National Capital Region
Transportation Planning Board

MEMORANDUM

TO: TPB Technical Committee

FROM: Eric Randall, TPB Transportation Engineer

SUBJECT: Transit Service Equity White Paper and Webmap

DATE: September 24, 2021

This memorandum reviews the purpose and findings of a white paper analysis on transit service in the region, prepared by consulting firms ICF Consulting and Foursquare Integrated Transportation Planning for the TPB.

The purpose and preliminary results of the transit service equity study were initially presented at the May 7 TPB Technical Committee meeting.
    Item 8 - Presentation - Transit Equity White Paper
    Item 8 - Memo - Transit Equity White Paper

PURPOSE OF THE WHITE PAPER

In March 2020, transit agencies across the region drastically cut service in response to the coronavirus pandemic. Since then, transit agencies have gradually restored service. In response to requests to identify transit service that should be a priority for restoration, the firms ICF Consulting and Foursquare Integrated Transportation Planning were contracted to produce a white paper to inform regional decision makers about equity considerations when restoring transit service and improving transit service equity in the longer-term post-pandemic.

Questions to be addressed with the analysis included:
- Can these service restorations improve equity in the region?
- How does transit access for COG's Equity Emphasis Areas (EEAs) work compare to the region's overall population's transit access?
- How does transit access for traditionally underserved groups compare to the region's overall population's transit access?
- How does transit access to peak, high-frequency service (15 minutes or better) compare for traditionally underserved groups?
- How does transit access to jobs for low-wage work compare to the region's overall population's transit access to jobs?

The white paper analysis assessed bus service (route coverage, frequency, time of day, and span of service) as of March 15, 2021 for those living in COG's Equity Emphasis Areas (EEAs), historically disadvantaged populations, and essential workers. The analysis assessed whether service is distributed equitably and identified gaps in that service that could be filled to improve equity, both for service as of March 15 and for pre-pandemic service.

GEOGRAPHIC ANALYSIS AND WEBMAP TOOL

The transit service equity analysis focused on the geographic distribution of transit service compared to various demographic and employment groups of interest. Initially, the analysis produced static maps showing the density of select population groups within a ¼ mile of a bus stop in blue, and density outside of a ¼ mile of a bus stop in red. Select groups included:

- Total population density
- Total household density
- Persons of color population density
- Persons with disabilities density
- Low-income household density
- Zero/one-car household density
- Language other than English (LOTE) density
- Veteran population density

- All workers home location density
- Low-wage workers home location
- Total job density
- Density of essential service jobs
- Density of low-wage jobs

Static maps were succeeded by a dynamic map in ArcGIS Online format (AGOL) available at the following link. The full white paper is also available on this site in the introductory pop-up window.

https://fitp.maps.arcgis.com/apps/webappviewer/index.html?id=dd131b91ef5148fbadd4778015f19cc9

KEY FINDINGS

The white paper analysis had the following key findings:

Gaps in Service vs. Population
- While 60 percent of the total population in the TPB region is within one-quarter mile of fixed route bus service, only 68 percent of that group have access to 15-minute or better service in the AM peak period.
- Overall, transit service, major corridors, and population density are generally congruent.
- There are select block groups across the region that are high in population density (both total and specific equity subgroups) that are not within one-quarter mile of a bus stop.
    - Areas with concentrations of these block groups include Prince George's County outside the Beltway (such as in Laurel and Bowie); Prince William County around Dale City and parts of Manassas; and portions of Loudoun County south of Leesburg.

Gaps in Service vs. Employment
- Overall, transit service, major corridors, and job density are generally congruent, particularly in the region's core.
- Overall, 73% of all jobs are within a ¼ mile of a bus stop, reflecting the fact that a significant amount of transit service is directed towards job centers and jobs access.
- A higher density of low-wage jobs with no transit access can be seen primarily in Loudoun County around Dulles Airport and in and around Manassas and Manassas Park.
    - Other significant areas include the edges of the City of Frederick; Stafford County; and Prince George's County outside of the Beltway (such as Laurel, College Park, and Bowie).

- Essential jobs follow the same patterns, but with additional underserved essential job hotspots in Fairfax County and on the eastern boundary of Prince George's County.

Disparities in Access to Bus Transit
- Overall, most persons of color, people with low incomes, and zero and one-car households have higher access to bus stops than the overall population (total population and total households).
  - However, many of these percentages fall when looking at frequent bus service in the peak periods (15 minutes or better).
- When looking at low-wage workers, only 61 percent are within one-quarter mile of a bus stop, and this figure drops to 41 percent in the peak periods.
- While marginalized population groups overall have more access to transit service compared to the general population, a smaller share (41 to 55 percent) have access to high-frequency service (15 minutes or better in the AM Peak) compared to the 62 to 68 percent of the transit-accessible population overall.
- The low percentage of access to frequent service for all groups, even in the peak periods, remains a concern, particularly for quality of life and jobs access.
- Equity Emphasis Areas (EEAs) have a higher percentage of residents within one-quarter mile of a bus stop for every analyzed sub-group, often by a factor of 20 percentage points.
  - However, this is compared to the region as a whole, which is overall less dense than the EEAs.
- When looking at low-wage jobs within a quarter mile of transit compared to all jobs, the percentage drops five percentage points, indicating that those in this higher need category have less slightly less access to their employment location.
  - When looking at essential jobs (work location) the figure rises slightly to 75%
  - When evaluating the peak periods however, access drops significantly, with only 56% of jobs within a ¼ mile of 15-minute or better service in the AM peak period, during the PM Peak period this rises slightly to 57%.
    - For low-wage jobs this drops to 41% in the AM peak and 48% in the PM peak.
    - Access to essential jobs (work location) in the AM peak period remains on par with overall access to jobs (56%).

Network Job Accessibility Analysis
- The service period with the highest quantity of jobs accessible is the weekday peak period, followed by weekday midday, Saturday, and weekday late night.
- For all time periods, low-wage workers have access to fewer jobs compared to all workers.
- Job access for all job types and all workers decrease consistently from the peak, to midday, to the late periods.
- More jobs are accessible for people living within EEAs compared to those living outside of them.
- The highest levels of job access are found in the dense core of the District of Columbia and radiate out along major corridors. However, Montgomery County shows generally better access along its corridors compared to Prince George's County and Northern Virginia.

Transit Level of Service Change
- Areas that lost the greatest amount of service during the pandemic included:
  - Burke (Fairfax County)
  - McLean (Fairfax County)
  - City of Falls Church
  - Fort Washington, Mitchellville, and Crofton (Prince George's County)

Areas which Lost High-Frequency Service
- The loss of high-frequency service (service that comes every 15 minutes or more) was most prevalent across the District of Columbia and along Columbia Pike in Fairfax County.
- Other smaller pockets saw a loss of high-frequency service in Arlington County, the City of Falls Church, and throughout Montgomery County and the northern end of Prince George's County.

Transit Equity Need Index
- The Transit Need Equity Index measures demographic characteristics at the block group level which are known to indicate likelihood of transit use and/or transit dependency. These variables measure population and households at their home location and are therefore indicators for access on the origin side.
- There is a large degree of overlap between the areas which scored high on this index and Equity Emphasis Areas (EEAs): The eastern and southwest portions of the District of Columbia; the inner beltway regions of Prince George's County and Montgomery County; adjacent to major corridors in Northern Virginia; and, the densest areas of the region's satellite communities such as Rockville, Frederick, and Manassas.
- Clusters of high-scoring areas outside EEA boundaries can be found primarily in Prince George's and Charles Counties.

Level of Service (LOS) Change Index
- The Level of Service (LOS) Change Index measures how much service changed in each block group from before the pandemic until now. The change in number of trips per period calculations were used to create the LOS Change Index.
- The highest scoring areas (those that experienced the most significant losses in service) are in Northern Virginia (including Fairfax County, Falls Church, McLean, and Burke) and Prince George's County (around Fort Washington, Bowie, and Laurel).

Gap Analysis Index
- The Gap Analysis Index determines the areas within the region that have high transit need and experienced notable reductions in or losses of service during the pandemic. This index is calculated by taking the Transit Equity Need Index and LOS Change Index and calculating the size of the gap between them. Block groups with higher Transit Need Equity scores that experienced a larger decrease in trips resulted in larger Gap Analysis Index scores, while block groups with lower Transit Need Equity scores with a similar service reduction would yield a smaller gap.
- The District of Columbia had many block groups with moderate scores on this index. Most of the largest gaps were found in Maryland and Virginia.
- The largest gaps in Maryland can be found in College Park, Laurel, Bowie, and the National Harbor/Fort Washington area.
- In Virginia, major gaps exist around Falls Church, Annandale, Burke, and Quantico.
- High-scoring gaps can be found both within and outside of COG's Equity Emphasis Areas.