

Executive Summary

Micromobility and car share are modes of active and shared mobility that have the potential to offset some of the single occupancy vehicle trips. In the United States, automobiles are a significant contributor of CO₂ emissions accounting for 45% of emissions in the transportation sector, which of all sectors accounts for 29%. In addition to emissions, vehicle miles traveled (VMT) is projected to increase by 43% by 2040 contributing to significant delays for residents totaling 56 hours per resident annually. In a city such as Thornton, Colorado that has 80% of work trips done by driving alone, the implementation of a network of neighborhood micromobility hubs could help shift some of those trips while creating a complete mobility network, complementing the existing N-Line commuter rail to Denver and RTD bus service. This report sought to address policies and recommendations of the 2020 Comprehensive Plan and draft 2021 Transportation and Mobility Master Plan (TMMP), and the desire of the City to plan for new mobility options.

Objectives and Addressed Policies and Recommendations

1. Locate mobility hubs
2. Identify hub typologies and amenities
3. Consider implementation and next steps

CPP 1.4 - First-and-Last-Mile Connections

Strengthen first and last mile connections to/from existing and planned high frequency transit stops by providing safe and continuous bicycle and pedestrian routes, and exploring other programmatic solutions, such as shared mobility programs.

CPP 1.6 - Access to Services

Continue to coordinate among transportation providers and other human services and nonprofit organizations to provide affordable services and programs that better serve populations with special transportation needs including seniors, persons with disabilities, and other transit-dependent populations.

Recommendations from the TMMP related to improving safety and comfort for active transportation, making biking for transportation and recreation accessible for all ages abilities and populations, making travel by bus, rail and On-demand services convenient and reliable, and improve amenities at bus stops and stations including secure bike parking.

Equity Considerations and Background Research

In developing a plan for micromobility hubs, the consideration for equity should be at the foundation of the plan to make sure all residents have access to these services. To help guide this conversation of equitably locating transit and mobility solutions, the Federal Highway Administration defines ways of considering equity through the STEPS outline: **Spatial** Is it where I need it? **Temporal** Can I use it when I need it? **Economic** Am I able to pay for it? **Physiological** Am I capable of using it? **Social** Is it desirable? Using this framework, planning hubs should be done with extensive community outreach asking if the locations identified in this report work or would be better elsewhere. A successful version of this type of pilot study is the one done in Minneapolis in 2019 and 2020.

Background research for the report explored the history of neighborhood mobility hubs, types of shared services, and the equity considerations when implementing shared mobility. One of the first places to bring this concept of neighborhood hubs was Bremen, Germany a city with a population of 500,000 people. Over the last 10 years, “mobil.punkte” or mobility with a primary focus of car share have eliminated 4,200 privately owned vehicles from the road. At these hubs adjacent to transit and within neighborhoods there are also racks for bicycles creating places for multimodal connection. Research into different types of micromobility devices and car share types found certain options to be more suitable for the suburban context of Thornton. Dockless and hybrid micromobility systems with a lock-to requirement and no, or low cost docks/racks such as the Portland BIKETOWN program would make more sense than traditional bike share docked systems like CitiBike in New York City. Lock-to requirements allowed for devices to be locked to designated racks using geofencing GPS either at hubs or at other locations with delimitation for the shared devices.

One-way and roundtrip car share such as Free2Move which launched in Denver and Colorado Car Share respectively located at proposed mobility hubs with electric charging could facilitate trips for the 3% of households with no access to vehicles in Thornton, as well as other residents either looking to live car-lite, car free, or need access to a car in certain situations. In addition to more traditional shared micromobility and car share, the other type of shared service which is common in European cities but not found anywhere in the U.S. is shared e-cargobikes. These devices which have a large storage compartment

allow for residents to truly replace a car trip for say picking up groceries, transporting children to and from school, or combinations of trips similar to the journeys described by survey respondents of the Smart Commute Metro North survey 2021 that were reasons they did not bike to work more. This fact, along with lack of secure bike storage at destinations, and desire for more comfortable and safe active transportation infrastructure are the main reasons that more people don't consider these non automobile modes of travel. Even among the initial participants of the Smart Commute Metro North e-bike pilot program, this sentiment existed which if solved would have allowed them to use their bikes more.

Secure bike storage is something many European cities also have, with some cities in the Netherlands having multiple garages filled with thousands of bikes. In the U.S. however, the only solution are small caged storage rooms that are often not monitored and accessed via key card. Other types of storage are individual lockers which do not exist in high enough quantities with many commuters wanting to bike to a station being on waiting lists for them. Solutions to this for Thornton at all sized hubs proposed could be types of secure racks like the ones made by Bikeep, a European company which manufactures racks that allow private owners to lock bikes and scooters via RFID access and feel confident that their bikes are safe, especially with the racks having alarms built in.

Deliverable and Next Steps

Research showed that hub spacing should be **300-700m (.18-.43miles)** and there should be **8-12 hubs per square mile**. This distance and density allows for adequate access for those looking for devices on foot and the distance most people are willing to walk to find a micromobility device or car share. The final result of this report is a network of **252 mobility hubs** ranging in size and quantity of amenities based on The methodology created based on on academic case studies. A Neighborhood and Activity suitability analysis weighted land use, employment density, low stress bike and trail network, and level of bus stop ridership based on whether those land uses, employment density, and bus stop ridership total activity (excluding Park & Rides) were high or low, and whether the bike/trails were protected, separated, or not. Placing hubs also used the demographic overlays mapped to determine what amenities went at each hub. The number of each typology identified through suitability and qualitative analysis included:

111 Mini-Neighborhood Hubs - at trailheads, smaller parks, and in areas with less employment density.

75 Minor Activity Hubs- at or near low ridership bus stops (excluding Park & Rides) or places with lower employment density.

61 Mid Activity Hubs- at or near high ridership bus stops (excluding Park & Rides) or places with higher employment density.

5 (existing) Major Hubs- at Park & Rides and N-Line commuter rail stations.

This report will be instrumental in the next stage of planning micromobility hubs in Thornton, Colorado and allow for the City to begin offering active and shared transportation solutions at neighborhood mobility hubs. Data showing market potential of the thousands of employees and residents living within 3 and 10 mile bikesheds will be important for attracting existing and new shared mobility operators to provide service in a growing, climate conscious city.

