals

- Move people and goods, create jobs, and strengthen communities
- Shift in thinking from just transit/vehicle connections to Complete Streets approach, with focus on human-powered connections

Challenges Addressed

- Maximizing transit ridership
- Minimizing costs of travel
- Promote development and infill
- Provide options for non-motorized travel

Location Criteria

- Current transects (rural, suburban, urban, core, etc.)
- Future land use
- Transit ridership and frequency
- Existing/potential trip generation
- Minimum criteria for consideration as a candidate location:
 - 2 or more transit routes within ½ mile
 - Rail Station
 - Park and Ride Terminus
 - Transfer Center



SANDAG (San Diego, CA)

Stage: Planning, Design

Scope: Regional

"Mobility Hubs are communities with a high concentration of people, destinations, and travel choices. They offer on-demand travel options and supporting infrastructure that enhance connections to high-quality Transit Leap services while helping people make short trips around the community on Flexible Fleets."

- SANDAG Mobility Hub program description

Key Themes/Goals

- Connecting low-income households, seniors, and minority residents with the region's jobs
- Ability to pivot to incorporate emerging transportation technology, such as autonomous vehicles
- By 2050, it is anticipated that the Mobility Hub network could serve approximately half of the region's population and more than two-thirds of the region's jobs.

Challenges Addressed

- Help close the gap for short trips in highly concentrated areas.
- Provide on-demand travel options.

Location Criteria

- Evaluate census block groups for the whole region including:
 - Total employment (current and projected)
 - Population density
 - Proximity of Mobility Hub locations to "Activity Centers"
- Amenities provided: Interactive trip planning, Wifi, lockers, charging services



Metrolinx (Toronto, ON)

Stage: Planning, Design, Implementation

Scope: Metro Area

*“Mobility hubs serve a critical function in the regional transportation system as the **origin, destination, or transfer point for a significant portion of transit trips**. They are **places of connectivity** where different modes of transportation – from walking to riding transit – come together seamlessly and where there is an **intense concentration of working, living, shopping and/or playing**.”*

- Metrolink Mobility Hub program description

Key Themes/Goals

- Three goals: Seamless mobility, placemaking, and successful implementation
- Key transit stations become mobility hubs, where transportation modes, including rapid transit, local transit, specialized transit, cycling and accessible pedestrian networks come together seamlessly.
- Mobility hubs are locations for major destinations such as offices, hospitals, educational facilities and government services.

Challenges Addressed

- Transform current transit stations to become more accessible and comprehensive

Location Criteria

- Mobility hubs are located at key intersections of their regional rapid transit network
- Amenities provided:
 - Heated waiting areas
 - Traveler information centers
 - Cafes/restaurants
 - Services (day cares, small grocery stores, post offices, etc.)





Capital Metro (Austin, TX)

Stage: Planning, Pilot

Scope: Citywide

*“Mobility hubs play a vital role in the [transportation] network by facilitating **safe and easy connections between shared travel modes**, as places for people to switch from a personal vehicle to a shared mobility service. Mobility hubs are more than a typical transit station or park-and-ride facility. They **create welcoming and attractive places for travelers** that include amenities, information resources, and a variety of **both public and private transit services.**”*

- Austin Strategic Mobility Plan

Key Themes/Goals

- Enhanced walkable access to amenities that would otherwise not be available or would only be available via personal car (good, social gathering space)
- Enhance access to – and user experience associated with – a variety of personal-car-alternative mobility services

Challenges Addressed

- Reverse the current trend of auto-centric design and reimagine cities as places for people.
- Reduce emissions
- Improve physical health, mental health, and well-being
- Enhance equity and access

Location Criteria

- Walkable and bike friendly environment
- Low(er) Transit Frequency
- Demographic Diversity
- Poor Health Metrics
- Proximity to Housing and Businesses

City of Minneapolis (Minneapolis, MN)

Stage: Planning, Pilot

Scope: Citywide

*"[A Mobility Hub is] a place where people can **connect to multiple modes of transportation** to make their trip as **safe, convenient and reliable** as possible."*

- Public Works Transportation Planning and Programming Division Mobility Hubs webpage

Key Themes/Goals

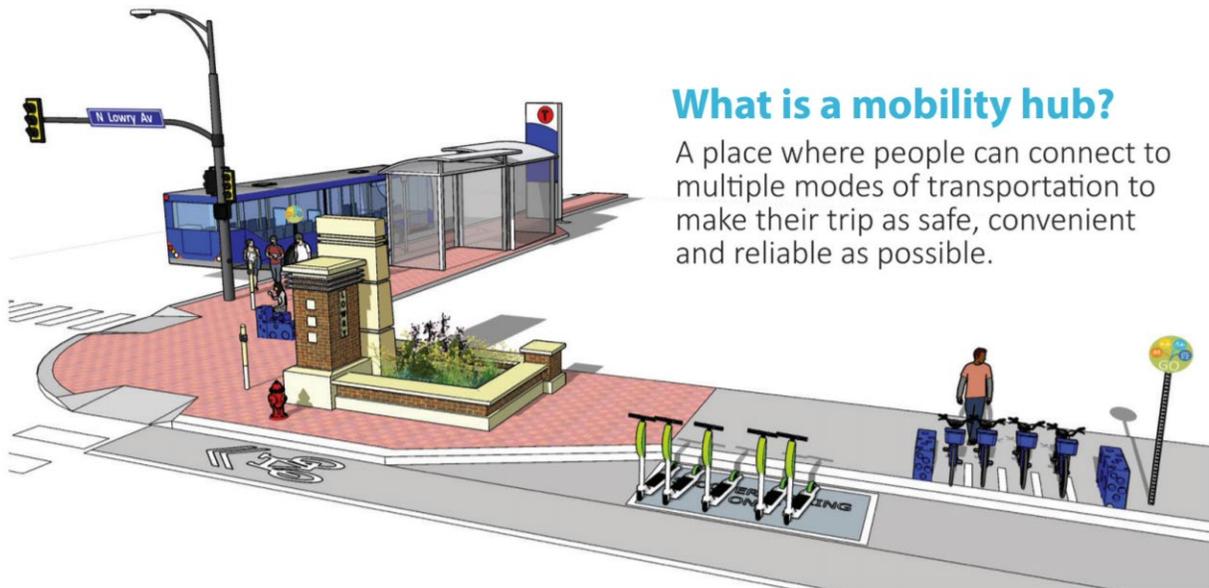
- Shift SOV trips to travel options
- Increase access to convenient, low or no carbon transportation options, including transit, shared scooters and Nice Ride bicycles

Challenges Addressed

- More access to non-motorized or shared transportation options
- Reduce environmental impact of current transportation system.

Location Criteria

- Multiple data layers (32 layers) across 5 categories:
 - Physical (transport, public facilities, underutilized land), Economic, Demographic, Access, Behavior
- Followed up analysis by working with neighborhood groups to filter hub locations to specific sites.
- Mobility Hub Characteristics
 - Safe, accessible, and comfortable
 - Provide a welcoming and useful experience
 - Consistent Design and clearly defined areas
 - Seamless connections and reliable transportation options for all
 - Accurate and understandable trip/modal information



Research Triangle Park (RTP) (NC)

Stage: Planning, Design

Scope: Campus Area

*“At RTP, **mobility hubs will enable multi-modal trips**. Put simply, they allow visitors to **arrive via one mode and depart another**. Consolidating mobility options at mobility hub sites increases the **convenience and practicality** of choosing modes other than personal vehicles.”*

- RTP Mobility Hub Concept Design

Key Themes/Goals

- With ongoing development and concurrent planning and development projects taking place in the RTP area, siting mobility hubs well throughout the campus will set up the area well for the expanded access to transit, walking, biking, and other mobility options.
- Increase access and convenience of multiple modes of transportation while supporting reduced single occupancy vehicle trips
- Create a more seamless, desirable experience for transit linked trips
- Manage private mobility services to align with local goals

Challenges Addressed

- Urban design improved through the addition of public art, landscaping, lighting, etc.
- Community development, through services and events at mobility hub sites
- Economic development, by creating a vibrant space for locating RTP businesses
- First/last mile transportation options provided

Location Criteria

- Place mobility hubs in clear relation to building entrance points
 - Connect hubs to buildings and other key locations with multi-use trails
- Mobility Hub Elements (general site features (benches, lighting, shelter, etc.), bike/ped/mobility features, vehicle/parking features, and transit passenger features) are selected based on the mobility hub type and who it will serve.



Mobility Hub Typology for the CONNECT Beyond Region

Mobility hubs are a collection of elements that make it easier to access the shared and active mobility network. The key elements can be mixed and matched to create a mobility hub that's customized for the location. The following pages illustrates a hierarchy of mobility hub types ranging from large to small scale.

CONNECT Beyond Typology

The mobility hub typology is structured as four scales of hub (level 0 to 3). Two hub types are described within each level to show the hub's application with different contexts. These hub concepts build from and complement the mobility hub typology adopted by the Charlotte Area Transit System (CATS) in 2018.

The eight hub types intended for strategic implementation around the region are:

Neighborhood Node – LEVEL 0

- Outside of Designated Corridors
- Can serve a transit gap or transit-limited area
- Unique potential to serve rural communities

Optimized Bus Stop – LEVEL 1

- Outside of Designated Corridors and on Mobility Corridors
- Distinguished for urban and non-urban

High Activity Center – LEVEL 2

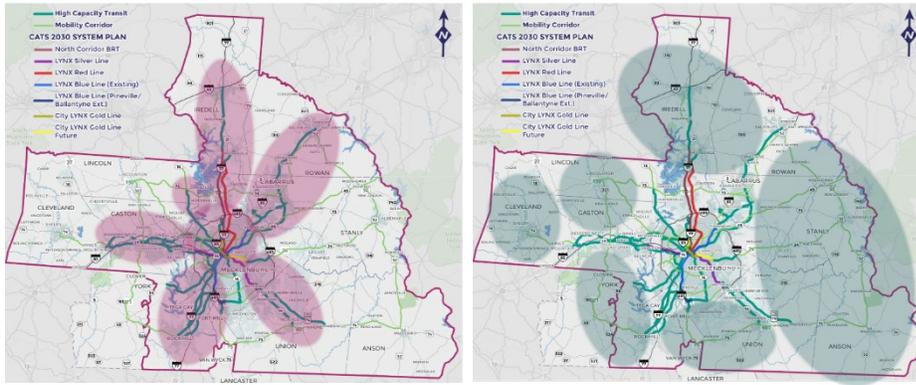
- On Mobility Corridors, limited application outside of designated corridors
- Distinguished for urban and non-urban

Regional Connector – LEVEL 3

- On High-Capacity Corridors, limited application on Mobility Corridors
- Minor and Major scale

The hub typology is based on the categories of transportation and community context developed in CONNECT Beyond. More detail on the relationship between these typologies and contextual mobility hub siting can be found in the Framework for Mobility Hub Siting section of this memo.

TRANSPORTATION CONTEXT



High-Capacity Corridors; Mobility Corridors; Mobility Solutions Areas, specifically nodes of activity outside of the two designated corridors

COMMUNITY CONTEXT

<p>CHARACTER TYPE</p>  <p>City Infill Examples: Uptown Charlotte, SouthPark, light rail station areas</p>	<p>CHARACTER TYPE</p>  <p>Suburban Retrofit Examples: Northlake Charlotte, Carolina Mall, Concord, Indian Trail, Lake Wylie</p>
<p>CHARACTER TYPE</p>  <p>Main Street – Regional Examples: Statesville, Salisbury, Monroe, Rock Hill, Albemarle, and Gastonia</p>	<p>CHARACTER TYPE</p>  <p>New Community Examples: Dixie/Berryhill and Old Coliseum (Charlotte), Rocky River (Cabarrus)</p>
<p>CHARACTER TYPE</p>  <p>Main Street – Town Examples: York, Kings Mountain, Davidson, Lincolnton, and Wadesboro</p>	<p>CHARACTER TYPE</p>  <p>Rural Crossroads Examples: Richfield, Locust, Iron Station, Midland, and High Shoals</p>

City Infill; Main Street – Regional; Main Street – Town; Suburban Retrofit; New Community; Rural Crossroads

The graphic below shows the conceptual relationship of the region’s layers of mobility, as well as areas beyond those designated zones, with the application of the four scales of mobility hub. In practice, more than one type of hub may suit an area. For example, a hot spot may be large enough in size and demand that it warrants both

a large (Level 3) and a small (Level 1) hub. Outside of these hot spots, connector hubs (Level 0) may be self-sufficient in serving mobility needs, or may act as a link to the services and amenities available at nearby larger hubs (e.g. first and last mile trips). The conceptual mobility hub network shown below illustrates these scenarios.

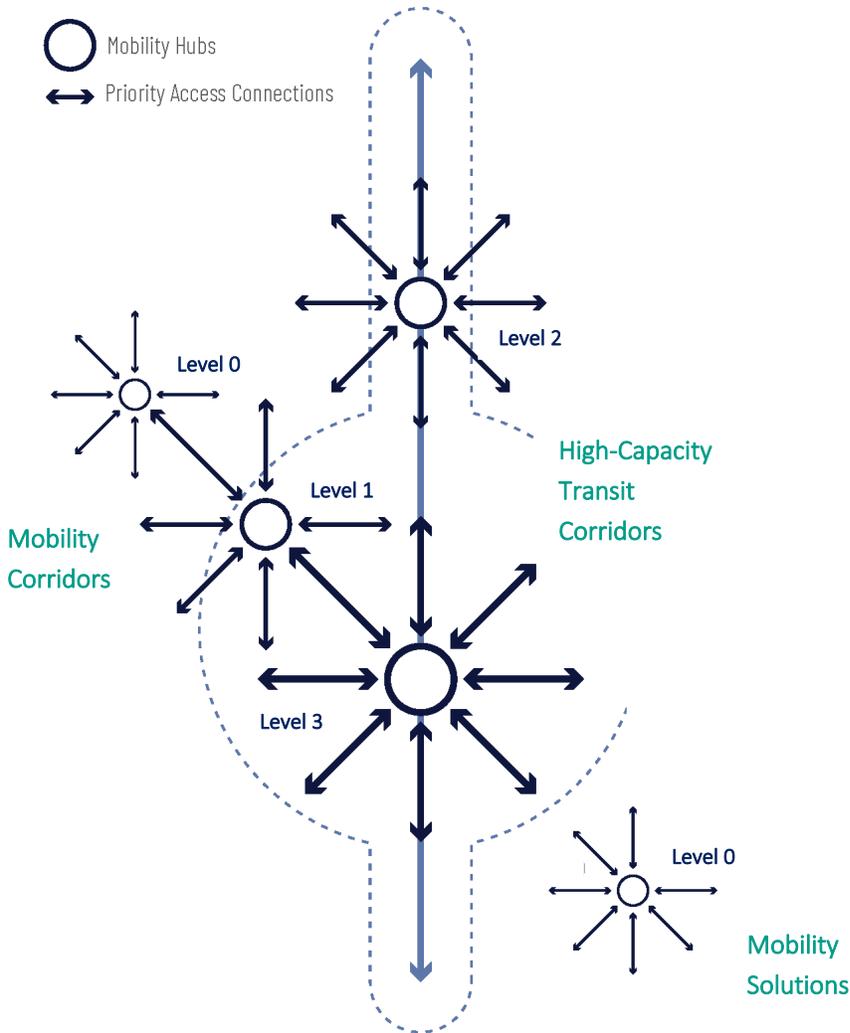


FIGURE 9. RELATIONSHIP BETWEEN THE REGION'S LAYERS OF MOBILITY AND A NETWORK OF MOBILITY HUBS

Amenities by Type

Each type of mobility hub offers a collection of elements that allows the site to function as a seamless mobility connector in different contexts. A Neighborhood Node hub has a small footprint and serves a smaller access-shed than a large-scale Regional Connector hub. The Regional Connector hub has a large footprint, provides access for high-capacity modes, and serves a large access-shed reflecting regional demand. The four levels, and six types of mobility hub complement one another, acting as portals within a connected multimodal ecosystem.

The matrix of mobility hub elements below indicates recommended and required mobility hub features for each level of hub.

MOBILITY HUB ELEMENTS	LEVEL 0: NEIGHBORHOOD NODES	LEVEL 1: OPTIMIZED BUS STOPS	LEVEL 2: HIGH ACTIVITY CENTERS	LEVEL 3: REGIONAL CONNECTORS
	Bus Stop		●	●
High Capacity Transit				●
Passenger Pick-up/Drop-off (Microtransit and/or TNC)	●		○	●
Transit Ticket Kiosks				○
Seating	○	● *	●	●
Shelter/Shade Structure	○	● *	●	●
Indoor Waiting Area				○
Scotershare Parking	○ **	○ *	○	●
Bikeshare Parking	○ **	○ *	○	●
Short Term Bike Parking	○	● *	●	●
Long Term Bike Parking				○
Personal Vehicle Parking				○
Carshare Parking	○ **		○	●
Electric Vehicle Charging			○	●
Wayfinding	○ *	○	●	●
Real-Time Information			○	●
Wifi Hub			○	●
Water Fountains			○	●
Restrooms				●
Sidewalks	●	●	●	●
Safe Pedestrian Crossings	●	●	●	●
Dedicated Bike Infrastructure	○	○	○	●
Active Public Space			○ *	○
Convenience Retail			○ *	○

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

○ Recommended ● Required * At high ridership locations ** Where services available

FIGURE 10. MOBILITY HUB AMENITIES MATRIX BASED ON HUB TYPE

LEVEL 0: NEIGHBORHOOD NODES

A: Rural Connector Hub

Context Characteristics:

- Mobility Solutions Areas
- Low density
- Low demand (i.e. trip attractors)
- Supports FM/LM access to mobility corridors and/or high capacity transit corridors, as well as non-transit trips
- May provide a transfer point for specialized services, such as regional express buses, shuttle services, demand-response, and paratransit

Likely Place Types:

- Rural Crossroads
- New Community



FIGURE 11. NEIGHBORHOOD NODE – LEVEL 0 A - RURAL CONNECTOR HUB

B: Community Connector Hub

Context Characteristics:

- Mobility Solutions Areas
- Low to moderate density
- Low to moderate demand (i.e. trip attractors)
- Supports FM/LM access to mobility corridors and/or high capacity transit corridors, as well as non-transit trips
- May provide a transfer point for specialized services, such as regional express buses, shuttle services, demand-response, and paratransit

Likely Place Types:

- Suburban Retrofit
- New Community
- City Infill (where transit is not available)



FIGURE 12. NEIGHBORHOOD NODE – LEVEL 0 B - COMMUNITY CONNECTOR HUB

LEVEL 1: OPTIMIZED BUS STOPS

Level 1 A: Community Bus Stop

Context Characteristics:

- Mobility Corridors and Mobility Solutions Areas
- Low to moderate density
- Low to moderate activity (i.e. trip attractors)

Likely Place Types:

- Rural Crossroads
- Suburban Retrofit
- Main Street - Town



FIGURE 13. OPTIMIZED BUS STOPS – LEVEL 1 A – COMMUNITY BUS STOP

Level 1 B: Metro Bus Stop

Context Characteristics:

- Mobility Corridors
- High density
- Moderate demand (i.e. trip attractors)

Likely Place Types:

- Suburban Retrofit
- City Infill



FIGURE 14. OPTIMIZED BUS STOP – LEVEL 1 B – METRO BUS STOP

LEVEL 2: HIGH ACTIVITY CENTERS

Level 2 A: Community District Hub

Context Characteristics:

- Mobility Corridors
- Low to moderate density
- Moderate demand (i.e. trip attractors)

Likely Place Types:

- Main Street – Town
- Main Street - Regional



FIGURE 15. HIGH ACTIVITY CENTER – LEVEL 2 A – COMMUNITY DISTRICT HUB

Level 2 B: Metro District Hub

Context Characteristics:

- Mobility Corridors and High Capacity Corridors
- High density
- Moderate to High demand (i.e. trip attractors)

Likely Place Types:

- Main Street – Regional
- City Infill



FIGURE 16. HIGH ACTIVITY CENTER – LEVEL 2 B – METRO DISTRICT HUB

LEVEL 3: REGIONAL CONNECTORS

Level 3 A: Regional Hub

Context Characteristics:

- High Capacity Corridors
- High density
- Moderate to High demand (i.e. trip attractors)

Likely Place Types:

- Suburban Retrofit
- City Infill



FIGURE 17. REGIONAL CONNECTOR HUB – LEVEL 3 A – REGIONAL HUB

Level 3 B: Regional Hub

Context Characteristics:

- High Capacity Corridors
- High density
- Moderate to High demand (i.e. trip attractors)

Likely Place Types:

- Suburban Retrofit
- City Infill



FIGURE 18. REGIONAL CONNECTOR HUB – LEVEL 3 B – REGIONAL HUB

Framework for Mobility Hub Siting

For mobility hubs, success is contingent on identifying feasible locations for investment that are also appropriately located to expand mobility options and solve transportation challenges. An outcomes-oriented approach to siting mobility hubs requires a multi-step process.

1. Measuring Need and Demand: analyze the factors that influence transportation choice
2. Aligning with Outcomes: further narrow areas of suitability based on regional priorities
3. Adjusting for Scale and Context: identify appropriate mobility hub types for the suitable contexts
4. Evaluating Candidate Sites: determine the factors for feasibility of mobility hub development
5. Making it Work: make site-specific programming and design decisions to achieve set objectives

The Connect Beyond study combined the input of stakeholders and service providers, with an analysis of the major forces influencing travel behavior in the region to understand mobility hub siting opportunities and challenges. The following data points are indicators of land use and transportation context. These key factors can be used now and, in the future, to identify candidate mobility hub sites.

- Existing Context
 - Transit centers
 - Park-and-Rides
 - Superstops
 - 2030 System Plan
 - Downtowns
 - Pop & employment mix
 - Major shopping attractors
 - Multimodal connections, including greenways
 - Medical facilities/hospitals
 - Universities, community colleges, etc.
- Future Context
 - Mobility corridors
 - Commuter Rail corridors
 - HCT corridors
 - Destination density
 - Land use mix
- Areas of service
 - Urban core
 - Urban
 - Mixed Suburban
 - Residential Suburban
 - Rural

Mobility hub locations should be carefully selected and respond directly to site context. One should consider things like population densities, proximity to community destinations, high densities of multiple transit service providers to an area, where there are gaps in the transit service, and where high levels of commercial activity are found. The following should guide the siting of mobility hubs in different community contexts:

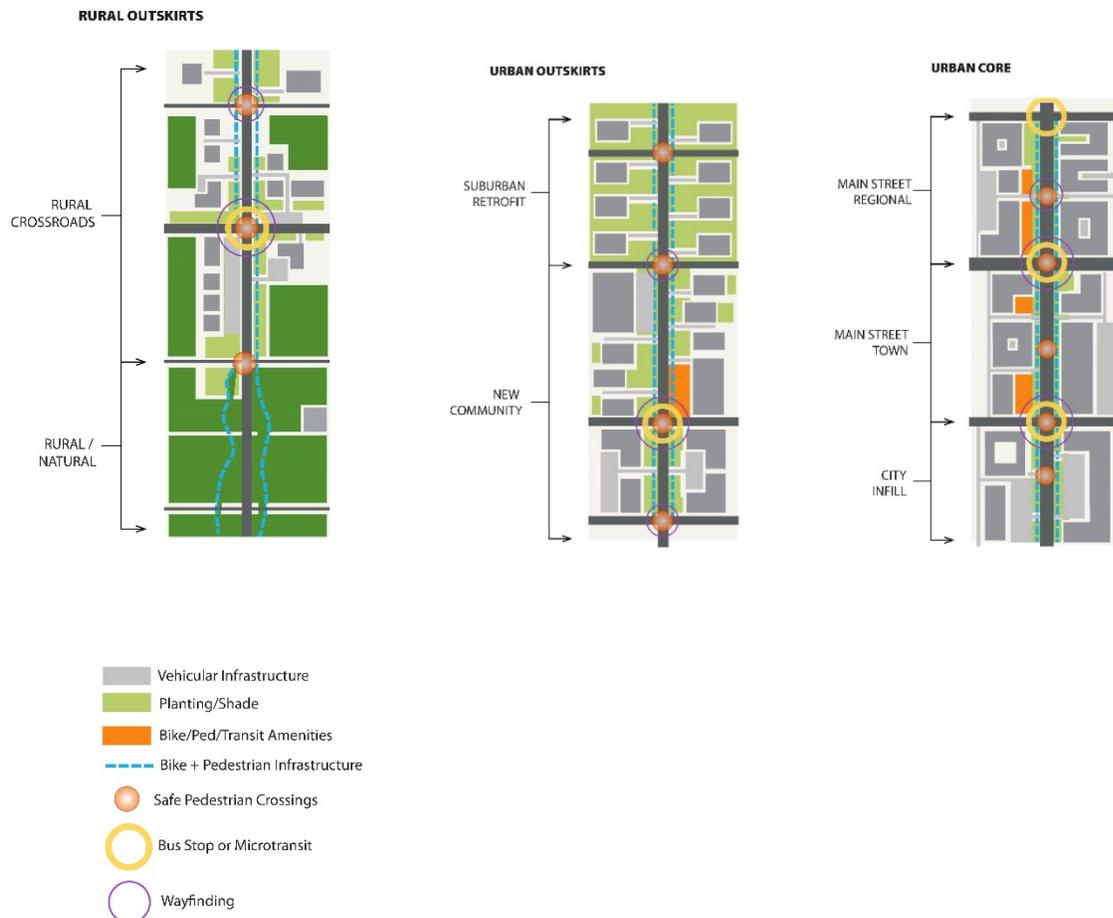


FIGURE 19. APPLICATIONS OF CONNECT BEYOND HUBS BASED ON PLACE TYPE

Recommended Next Steps

To advance the CONNECT Beyond mobility hub framework, regional partners will need to take the following actions in the near- to mid-term:

Fund and initiate a Regional Mobility Hub Implementation Strategy:

Build from the Mobility Hub Framework to develop a region-wide strategy for implementing a network of hubs. The process will include 1) refining the mobility hub siting methodology and evaluation of candidate sites; 2) engaging local communities and seeking public involvement; 3) identifying partners and funding sources for site design and construction; 4) identifying opportunities for a Mobility Hub Pilot Program to test and refine the Implementation Strategy.

This action will support long term integration of mobility layers and better connecting transit providers around the region.

Integrate mobility hub elements into Regional TDM Plan:

Mobility hubs must remain a component of CONNECT Beyond's vision for expanding transportation choices through Travel Demand Management (TDM) programming. A Regional TDM Plan should identify mobility hub elements that will support mode shift goals and provide guidance for connecting TDM programs to mobility hub siting, design, and promotion.

This action will support coordination across multiple strategies.

Integrate mobility hub locations and service connections within short-, medium- and long-term sub-area transit plans:

CONNECT Beyond's vision for Building a Better Bus Network includes the development of short- (0-5), mid- (5-10) and long-range (+10 years) sub area (e.g. by MPO region) transit plans. Each plan is an opportunity to apply the mobility hub typology and framework within the sub-area's localized context.

This action will improve connections between service providers and transfer locations.

Work with local governments to identify and address land use regulations and development codes that may hinder mobility hub development:

CONNECT Beyond's vision for Transit Supportive Development includes assisting local governments in updating their development codes to allow for transit supportive development. Development code provisions that effect transit supportive development are likely to effect mobility hub elements as well. Where applicable, this process should also include updates to enable, or remove barriers to, mobility hub siting, programming, and design.

This action will address existing standards and permitted uses that limit hub amenities and site design.

Identify small area or station area plans that coincide with mobility hub candidate areas and incorporate hub elements:

CONNECT Beyond's vision for Transit Supportive Development includes the creation of small area or station area plans that create the walkability, intensity of uses, and mix of uses that will be needed to support the transit that is envisioned for the future. Each plan is an opportunity to apply the mobility hub typology and framework within a localized context or specific site.

This action will support coordination across multiple strategies.

Define mobility hub elements within proposed regional amenity guidelines:

Regional Amenity Guidelines will standardize how agencies throughout the region invest in amenities for transit stops, including benchmarks based on ridership level. Development of these guidelines is an opportunity to apply the matrix of mobility hub elements developed for CONNECT Beyond, which is based on relative levels of demand (See Figure 10).

This action will support coordination across multiple strategies.

Develop a Mobility Hub Pilot Program that implements a limited number of demonstration sites with low-cost temporary installations and evaluate outcomes

A Mobility Hub Pilot Program provides an opportunity to learn effective strategies for mobility hub design and operations, while best practices for mobility hubs are still evolving. Demonstration hubs may offer immediate benefits for mobility access without the wait required for large capital funding and construction timelines. Pilot projects are also recommended as a strategy for Building a Better Bus Network. This action is an opportunity to seek out and implement mobility hub pilot projects that align with bus service enhancements and that demonstrate the benefits of transit investments in the region.

This process will include: 1) identifying the highest priority mobility hub candidate areas through the Mobility Hub Implementation Strategy; 2) identifying participating funding partners in priority counties; 3) establishing funding agreements with partners; 4) setting performance measures and a process for evaluating pilot outcomes so that permanent investments will reflect the program's findings.

This action will support coordination across multiple strategies.