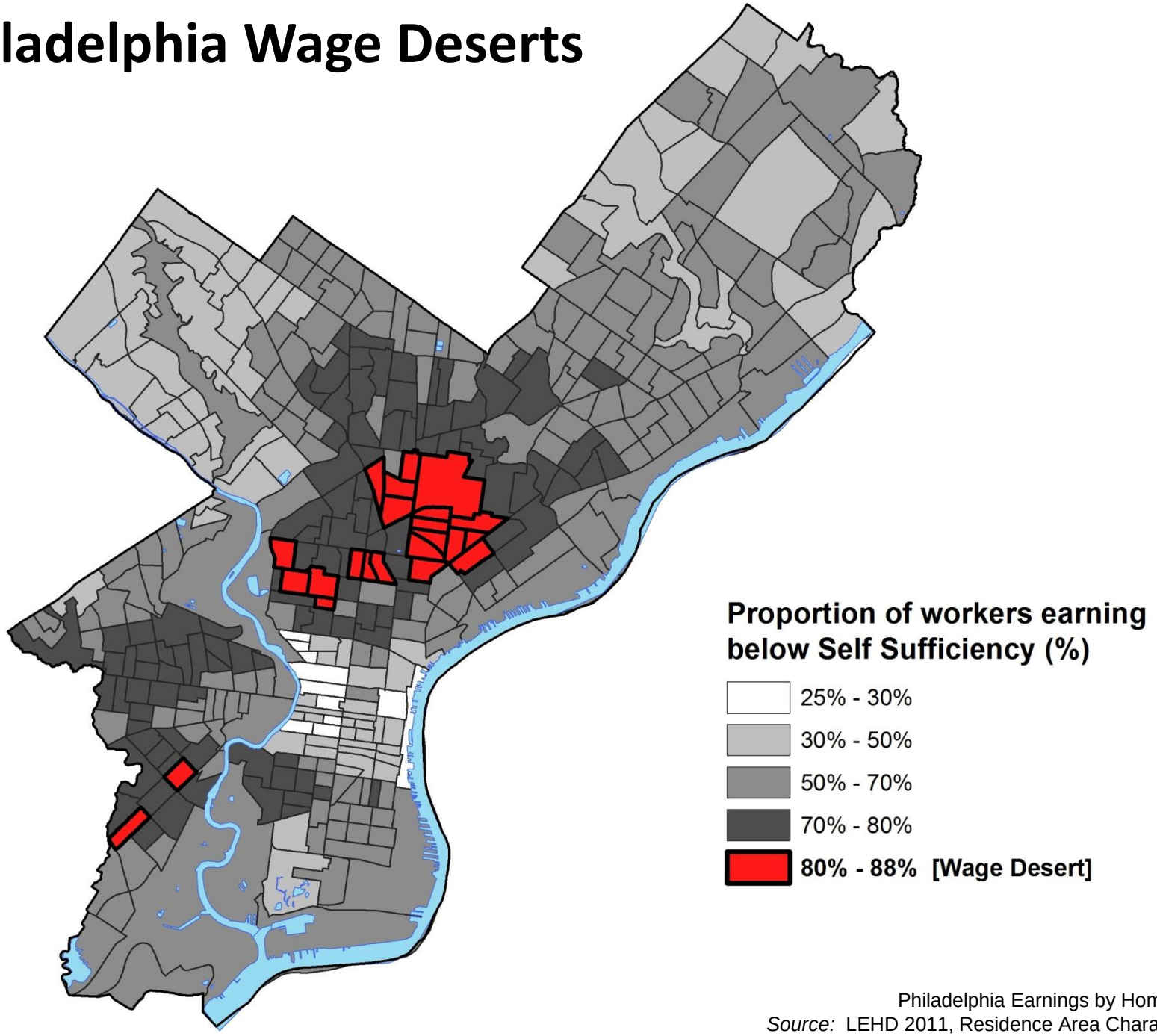
LED in Action:

"Wage Deserts:" An Exploration of Geographically Concentrated Working Poverty in Philadelphia, PA Using Census LEHD Data

Joshua Warner *joshuawa@design.upenn.edu*

PennDesign

Philadelphia Wage Deserts



Philadelphia Earnings by Home Census Tract
Source: LEHD 2011, Residence Area Characteristics (RAC)

Data Sources

- LODES data files
  - In this case, RAC

- GIS Data
  - Tracts (or for finer detail, block groups; blocks)
  - Any specific cartographic or analytical data you wish to compare to concentrations of low/high earnings

Extraction and Mapping Process:

Resident Area Characteristics (RAC) File

Objective: to apply and aggregate residents' job and earnings records to home census tracts

- Process steps:
  1. Aggregate LODES data from the Block Group to the Census Tract level
  2. Trim statewide RAC data to Philadelphia's 384 census tracts
  3. Characterize Wage Deserts at the city level
- Software: ArcGIS, *R* statistical package

Extraction and Mapping Process:

Resident Area Characteristics (RAC) File

Objective: to apply and aggregate residents' job and earnings records to home census tracts

- Process steps:
  1. Aggregate LODES data from the Block Group to the Census Tract level
  2. Trim statewide RAC data to Philadelphia's 384 census tracts
  3. Characterize Wage Deserts at the city level
- Software: ArcGIS, *R* statistical package

Download LODES data*:

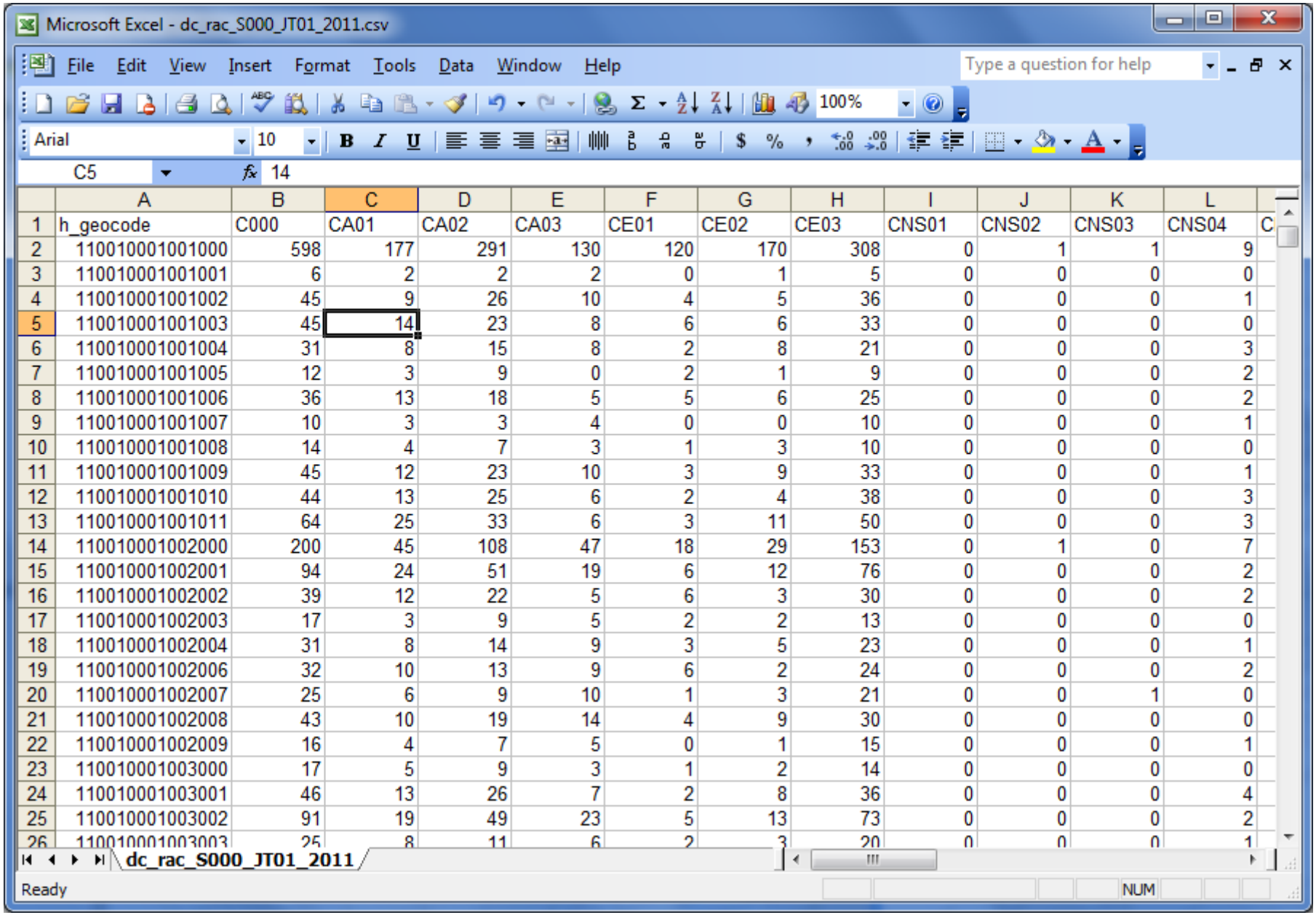
Version: LODES7 State/Territory: Virginia

Type: Origin-Destination (OD)

View Files Close

Metadata for VA | Geography crosswalk for VA | VA md5sum file

va_od_aux_JT01_2002.csv.gz	14 Nov 2013 12:46	1 MB
va_od_aux_JT01_2003.csv.gz	14 Nov 2013 12:46	1 MB
va_od_aux_JT01_2004.csv.gz	14 Nov 2013 12:46	1 MB
va_od_aux_JT01_2005.csv.gz	14 Nov 2013 12:46	1 MB
va_od_aux_JT01_2006.csv.gz	14 Nov 2013 12:46	1 MB
va_od_aux_JT01_2007.csv.gz	14 Nov 2013 12:46	2 MB
va_od_aux_JT01_2008.csv.gz	14 Nov 2013 12:46	2 MB
va_od_aux_JT01_2009.csv.gz	14 Nov 2013 12:46	2 MB
va_od_aux_JT01_2010.csv.gz	14 Nov 2013 12:46	2 MB
va_od_aux_JT01_2011.csv.gz	14 Nov 2013 12:46	2 MB
va_od_aux_JT02_2002.csv.gz	14 Nov 2013 12:46	1 MB
va_od_aux_JT02_2003.csv.gz	14 Nov 2013 12:46	1 MB
va_od_aux_JT02_2004.csv.gz	14 Nov 2013 12:46	1 MB
va_od_aux_JT02_2005.csv.gz	14 Nov 2013 12:46	1 MB



	A	B	C	D	E	F	G	H	I	J	K	L	
1	h_geocode	C000	CA01	CA02	CA03	CE01	CE02	CE03	CNS01	CNS02	CNS03	CNS04	C
2	110010001001000	598	177	291	130	120	170	308	0	1	1	9	
3	110010001001001	6	2	2	2	0	1	5	0	0	0	0	
4	110010001001002	45	9	26	10	4	5	36	0	0	0	1	
5	110010001001003	45	14	23	8	6	6	33	0	0	0	0	
6	110010001001004	31	8	15	8	2	8	21	0	0	0	3	
7	110010001001005	12	3	9	0	2	1	9	0	0	0	2	
8	110010001001006	36	13	18	5	5	6	25	0	0	0	2	
9	110010001001007	10	3	3	4	0	0	10	0	0	0	1	
10	110010001001008	14	4	7	3	1	3	10	0	0	0	0	
11	110010001001009	45	12	23	10	3	9	33	0	0	0	1	
12	110010001001010	44	13	25	6	2	4	38	0	0	0	3	
13	110010001001011	64	25	33	6	3	11	50	0	0	0	3	
14	110010001002000	200	45	108	47	18	29	153	0	1	0	7	
15	110010001002001	94	24	51	19	6	12	76	0	0	0	2	
16	110010001002002	39	12	22	5	6	3	30	0	0	0	2	
17	110010001002003	17	3	9	5	2	2	13	0	0	0	0	
18	110010001002004	31	8	14	9	3	5	23	0	0	0	1	
19	110010001002006	32	10	13	9	6	2	24	0	0	0	2	
20	110010001002007	25	6	9	10	1	3	21	0	0	1	0	
21	110010001002008	43	10	19	14	4	9	30	0	0	0	0	
22	110010001002009	16	4	7	5	0	1	15	0	0	0	1	
23	110010001003000	17	5	9	3	1	2	14	0	0	0	0	
24	110010001003001	46	13	26	7	2	8	36	0	0	0	4	
25	110010001003002	91	19	49	23	5	13	73	0	0	0	2	
26	110010001003003	25	8	11	6	2	3	20	0	0	0	1	

Resident Area Characteristics (RAC) File [1]

Aggregate LODES data from the Block Group to the Census Tract level

- Can be done in ArcGIS, or a statistical package like ***R***

Resident Area Characteristics (RAC) File [1]

Aggregate LODES data from the Block Group to the Census Tract level

- Can be done in ArcGIS, or a statistical package like ***R***
- In GIS, adding a new field and use a trimming function to aggregate to the tract level:
  - HomeTract = left([h_geocode],11)

Resident Area Characteristics (RAC) File [2]

Aggregate LODES data from the Block Group to the Census Tract level

- Taking multiple records that exist for each tract and aggregating values into one record
- In GIS, do this through the creation of ***summary tables***
- In ***R***, use the **aggregate()** command

B	C	D	E	F	G	H	I	J	K	L	M
	TOTAL	Age			Monthly Earnings						
tract	JOBS	<= 29yrs	30 - 54	55+	<= $1250	$1251 - $3333	>= $3333	11 (Ag, Frst, Fish,Hun	21 (Mine, Oil&Gas)	22 (Utilities)	23 (Construction)
GEOID10	C000	CA01	CA02	CA03	CE01	CE02	CE03	CNS01	CNS02	CNS03	CNS04
GEOID10	TotalJobs	Jobs_A29u	Jobs_A30_54	Jobs_A55o	Jobs_E1250u	Jobs_E1251_3333	Jobs_E3333o	NAICS11	NAICS21	NAICS22	NAICS23
42101000100	1592	531	878	183	142	237	1213	0	0	4	16
42101000200	840	241	488	111	239	224	377	0	0	6	13
42101000300	1361	381	775	205	141	198	1022	0	1	1	11
42101000401	725	213	400	112	68	160	497	2	0	4	4
42101000402	1164	301	540	323	132	217	815	1	0	0	22
42101000500	631	260	300	71	104	176	351	1	1	2	6
42101000600	780	290	393	97	95	188	497	2	0	4	9
42101000700	1447	491	709	247	182	319	946	1	1	3	19
42101000801	776	234	420	122	91	149	536	1	0	3	13
42101000803	1691	526	800	365	185	363	1143	0	0	6	20
42101000804	1754	565	890	299	210	286	1258	0	3	4	21
42101000901	1078	402	526	150	162	262	654	1	0	5	14
42101000902	1078	304	577	197	142	186	750	0	1	3	6
42101001001	1249	304	603	342	170	230	849	1	0	4	10
42101001002	1690	386	886	418	196	325	1169	1	1	5	25
42101001101	1668	506	909	253	209	350	1109	0	1	5	13
42101001102	1393	444	747	202	161	291	941	0	0	4	20
42101001201	1869	484	986	399	205	319	1345	3	1	8	32
42101001202	2521	848	1322	351	276	479	1766	1	0	9	29
42101001300	2494	676	1477	341	323	585	1586	0	0	10	34
42101001400	1955	579	1098	278	325	449	1181	1	2	2	26

cts(384) RAC_WageDesertTracts(23) RAC_WageAbundanceTracts(11) RAC_Other_PhilaTracts(350)

Extraction and Mapping Process:

Resident Area Characteristics (RAC) File

Objective: to apply and aggregate residents' job and earnings records to home census tracts

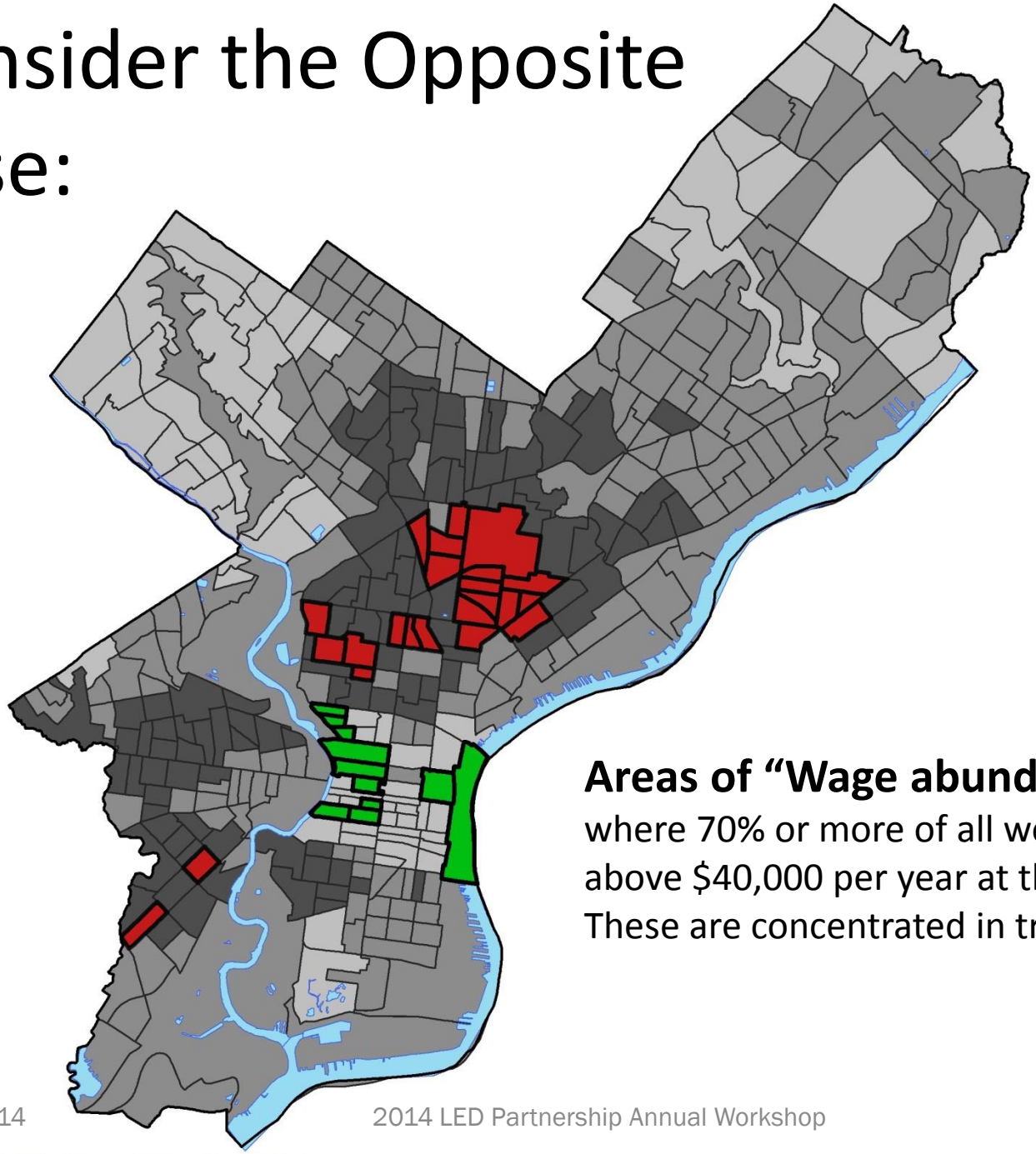
- Process steps:
  1. Aggregate LODES data from the Block Group to the Census Tract level
  2. Trim statewide RAC data to Philadelphia's 384 census tracts
  3. Characterize Wage Deserts at the city level
- Software: ArcGIS, *R* statistical package

Perform calculations on Earnings columns

- Pct_E01 = Jobs_E01 / Total Jobs
- Etc. for E02, E03
- Pct_E01+E02 = (Jobs_E01 + Jobs_E02) / Total Jobs

Wage Deserts are tracts where 80% or more of resident workers earn at the E01 or E02 level (i.e., make < $39,996 / yr)

Consider the Opposite Case:



Areas of "Wage abundance,"
where 70% or more of all working residents earn above $40,000 per year at their primary job. These are concentrated in tracts near the CBD.

Perform (more) calculations on Earnings columns

- Pct_E01+E02 = (Jobs_E01 + Jobs_E02) / Total Jobs

Wage Abundance tracts have 70% or more of resident workers earn at the E03 level (i.e., make > $40,000 / yr)

Additional Analysis:

Origin-Destination (OD) File

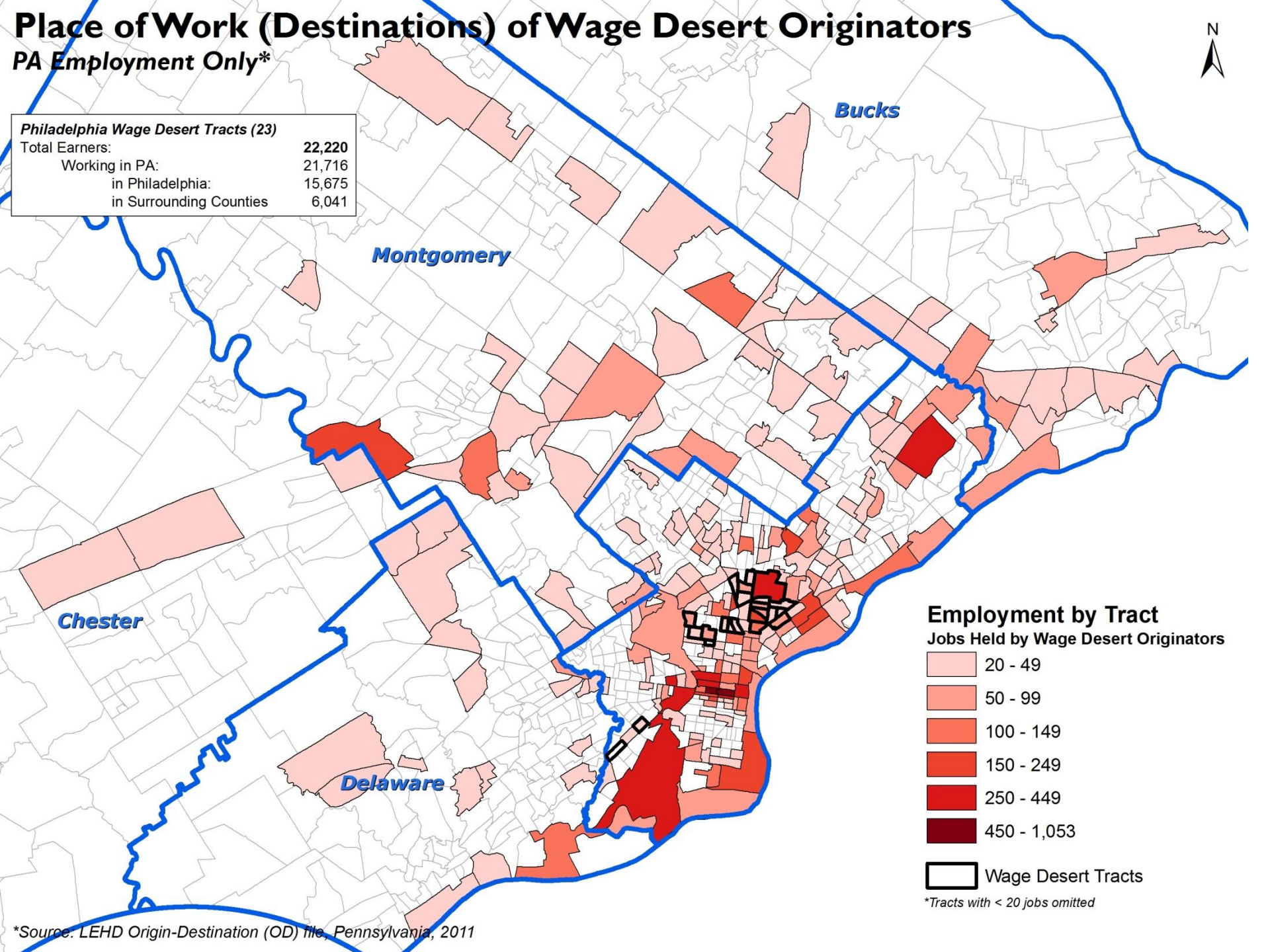
Objective: to trace wage desert or wage abundance originators to their place of work

- Process steps:
  1. Aggregate LODES (OD) data from the Block Group to the Census Tract level
  2. Match workers' "home tracts" (originating in Wage Desert or Wage Abundance areas) to their respective "work tracts"
- Software: ArcGIS, *R* statistical package

Place of Work (Destinations) of Wage Desert Originators

*PA Employment Only**

Philadelphia Wage Desert Tracts (23)	
Total Earners:	**22,220**
Working in PA:	21,716
in Philadelphia:	15,675
in Surrounding Counties	6,041

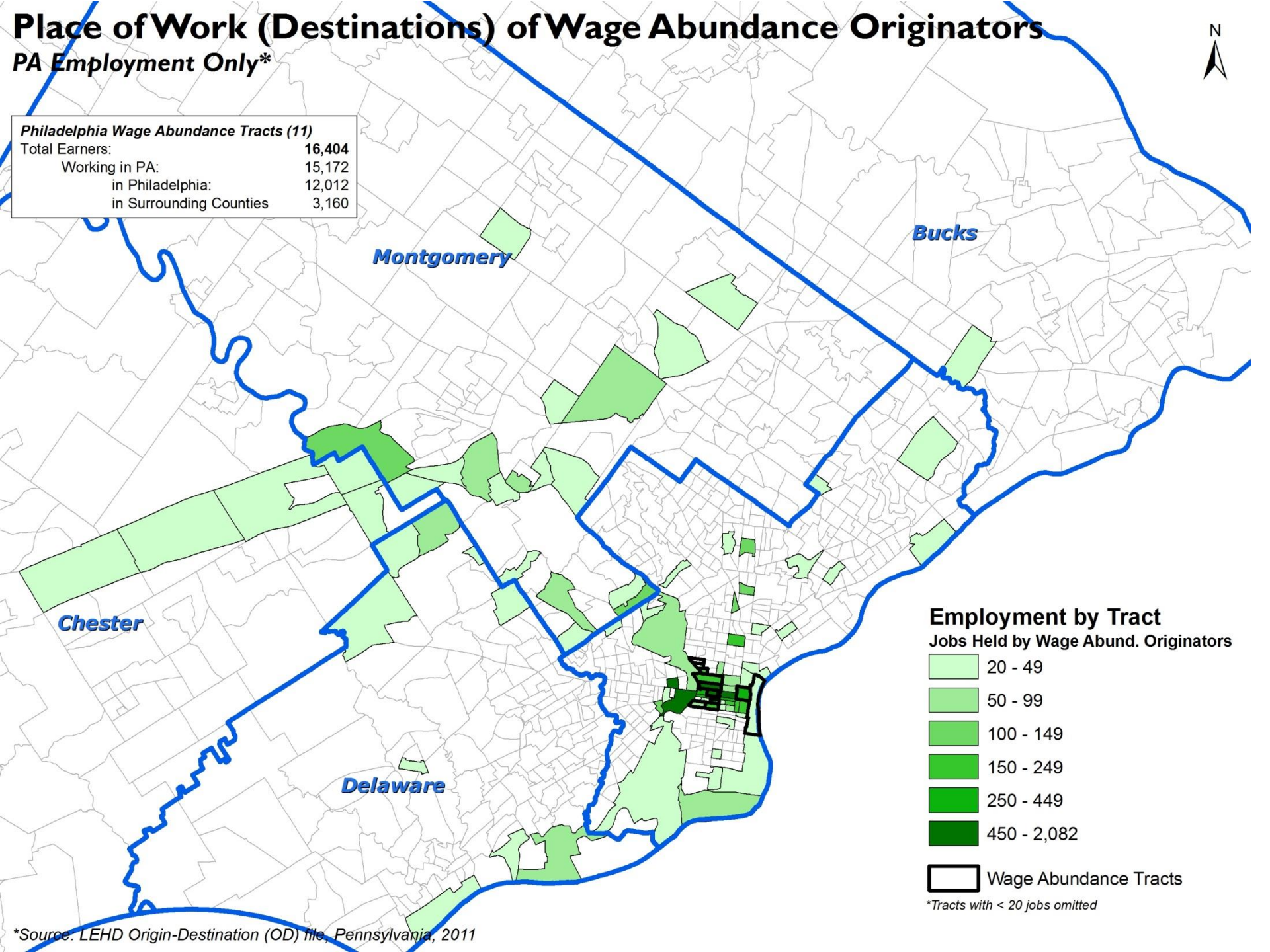


*Source: LEHD Origin-Destination (OD) file, Pennsylvania, 2011

Place of Work (Destinations) of Wage Abundance Originators

*PA Employment Only**

Philadelphia Wage Abundance Tracts (11)	
Total Earners:	**16,404**
Working in PA:	15,172
in Philadelphia:	12,012
in Surrounding Counties	3,160



*Source: LEHD Origin-Destination (OD) file, Pennsylvania, 2011

Thank You!

LED in Action:

"Wage Deserts:" An Exploration of Geographically Concentrated Working Poverty in Philadelphia, PA Using Census LEHD Data

Joshua Warner

joshuawa@design.upenn.edu

PennDesign