

The CTPP Workplace Data for Transportation Planning: A Systematic Review

Commissioned Paper for Applying Census Data for Transportation:
50 Years of Transportation Planning Data Progress

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Overview

- Background
- Objectives
- Methodology
- Comparative Analysis
- Utilization of the CTPP Workplace Data

Objectives



Objectives

- Discuss about the strengths and limitations of the CTPP as compared to other data products relevant for transportation planning
- Summarize a variety of uses of the CTPP and its workplace data
- Identifies the key subject areas and the emerging topics
- Suggest potential enhancements to the CTPP workplace data for better utilization

Methodology



Methodology

- Comparative analysis between the CTPP and other data products, such as:
 - Longitudinal Employer-Household Dynamics (LEHD)
Origin-Destination Employment Statistics (LODES)
 - National Household Travel Survey (NHTS)
- Literature review of over 300 studies that cite the use of the CTPP
 - Summary by subject area and publication year

Comparative Analysis



Design Comparison: Overview

1. Data Sources/Coverage
2. Data Update Frequency and Geographic Unit
3. Workplace Information



OnTheMap



Design Comparison: Data Sources/Coverage

CTPP

- Special tabulations from ACS on socioeconomic and demographic characteristics, home and work locations and commuting flows
- 2006-2010 ACS 5-year estimates – roughly 10% of all U.S. households

LODES

- Generated from administrative and survey data
- Produced by the LEHD program at the U.S. Census Bureau
- Collected administrative records from 50 states

NHTS

- Used customized survey to randomly survey households on travel behaviors
- Survey samples represent all areas within the U.S. (app. 129,000 households surveyed for the 2016 NHTS)

Design Comparison: Data Update Freq. & Geographic Unit

CTPP

- The latest CTPP product is 2006-2010 5-year CTPP (2006-2010 ACS). The next version of CTPP uses 2011-2015 ACS. Release roughly every five (5) years
- Available at TADs, TAZs and census tracts

LODES

- Available annually since year 2002 with the exceptions of some states
- Available at census block

NHTS

- The latest NHTS product is 2009 NHTS. The 2016 NHTS Public Use Data will be released in early 2018. Release roughly every 5-10 years.
- Latitude and longitude of trip ends (for Add-ons only)

Design Comparison: Workplace Information Available

CTPP

- 115 workplace based tables for over 200,000 geographies
- Including workplace location, commute mode, travel time, sex, age, race, ethnicity, citizenship status, language, earnings, poverty status, industry, number of vehicles available, etc.

LODES

- Workplace characteristics (i.e. firm size, firm age, industry sector, work location) and
- Worker characteristics (i.e. primary/secondary job, earnings, education, age, gender, ethnicity, house location)

NHTS

- The NHTS Add-on deliverables provide the location of origin and destination address which can be linked with main data files
- The main data file includes characteristics for each household, person, worker, vehicle, and daily travel data

Strengths of the CTPP

- The CTPP provides several unique socioeconomic and travel characteristics that are not included in the LODES
 - e.g., means of transportation, travel time to work, vehicle available and poverty status
- Improvement in its contents by introducing more customized tables since 1990
- The CTPP provides useful special tabulations from using sampled dataset to statistically represent all areas within the U.S.
- The CTPP allows users to analyze workplace and travel patterns with more customized tabulations than the LODES.

Limitations of the CTPP

- Although CTPP provides more variables about workplace at census tracts, the LODES is available at census blocks.
- To generate CTPP tabulations with low MOE, ACS 5-year estimates are used—which is difficult to perform temporal analyses using this data
- Due to confidentiality, some of the information is suppressed, which results in unsatisfactory statistical reliability.
- Inaccurate geocoding of workplace due to misreporting
- Data quality issues due to low sample size
- Omitting some low-frequency OD pairs (i.e. short trips by walk/bike) not capture by the survey

Uses of the CTPP



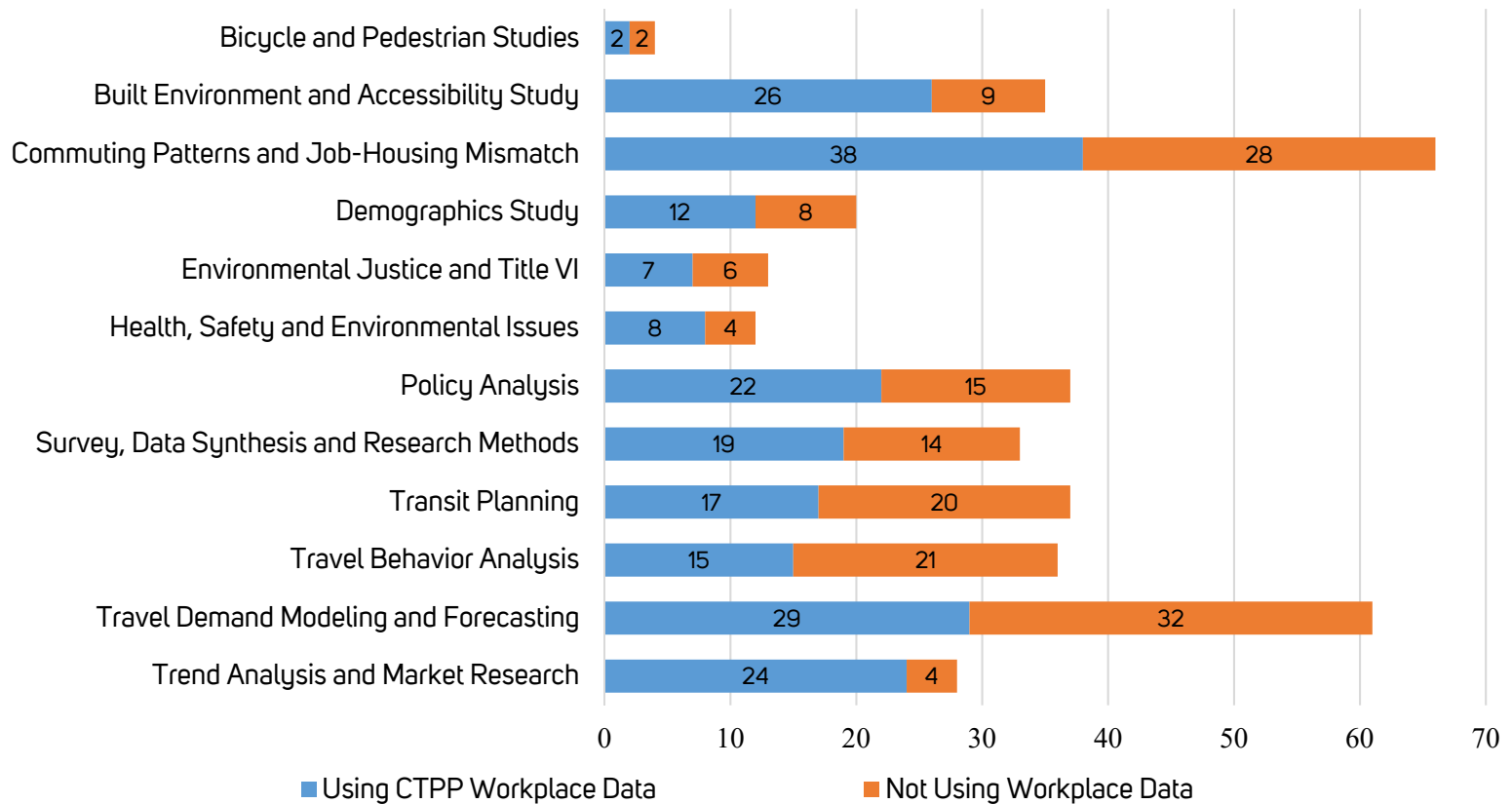
Literature Review

- Search for studies that cited the use of the CTPP from:
 - Academic libraries
 - Journal websites, such as TRR and JAPA
 - Various conference publication websites
 - Google search engine results pertaining to CTPP data
- The publication dates range from 1989 to 2017.
- The publication types included journal articles, dissertation/thesis, books, reports, conference proceedings, and poster presentations.

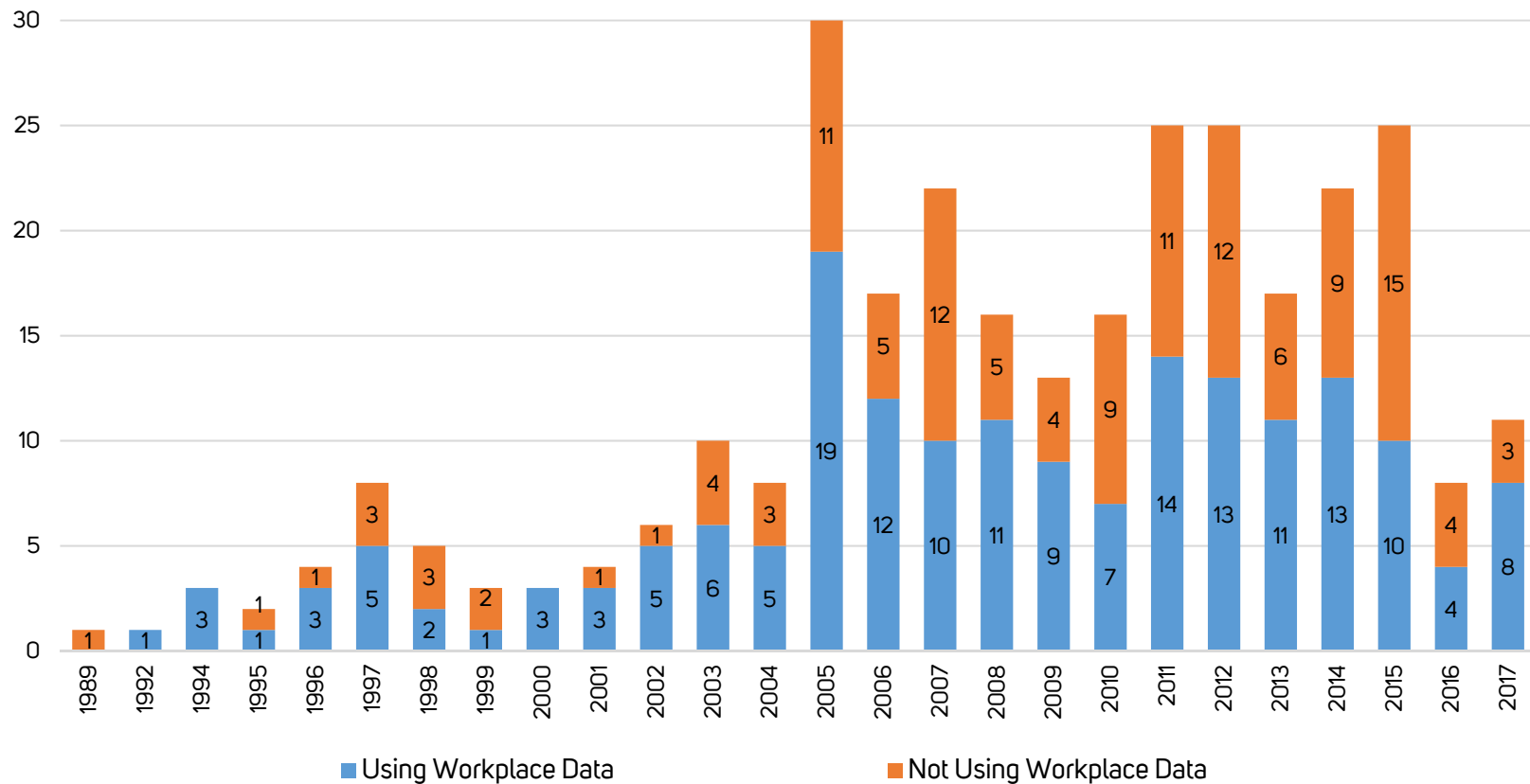
Subject Areas

- Grouping studies into 12 categories based on the primary subject area identified in their abstracts.
 - Bicycle & Pedestrian Studies
 - Built Environment & Accessibility Study
 - Commuting Patterns & Job-Housing Mismatch
 - Demographics Study
 - Environmental Justice & Title VI
 - Health, Safety & Environmental Issues
 - Policy Analysis
 - Survey, Data Synthesis & Research Methods
 - Transit Planning
 - Travel Behavior Analysis
 - Travel Demand Modeling & Forecasting
 - Trend Analysis & Market Research

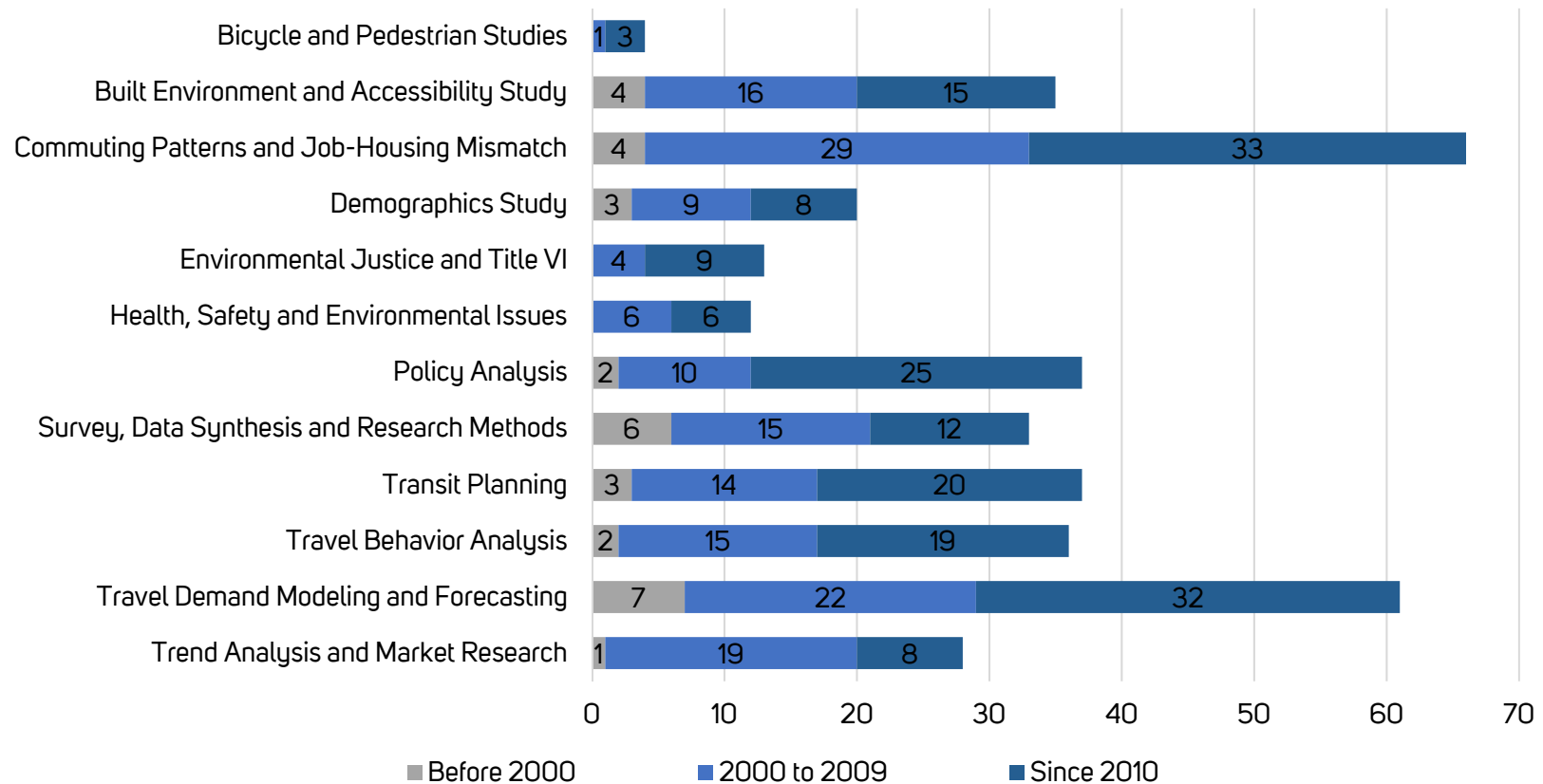
Uses of the CTPP Data by Subject Area



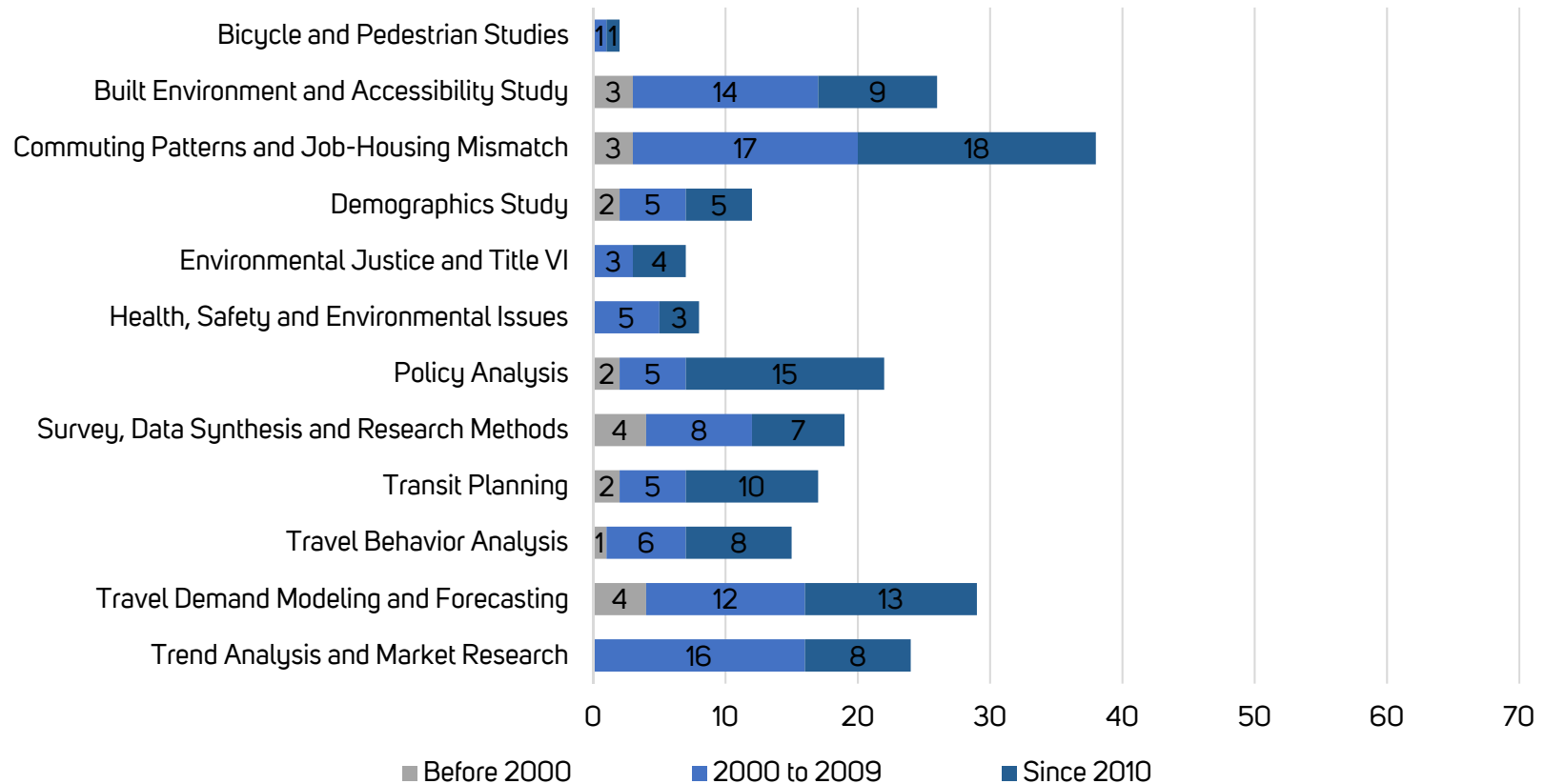
Uses of the CTPP Data by Publication Year



Uses of the CTPP Data by Subject Area & Publication Year



Uses of the CTPP Workplace Data by Subject Area & Publication Year



Key Subject Areas

- Key subject areas using the CTPP workplace data
 - Commuting Patterns & Job-Housing Mismatch
 - Travel Demand Modeling & Forecasting
 - Trend Analysis & Market Research
 - Built Environment & Accessibility Study
 - Policy Analysis
- Emerging subject areas using the CTPP workplace data
 - Bicycle & Pedestrian Studies
 - Environmental Justice & Title VI
 - Health, Safety & Environmental Issues
 - Trend Analysis and Market Research
 - demographics

Future Improvements

- The customized tables in 2011-2015 five-year CTPP will be reduced by app. one-third, as compared to the 2006-2010 CTPP.
- Accuracy of geocoding workplace locations
 - Incorporating real-time mapping application for respondents
- The CTPP workplace data may be integrated with other major datasets such as LODES and NHTS to unlock more unique workplace tabulations.
- Developing user friendly applications to easily retrieve the customized tables from the big CTPP datasets
- Sharing the best practices and collaborating with partner agencies to provide a technical support to local jurisdictions and data users.

Q&A

