

OnTheMap: Data Overview (LODES Version 8)

Longitudinal Employer-Household Dynamics

LEHD Origin-Destination Employment Statistics (LODES)¹ are the job data that are delivered in the OnTheMap application. This document describes the contents of the LODES Version 8 dataset in the context of the OnTheMap application.

Overview

As with previous versions of data released in OnTheMap, LODES Version 8 is a partially synthetic dataset that describes geographic patterns of jobs by their employment locations and residential locations as well as the connections between the two locations. These data and marginal summaries are tabulated by several categorical variables. More detailed information on the variables and scope of the data follows.

Job Definition

In the context of LODES and OnTheMap, a job is counted if a worker is employed with positive earnings during the reference quarter as well as in the quarter prior to the reference quarter. This is called a “beginning of quarter” job because the assumption is that the worker was employed on the first day of the reference quarter.

Years

LODES Version 8 includes data for 2002-2022, for which Quarter 2 (April – June) is the reference period in each year. Not all states have data available for each year and not every variable is available in each year.

States

LODES Version 8 includes 51 states and territories. Unavailable data are listed in Table 1:

¹ Formerly, the LODES data was referred to as “OnTheMap data.” “OnTheMap” now refers only to the web-based data tool. The U.S. Census Bureau reviewed the LODES data product for unauthorized disclosure of confidential information and approved the disclosure avoidance practices applied to this release. CBDRB-FY21-249.

Table 1: State-Year Combinations without OD/WAC data

| State (or equivalent) | Years |
|-----------------------|----------------------|
| Alaska | 2017-2022 |
| Arizona | 2002-2003 |
| Arkansas | 2002 |
| District of Columbia | 2002-2009 |
| Massachusetts | 2002-2010 |
| Michigan | 2022 |
| Mississippi | 2002-2003, 2019-2022 |
| New Hampshire | 2002 |
| Puerto Rico | All Years |
| U.S. Virgin Islands | All Years |

Geographical Vintage

LODES Version 8 and OnTheMap use 2020 census blocks, defined for the 2020 Decennial Census, as their base geography. Data released in previous versions of LODES and OnTheMap used 2010 or 2000 census blocks as the geographical base. For data previously released in 2010 census blocks, the LODES data has been “crosswalked” or “transformed” into the base of 2020 census blocks. Further information on how OnTheMap and LODES implement the 2010 census blocks can be found in [OnTheMap: Updating the Base Geography](#) [PDF 98KB].

LODES Version 8 is based on 2023 TIGER/Line shapefiles. The data are enumerated with 2020 census blocks.²

Data Structure

The overall file structure of LODES Version 8 remains similar to that of previous versions. The origin-destination (OD) matrix is made available by 10 different “labor market segments.” The area characteristic (AC) data – summary margins by residence block and workplace block – contain additional variables including age, earnings, and industry plus the newer variables outlined below. The [LODES Technical Documentation](#) provides additional details on data structure.

In OnTheMap, the OD data are used to produce the Destination, Distance/Direction, Inflow/Outflow, and Paired Area analyses. The AC data are used to produce the Area Profile and Area Comparison analyses.

Variables

The age, earnings, and industry variables will continue to be implemented as they have been in the last few releases of the LODES data. Additional variables were introduced Version 5, 6, and

² See [census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html](https://www.census.gov/geographies/mapping-files/time-series/geo/tiger-line-file.html) for more information on the TIGER/Line data products and lehd.ces.census.gov/applications/help/onthemap.html#!geographic_data for more information on how OnTheMap sources its geography.

7 of LODES. All variables available as part of LODES Version 8 are described below. In addition, Table 1 lists all the possible categories for each variable.

Age, Earnings, and Industry

These are the original variables released in OnTheMap. Age and Earnings serve as both “labor market segments” and as “area characteristics”. Industry is report in two separate aggregations: The Industry Sectors are the 20 top-level NAICS sectors and these are part of the area characteristics data. The Industry Groups are 3 aggregations of the Industry Sectors and are part of the labor market segments. More detailed information on the difference between Industry Sectors and Industry Groups is in Table 1.

Sex, Race, Ethnicity, and Education

The race, ethnicity, and education (REE) variables were released with LODES Version 5 and are available in Version 6, 7, and 8. The Race and Ethnicity variables conform to OMB standards for publication of data on race and ethnicity. Further information about OMB standards can be found at www.whitehouse.gov/wp-content/uploads/2017/11/Revisions-to-the-Standards-for-the-Classification-of-Federal-Data-on-Race-and-Ethnicity-October30-1997.pdf. The REE variables are only available in the area characteristic data and not on the OD files. With the release of Version 8, the REE variables – are available in data years 2009 onward in all states that have data for those years. The Sex variable – as the REE variables – is available in data years 2009 onward and only in the area characteristics data.

Firm Age and Firm Size

Firm Age and Firm Size variables were released with LODES Version 7 and continue in Version 8. Firm Age and Firm Size are only available for All Private Jobs and are not crossed with any of the labor market segments. Additionally, these variables only appear on the Workplace Area Characteristics – that is, these variables do not appear on the OD matrix or on the Residence margins. For further information about the Firm Age and Firm Size variables, see the [one page brief](#) [95 KB] about them or read more at the [LEHD Research page](#). In Version 8, data years 2011 onward contain Firm Age and Size data.

Ownership, Job Dominance, and Job Type

In addition to the variables that appear explicitly as labor market segments and area characteristics, two other variables are used to classify job counts: ownership and job dominance. Ownership refers to the ownership class of the firm to which the job belongs. LODES and OnTheMap use only two ownership classifications, private and public, the latter of which consists of local, state, and Federal government employers. However, instead of reporting both private and public independently, LODES and OnTheMap release a “Private” count and an “All” count which totals private and public. The Public count can be constructed by subtracting Private from All.

Job dominance is a feature of the LODES data made available because the LEHD data infrastructure tracks jobs as its primary unit instead of people. As such, the system naturally captures more than one job per person when available in the data. The dominant (or primary) job for an individual is defined as the job that earned the individual the most money.

Constructed this way, the number of primary jobs should be equal to the number of workers. LODES and OnTheMap release “Primary” jobs and “All” jobs so that “Non-primary” jobs can be calculated through subtraction.

Job Type is an auxiliary variable constructed by crossing the Ownership categories with the Job Dominance categories. LODES and OnTheMap report the data according to job type rather than by ownership or job dominance individually. The four Job Type categories are listed below:

Table 2: Job Types

| | | Ownership | |
|---------------|---------------|---------------|----------------------|
| | | All Ownership | Private Jobs |
| Job Dominance | All Dominance | All Jobs | All Private Jobs |
| | Primary Jobs | Primary Jobs | Private Primary Jobs |

Coverage

Until LODES Version 6, the LEHD program and – as a result – LODES/OnTheMap have been limited in coverage to unemployment insurance-covered jobs in partner states. With the release of Version 6 LODES data, the program began reporting data for Federal workers. In Version 8, data years from 2010 onward contain Federal workers³.

Variable Details

The following table provides a list of all the variables by which the LODES data are categorized. Not all variables are released on the origin-destination matrix or for the inclusion in the OnTheMap application. Unless otherwise stated, a “total” category is always available, in some cases at the exclusion of one other category for a certain variable. In these cases, the additional variable can always be calculated by complementarity.

Table 3: Variable Details

| Variable (Category Count) | Categories |
|------------------------------|------------------------------|
| Age (3) | 29 or younger |
| | 30 to 54 |
| | 55 or older |
| Earnings (3) | \$1250/month or less |
| | \$1251/month to \$3333/month |
| | Greater than \$3333/month |

³ For more information about Federal employment data in LODES, please see lehd.ces.census.gov/doc/help/onthemap/FederalEmploymentInOnTheMap.pdf as well as lehd.ces.census.gov/doc/help/onthemap/LODESDataNote-FedEmp2015.pdf.

| | |
|----------------------------|---|
| Industry Group (3) | Goods Producing industry sectors ⁴ |
| | Trade, Transportation, and Utilities industry sectors |
| | All Other Services industry sectors |
| Industry Sectors (20) | 20 categories, available at census.gov/naics/ |
| Race (6) | White Alone |
| | Black or African American Alone |
| | American Indian or Alaska Native Alone |
| | Asian Alone |
| | Native Hawaiian or Other Pacific Islander Alone |
| | Two or More Race Groups |
| Ethnicity (2) | Not Hispanic or Latino |
| | Hispanic or Latino |
| Educational Attainment (4) | Not available (29 or younger) ⁵ |
| | Less than high school |
| | High school or equivalent, no college |
| | Some college or Associate degree |
| | Bachelor's degree or advanced degree |
| Sex (2) | Male |
| | Female |
| Job Dominance (2) | Primary Job |
| | Non-primary Job ⁶ |
| Ownership (2) | Private |
| | Public ⁷ |
| Firm Age ⁸ (5) | 0-1 Years |
| | 2-3 Years |
| | 4-5 Years |
| | 6-10 Years |
| | 11+ Years |
| Firm Size (5) | 0-19 Employees |
| | 20-49 Employees |
| | 50-249 Employees |
| | 250-499 Employees |
| | 500+ Employees |

⁴ The 2-digit NAICS codes associated with the industry Labor Market Segments are as follows: *Goods Producing* (SI01) includes NAICS 11, 21, 23, and 31-33, *Trade Transportation and Utilities* (SI02) includes NAICS 42, 44-45, 48-49, and 22, and *All Other Services* (SI03) includes the remaining twelve 2-digit NAICS industry sectors.

⁵ Because educational attainment is dynamic for younger populations, LODES and OnTheMap only provides data for the Educational Attainment characteristic for workers age 30 or older. For example, if a user selects Age 29 and Younger as the Labor Market Segment for an Area Profile analysis, Educational Attainment data will be unavailable for that analysis. All other characteristic groups in this example (Age, Earnings, NAICS Industry Sector, Race, Ethnicity, and Sex) would contain data.

⁶ Non-primary jobs are not released but can be calculated by subtracting Primary jobs from the Total.

⁷ Public jobs are not released but can be calculated by subtracting Private jobs from the Total.

⁸ Firm Age and Firm Size are only available for All Private Jobs and are not crossed with any of the labor market segments.

Further information about the construction of these new variables will become available at lehd.ces.census.gov.

Questions or comments should be sent to CES.OnTheMap.Feedback@census.gov.