DURHAM • CHAPEL HILL • CARRBORO
METROPOLITAN PLANNING ORGANIZATION

4307 Emperor Boulevard • Durham, NC 27703 • Phone (919) 503-4123 • dchcmpo.org

Post Pandemic Determinants of Transit Ridership

By: Samad Rangoonwala- Planning Intern

This research brief was written to answer questions the MPO board had on how congestion impacts transit ridership in the post-pandemic landscape, it outlines the current ridership landscape in the MPO area and how different factors impact ridership

Overview of Current Circumstances

Just 5.17% of commuters in the DCHC MPO area use transit services despite 64% of commuters and 76% of jobs are within in the MPO living within ½ mile of transit. The average household in the area lives within a ½ mile of 6 bus routes, however, just 8.6% of the MPO's households have access to rush hour high frequency transit and just 1.2% have day-round access. There are two issues- for some, transit access to their jobs doesn't exist, for others direct transit access to their jobs exists but is not a competitive option.

One occasional transit commuter explained what influenced their choices.

"The 700 only runs every 30 minutes, it gets stuck in the same traffic cars commuters create, it drops me off on the side of a highway[...]the bus feels like an accommodation for "other" people not a proud public resource. Taking the bus should feel like a normal thing to do, not something you do because you have no other option. It takes me 15 minutes to drive to work, 50 minutes to take the bus."

While the research indicates that making driving worse (via increased congestion, reduced parking availability, higher gas costs etc.) can increase ridership, making transit easier and enjoyable is far more effective. There is room for both, however in this case the carrot is better than the stick.

This one pager is part of a larger piece of research into transit ridership choices- we highlight four high impact factors here:

Travel Time

Research shows that when travel time via transit is over 1.25x of travel time in a personal vehicle. For example, if a 10-minute drive takes more than 12.5 minutes by bus- preference for public transit decreases significantly[1]. Travel time is also impacted heavily by the number of transfers and service frequency, particularly for mixed traffic bus lines. "While riders travel time calculation is modulated both by driving time and transit time, with mixed traffic buses, increased congestion also increases transit travel time and can decrease on time performance having a negative impact on ridership".

Service Quality:

As quantified by three primary characteristics

1. **Distance to stop**- 80% of riders walks to their stops[2], keeping distances from stop to destination and vice versa under .25-.5 miles (5-10 minutes) is ideal.

2. **Transfers**- 2 or more transfers reduces trip satisfaction by 37%[3], one and two transfer increases driving likelihood by 4.7% and 24.3%, respectively[4].
3. **Stop Characteristics**- Sidewalks/safe pedestrian facilities are an equity and accessibility issue- everyone needs to be able to get to the stop and even for those with full mobility walking along a shoulder or median to reach a bus stop is an unenjoyable dangerous experience. This impacts everyone but especially hampers children, the elderly and those with mobility issue's ability to access the transit system. In addition to sidewalks some jurisdictions have built small benches directly into the stop pole at low usage stop locations which proves to be an inexpensive way to make stops more accessible and comfortable. The main take away is that a stop being merely a sign on a pole on the side of a roadway makes using transit seem hostile and an afterthought. Benches, shelters and sidewalk alone have been shown to increase boardings by 5.7% [5]
4. **Service Reliability:** Research based on Charlotte data found that bus service reliability was strongly associated with increases in weekday travel during peak commute hours as well as general weekend travel, people want to know they will get to work and back on time. The same study found that bus service reliability was impacted by land use characteristics including the number of signalized intersections, roadway network length and zoning types. A major conclusion was that even the best systems maxed out at 70% on time performance when buses were in mixed traffic. Comparisons of NSBRT performance and existing NS route reliability would be useful in seeing how much reliability can increase due to dedicated bus lanes and signal priority.

Parking Access: While the MPO has limited influence on parking policy, we can work with members to align the relevant land use polices to encourage better parking practices. Free parking at work has been shown to increase solo driving by up to 60%, this effect is maintained even when employers offer free transit passes or bike/ped facilities but disappears when employees can either park for free or take the value of that parking pass in cash. The research also indicates that parking costs and difficulties are better at reducing personal vehicle use than congestion increases.

Takeaway:
Improving transit ridership in the MPO area is going to require multiple facets: the most important of which is achieving high frequency and reliable service along the area's most common commuter corridors and ensuring the stops and the areas around them are safe and comfortable for pedestrians. Secondly, work to reduce excess parking capacity and reward commuters for not taking up parking spaces.

Both are far easier said than done, however the success/failure of Chapel-Hill's NSBRT project at increasing ridership along the corridor will be a good test of how well the region can apply these principles to an actual project.

Secondly because all the MPO's existing service and most of its planned service is mixed traffic, increases in congestion will negatively impact travel time and reliability.