



Census Transportation Planning Products (CTPP)

Penelope Weinberger
CTPP Program Manager - AASHTO

September 15, 2010





What is the CTPP Program Today?

The CTPP is an umbrella program of data products, custom tabulations, training, technical assistance, and research for the transportation community.

CTPP uses American Community Survey (ACS) data from U.S. Census Bureau.

WARNING!

Decennial Census has no Long Form – No JTW data in Decennial Census!



Quick Overview of ACS

- Period Estimate, not Point in Time
- ~ 1 in 20 sample
- Household based
- Collected monthly and accumulated
- One year
 - Data released for areas 65,000 or greater
- Three Year
 - Data released for areas 20,000 or greater
- Five Year
 - Data released for All Geographies
- Subject to Disclosure Rules, of course



CTPP Then and Now

CTPPPackage → CTPProducts Program

The CTPP program now includes:

- Data products**
- Training and technical assistance**
 - On-call user support
 - Training classes and web seminars
- Research**
 - Integration of data sources
 - Disclosure avoidance



CTPP Program Activities and Costs

Develop specialized data products	63%
Conduct research, training and outreach	21%
Manage the program	3%
Unallocated balance	12%
Total Program Costs	\$5,844,332

5-Year Program: 2008 ~ 2012



Key CTPP Products

- Transportation Profiles for state, county and (some) place(s)
- **CTPP based on 3-Year ACS Data Products**
 - Data access and visualization tools
- CTPP based on 5-year ACS Data Products
 - TAZ development
 - Data access and visualization tools
- Disclosure Proofing Research
 - NCHRP 8-79
- National Data Products – Commuting in America



CTPP based on 3-Year

ACS Data (2006 – 2008 ACS)

- Contains 305 different tables of demographic, income, work and travel information, by geography
 - Residence – information about people broken down by where they live
 - Workplace – information about people broken down by where they work
 - Flows – information about people and broken down by both residence and workplace for modeling commuting patterns
- Data includes estimates and error terms



CTPP based on 3-Year ACS Data Products

- Workplace and Residence data available at the following levels:
 - USA (qualified by urban, rural, etc)
 - State (qualified by urban, rural, etc)
 - County
 - County Subdivision
 - Place
 - PUMA (Public Use Microdata Area) – place of work PUMAs are slightly different from residence ones
 - Metropolitan Statistical Area (MSA)
 - MSA Principal City
 - Outside USA (workplace only)
- Symmetrical and Asymmetrical flow data available (state-to-state, county-to-county, county-to-place, etc)



Key CTPP Variables

- Data on **Households**
 - Size, income, vehicles per household
- Data on **Workers**
 - Age and gender, occupations, earnings
- Data on **Journey to Work**
 - Usual mode to work, commuting time, work departure time
- Data on **Workplaces**
 - Work locations, times of arrival at work



Accessing the 3-year data

- All available on a single easy-to-use free website
 - Free to use, but you do need to register
 - Online help and tutorials help users along the way
- Create “sessions”, which are groups of tables with a common geography selection
 - Select geography using a map and/or drill down through the geographic hierarchy
- Search for tables by dimension name or any relevant word
 - Either within one of the parts or across all parts



Viewing the data

- Open any table, either in your “session” or from the public view.
- From there, you can customize your view of the data:
 - Rearrange dimensions
 - Make selections on any dimension
 - View charts
 - View the data on a thematic map
 - Aggregate items using standard functions or provide a formula (margin of error will be recalculated for you for simpler formulas)
 - Save your report for future use
 - Save your selections and aggregations for use in other tables



Exporting the Data

- Once you have set up the table you want to see, you can export it:
 - Export the data in CSV, XLS or Beyond 20/20 (IVT) format for use in your own analysis tools
 - Export SHP files for viewing maps in your own GIS engine
- Entire “sessions” can be exported in a single operation.



Key CTPP Products

- **Transportation Profiles for state, county and (some) place(s)**
- **CTPP based on 3-Year ACS Data**
 - Data access and visualization tools
- **CTPP based on 5-year ACS Data (2006 -2010)**
 - TAZ development
 - Data access and visualization tools
- **Disclosure Proofing Research**
 - NCHRP 8-79
- **National Data Products – Commuting in America**



Additional CTPP Products

- **Training and technical support**
 - On-call user support
 - Training classes and web seminars
- **Research**
 - Integration of data sources
 - Disclosure avoidance
- **Sharing of best practices, successes, challenges and constraints**



CTPP Accomplishments To Date

- **State, Local and County Profiles for 2005-2007 are completed and posted at the AASHTO website**
- **CTPP based on 3-Year ACS list finalized and approved by the Census Bureau and Special Tabulations delivered**
- **Data access software development underway – Beta testing in October – Final in November**
- **Plans for a TRB Census Conference in fall 2011 are underway**
- **CTPP based on 5-Year ACS (2006 – 2010) table list developed as part of NCHRP 8-79 Disclosure Proofing Research Project**



NCHRP 8-79 Producing Transportation Data Products from the ACS that Comply with Disclosure Rules

- Preliminary research done under NCHRP Project 8-36 (71), “Disclosure Avoidance Techniques to Improve ACS Data Availability” suggests that credible techniques can be found to produce disclosure-proofed representative data for small areas. The objective of this research is to develop, evaluate, and test credible techniques to produce specially tabulated data products using 5-year ACS data. The resulting data products must satisfy U.S. Census Bureau disclosure rules and support transportation planning at small area geography (TAZ).



NCHRP 8-79 Producing Transportation Data Products from the ACS that Comply with Disclosure Rules

- Research Team's Objective
 - Operationally-practical data perturbation approach
 - Satisfy transportation analytical needs
 - Satisfy the DRB rules
- Phases of research
 - Preliminary investigations
 - Development and evaluation -- current
 - Validation of best approach
 - National test of best approach



- Tables to be generated from the ACS 5-year data
 - Part 1 Residence
 - Means of Transportation (MOT)
 - Demographics and transportation variables
 - Part 2 Workplace
 - Part 3 Flows
 - E.g., Mean travel time



Disclosure risk

- Some disclosure concerns
 - Small geography – Traffic Analysis Zones (TAZs)
 - TAZ to TAZ flow tables -- many singletons

Risk reducing elements

Matchability to the ACS PUMS

Sampling rate

Mobility and change of workplace

Imputation and Census swapping procedure

Other measurement error (e.g., processing error)



Disclosure risk

- DRB disclosure rules on CTPP tables
 - Rule of 3 – Need to have at least 3 sample cases in...
 - Categories of Means of Transportation (MOT) when crossed with another variable
 - Cell means and aggregates
 - Flow tables that involve table variable other than MOT
 - Alternative to cell suppression needed
 - Becomes jointly a tabular and microdata problem due to table linking with potential to match to ACS PUMS



TAZ

- Software being developed by Caliper at CB
- TAZ Delineation Business Rules
- ARC Guidelines



TAZ Delineation

Business Rules Highlights

- http://download.ctpp.transportation.org/TAZ_Rules/TAZ%20Delineation%20Business%20Rules_CTPP%20Final.pdf
- Population – Residence and Workplace
 - At block, block group, or 2000 TAZ to assist
- Geography – 2010 vintage TIGER file is expected to be used
- TAZ and TAD



TAZ Size

- The Census Bureau recommends that the minimum resident worker population and workers by place of work level should be approximately 600 persons. This minimum corresponds to the minimum threshold allowable for 2010 Census block groups. However, this threshold is only a guideline or recommendation and is not a requirement. Base TAZs may be defined with fewer than 600 residents or workers; however, as a general rule, data reliability and availability improves as population size or number of workers increases.



TAZ Size and Characteristics

- **Compactness**
- **Nesting**
- **Contiguity and Slivers**
- **Water and Island Features**
- **Overlapping TAZs**
- **MPO IDs**
- **Uniqueness**
- **Boundary Restrictions**



TADs

- Census TADs. These are aggregates of the Base TAZs and must have an estimated population lower limit of 20,000 residents. The software would issue a warning when the threshold is not respected and reject the TAD. If Base TAZ are not defined for a particular county, Census TADs can be delineated using aggregates of 2010 census tracts or block groups instead.



ARC TAZ Delineation Strategic Plan

- Methodology
 - Each county is examined separately and modifications are proposed for review.
- Census tract geography is paramount in that census tracts are always treated as TAZ boundaries and all TAZs aggregate to tracts. In addition all roads that are in the NAVTEQ network are treated as TAZ boundaries.
- Process
 - The general process is step down starting with the county census tracts and working to progressively finer levels of detail, adding TAZ splits at each step.
 - All TAZ splits are done in ARCGIS with the Completed County Census Tracts as a base using the Editor's split polygon tool to maintain polygon boundary consistency.



ARC TAZ Delineation Strategic Plan Checks

- Check for TAZs below size threshold and remove/consolidate sliver zones or micro-zones
- Redistribute existing forecast data to new TAZs to check densities
- Assign surveyed transit trip table to revised TAZ structure