



MEMORANDUM

TO: TPB Technical Committee
FROM: Eric Randall, TPB Transportation Engineer
SUBJECT: Transit Equity White Paper – Additional Details
DATE: April 30, 2021

In March 2020, transit agencies across the region drastically cut service in response to the coronavirus pandemic. Transit agencies have gradually been restoring service. In response for requests to identify transit service that should be a priority for restoration, TPB staff have contracted with ICF Consulting and Foursquare Integrated Transportation Planning to produce a white paper to inform regional decision makers about equity-related factors to consider in restoring transit service.

PURPOSE OF THE WHITE PAPER

Throughout the pandemic, the region has leaned on its essential workers, such as those in the food service and healthcare industries. Not only do many essential workers depend on transit to reach their jobs, but many are also from population groups (e.g., people of color, low-income households, non-native English speakers) and communities that face historical disadvantage and marginalization, which have been dramatically exacerbated by the pandemic's health and economic impacts.

Over a year after the pandemic reached us, the region looks forward to recovery from the pandemic as the population is vaccinated, infection rates are anticipated to decrease, and businesses look to restart normal operations. The region's transit agencies are restoring service in the face of extreme fiscal constraint.

- 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 for this project will recommend criteria for agencies to consider both for service restoration and for longer-term (post-pandemic) transit service expansion.

SCOPE OF WORK AND SCHEDULE

The white paper analysis will assess bus service (route coverage, frequency, time of day, and span of service) during the pandemic for those living in COG's Equity Emphasis Areas (EEAs), historically

disadvantaged populations, and essential workers. For each bus operator and for the region, the analysis will assess whether service is distributed equitably and will identify gaps in that service that could be filled to improve equity.

Interim analysis products focusing on transit service during the pandemic were submitted in mid-April and are under review. Final products also analyzing pre-pandemic service (i.e., normal service) will be produced by the end of June. The resulting products (technical memorandum and white paper) will discuss methodology, present the results of the analysis, and highlight key findings and recommendations. The technical memorandum provides the foundational mapping and statistical analysis. The white paper will build on that and explore topics in more detail and will ultimately serve as an important reference in the recovery of the public transportation system for the region from the pandemic.

DATA SOURCES AND METHODOLOGY

The following data sources have been used in the analysis to date:

- COVID-19 era General Transit Feed Specification (GTFS) were acquired for every transit provider offering fixed route bus service in the COG region. Special services such as rail feeders, employment connectors, airport shuttles, and commuter services were not included.
- Population and Demographics: 2019 American Community Survey
- Employment: 2018 LEHD
- Essential Workers based on CDC classification

The methodology assesses current service levels and current disparities in access to transit:

- Used a GTFS to Existing Conditions tool to combine all individual GTFS into a single route layer and single stop layer.
 - For shared stops with the same unique stop ID a combined frequency is produced.
 - For shared stops with different stop ID's where a combined frequency cannot be calculated the best frequency is selected.
 - For each stop the span and headway is captured by day of week and time of day.
- The single stop layer is buffered to a ¼ mile and intersected with the ACS and LEHD data to produce all of the summary statistics.
- Essential worker data was available at the zip code level and was disaggregated to census blocks, then intersected with the stop layer.

The analysis then considered current access to essential service jobs using a two-step process. The first step (a network analysis) is performed using Network Analyst in ArcGIS where a travel distance is calculated from each census block group within the study area. The second step (quantifying access to jobs) utilizes R code to extract quantities of jobs accessible:

- The combined GTFS is built into a network representing service in the weekday AM peak period
- This network measures the distance one can travel during a typical weekday AM peak period by bus in 45 minutes from every census block group in the region. The 45-minute travel time includes walk time to a bus stop.

- The R code, using network outputs and ACS and LEHD data, extracts the quantity of jobs accessible from every census block group (by total population and for each sub demographic group)

Current service levels were assessed using regional transit service maps for the following periods of times and operational frequencies:

- Coverage: All regional local fixed route transit routes
 - Weekday, Saturday, Sunday
- Span of service: less than 6, 6-12, 12-18, 18-21, 21+
 - Weekday, Saturday, Sunday
- Level of service: 15 minutes or better, 15-30, 30-60, 60+
 - Weekday: peak, midday, evening, late night
 - Saturday and Sunday: midday

POPULATION DENSITY MAPS

Population density maps have been produced to assist in evaluation of bus service in the region. These maps show density within a ¼ mile of a bus stop in blue, and density outside of a ¼ mile of a bus stop in red. The following maps have been developed to date:

- Total population density
- Persons of color population density
- Persons with disabilities density
- Total household density
- Low-income household density
- Zero/one-car household density
- Density of low-wage workers home location

EMPLOYMENT DENSITY MAPS

The following employment density maps have been produced to assist in evaluation of bus service in the region. These maps show density within a ¼ mile of a bus stop in blue, and density outside of a ¼ mile of a bus stop in red. The following maps have been developed to date:

- Total job density
- Density of essential service jobs
- Density of low-wage jobs

As part of upcoming work, static maps will be replaced by a dynamic map in ArcGIS Online format (AGOL).