

Spatiotemporal Analysis of Freight Patterns in Southern California Dataset

Dataset available at: <https://doi.org/10.25338/B8X030>

(This dataset supports report **Spatio-Temporal Analysis of Freight Patterns in Southern California**, <https://doi.org/10.7922/G2MG7MS4>)

This U.S. Department of Transportation-funded dataset is preserved by the University of California, Davis in the digital repository Dryad (<https://datadryad.org>), and is available at <https://doi.org/10.25338/B8X030>.

The related final report **Spatio-Temporal Analysis of Freight Patterns in Southern California**, is available from the National Transportation Library's Digital Repository at <https://rosap.ntl.bts.gov/view/dot/57495>.

Metadata from the Dryad Repository record:

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Abstract:

There has been general trend to shift the location of warehouses and distribution facilities away from consumer markets (logistics sprawl) in Southern California. This shift has a negative impact on cost and the environment because freight vehicles have to travel longer to reach their destinations. However, during the last decade, this trend has not continued at the same pace, and it may have even reversed. Two main factors potentially explain this phenomenon: the 2008-2009 economic slow-down, and an increase in e-commerce activity. E-commerce impacts are relevant for freight planning because of the changes in vehicle size to distribute smaller shipments at higher frequencies, consumer proximity requirements to improve delivery times, and the redistribution of freight activity and supply chain configurations.

This research conducted spatio-temporal analyses of Caltrans Weigh-in-Motion data to validate some of these assumptions. There is evidence that during 2003-2015, the short-haul volume has increased by 69%, whereas long-haul 59%. The analyses identified changes in concentrations of trip origins by vehicle evidencing changes in long-haul versus last-mile distribution patterns. The results can help estimate changes in vehicles miles traveled, and more importantly, identify the geographical areas of the most impacted communities.

- **Methods:** The data was collected from Caltrans Weigh-in-Motion (WIM) database. The California Department of Transportation (Caltrans) has installed WIM devices in about 150 sites. Several stations are at PrePass locations, but the majority are spread throughout the transportation network as WIM data stations. The Caltrans WIM database contains the information of the WIM data stations in 13 years (2003-2015). California has twelve districts, but this analysis was filtered the data base with the four districts in southern California and their 39 stations, it also includedes analysis of raw_wim and vehicle class using those vehicles with maxgvw>0 and gvw>0. The database also contains information of twelve vehicle classes (VC), from VC 4 to VC 15. Vehicle class 4 is bus service and vehicle class 15 is unclassified. Therefore, the analysis excludes these two classes (Class

7 is another particular case). Finally, the variables recorded are Gross vehicle weight (GVW) and Maximum gross vehicle weight (maxGVW).

- Usage Notes: The data set contains the 18 columns: Vehicle class, district, county, raw_wim, year, minGVW, maxGVW, meanGVW, minLTR, maxLTR, meanLTE, volume, Q1GVW, Q2GVW, Q3GVW, Q1LTR, Q2LTR, and Q3LTR. GVW means gross vehicle weight, max=maximum. min=minimum, Q1, Q2 and Q3= quartiles 1, 2 and 3, finally volume= number of vehicles. There are 5070 rows and 145076053 vehicles measured.
- Funding: Pacific Southwest Region University Transportation Center

Recommended citation:

Rivera-Royero, Daniel et al. (2020), Dataset: Spatiotemporal analysis of freight patterns in Southern California, Dryad, Dataset, <https://doi.org/10.25338/B8X030>

Dataset description:

This dataset contains 1 .zip file collection described below.

doi_10.25338_B8X030_v5.zip:

This collection contains 1 .csv file listed below.

- DATAMANAGEMENT_f.csv

The .csv, Comma Separated Value, file is a simple format that is designed for a database table and supported by many applications. The .csv file is often used for moving tabular data between two different computer programs, due to its open format. The most common software used to open .csv files are Microsoft Excel and RecordEditor, (for more information on .csv files and software, please visit <https://www.file-extensions.org/csv-file-extension>).

National Transportation Library (NTL) Curation Note:

As this dataset is preserved in a repository outside U.S. DOT control, as allowed by the U.S. DOT's Public Access Plan (<https://doi.org/10.21949/1503647>) Section 7.4.2 Data, the NTL staff has performed *NO* additional curation actions on this dataset. NTL staff last accessed this dataset at <https://doi.org/10.25338/B8X030> on 2021-10-26. If, in the future, you have trouble accessing this dataset at the host repository, please email NTLDataCurator@dot.gov describing your problem. NTL staff will do its best to assist you at that time.