Documentation for the Urban Institute's Summary Files
of the LEHD Origin-Destination Employment Statistics (LODES):
Census Tracts, Census Designated Places, and ZIP Code Tabulation Areas

LODES data provide a unique source of national fine-grain data over time by describing the number of jobs by place of work and place of residence. It includes tabulations for many characteristics of workers (race and ethnicity, education, income, and gender) and firms (industry, age, and size). The US Census Bureau has published LODES data for most states at the block level annually from 2002 to 2019 (see table below for exceptions).

Urban researchers have used LODES to analyze capital flows in Detroit (PDF) and create scores for Opportunity Zones (PDF). The National Neighborhood Indicators Partnership (NNIP) has also compiled many examples from their member organizations on the NNIP website, including an analysis of neighborhood change in Minneapolis and of opportunity in the Kansas City region (PDF).

To make these data accessible to more analysts, the Urban Institute has published files summarized at the census tract, census place, and census Zip Code Tabulation Area levels for public use. This is a brief description of the source and data provided by Urban. For more information on the source data, see the full census documentation (PDF).

The LODES data are derived from the Longitudinal Employer-Household Dynamics (LEHD) microdata. LEHD data link employee and employer data by combining administrative state unemployment insurance wage records with the American Community Survey and other administrative data. The source data are aggregated to the block level and adjusted when necessary to protect confidentiality.

The unit of observation for the LEHD program is a job, as opposed to a person. As such, the system captures multiple records when a person has more than one job. The "primary" job for an individual is defined as the job that paid them the most money. The Census Bureau publishes files for all jobs and for primary jobs.

The US Census Bureau released data for 2019 in December 2021, and there is currently no public information about the next release. The Urban Institute has published a total of sixteen datasets derived from LODES for each level of geography, drawn from the following core datasets:

- Residence Area Characteristics (RAC): the number of jobs by census tract where the employee lives
- Workplace Area Characteristics (WAC): the total number of jobs by the census tract where the employee works

For these two categories, we have produced the following:

- Five files that provide the longest series available of consistent data (2002–18)
  - All jobs: includes multiple jobs per worker, excluding federal employment, for 2002–19
  - Primary jobs: includes one job per worker, excluding federal employment, for 2002–19
  - All jobs, excluding federal employment, for jobs that earn $1,250 per month or less for 2002–19.
  - All jobs, excluding federal employment, for jobs that earn 1,251 - $3,333 per month for 2002–19.
  - All jobs, excluding federal employment, for jobs that earn $3,333 per month or more for 2002–19.

- Two files that cover the recently released data on federal jobs
  - All federal jobs: includes all federal jobs in most agencies (PDF) for 2010–19
  - Primary federal jobs: includes federal jobs in most agencies (PDF) that are classified as primary jobs for 2010–19

- One file covering private-sector jobs, which includes firm size and age for most years
  - Private jobs: includes private-sector jobs for 2002–19.

The Census Bureau publishes a third file not summarized by Urban at this time—the Origin-Destination (OD) file, which lists, at the census block level, the number of jobs for which a person works in one census block and lives in another census block.

Notes on definitions and changes in variables

The LODES system covers jobs in the private sector that are included in the Unemployment Insurance program and federal jobs as provided by the Office of Personnel Management (OPM). Thus, it does not include the military, self-employed workers, informally employed people, and several other specific classes of workers.

OPM provided data on federal jobs from 2010 to 2019. Federal employee numbers might change between 2014 and 2015 in a given geography because OPM released guidance exempting additional federal job categories from being counted in LODES. The magnitude of the change led to a 14 percent decline in federal counted jobs in LODES from 2014 to 2015. For more detail, see the Census Bureau's LODES data note (PDF).

Datasets for 2009 to 2019 contain additional variables (race, ethnicity, education, and sex) on the RAC and WAC files that are not available in other years of data. And datasets for 2011 to 2017 contain additional variables (firm age and firm size) on the WAC private jobs file.

Notes on geography

The data are enumerated with 2010 census blocks. We merged the data files for all years with the most recent version of the census provided geographic crosswalk by the 2010 Census tabulation block code (tabblk2010—the primary identifier) to obtain the most recent definitions of legal, statistical, or administrative areas. We summarize the data for three levels of geography: census tract, ZIP Code Tabulation Areas (ZCTAs), and census designated places.

Census Tract Files

We summarized by the census tract code provided. Note that in 0.01 percent of the blocks, the census tract assignment differed from the census tract associated with the tabulation block code. In a very small percentage of cases, this difference also resulted in a change in state. The number of jobs affected was very small—less than 0.05 percent. This difference resulted in a few block observations for states for years in which data were not published for that state (primarily Massachusetts, as per the table above, for which we are missing the most WAC data). We deleted those blocks before creating our tract-level files.

ZIP Code Tabulation Area Files

We summarized by the ZCTA code provided. ZCTAs are only approximations of ZIP Codes created for statistical purposes and may cross state lines; see the Census Bureau website for a full description. There may be ZCTAs that are partially or entirely within states that do not have WAC data for a given year, and thus may have an undercount of total number of jobs within those ZCTAs for the missing years.

Census Designated Place Files

We summarized by the Census Designated Place code provided. See the Census Bureau website for a description of Census Designated Places.

Missing Data for Selected States

Some states are missing data for some years, as listed in table 1 below. The residential data is originally derived from the workplace records. People who work in the states with missing data but live in adjacent states will be missed in their home state counts in the RAC files.

Table 1. State-Year Combinations without OD/WAC Data

Alaska	2017-2019
Arizona	2002–03
Arkansas	2002, 2019
District of Columbia	2002–09
Massachusetts	2002–10
Mississippi	2002–03, 2019
New Hampshire	2002
Puerto Rico	All years
US Virgin Islands	All years

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> Urban Institute. 2022. ZCTA–Level Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics (LODES). Accessible from https://datacatalog.urban.org/dataset/census-zcta-level-longitudinal-employer-household-dynamics-origin-destination-employment. Data originally sourced from the US Census Bureau, developed at the Urban Institute, and made available under the ODC-BY 1.0 Attribution License.

> Urban Institute. 2022. Census Place–Level Longitudinal Employer-Household Dynamics Origin-Destination Employment Statistics (LODES). Accessible from

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Reference

U.S. Census Bureau. LEHD Origin-Destination Employment Statistics Data (2002–2019) [computer file]. Washington, DC: US Census Bureau, Longitudinal-Employer Household Dynamics Program [distributor], accessed March 9th, 2022 at https://lehd.ces.census.gov/data/lodes/LODES7/LODESTechDoc7.5.pdf [version]