CTPP Status Report

U.S. Department of Transportation
Federal Highway Administration
AASHTO Standing Committee on Planning

TRB Census Subcommittee
Bureau of Transportation Statistics
Federal Transit Administration

Small and Custom Geography Policy Change Announcement
CTPP Oversight Board is Discontinuing Census TAZ for Small Geography Data Reporting and Urging the Transportation Planning Community to Engage in 2020 Census Participant Statistical Areas Program (PSAP)

Penelope Weinberger, AASHTO, pweinberger@aashto.org

Following the release of the Census Transportation Planning Products (CTPP) 2012-2016 dataset in early 2019, the Oversight Board to the CTPP Program will no longer include Transportation Analysis Zone (TAZ) and Transportation Analysis District (TAD) geographies in future requests for special tabulations of the U.S. Census Bureau's American Community Survey (ACS) data. Future CTPP special tabulation requests will include the standard geography of census block groups.

Who May Be Affected?

State DOTs, MPOs, Demographers, Travel Demand Modelers, Planners, GIS Specialists, and anyone else who uses CTPP data by census TAZ and/or census TAD.

Why This Decision?

The CTPP Board decided to make this change due to not only data quality and usability concerns, but also due to a desire to use limited resources more effectively:

- The shift from a decennial-based CTPP tabulation to an ACS-based tabulation led to smaller sample sizes and increased margins of error in the data at all geography levels – though usually to an acceptable degree. Typically, the smaller the geography, the larger the issues with data quality. Introducing non-standard census geographies could diminish data quality because, generally, the population distribution – and consequently, sample distribution – had greater variation in non-standard geographies than in standard geographies. Therefore, while data users still must be discerning about the use of the block group geography (smaller) or the census tract geography (larger), block group data generally will contain lower sample error than census TAZs;
- Many areas of the country struggled to use CTPP data at the census TAZ level because these TAZs did not align with the TAZs used in their travel models;
- Consistent with the assessment to discontinue tabulations at Census TAZ level geography, the CTPP board also decided to discontinue tabulations using TADs; and
- The cost estimate to implement a 2020 Census TAZ Delineation Program exceeded $2.5 million – more than half the 5-year budget of the CTPP Program. Moreover, non-standard geographies are disproportionately more expensive to tabulate than standard geographies.

Given that future CTPP tabulations will use only the standard geographies, the Oversight Board is urging engagement by the transportation planning community in the Participant Statistical Areas Program (**PSAP**). The PSAP is the only opportunity prior to the 2020 Census for designated agencies to review and update the standard statistical geographies, including census tracts and block groups.

For more information on this decision, related technical information, and the PSAP see ctpp.transportation.org.

CTPP Users Come Together

Ed Christopher, Independent Transportation Planning Consultant, edc@berwynet.com

This past November I had the opportunity to chair the *Applying Census Data for Transportation: 50 Years of Transportation Planning Data Progress* conference. The conference, organized by TRB with support from the AASHTO CTPP program and U.S. DOT was held in Kansas City, MO. The conference looked at the past, present, and the future of using census data for transportation planning with the goal of supporting future transportation applications of census data. Tagged onto the conference was a preconference workshop focusing on advanced uses of the CTPP data. Overall, the conference featured four commissioned papers, 13 posters, and numerous presentations from data users across the country. In all, 115 people attended the conference. Links to presentations are available http://onlinepubs.trb.org/onlinepubs/conferences/2017/censusdata/program.pdf.
At the end of the conference, the AASHTO CTPP Oversight Board met to discuss the conference outcomes, special tabulations, and other items.

The papers commissioned by the CTPP Oversight Board were interspersed throughout the program. The paper topics were chosen to help inform the Board discussions on the future for the CTPP. The authors, selected through a competitive RFP process, wrote papers on the following four topics:

- Understanding the Role and Relevance of the Census in a Changing Transportation Data Landscape (http://onlinepubs.trb.org/onlinepubs/conferences/2017/censusdata/KeepingCensusRelevant.pdf)
- Advancing Transportation Performance Management and Metrics with Census Data (http://onlinepubs.trb.org/onlinepubs/conferences/2017/censusdata/PerformanceMetrics.pdf)
- Traffic Analysis Zones – How Do We Move Forward? (http://onlinepubs.trb.org/onlinepubs/conferences/2017/censusdata/TAZ_Paper.pdf)
- The CTPP Workplace Data for Transportation Planning: A Systematic Review (http://onlinepubs.trb.org/onlinepubs/conferences/2017/censusdata/WorkplaceData.pdf)

At the conference, each author had 20 minutes to present and then a facilitated audience discussion took place around the topic of the paper. Many Oversight Board members attended at each session and the results of the sessions were brought back to the Board meeting. Through this process, the Board was able to reach closure on several pressing issues. Perhaps most important is the future of the special journey-to-work tabulation as it relates to the custom transportation geography – the CTPP will move away from TAZs after the 2012 to 2016 data tabulation (discussed under "Small and Custom Geography Policy Change Announcement" in this Status Report).

To make sure attendees had ample time to visit with the authors and take in the posters, the poster presentations were incorporated as part of the opening reception. There was a high level of interaction between the authors and the attendees. It was exciting to see several of the new and emerging uses and ways to work with census data along with the other available data sets. Poster descriptions along with their extended abstracts will be part of the Circular summarizing the conference. The Circular is expected in spring 2018.

As noted, the overall structure of the conference was designed to briefly look at the past, focus on the present, and think about the future when it comes to census data used for transportation planning. Following along these lines, early in the conference, there was one session specifically focused on the past where "old" users of the journey-to-work data told their stories. For those new to the CTPP data products, this session was a good historic introduction. One of the last conference sessions featured a panel of forward-looking data users and providers who, along with the audience, discussed their prognostication of the future of planning with regard to census and all the other data that is coming our way. Feedback indicated that everyone walked away more enlightened but recognized the uncertainty in the precise direction that future will take. Many issues were unearthed, not the least of which was privacy.

In the middle of the conference there were two sessions dedicated to the Census Bureau. Attendees at these sessions heard the latest on new data products, the commuting program, geography, the Longitudinal Employer-Household Dynamics, and the developing data dissemination program. Without scooping any of these sessions or their presentations, please look through the conference program and use the links to download the PowerPoints provided by the various Census Bureau presenters.

Throughout the conference, there was a variety of topical sessions. Topics included: Demographics, Equity and Access; Advanced Data Analysis; PUMS Data; Transportation Modeling; Using Census Data to Understand Alternative Modes; National Household Travel Survey – Building on 50 years of Experience; and Comparing Census Data Sets. As one might expect there was a plethora of material presented during the conference. It goes without saying that "you should have been there." In lieu of that, please check out the PowerPoints which are posted in the program. Extended abstracts will be published in the conference Circular.

As noted in the opening remarks at the conference, it is important for groups like this to come together. One of the unstated themes running through the conference was that we all came together with one goal in mind: to make our special tabulation, and the ACS for that matter, the best quality that it can be. Quality data is vital to our business. We need to know how our data is collected, what warts it has and when and how it can be used. Just because it is on the Internet or someone has it in a glitzy app does not mean it is good enough for, as we used to say back in the day, "government work." It behooves all of us to think about quality and continue to make our data better.

As noted in conference closing remarks, when we think about the future of data, especially with "big data" coming our way, we must continue to battle for quality data. It seems that more and more the discussion is shifting towards quantity and away from quality. Lately, those pushing quantity think that they can win every time. Even when playing "Words with Friends" or "Scrabble," quality, which gives you twenty points, loses to quantity by a point. We have to change that. The future is ours, so let's make it a quality one!

Using Census Data and Lorenz Curves to Measure Public Transportation Equity Within the DART Service Area

Reza Sardari, University of Texas, Arlington, Mohammadreza.Sardari@mavs.uta.edu
Raha Pouladi, University of Texas, Arlington, Raha.Pouladi@mavs.uta.edu

Background and Objective

Access to public transportation empowers disadvantaged families and other transit-dependent groups to travel within urban areas. As low-income workers and minorities are most dependent on public transit, it is vital to ensure that these groups have adequate access to service. This study implemented Lorenz curves to examine the equity of public transit services within the Dallas Area Rapid Transit (DART) service area.

More specifically, this study explores the equity distribution of public transportation for six separate transit-dependent groups: low-income workers, families below the poverty threshold, households without vehicles, elderly residents, and Black and Hispanic populations.

Data and Variables

Multiple datasets were assembled from several sources to analyze public transit within the DART service area. These data sources include the U.S. Census, American Community Survey (ACS) 2014 5-Year Estimates, Longitudinal Employer-Household Dynamics (LEHD), the North Central Texas Council of Governments (NCTCOG) 2014 On-Board Transit Survey, and General Transit Feed Specification (GTFS).

Methodology and Results

Step 1: Transit Demand

Transit-dependent populations often include low-income workers, individuals below the poverty threshold, and households without any vehicles. To identify separate transit-dependent groups within the DART service area, different regression models were developed and tested to identify the relationship between public transportation ridership (as the dependent variable) and other socioeconomic factors.

Using NCTCOG on-board transit survey data from 2014, the home locations of transit riders were geocoded in ArcGIS and aggregated by block groups. After developing the regression models, a model with p-values less than 0.05 was selected (1). The variables in the final model, transformed via natural logarithms, are presented in Table 1.

Table 1. Variables Included in the Model

Variable	Definition	Source
Outcome variable		
pt_rider	% of public transits riders within the block groups	NCTCOG On-Board Survey – 2014
Independent variable		
black	% of African Americans within the block groups	ACS 2014 – 5 Year Estimates
hisp	% of Hispanics within the block groups	ACS 2014 – 5 Year Estimates
senior	% of Seniors (age over 65 years) within the block groups	ACS 2014 – 5 Year Estimates
noveh	% of households without vehicles within the block groups	ACS 2014 – 5 Year Estimates
poverty	% of population below poverty threshold within the block groups	ACS 2014 – 5 Year Estimates
lowrk_	% of low-wage workers within the block groups	LEHD 2014

As shown in Table 2, vehicle availability and low-wage employment are the most important factors affecting transit demand within each block group (1).

Table 2. Regression Model Estimates

Variables	B	Std. Error	t	Sig.	VIF
(Constant)	-3.0	0.525	-5.9	0.0	
Black	0.10	0.036	2.9	0.0	1.46
Hispanic	0.16	0.047	3.6	0.0	1.48
No vehicle	0.34	0.045	7.6	0.0	1.47
Senior	0.18	0.047	4.0	0.0	1.11
Poverty	0.18	0.049	3.7	0.0	1.90
Low-wage worker	0.39	0.20	2.0	0.0	1.77

Figure 1 illustrates the spatial distribution of transit-dependent population groups within the DART service areas. As shown, the transit-dependent population is clustered in the southern portion of Downtown Dallas. These areas include a higher percentage of African-Americans, low-wage workers, and individuals below the poverty threshold. In addition, a higher density of Hispanics is located in the southwest portion of Downtown Dallas.

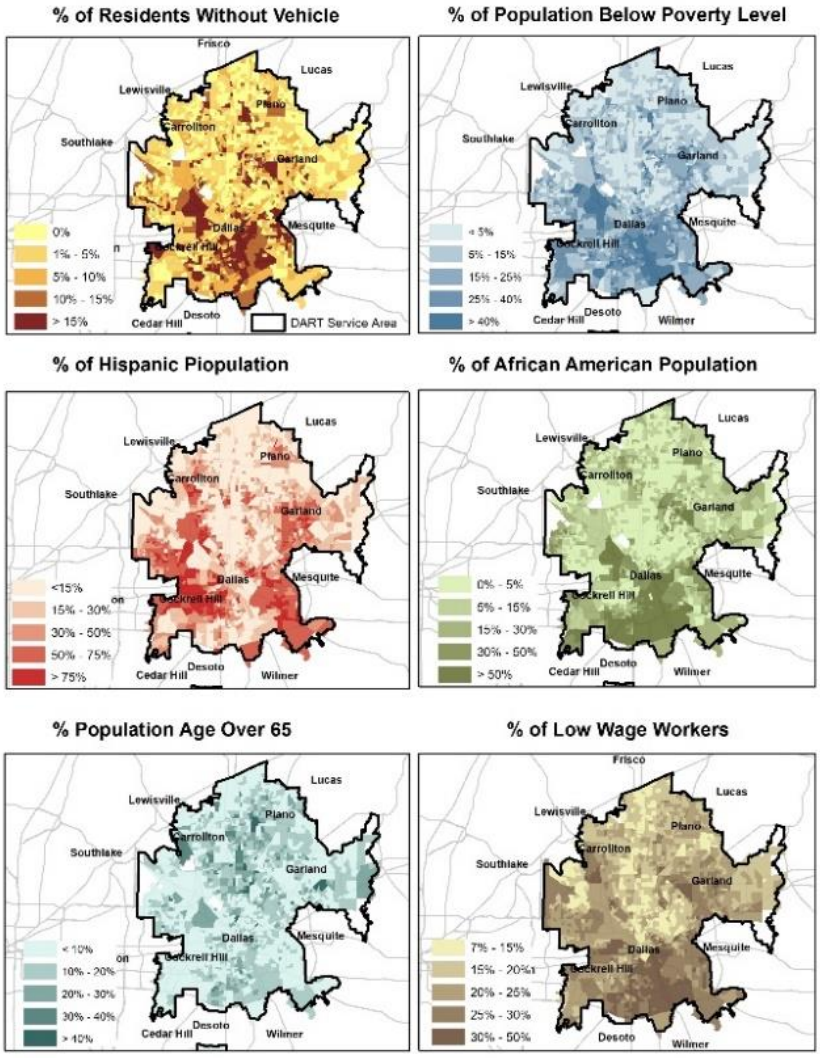

Figure 1. Spatial Distribution of Transit – Dependent Populations

Step 2: Transit Supply

To measure the distribution of transit service access, GTFS data were obtained and coded in ArcGIS. After preparing a multimodal transit network, which was joined to GTFS transit data, transit service frequency was calculated for the centroid of each Census block. In this study, transit service frequency is the average number of transit services per hour during weekdays from 6:00 a.m. to 9:00 p.m. As shown in Figure 2, higher transit service frequencies are available in the Dallas Central Business District (CBD), the southwestern portion of Downtown Dallas, Addison, West of Farmers Branch, University Park, and University of Texas at Dallas (UTD) Campus.

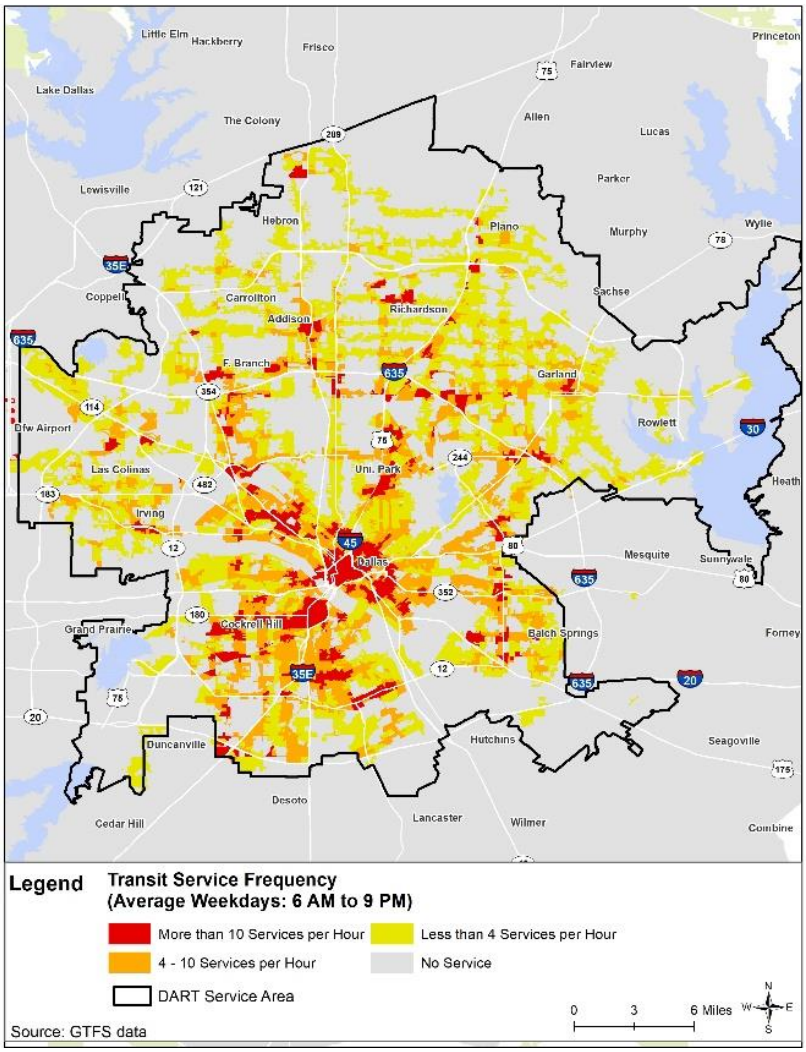

Figure 2. Spatial Distribution of Transit Service Frequencies

Step 3: Gini Coefficient

In this step, the Gini coefficient was calculated to analyze the inequality of transit service frequency and transit demand within the DART service area. Based on a Lorenz curve (Figure 3), the equity line would be a perfect 45-degree line if transit services were equally distributed within the service area. In that case, everyone would have access to public transit services that perfectly matches their demand (2, 3). The Gini coefficient is the percentage of the area between the perfect equity line and the Lorenz curve (A) divided by the area between the perfect equity line and the perfect inequality line (A + B). The larger

the Gini coefficient, the greater the level of inequality observed (i.e., the greater the mismatch between transit service frequency and transit demand).

The Gini coefficient results are presented in Figure 4. As shown, the greatest inequality in transit services is experienced by low-wage workers, with a Gini coefficient equal to 0.64. In other words, 70 percent of low-income workers had access to 22 percent of transit services within the DART service area. The lowest Gini coefficient (i.e., the least inequality) is associated with the households without vehicles, translating to a Gini coefficient of 0.49. This Gini coefficient means that 70 percent of this group had access to 35 percent of transit services.

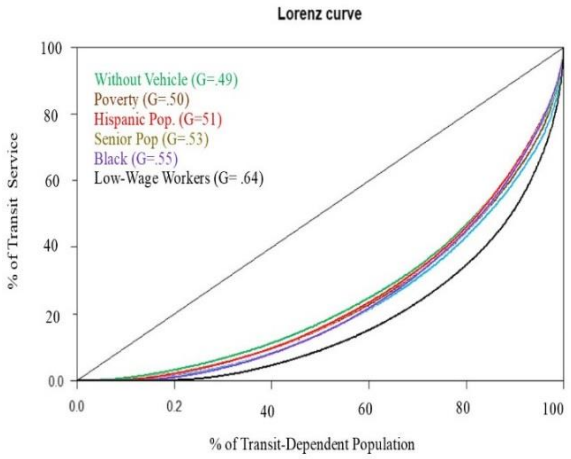

Figure 3. An example of Lorenz Curve (2)

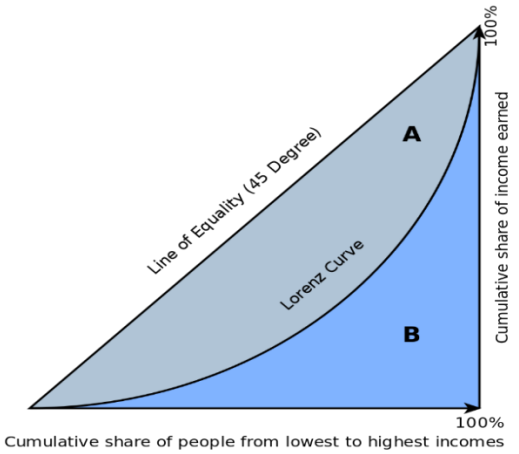

Figure 4. Lorenz Curve of Transit-Dependent Population

Conclusion

This study examined the equity distribution of transit frequencies for six transit-dependent population cohorts. It offers a multi-step geospatial approach to understanding transit-dependent populations and examines public transport equity using ACS, CTPP, and LEHD data. The advantage of using a Lorenz Curve is that it provides a disaggregated inequality analysis while providing critical information for transit agencies and decision-makers to understand the gap between transit service distribution and transit-dependent populations.

References

1. Sardari, R., Hamidi, Sh., & Pouladi, R. (2017). Transit Demand Catchment Areas and Transit-Dependent Populations: Discovering Hotspots. Unpublished Manuscript.
2. Ricciardi, a.m., Xia, J., & Currie, G. (2015). Exploring Public Transport Equity Between Separate Disadvantaged Cohorts: A Case Study in Perth, Australia. Journal of Transport Geography, 43, 111–122.
3. Delbosc, A., & Currie, G. (2011). Using Lorenz Curves to Assess Public Transport Equity. Journal of Transport Geography, 19(6), 1252–1259.

CTPP Contact List

Email: CTPPSupport@camsys.com
CTPP 2006-2010 Data: http://ctpp.transportation.org/Pages/5-Year-Data.aspx
CTPP website: http://www.fhwa.dot.gov/planning/census_issues/ctpp/
FHWA website for Census issues: http://www.fhwa.dot.gov/planning/census_issues
AASHTO website for CTPP: *http://ctpp.transportation.org*
1990 and 2000 CTPP data downloadable via Transtats: http://transtats.bts.gov/
TRB Subcommittee on census data: http://www.trbcensus.com

AASHTO
Penelope Weinberger
Phone: (202) 624-3556
Email: pweinberger@aashto.org

Jessie Jones, ARDOT
Chair, CTPP Oversight Board
Phone: (501) 569-2201
Email: Jessie.Jones@ahtd.ar.gov

Guy Rousseau, Atlanta Regional Commission
Vice Chair, CTPP Oversight Board
Phone: (404) 463-3274
Email: GRousseau@atlantaregional.com

U.S. Census Bureau: Social, Economic and Housing Statistics Division
Brian McKenzie
Phone: (301) 763-6532
Email: brian.mckenzie@census.gov

Federal Transit Administration (FTA)
Ken Cervenka
Phone: (202) 493-0512
Email: ken.cervenka@dot.gov

Bureau of Transportation Statistics (BTS)
Clara Reschovsky
TRB Census Subcommittee Co-Chair
Phone: (202) 366-2857
Email: clara.reschovsky@dot.gov

Federal Highway Administration (FHWA)
Joseph Hausman
Phone: (202) 366-9629
Email: Joseph.Hausman@dot.gov

TRB Committees
Stacey Bricka
Consultant
Chair, TRB Urban Data Committee
Email: Sgbricka@gmail.com

Mara Kaminowitz
TRB Census Subcommittee Co-Chair
Phone: (410) 732-0500
Email: mkaminowitz@baltometro.org

CTPP Technical Support
Jingjing Zang
Phone: (301) 347-9100
Email: CTPPSupport@camsys.com

CTPP Listserv

The CTPP Listserv serves as a web-forum for posting questions, and sharing information on Census and ACS. Currently, more than 700 users are subscribed to the listserv. To subscribe, please register by completing a form posted at: http://www.chrispy.net/mailman/listinfo/ctpp-news.

On the form, you can indicate if you want emails to be batched in a daily digest. The website also includes an archive of past emails posted to the listserv.