

Comparing CTPP and LEHD on Journey-to-Work Trip Length Distributions Statewide in Ohio

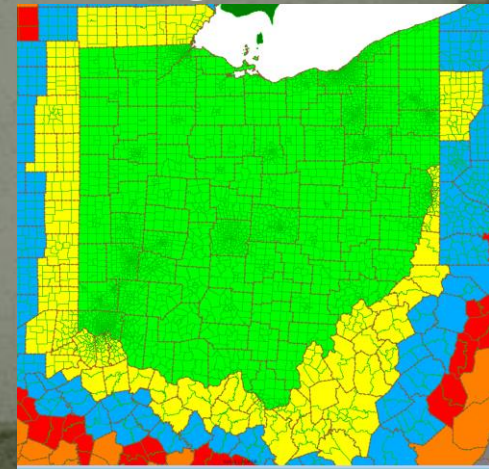
Sam Granato, Ohio DOT

For the TRB Census data conference, 11-16-17



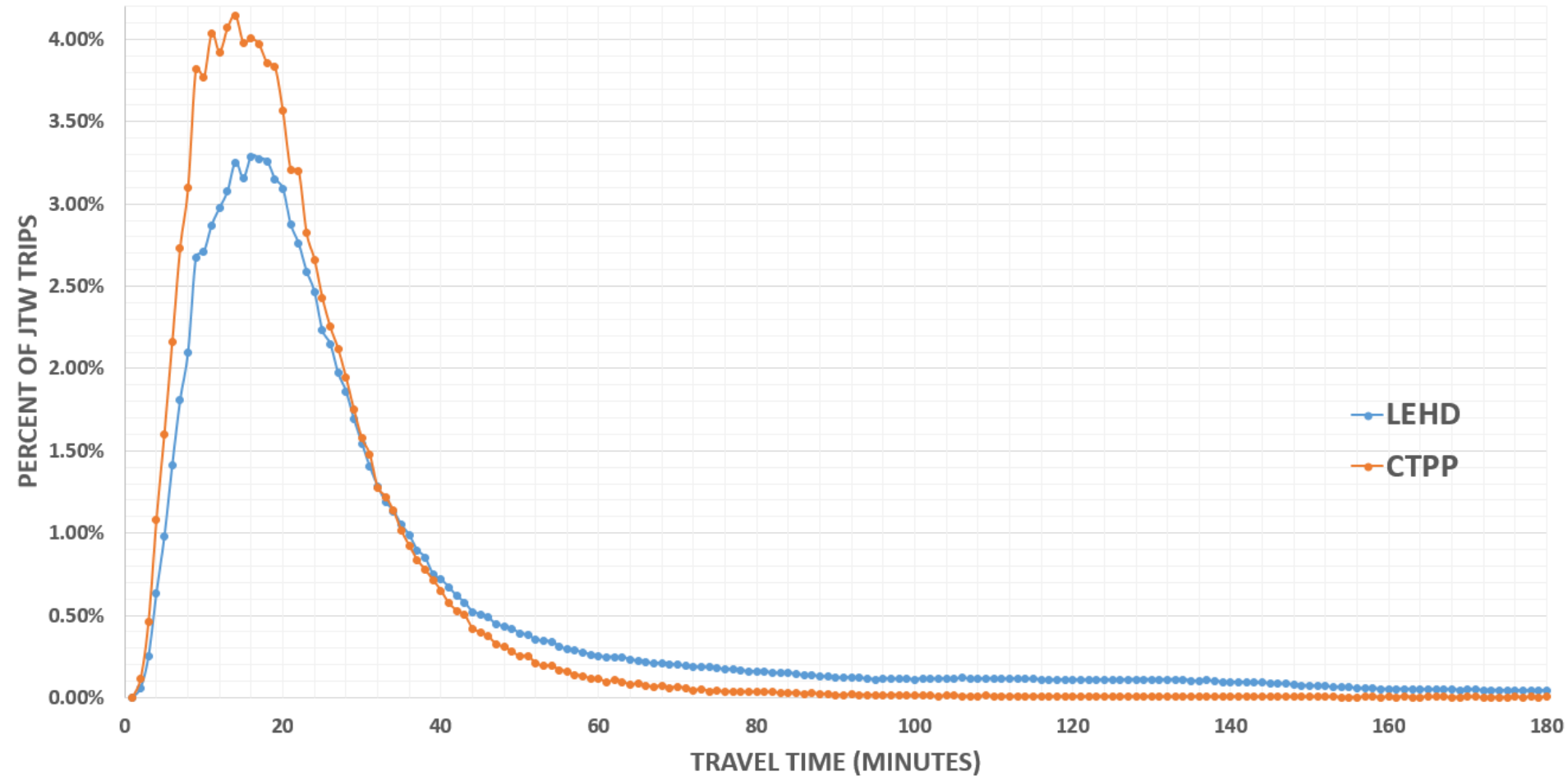
How were journey to work trip lengths estimated?

- Using statewide travel model network (collector & above)
- Aggregated census blocks up to tracts, based on use of CTPP trip table, also used only “primary” jobs from LEHD
- Average travel times on network based on statewide floating car surveys by type of route.
- Restricted the comparison to trips having both origin and destination inside the state of Ohio



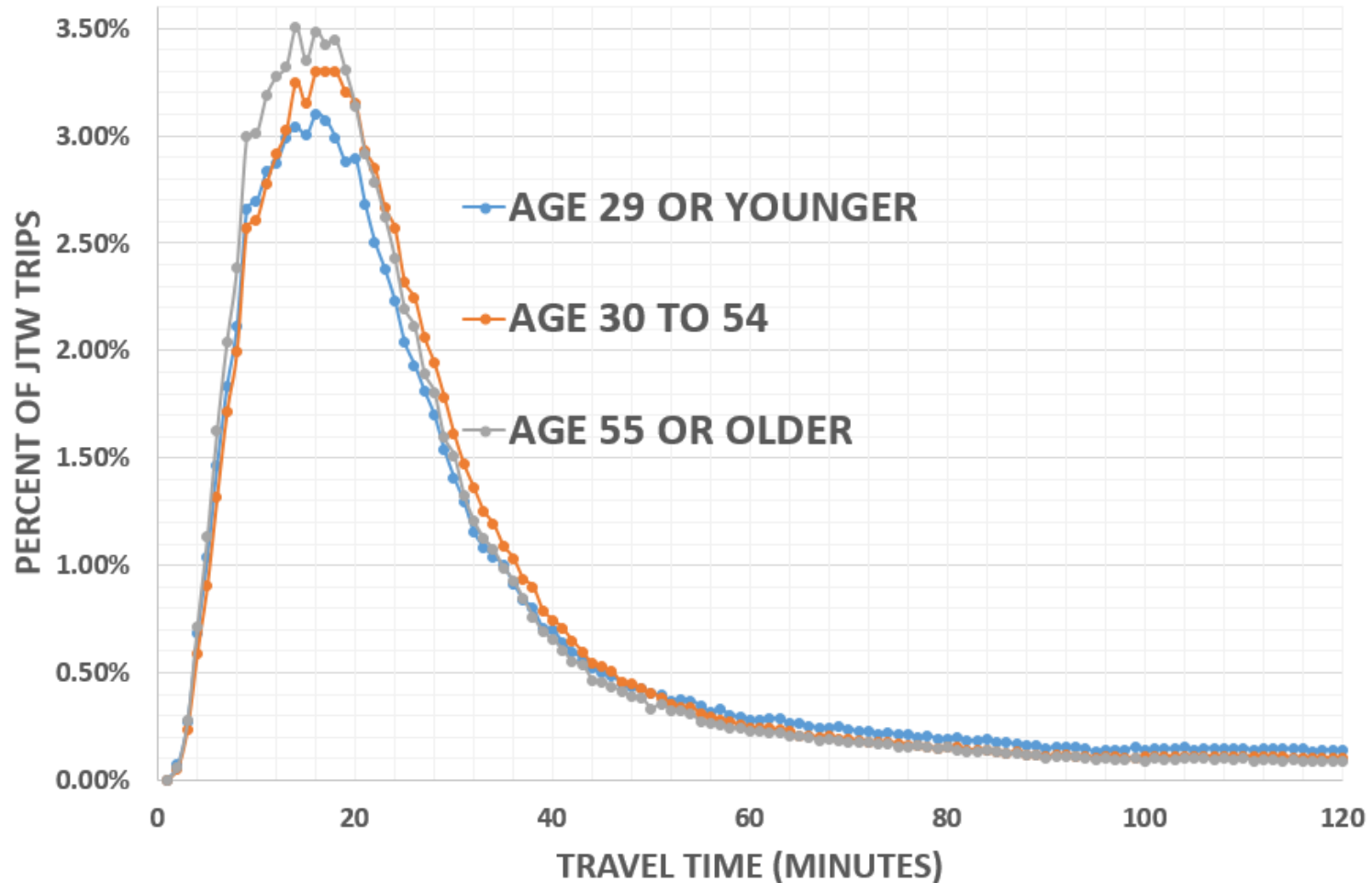
And what was the overall result for Ohio?

TRIP LENGTH DISTRIBUTION - LEHD VS CTPP



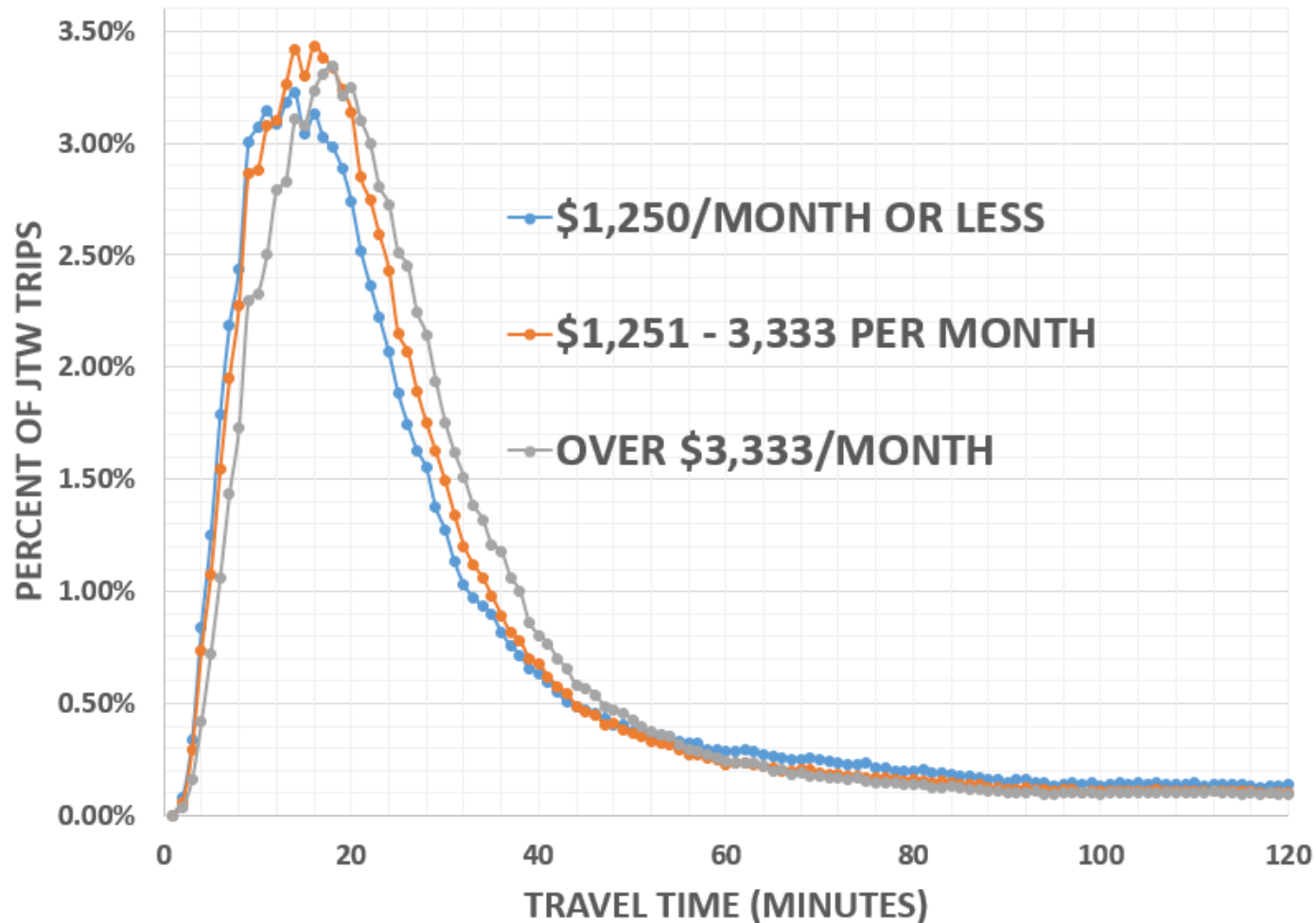
Breaking down the LEHD distribution by age group:

TRIP LENGTH FREQUENCY BY AGE GROUP IN OHIO



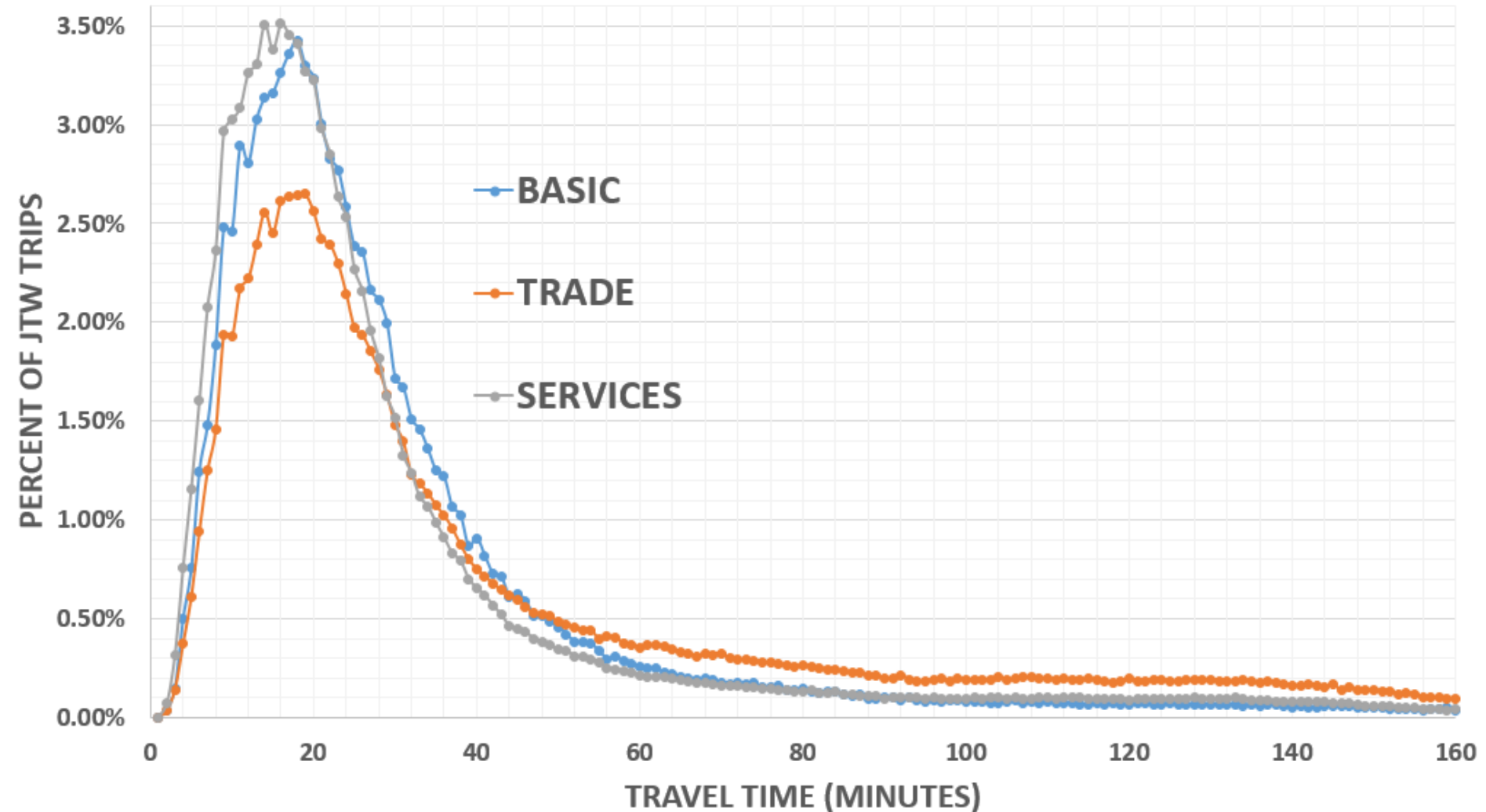
Breaking down the LEHD distribution by worker salary:

TRIP LENGTH FREQUENCY BY EARNINGS IN OHIO



Breaking down the LEHD distribution by industry:

TRIP LENGTH FREQUENCY BY INDUSTRY GROUP IN OHIO



Possible reasons for “excessively long” home-to-work trip lengths in LEHD:

- Some work trips not made (routinely) every day
- Differences in the data source used between home location and work location in LEHD (well beyond the CTPP distinction between “typical” and “last week”)
- Some employers not reporting all offices/factories/other work sites for QCEW (or not allocating workers to multiple sites correctly)?
- Inherent difficulty in some cases relating the actual workplace to a consistent geocodable address (i.e. working “on the road” or “in the field”)



Difficulty to ID causes of differences:

- Industry breakdown not the same for CTPP & LEHD
- Census PUMS can provide more detailed breakdown (but only with stated, not modeled, travel times)
- QCEW data can provide more detailed breakdown (for those with access to that data)
- Trip tables don't ID a specific employer (but could in most instances where only one employer geocoded to a census block in the QCEW file)
- Could lack of self-employed workers in LEHD make a big difference compared to Census data?

Impact of self-employed in journey-to-work travel times in Census data (PUMS)

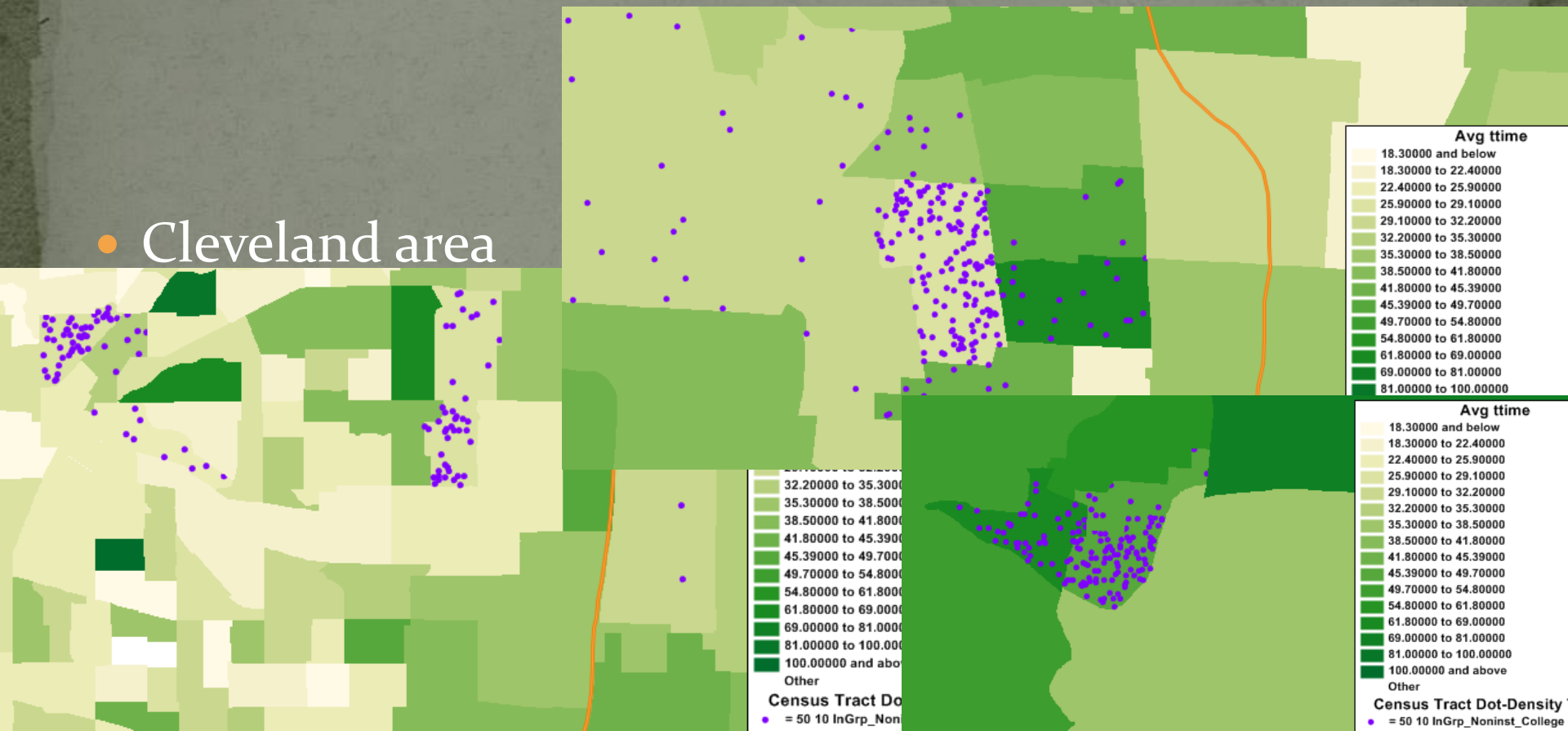
- Re chart below, some differences found, but overall average travel time estimated to be affected only 1% (at least in Ohio)
- Most self-employment is not the “primary” job that is the focus of Census data

AVERAGE TRAVEL TIME TO WORK (MIN)	
FROM 2006-2010 PUMS DATA, STATE OF OHIO	
CLASS OF WORKER:	
WAGE AND SALARY (COW=1-5)	22.7
SELF-EMP./UNPAID (COW=6-8)	21.2
OVERALL AVERAGE	22.6

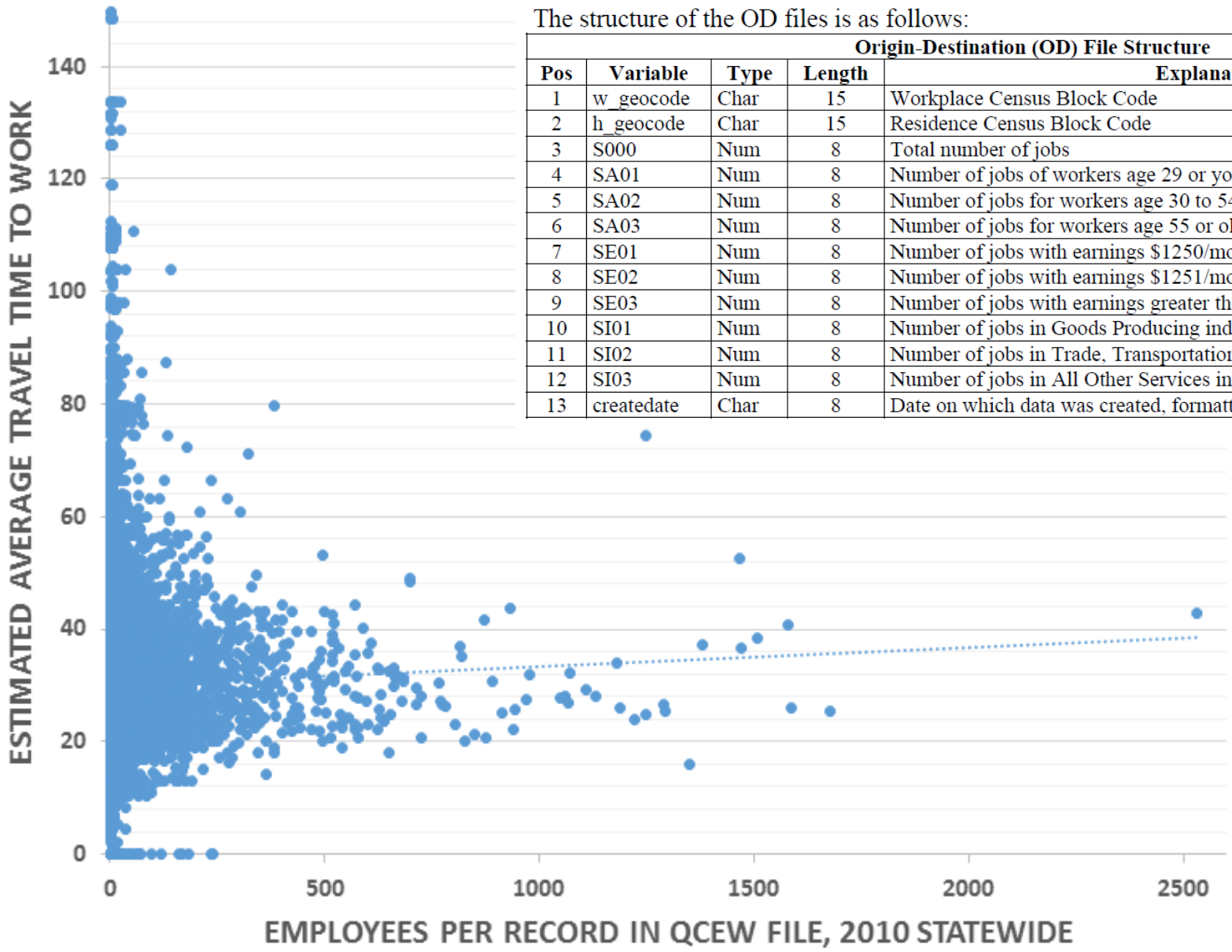
Impact of students in dormitories? Significant for estimated workforce at place of residence, but little impact for average travel time to work.

- OSU/OU main campuses

- Cleveland area



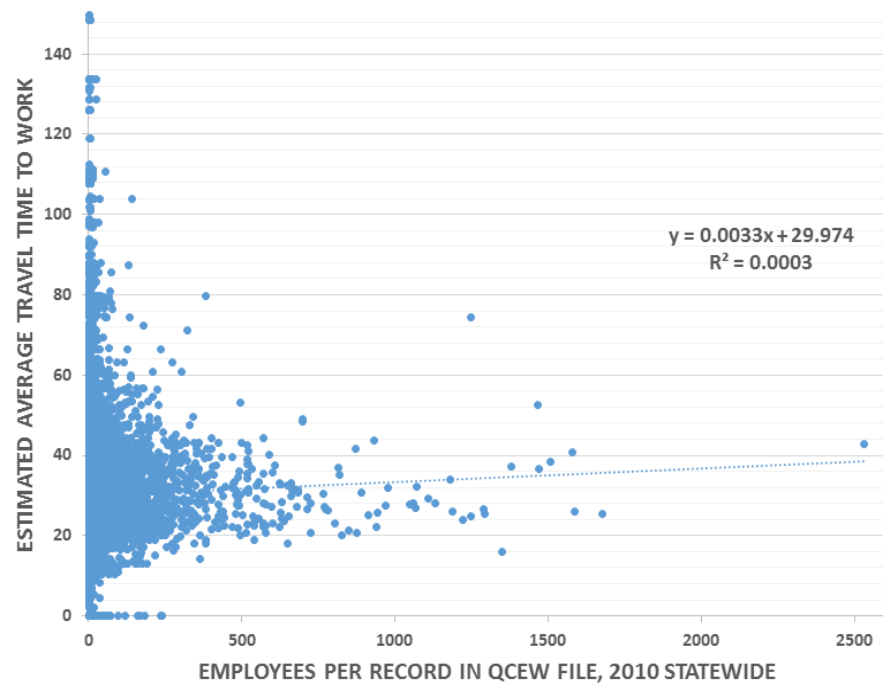
PRIMARY EMPLOYMENT (QCEW FILE STATEWIDE, BY UIN#)



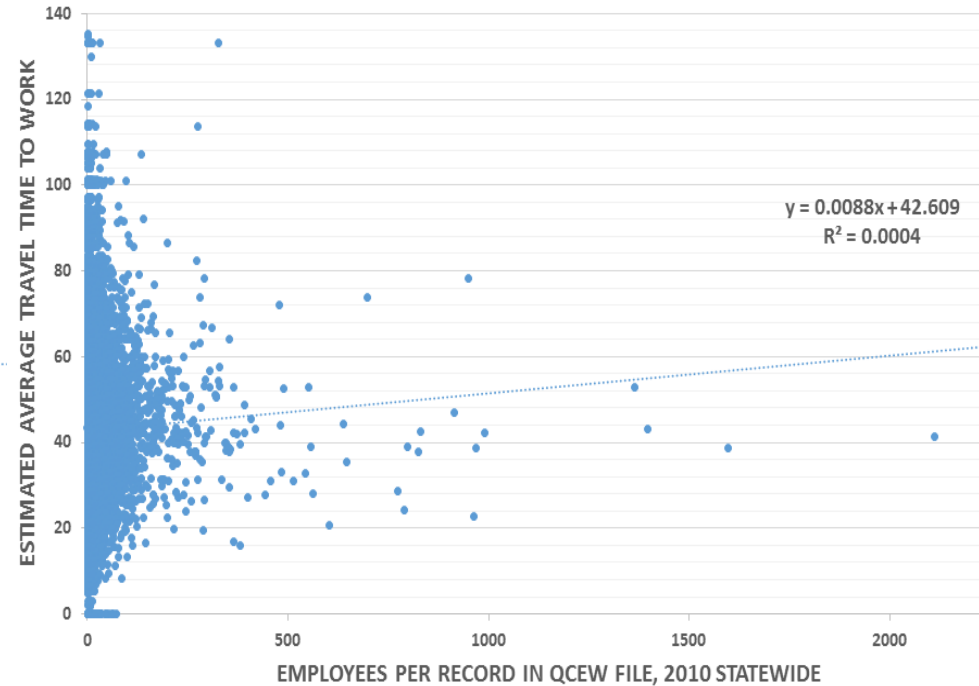
The structure of the OD files is as follows:

Origin-Destination (OD) File Structure				
Pos	Variable	Type	Length	Explanation
1	w_geocode	Char	15	Workplace Census Block Code
2	h_geocode	Char	15	Residence Census Block Code
3	S000	Num	8	Total number of jobs
4	SA01	Num	8	Number of jobs of workers age 29 or younger
5	SA02	Num	8	Number of jobs for workers age 30 to 54
6	SA03	Num	8	Number of jobs for workers age 55 or older
7	SE01	Num	8	Number of jobs with earnings \$1250/month or less
8	SE02	Num	8	Number of jobs with earnings \$1251/month to \$3333/month
9	SE03	Num	8	Number of jobs with earnings greater than \$3333/month
10	SI01	Num	8	Number of jobs in Goods Producing industry sectors
11	SI02	Num	8	Number of jobs in Trade, Transportation, and Utilities industry sectors
12	SI03	Num	8	Number of jobs in All Other Services industry sectors
13	createdate	Char	8	Date on which data was created, formatted as YYYYMMDD

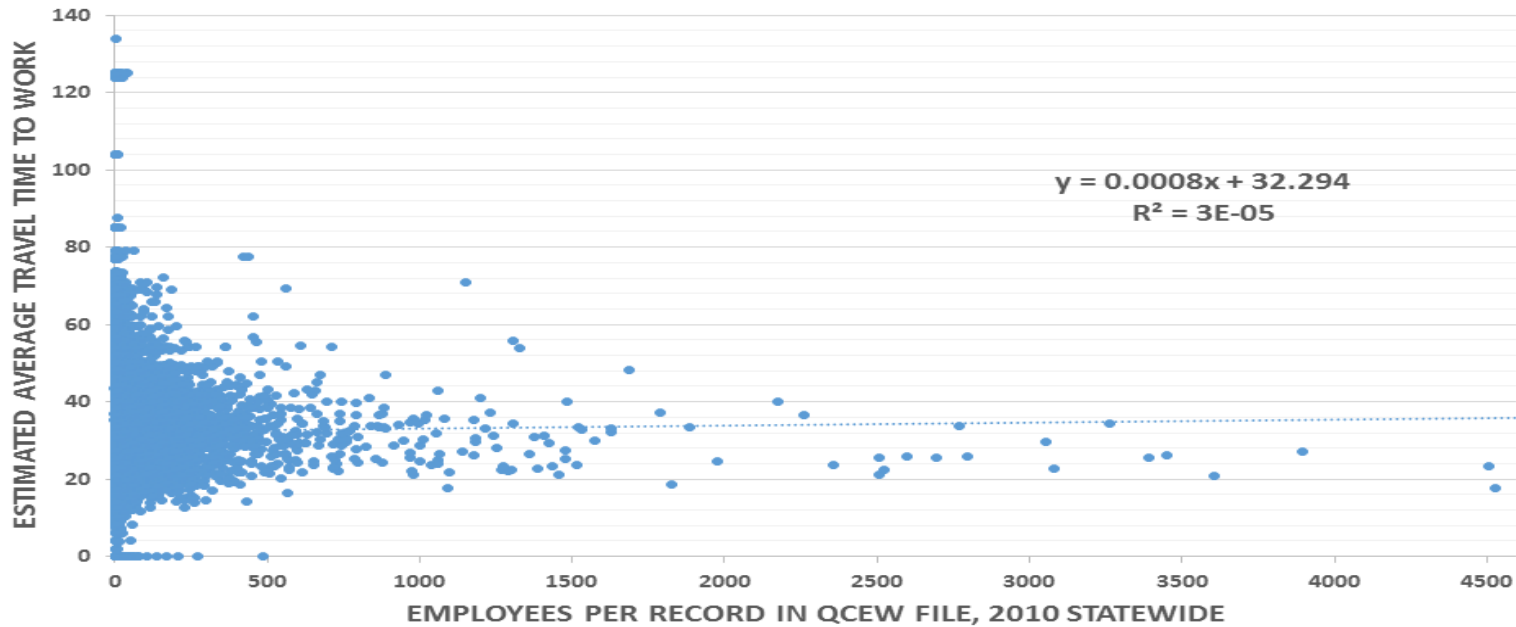
PRIMARY EMPLOYMENT (QCEW FILE STATEWIDE, BY UIN#)



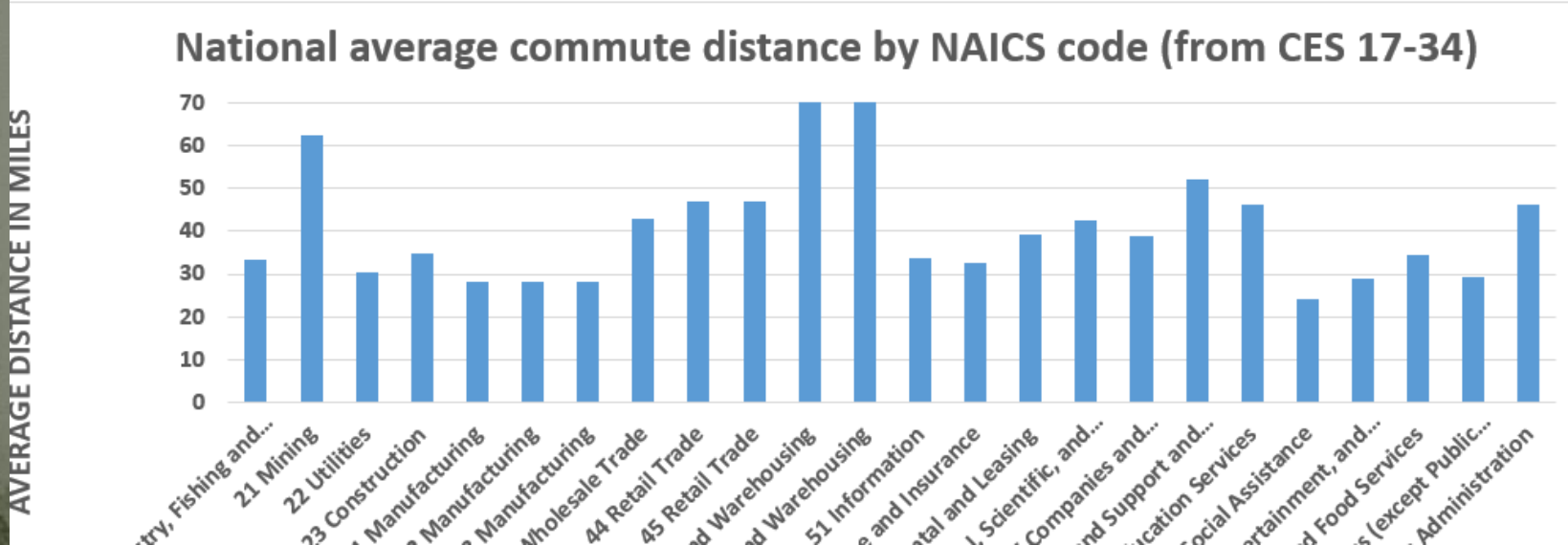
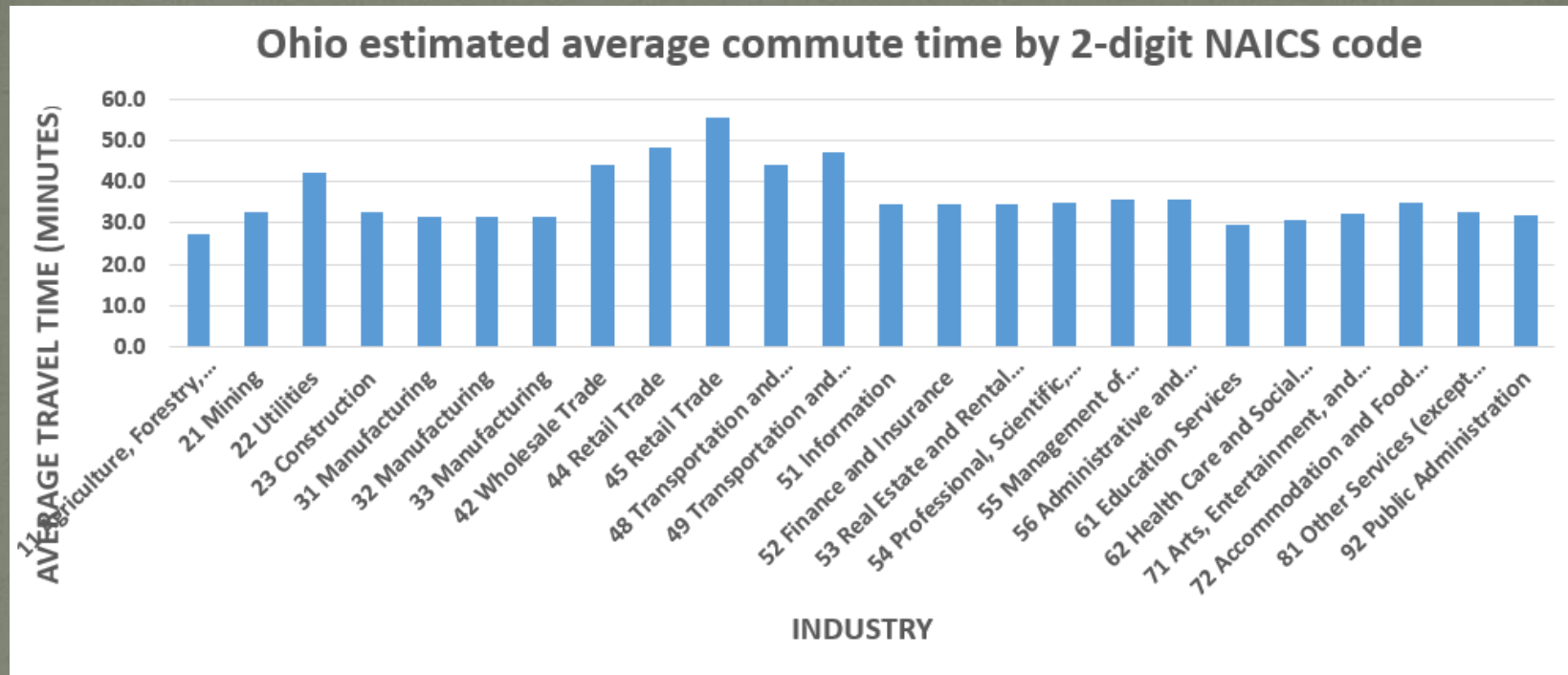
TRADE EMPLOYMENT (QCEW FILE STATEWIDE, BY UIN#)



SERVICE EMPLOYMENT (QCEW FILE STATEWIDE, BY UIN#)

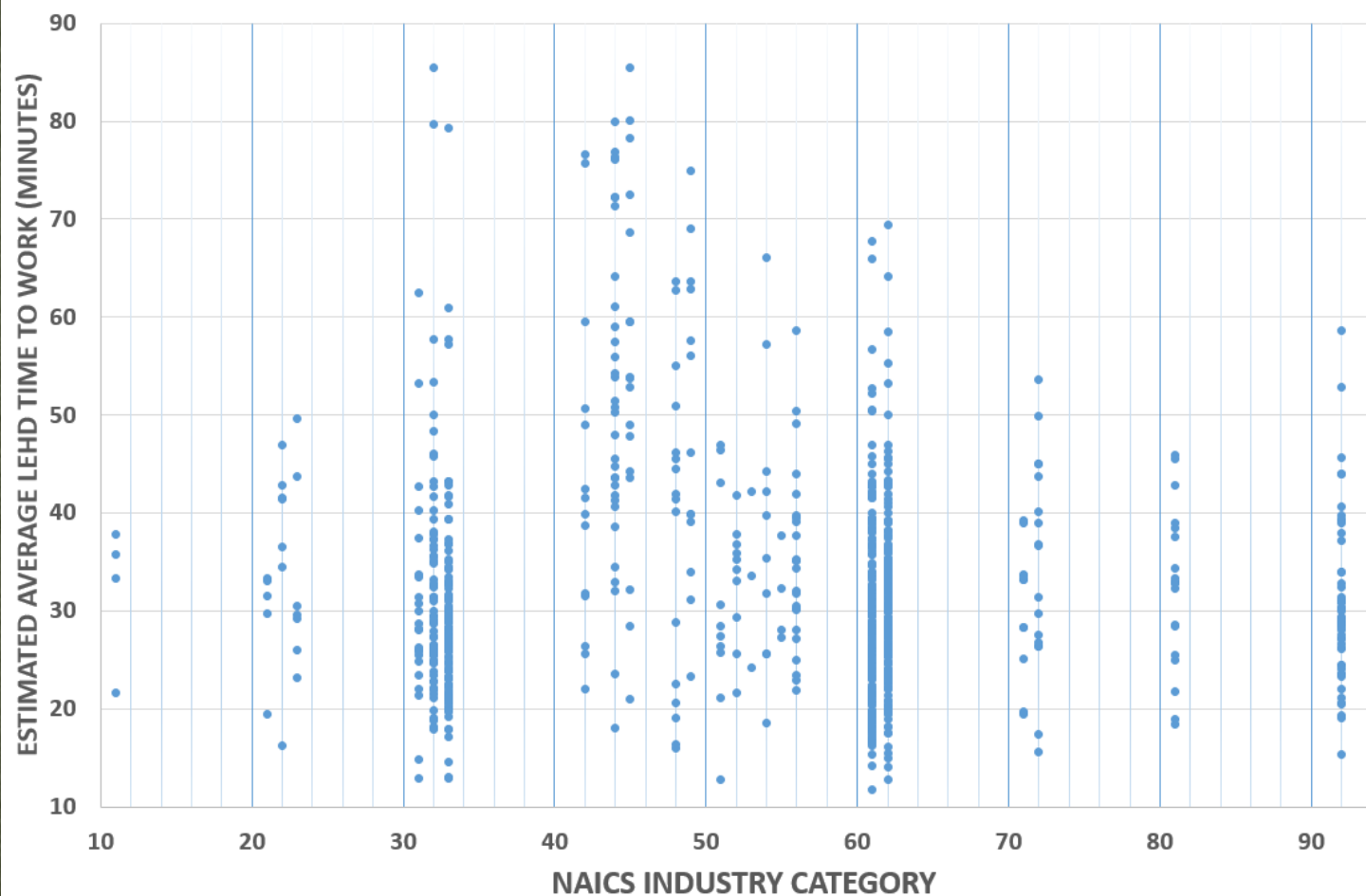


How the LEHD findings by industry compare to national-level:



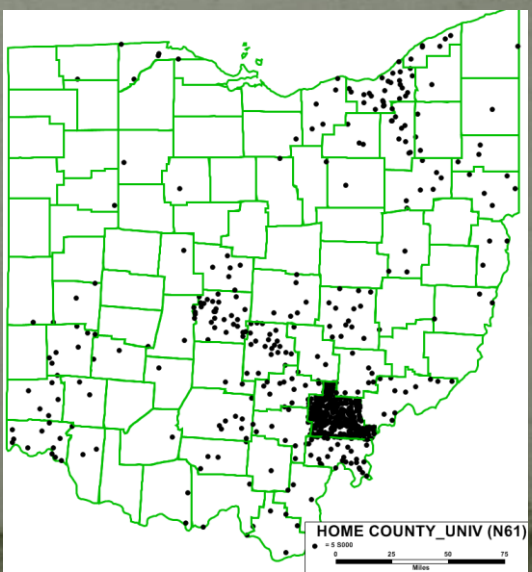
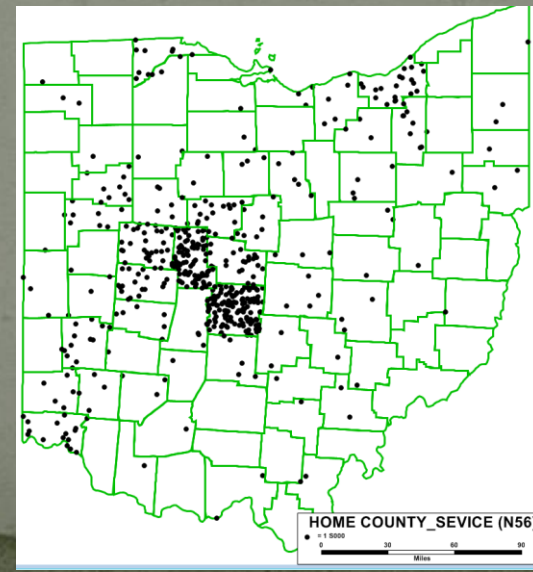
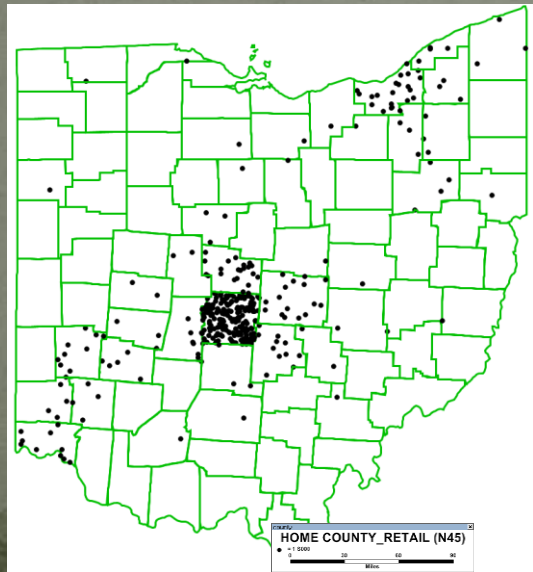
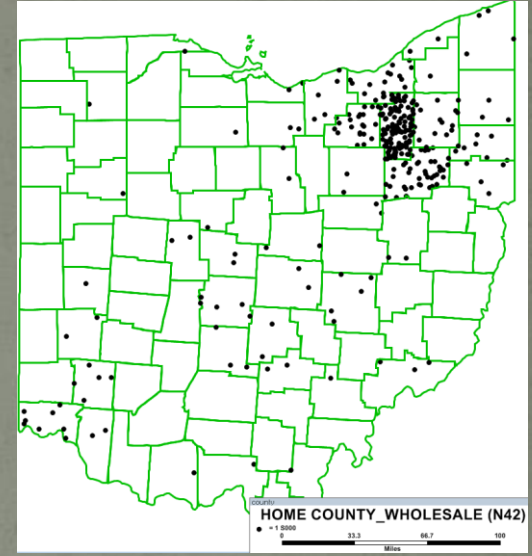
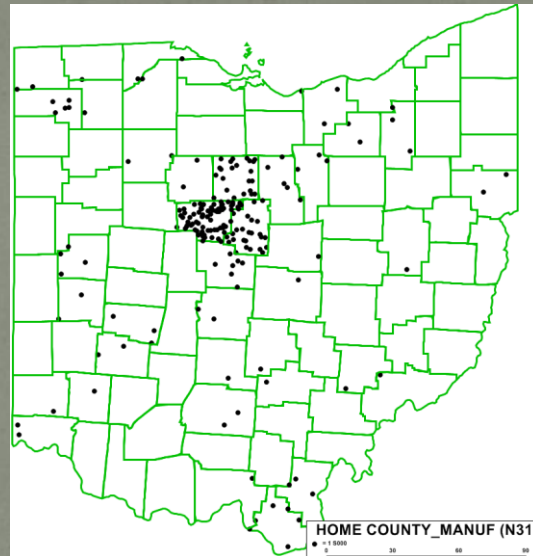
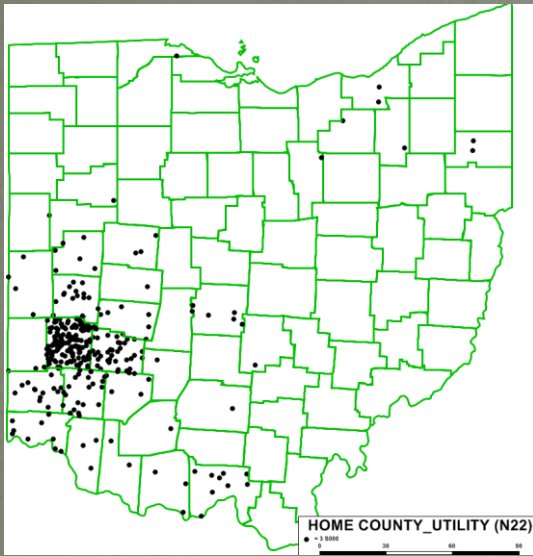
A “more precise” estimate of travel time by major employers (for those geocoded to a census block by themselves . . .)

RECORDS IN QCEW FILE OVER 100 EMP & ONLY ONE CODED IN ITS CENSUS BLOCK)



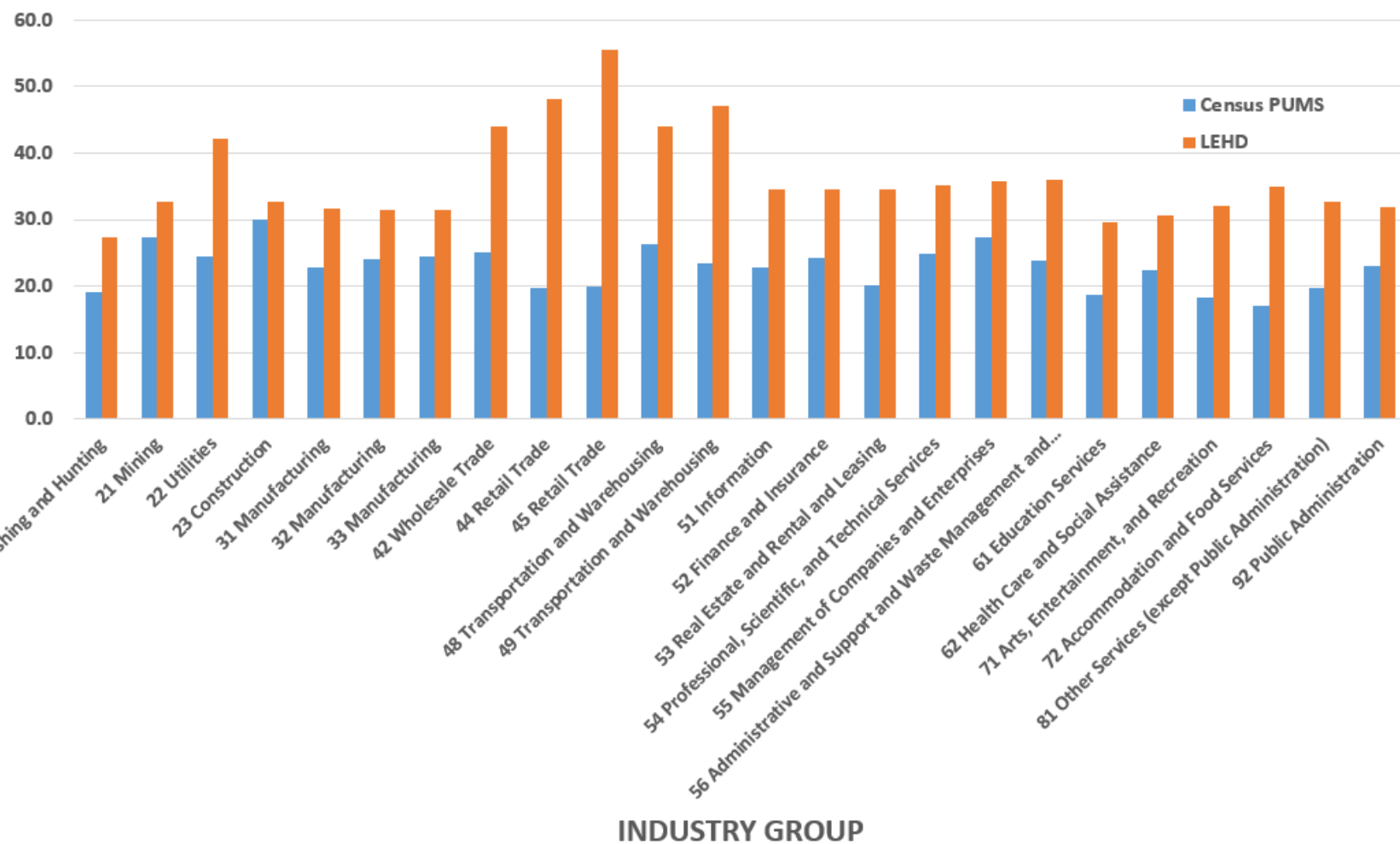
	AVERAGE	STD.DEV.	
NAICS	TRAVEL	TRAVEL	CV
	TIME	TIME	
11	32.1	6.3	0.19
21	29.4	5.1	0.17
22	37.2	9.3	0.25
23	33.1	9.0	0.27
31	30.6	10.9	0.36
32	32.7	12.4	0.38
33	28.5	9.8	0.34
42	43.7	16.6	0.38
44	52.4	15.5	0.30
45	54.8	17.7	0.32
48	42.5	22.1	0.52
49	45.9	15.4	0.34
51	30.9	10.7	0.34
52	33.2	5.7	0.17
53	33.4	7.4	0.22
54	38.6	13.9	0.36
55	31.3	4.1	0.13
56	35.1	9.0	0.26
61	28.7	9.2	0.32
62	30.9	8.7	0.28
71	30.3	6.5	0.21
72	34.8	10.5	0.30
81	32.3	7.9	0.25
92	30.7	8.2	0.27

Estimated distributions of home county for sample businesses in state QCEW file



Comparing LEHD to Census reported times by industry (via PUMS data)

Travel time to work in Ohio by NAICS group - LEHD vs Census reported times (PUMS)



So what's a planner to do? (options)

- Throw out a particular strand of data with significantly different results than the others
- Throw out records over a certain threshold value (such as 70 minute travel time?)
- Weight records from one data source for “likelihood” of daily/consistent occurrence based on the TLFD in the other data source
- (For all of the above, add one or more “re-scaling” factors to restore initial trip totals by category)

Questions?

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