



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

Census Transportation Planning Product (CTPP) Highlights

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The *Applying Census Data for Transportation: 50 years of Transportation Planning Data Progress* conference is coming!

[Conference Information](#)

[Call for Abstracts \(Due May 25, 2017\)](#)

[Call for Student papers](#)

Join us in Denver, Colorado

CTPP is holding data and software training in Denver, CO, June 27 – 28.

Thank you to our hosts:



Training



Please contact Penelope Weinberger, AASHTO, pweinberger@ashto.org if you are interested in training in your area.

Census Activities at TRB

Clara Reschovsky, *Census Subcommittee Co-Chair*, clara.reschovsky@dot.gov

The Census Data Subcommittee held its annual meeting at the TRB Annual Meeting in January in Washington, DC. Topics considered this year included preparations for the 2020 Decennial Census. The official Census Day will be on April 1, 2020, but preparations are underway to make the effort a success. Sara Cassidy from the Census Bureau's Geography Division came to share information on the programs under development and being implemented to make the 2020 Census a success. Programs include BAS, PSAP, GSS, and LUCA all using GUPS.

So, what is GUPS?

Geographic Update Partnership Software (GUPS): Software to aid local governments in the delineation of block boundaries that feed into the development of the files used in redistricting after the Census data are collected. Tabulation blocks must follow visible boundaries within TIGER, such as roads or rivers, but also can follow political boundaries that are part of TIGER as well. GUPS allows boundaries to be submitted electronically to the Census Bureau from a wide variety of participants.

Boundary and Annexation Survey (BAS): Occurs annually and takes in updates of geographical political boundaries from local areas for use in TIGER and for data tabulations.

Participation Statistical Areas Program (PSAP): Allows for local input and review of Census geography, specifically for Census Tracts and Block Groups, as well as Census Designated Places.

Geographical Support System (GSS): Spatial updates and submissions for new addresses and new streets. This is a

continuous program that can make the preparation for the Decennial Census easier.

Local Update of Census Addresses (LUCA): Operation specifically for the Decennial Census, ramp up of participation from local governments at all levels, as well as tribal governments.

All of these processes feed into the creation of the base for the Decennial Census that also contributes to better quality American Community Survey data. The Census Bureau currently is promoting the LUCA program to make sure participants are aware of it. FHWA has recently promoted a webinar on LUCA process on April 27, 2017. Training will begin the fall of 2017. Participants include states, counties, cities and towns, and tribal governments.

Stay tuned for more updates from the Census Bureau to make the 2020 Census a great success!

Application of ACS and CTPP Databases in Environmental Justice Assessment—Examples from MAG
Petya Maneva, Maricopa Association of Governments, PManeva@azmag.gov

This section provides a high-level description of a methodology for the quantitative analysis of the social impact of regional transportation planning. Such an analysis is appropriate for inclusion as part of a Title VI/Environmental Justice (EJ) assessment. As part of the assessment, potential transportation impacts are evaluated for key communities of concern, including minority populations, low-income and aged populations, and persons with disabilities and those with limited English proficiency.

The first step in performing an EJ assessment of a transportation plan is acquiring the relevant datasets, including information on transportation,

demographics, and commuter flows. For the purposes of quantitative analysis, it is important that all data are spatially represented. For most areas, the recommended first source for transportation data is the local or state transportation planning agencies. Good sources for demographic data are the decennial census and/or the American Community Survey (ACS). Finally, the commuting patterns of the vulnerable populations can be analyzed successfully with the help of data provided by the Census Transportation Planning Products (CTPP) program.

In the case of Maricopa Association of Governments (MAG), three sets of GIS files pertinent to the 2040 regional transportation plan were created for this analysis: freeway projects, arterial projects, and transit projects.

Once all necessary datasets are compiled, the next step is to evaluate the impact of each major component of the transportation plan for each community of concern. The goal is to assess the equity of the transportation planning process for the vulnerable populations in the planning area.

To see an illustration of such an EJ assessment, we consider the impact of MAG's long-range transit plan on low income communities. The sequences of work is as follows:

- Census tracts within MAG metropolitan planning organization (MPO) boundaries are identified.
- An ACS table with data on poverty status at tract level is chosen, with only the records pertaining to MAG retrieved.
- The average poverty rate for the region is calculated based on the total number of persons age 5 and over living within MAG, and the total number of persons

age 5 and over living in poverty. In this case it is 17 percent.

- The tracts with a higher than average share of persons living in poverty are flagged. In this example, 361 out of 960 total tracts meet the criterion for poverty.

Having obtained an overall picture of poverty in the planning region, the next phase is to determine which census tracts are served by the long-range transit plan. This can be done with a spatial overlay of the transit GIS file and the census tracts GIS file. As a result, the tracts affected by the transit plan are identified and flagged. The analysis showed 791 tracts were affected by the transit plan as illustrated in Table 1 and Figure 1. Some of the communities impacted by the transit plan have higher than average poverty rates while others represent nonpoverty communities. In this example, 361 communities in the region are considered in poverty—343 or 95 percent of these communities are served by the transit plan. Conversely, of the 599 nonpoverty communities in the region—448 or 74.8 percent are served by the transit plan.

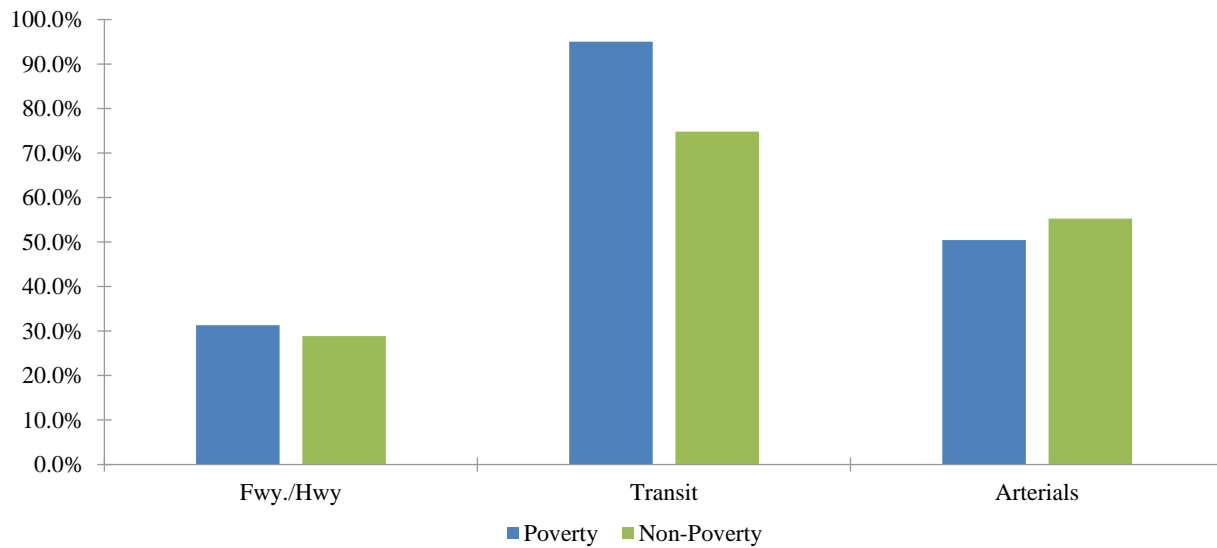
Similar calculations can be done to establish the impact of the freeway and arterial plans on the low-income communities.

Additionally, a three-prong assessment—impact of freeway, arterial, and transit plans—can be performed on the minority populations, aged populations, persons with disabilities, and those with limited English proficiency. No matter what social indicator is analyzed, the methodology described here can be employed, using the demographic data available in ACS and the regional transportation plan. The overlay analysis of the impact of the MAG transportation plan on communities of concern showed that transportation investments are equitably distributed across population groups in the region.

Table 1: Impact of MAG transportation plan on communities in poverty—part 1

	Freeway/Highway	Transit	Arterials	Total by Poverty Status
Poverty	113	343	182	361
Non-Poverty	173	448	331	599
Total	286	791	513	960
	Freeway/Highway	Transit	Arterials	
Poverty	31.3%	95.0%	50.4%	
Non-Poverty	28.9%	74.8%	55.3%	

Figure 1: Impact of the regional transportation plan on communities in poverty—part 2

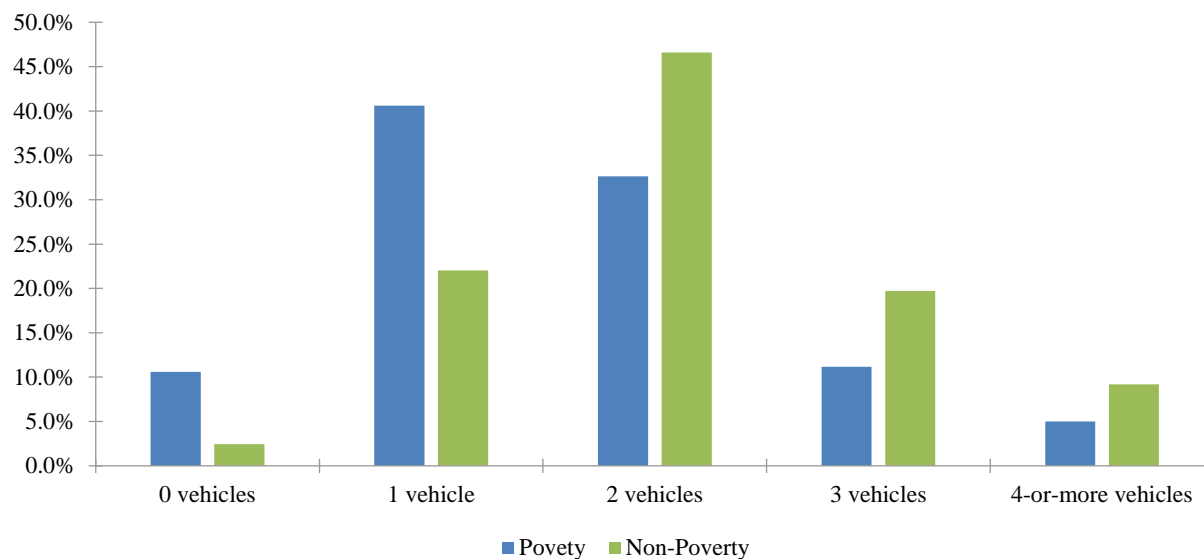


In regions where performing an analysis has proven challenging, the CTPP can be very helpful to assess EJ considerations in the transportation planning process. The examples shown in Table 2 and Figure 2 illustrate this point. Data on vehicle availability by poverty status can facilitate

transit planning for communities with higher number of families with no vehicles or insufficient number of vehicles. The inbound and outbound commuting flows of persons living in poverty are another example of CTPP data supporting transportation planning with EJ in mind.

Table 2: Communities in poverty by vehicle availability—part 1

	0 Vehicles	1 Vehicle	2 Vehicles	3 Vehicles
Communities in Poverty	10.6%	40.6%	32.6%	11.2%
Communities not in Poverty	2.5%	22.0%	46.6%	19.7%

Figure 2: Communities in poverty by vehicle availability—part 2

Using CTPP Data for Environmental Justice and Title VI Analysis

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The Maricopa Association of Governments' (MAG) practices on Environmental Justice (EJ) analysis (see article *Application of ACS and CTPP databases in Environmental Justice Assessment—Examples from MAG* for more details) show that CTPP data are useful as the unique and reliable data source for EJ evaluations. This article summarizes 2006-2010 CTPP data resources that are useful for EJ and Title VI analysis, and provides examples of applying CTPP data for EJ studies.

The 2006-2010 CTPP provides tabulations on key variables for key EJ and Title VI analysis, including minority status, poverty status and low income (household income), race, sex, age, and Linguistic Isolation (limited English proficiency). The data are tabulated for both Residence and Workplace, and provides Commuting Flow data for minority populations and populations in poverty; all tabulations are

available at small geography units (Census Tract and Traffic Analysis Zones). Besides single variables of interest for EJ evaluation, the 2006-2010 CTPP also provides two-way, crossed-tabulations that are not available in American Community Survey to support further analysis on EJ communities, including:

- Population in Poverty by Vehicle Availability
- Minority Population by Means of Transportation
- Minority Population by Industry
- Minority Population by Travel Time
- And more...

Below are a few more examples of how CTPP data is used to support transportation planning for EJ populations for the MAG region. Figure 3 shows the differences among mode choices between minority and nonminority populations. The data indicate that minority communities rely more on public transportation and active transportation, and can be used to support transit planning by helping to identify the

areas where most minority populations use public transportation to work. Figure 4 and Figure 5 show the inbound and outbound commuting flow of minority workers, helping to visualize and better understand the commuting pattern of the EJ population.

Table 3 provides a detailed list of CTPP tabulations that can be used for EJ evaluations. The 2006-2010 CTPP data are available at:

<http://data5.ctpp.transportation.org/ctpp/Browse/browsetables.aspx>.

Figure 3: Minority communities by means of transportation

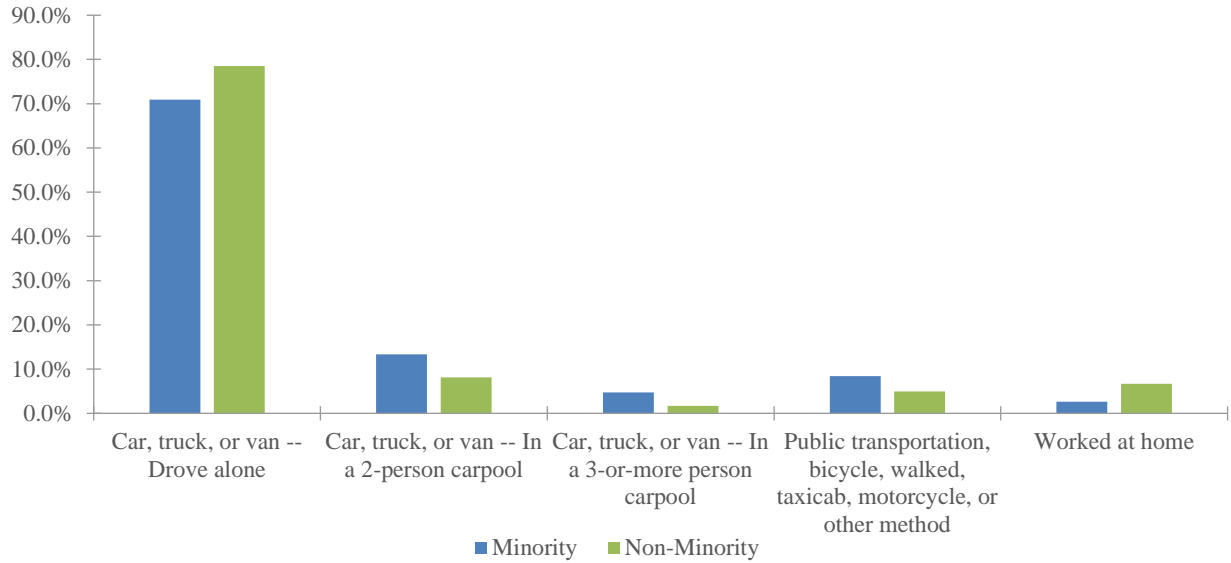


Figure 4: Outbound commuting flows for minority communities

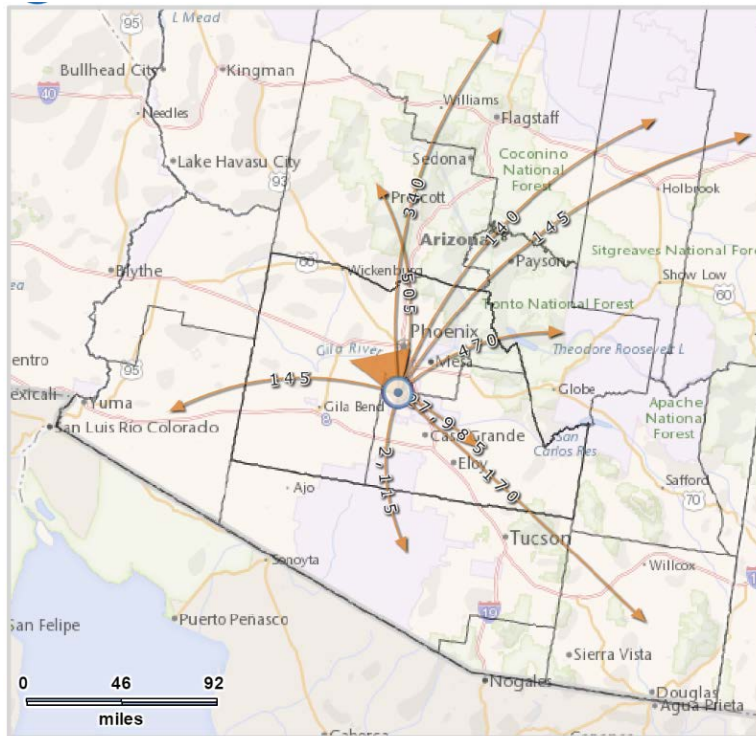


Figure 5: Inbound commuting flows for minority communities

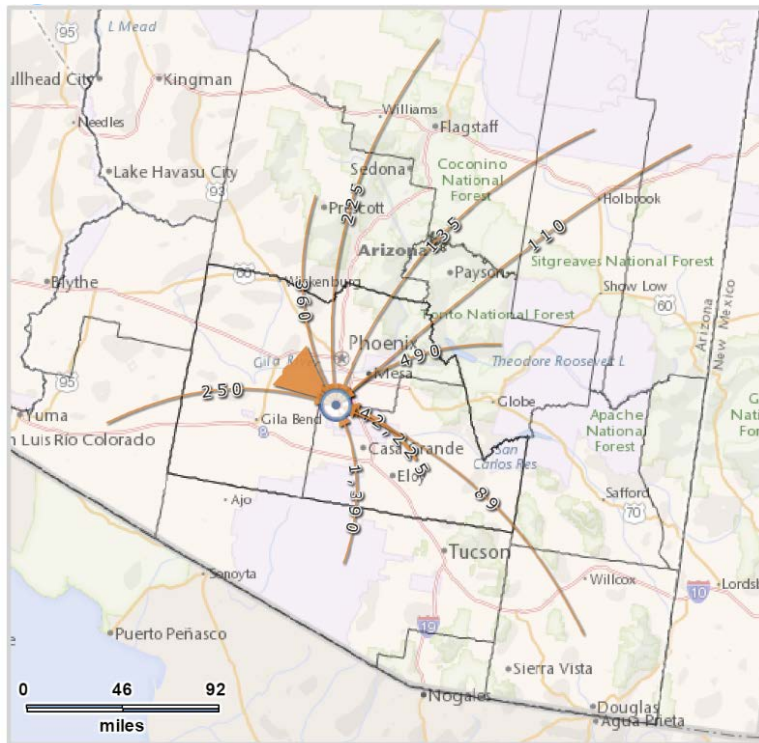


Table 3: 2006-2010 CTPP Tables for EJ Analysis

Geography	Table Number	Table Name
Residence (Part 1)	A101103	Hispanic Origin (3) (All Persons)
	A101104	Length of US Residence (6) (All Persons)
	A101105	Minority Status (3) (All Persons)
	A101108	Race (5) (All Persons)
	A101201	Age (11) by Minority Status (3) (All Persons)
	A101204	Hispanic Origin (3) by Race of Person (5) (All Persons)
	A117200	Linguistic Isolation (3) by Language spoken at home (12) (Persons 5 years old and over in households)
	A102205	Hispanic Origin (3) by Race (5) (Workers 16 years and over)
	A102208	Length of US residence (6) by Earnings in the past 12 months (in 2010 inflation adjusted dollars) (11) (Workers 16 years and over)
	A102208C	Length of US residence (6) by Earnings in the past 12 months (2010\$) (6) (Workers 16 years and over)
	A102209	Minority Status (3) by Class of worker (9) (Workers 16 years and over)
	A102210	Minority Status (3) by Earnings in the past 12 months (in 2010 inflation adjusted dollars) (11) (Workers 16 years and over)
	A102211	Minority Status (3) by Industry (15) (Workers 16 years and over)
	A102212	Minority Status (3) by Occupation (25) (Workers 16 years and over)
	A102213	Minority Status (3) by Travel time (18) (Workers 16 years and over)
	A104200	Poverty status (4) by Time leaving home (17) (Workers for whom poverty status is determined)
	B102201	Minority Status (3) by Means of Transportation (11) (Workers 16 years and over)
	B102201C	Minority Status (3) by Means of Transportation (7) (Workers 16 years and over)

Geography	Table Number	Table Name
	B102201C2	Minority Status (3) by Means of Transportation (6) (Workers 16 years and over)
	B102201C3	Minority Status (3) by Means of Transportation (4) (Workers 16 years and over)
	A103205	Vehicles available (6) by Length of US residence (6) (Workers 16 years and over in households)
	A104201	Vehicles available (6) by Poverty status (4) (Workers 16 years and over in households for whom poverty status is determined)
	A202107	Hispanic Origin (3) (Workers 16 years and over)
	A202204	Hispanic origin (3) by Race of person (5) (Workers 16 years and over)
	A112212	Minority Status of the householder (3) by Telephone availability (3) (Households)
	A112216	Vehicles available (6) by Minority Status of the householder (3) (Households)
	A112302	Household size (5) by Household income in the past 12 months (2010\$) (9) by Minority Status of the householder (3) (Households)
	A112313	Household income in the past 12 months (2010\$) (5) by Lifecycle of household (10) by Minority Status (3) (Households)
	A113100	Poverty status (4) (Households for which poverty status is determined)
	A113200	Poverty status (4) by Telephone availability (3) (Households for which poverty status is determined)
	A113201	Vehicles available (6) by Poverty status (4) (Households for which poverty status is determined)
Workplace (Part 2)	A202109	Length of US Residence (6) (Workers 16 years and over)
	A202206	Length of US residence (6) by Earnings in the past 12 months (in 2010 inflation adjusted dollars) (11) (Workers 16 years and over)
	A202206C	Length of US residence (6) by Earnings in the past 12 months (in 2010 inflation adjusted dollars) (6) (Workers 16 years and over)
	A202207	Minority Status (3) by Class of worker (9) (Workers 16 years and over)
	A202208	Minority Status (3) by Earnings in the past 12 months (in 2010 inflation adjusted dollars) (11) (Workers 16 years and over)
	A202209	Minority Status (3) by Industry (15) (Workers 16 years and over)
	A202210	Minority Status (3) by Occupation (25) (Workers 16 years and over)
	A202211	Minority Status (3) by Travel time (18) (Workers 16 years and over)
	A204201	Poverty status (4) by Time arriving (17) (Workers 16 years and over for whom poverty status is determined)
	B202200	Minority Status (3) by Means of Transportation (11) (Workers 16 years and over)
	B202200C	Minority Status (3) by Means of Transportation (7) (Workers 16 years and over)
	B202200C2	Minority Status (3) by Means of Transportation (6) (Workers 16 years and over)
	B202200C3	Minority Status (3) by Means of Transportation (4) (Workers 16 years and over)
	A202215	Linguistic Isolation (3) by Language spoken at home (12) (Workers 16 years and over in households)
	A203203	Vehicles available (6) by Length of US residence (6) (Workers 16 years and over in households)
	A204200	Vehicles available (6) by Poverty status (4) (Workers 16 years and over in households for whom poverty status is determined)
	Flow (Part 3)	B302105
B304100		Poverty status (4) (Workers 16 years and over for whom poverty status is determined)

Using Census Data to Develop Efficient Household Travel Survey Sampling Plans

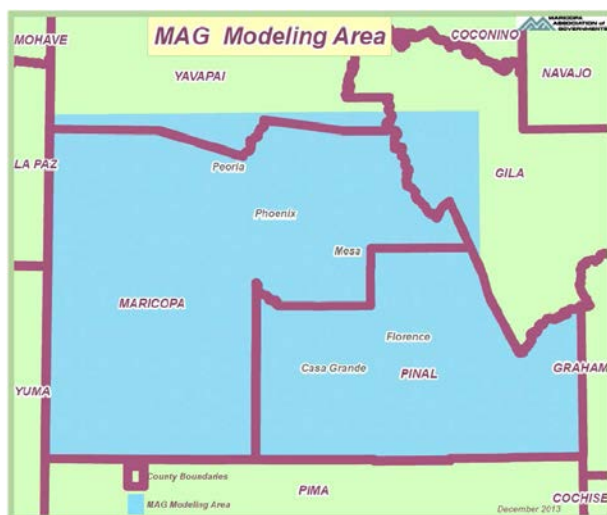
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Background

Household travel surveys (HTS) provide data for regional travel models and many other purposes. Collecting a proper survey depends on representing all meaningful demographics and behaviors in the population. The Census, ACS, and CTPP data are the primary data sources used to both design the sampling plan and calculate expansion factors for the responses.

In 2015, on behalf of the Maricopa Association of Governments (MAG), Cambridge Systematics (CS) planned an HTS in the Phoenix, Arizona metropolitan region, shown in Figure 7. CS produced a sampling plan that used Census data to assess the population of the region at various geographic and demographic levels. The result provided a framework for collection of surveys that would provide highly detailed information about travel in the region.

Figure 6: Map of survey region, including Maricopa and Pinal Counties and parts of Yavapai and Gila Counties



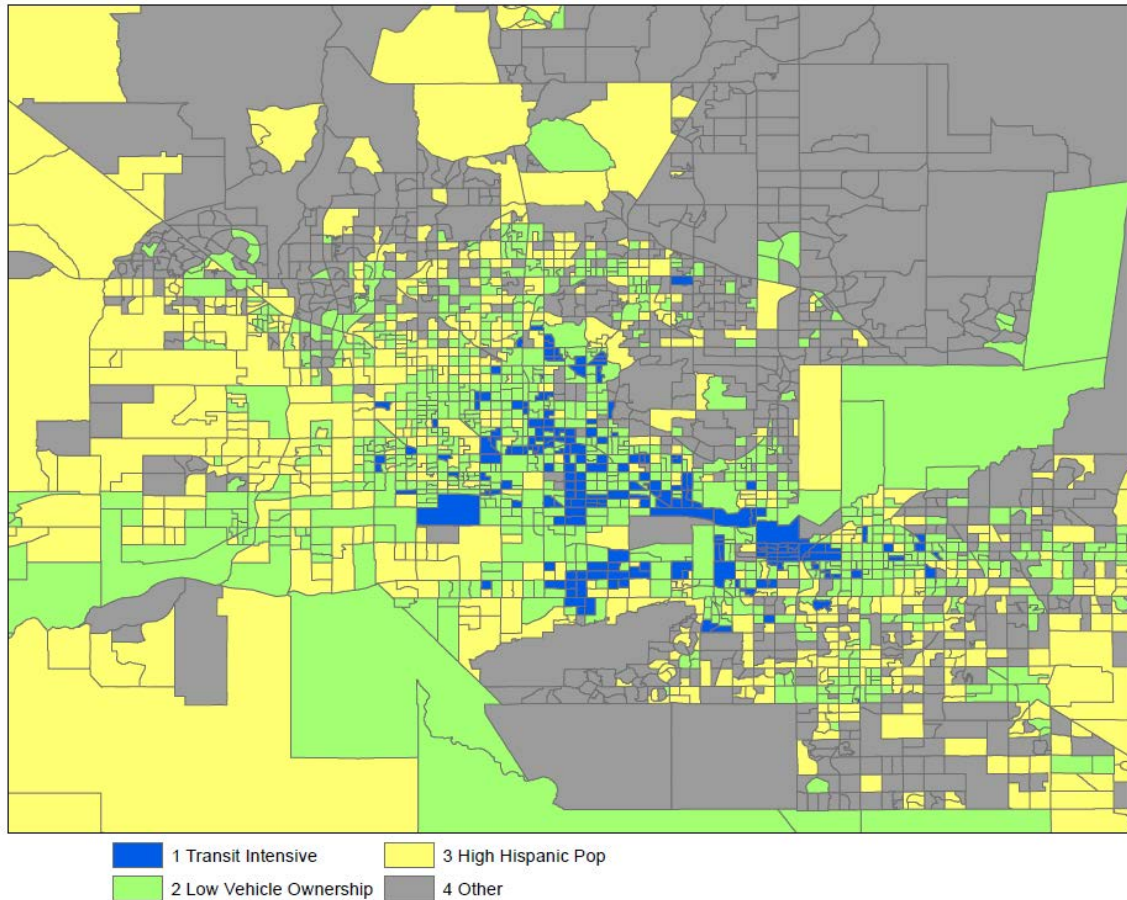
Methodology and Results

A certain number of surveys is sought from each population segment based on its size. Often survey targets are set by using geography, such as counties or other contiguous areas, and demographics. More recently, alternatives to this approach have come into use. This article describes such an alternative methodology based on noncontiguous areas and provides a guide for surveyors to focus efforts for oversampling hard-to-reach populations.

The initial step involved gathering all relevant data for the region at Census block group level. After some analysis and review with the local agency, it was decided that transit users, low-vehicle-ownership households, and Hispanic households should be explicitly targeted. Other important household characteristics were considered, and these also were monitored during data collection.

A classification scheme assigned block groups to one of four categories based on the percentile values of the aforementioned variables. The block groups with the highest concentration of transit usage were type 1. Those not type 1 that had above a certain threshold of low-vehicle-ownership households were marked type 2. The remaining block groups were marked type 3 if they had above a certain percentage Hispanic, and type 4 otherwise. The first two groups were oversampled to make sure that enough households with more unique or possibly complex travel behavior are surveyed. Figure 8 shows the resultant geographical patterns for a subset of the region.

Figure 7: Block groups by type for a subset of the MAG region, centered on Phoenix.



In addition to a targeted number of surveys stratified by household characteristics, additional surveys were targeted by block group type. The latter targeting helped to establish not just a goal, but a plan for meeting it, too. While not every household in the transit-intense or low-vehicle-ownership block groups will use transit or have zero vehicles owned, such households are much more likely to be found in such block groups. If, on the other hand, contiguous boundaries were used, getting more transit riders or getting more low-vehicle ownership households in the sample would involve increasing the sampling rate in an entire county or other large geographic area, which also would include block groups with high-vehicle ownership and low-transit ridership.

For example, to randomly find 100 zero-vehicle households in an area where they

make up 0.5 percent would require surveying around 20,000 households. It would require surveying only 2,000 households in an area where they are 5 percent of the total. Since sampling is random, the characteristics of the individual households are not known until they respond.

Table 4 indicates the expected shares of households by auto ownership in each of the block group types. Additional tables were produced showing shares by household size, number of workers, income, and Hispanic population. The total shown at the bottom is the number of households by auto ownership. By basing the sampling rate on the block group type and prioritizing the smaller, harder-to-reach groups, they could be more robustly represented. This was especially important in the case of those with more mode options and complex travel patterns.

Table 4: Targets by block group type and auto ownership

Area/Auto Ownership	Population				Rate	Targets			
	0-Auto	Auto < Workers	Auto >= Workers	Total		0-Auto	Auto < Workers	Auto >= Workers	Total
BG Type 1	19,253	7,792	81,506	108,551	1.10%	212	86	897	1,194
BG Type 2	66,585	34,483	400,143	501,211	0.55%	366	190	2,201	2,757
BG Type 3	7,297	18,729	409,166	435,192	0.33%	24	61	1,338	1,424
BG Type 4	9,344	13,377	474,226	496,947	0.33%	31	44	1,551	1,626
Total	102,479	74,381	1,365,041	1,541,901	0.45%	632	380	5,987	7,000

Conclusion

The method reported in this article employs oversampling and block group-based monitoring integrated into the survey plan. The objective of this approach is efficiency in getting sufficient representation of hard-to-reach or low-responding populations, as well as supplying models with enough

information on the choices of those households and individuals with more complex behavioral patterns or choices. The method does this by identifying the places where these groups are more likely to be found and integrating this information into the sampling plan.

CTPP Contact List

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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>

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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.