

BTS - LED Pilot Study

**Bureau of Transportation
Statistics**

LED Staff

Wende Mix, Contractor

Project Goals

- Develop a prototype model of local, state, and federal cooperation to produce annual **Home to Work flow relationships**.
- Illinois and Florida participated in this research.
- Enhancing ES-202 data for better establishment address geocodes.
 - Accuracy requirements - establishments geocoded by Census to roof top or block face level.

Results

Priority	Florida Number of Establishments	Illinois Number of Establishments
0	250,035	204,975
1	19,795	-
2	114,658	142,363
TOTAL	384,488	347,338
Priority	Florida Total Employment	Illinois Total Employment
0	4,075,597	4,341,350
1	502,427	-
2	2,002,997	1,773,886
TOTAL	6,581,021	6,115,236

Results

Priority 0 % Geocoded	Florida	Illinois
Establishments	65%	59%
Employment	62%	71%

Results

	Total Returned Addresses	Total Returned Single Unit Addresses	Total Returned Multi-Unit Addresses
Florida	11,932	11,382	550
Illinois	67,345	45,801	21,544
	Total Returned Employment	Total Returned Single-Unit Employment	Total Returned Multi-Unit Employment
Florida	441,845	336,453	105,392
Illinois	702,634	673,629	29,005

Results

Returned Addresses

	Establishments	Employment
Florida	10%	22%
Illinois	47%	40%

Results – Multi Units Illinois

PRIORITY	EDUCATION	MEDICAL	PRIV_MISC	PUBLIC	EMP10KPLUS	TOTALS
0	42	36	110	15	2	
2	11	17	33	13	5	
TOTAL	53	53	143	28	7	284
Multiple Addresses Returned	542	151	3,489	1,119	1,163	6,464
Employment	71,662	55,914	180,317	53,908	146,783	508,584

The Richness of the LED Data for Transportation Planners

Commuting Information

e.g. If you live in the southern half of Lake County, IL, you are more likely to commute **out** of county.

If you live in the Northern half of Lake County, IL, you are more likely to commute **within** the of county.

Maps for 1999 (un-clean data) and 2001 (cleaned data)

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McHenry Co. IL





Lake Michigan

Cook Co., IL

Commuting Patterns - 1999

Lake County, Illinois

Source Data: LED Pilot OD Matrix 1999 Data
2000 Census Tract Population Centroids,
U.S. Bureau of the Census

-  Circle size proportional to Total Workers Residing in the Tract
-  Commute within Tract of Residence
-  Commute within Lake Co.
-  Commute outside Lake Co.

WISCONSIN

McHenry Co. IL

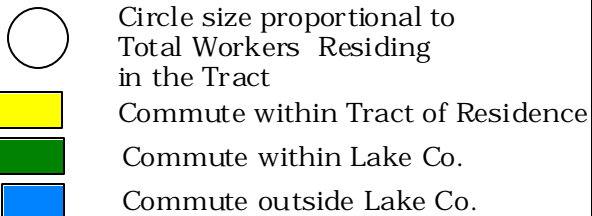
Lake Michigan

Cook Co., IL

Commuting Patterns

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids,
U.S. Bureau of the Census



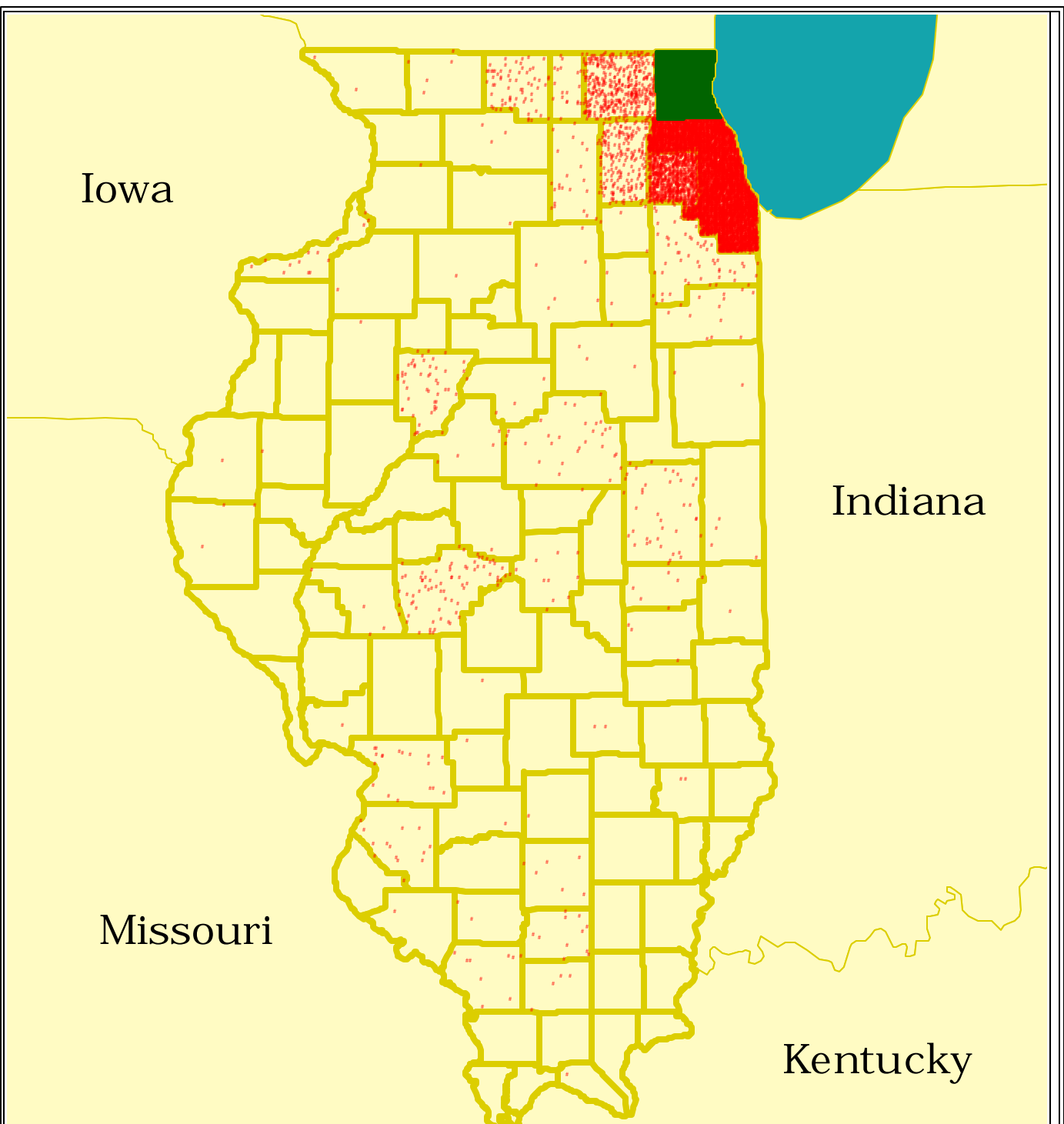
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Commuting Information

e.g. Most Out of County Commuters travel south to Cook Co.
or West to McHenry Co.

NOTE: Extremely distant commutes identify areas for
additional cleaning of ES202

Maps for 2001 (cleaned data)



Commuting Patterns

Out of County Flows
One dot = 10 Workers



Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003

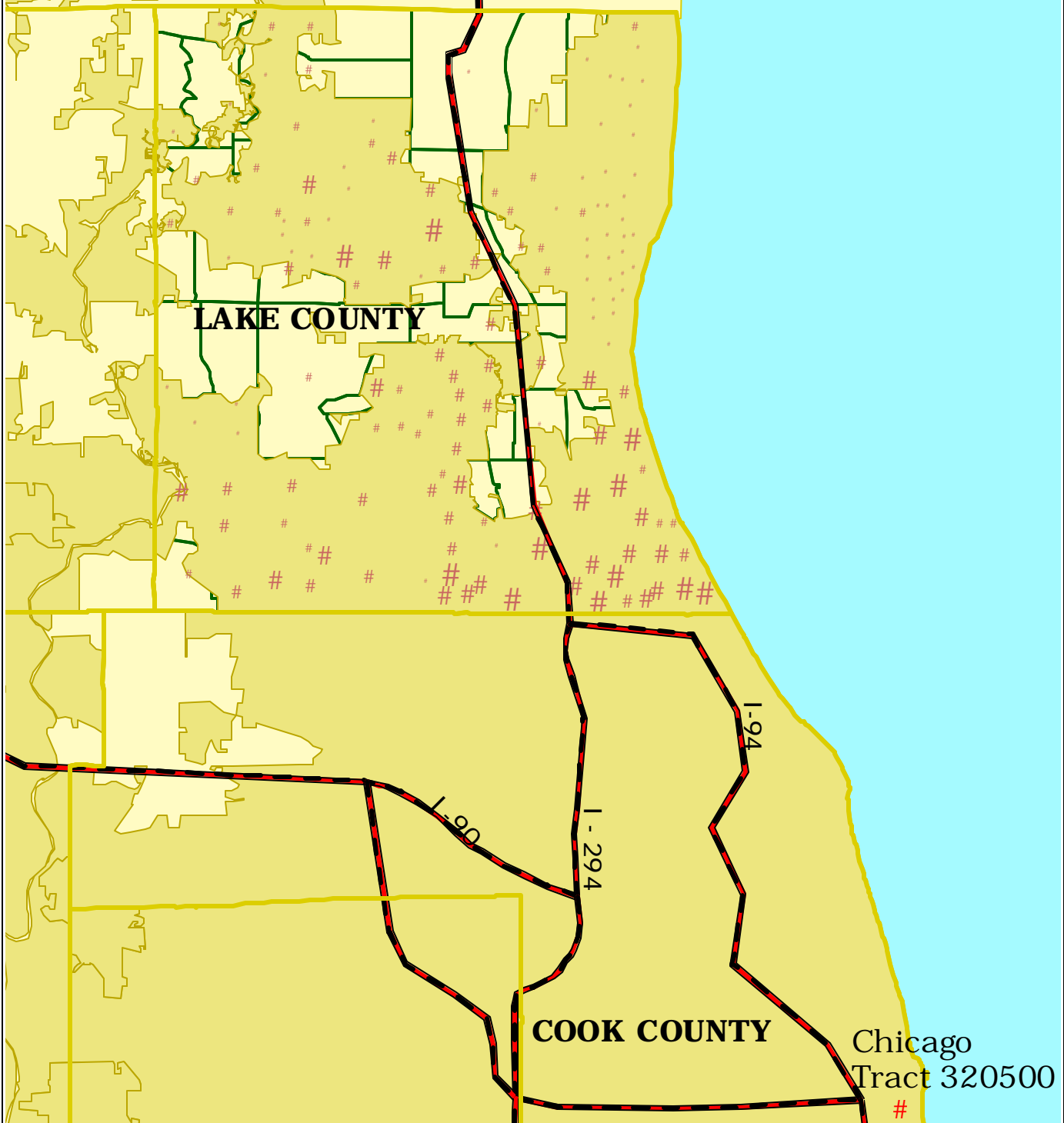
The Richness of the LED Data for Transportation Planners

Commuting Information

e.g. The most likely destination for commuters from Lake Co. to Cook Co. is downtown Chicago (Tract 320500) .

The majority of these trips come from southeastern Lake Co.

Maps for 2001 (cleaned data)



0 3 6 Miles

Number of Workers to
Cook Co Tract 320500

- 2 - 15
- # 15 - 30
- # 30 - 50
- # 50 - 75
- # 75 - 135

Commuting Patterns

Lake Co tracts to Cook CO Tract Max Flow to tract 320500

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids,
U.S. Bureau of the Census

The Richness of the LED Data for Transportation Planners

Transit Planning Information

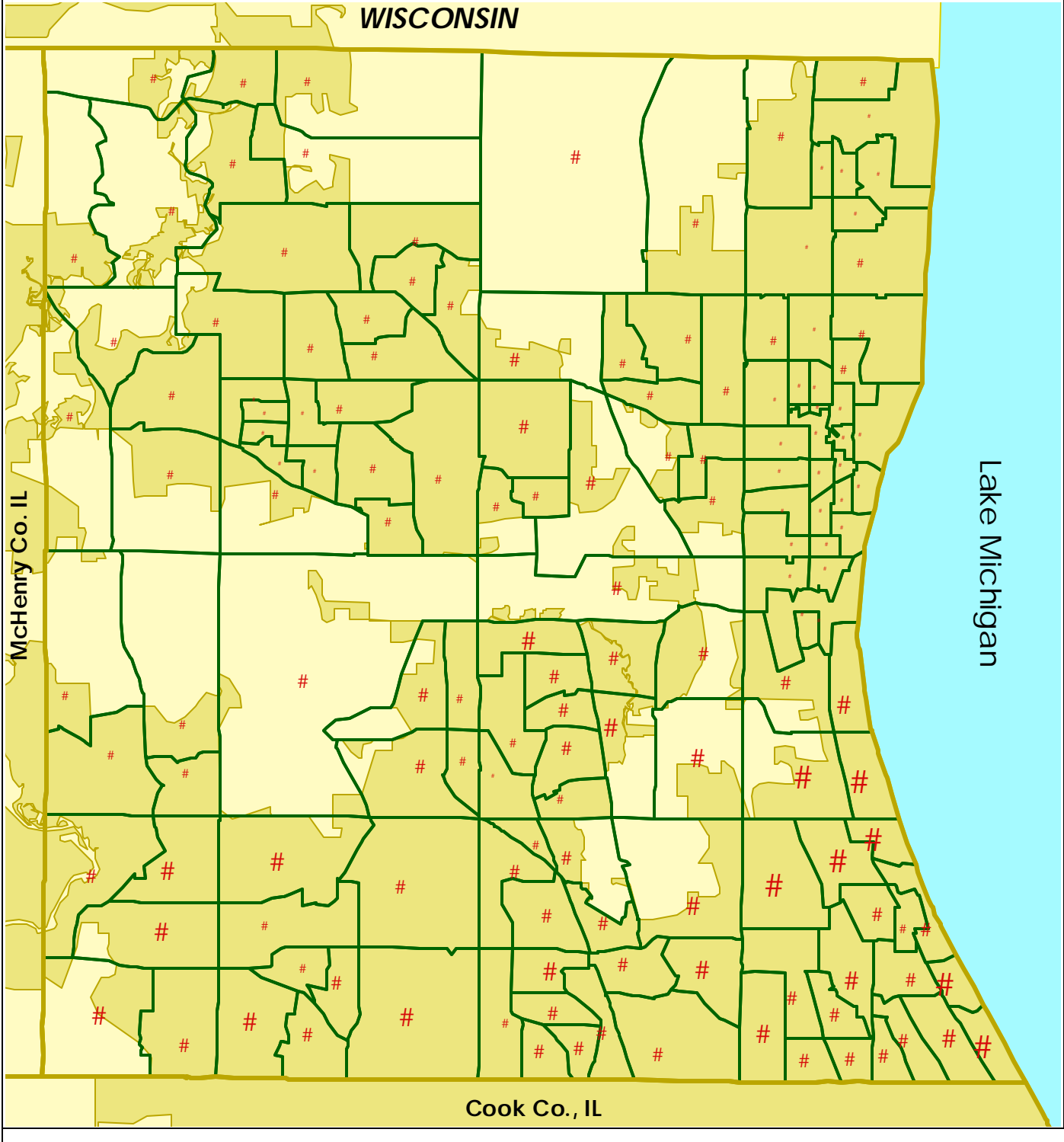
e.g. Low wage workers live primarily in the northern half of Lake County.

High wage workers live along Lake Michigan in the Southeastern part of the county.

The distribution of high wage workers to low wage workers is more disparate in the southern half of Lake Co.

Mean Monthly Pay is low in the north east part of Lake Co. but there are also relatively few workers in these tracts. Tracts with lots of Service establishments tend to have more workers with moderate to high monthly earnings. However, many tracts with workers earning high monthly pay have relatively few workers.

Maps for 2001 (cleaned data)



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McHenry Co. IL

Lake Michigan

Cook Co., IL

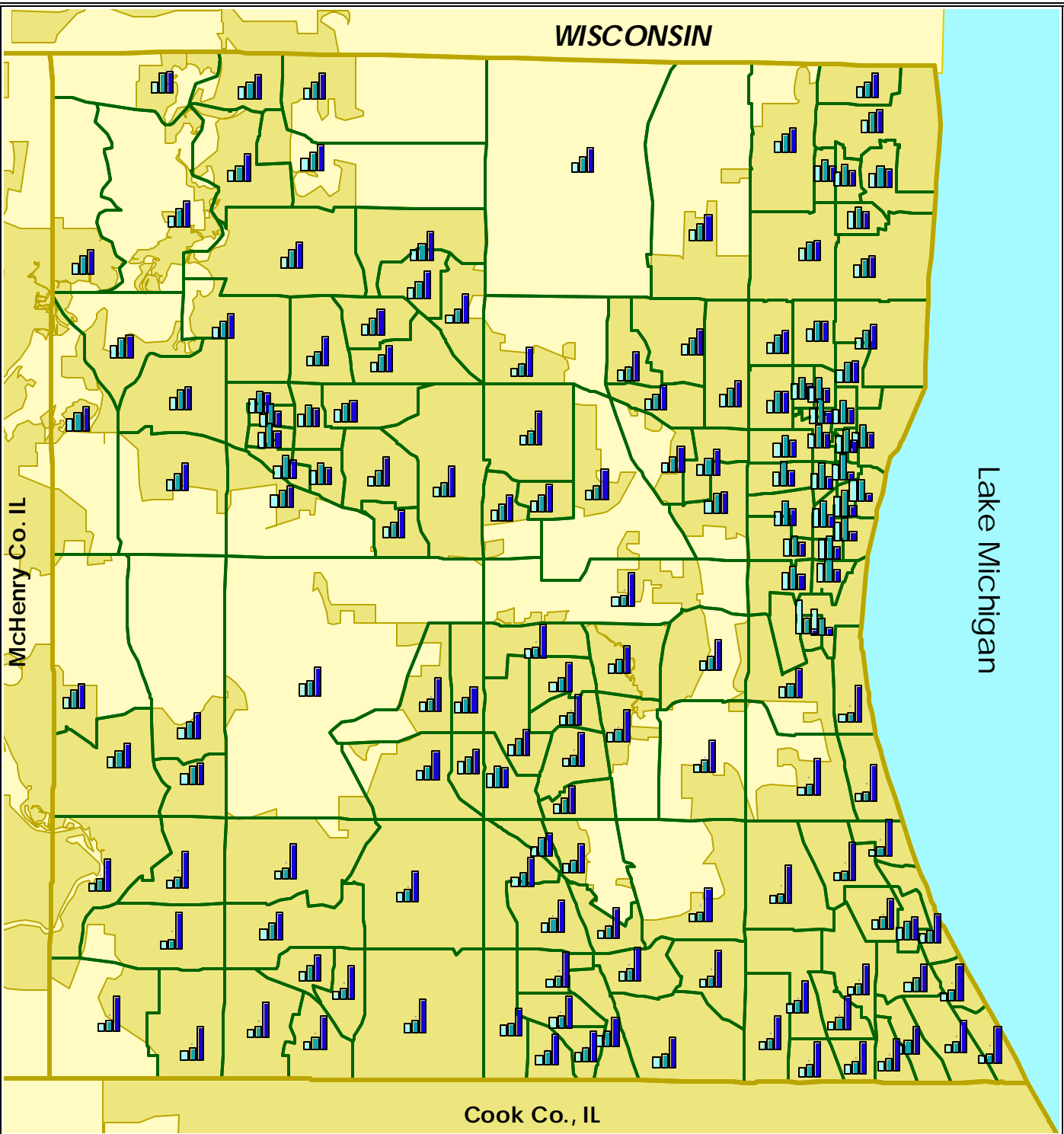
Average Wage by Tract of Residence

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids,
U.S. Bureau of the Census



- Average Wage
- \$10,500 - \$35,000
 - # \$35,000 - \$60,000
 - ## \$60,000 - \$105,000
 - ### \$105,000 - \$175,000
 - #### \$175,000 - \$425,000



Proportion of Workers
in Living in a tract
with average earnings

- Less than \$12,000
- Between \$12,000
and \$35,000
- Greater than \$35,000

LED Average Earnings by Tract of Residence

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids,
Summary File 3,
U.S. Bureau of the Census

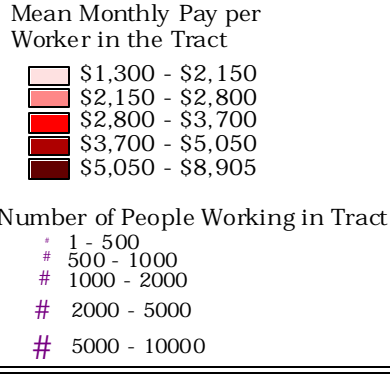


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McHenry Co. IL

Lake Michigan

Cook Co., IL



Mean Monthly Pay and Number of Workers

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids,
U.S. Bureau of the Census



The Richness of the LED Data for Transportation Planners

Transportation/transit Planning Information

e.g. What types of establishments are where most workers Work?

Few blocks with high presence of Agriculture, Forestry, Fishing establishments

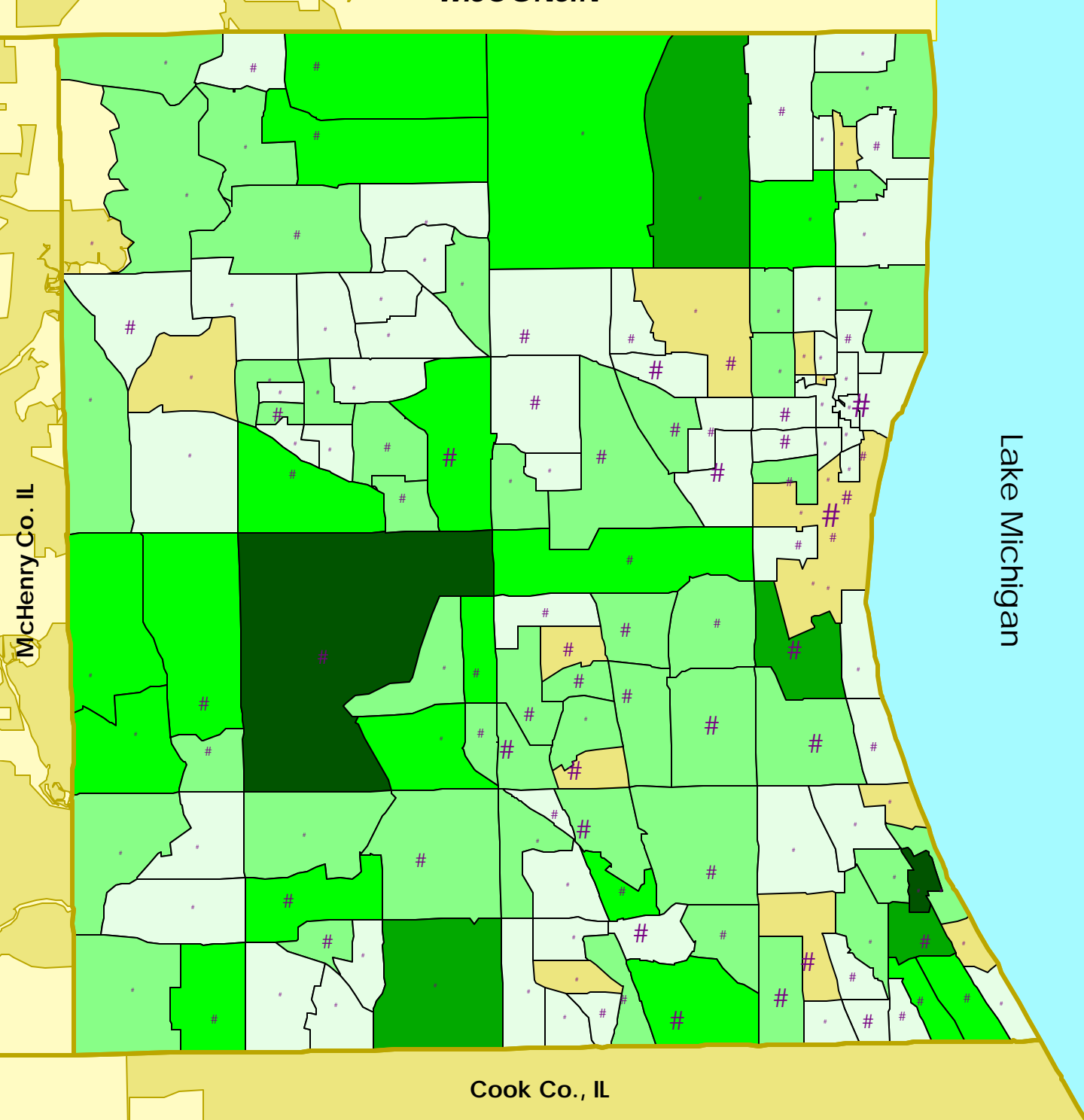
Most tracts contain many Service establishments

However, the southwestern (lake front) tracts contain a high percentage of blocks with Service Establishments. Tracts heavy in Services are usually major work locations.

Tracts higher Manufacturing presence generally draw many workers. Lake Co. does not have many tracts with a High presence of manufacturing establishments.

High presence of Retail establishments are fairly dispersed throughout Lake County.

Maps for 2001 (cleaned data)



SIC Division: Agriculture, Forestry, Fishing

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids,
Summary File 3
U.S. Bureau of the Census



Number of Blocks in Tract with Div. A Establishments

- 1 - 2
- 3 - 5
- 6 - 8
- 9 - 12
- 13 - 16

Number of People Working in Tract

- 1 - 500
- # 500 - 1000
- # 1000 - 2000
- # 2000 - 5000
- # 5000 - 10000






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Lake Michigan

McHenry Co. IL

Cook Co., IL

Number of Blocks in Tract with Div. I Establishments

-  1 - 10
-  10 - 15
-  15 - 25
-  25 - 35
-  35 - 50

Number of People Working in Tract

- * 1 - 500
- # 500 - 1000
- # 1000 - 2000
- # 2000 - 5000
- # 5000 - 10000

SIC Division: Services

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids, Summary File 3
U.S. Bureau of the Census



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McHenry Co., IL

Lake Michigan

Cook Co., IL

Number of Blocks in Tract with Div. D Establishments

- 1 - 3
- 3 - 5
- 5 - 8
- 8 - 12
- 12 - 18

Number of People Working in Tract

- 1 - 500
- # 500 - 1000
- # 1000 - 2000
- # 2000 - 5000
- # 5000 - 10000

SIC Division: Manufacturing

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
 2000 Census Tract Population Centroids, Summary File 3
 U.S. Bureau of the Census



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Lake Michigan

McHenry Co. IL

Cook Co., IL

Number of Blocks in Tract with Div. G Establishments

- 1 - 3
- 3 - 5
- 5 - 8
- 8 - 12
- 12 - 25

Number of People Working in Tract

- 1 - 500
- # 500 - 1000
- # 1000 - 2000
- # 2000 - 5000
- # 5000 - 10000

SIC Division: Retail Trade

Lake County, Illinois

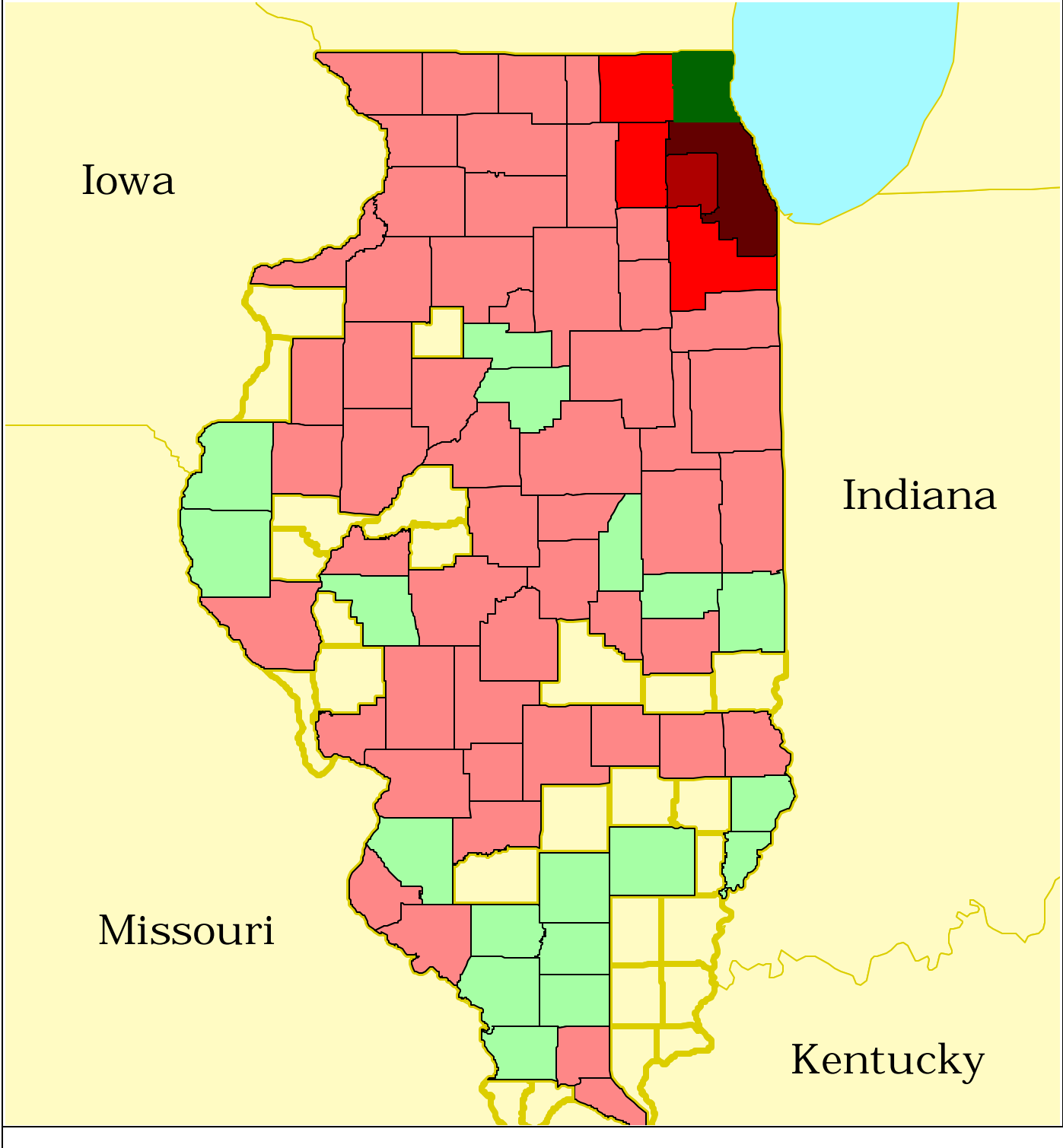
Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids,
Summary File 3
U.S. Bureau of the Census



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How important is data cleaning?

- 1999 un-cleaned data indicates more out of county trips to more counties than the 2001 cleaned data.
 - Where 2001 has slightly fewer trips than 1999 reflects errors in the models as well as places for additional cleaning potential.
- At the tract level, more work is needed to verify the extraordinary loss of workers in Lake Co. between 1999 and 2001.



Change in Commuting Patterns

- Change in No. of Workers from Lake County
1999 - 2001
- More Workers in 2001 (1-99)
 - 1 - 500 more Workers in 1999
 - 500 - 1500 more Workers in 1999
 - 1500 - 4000 more Workers in 1999
 - 4000 - 15,000 more Workers in 1999

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
LED Pilot OD Table 1999 Data

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McHenry Co. IL

Lake Michigan

Cook Co., IL

Change in Workers By Place of Residence

Lake County, Illinois

Change in Total Workers
between 1999 and 2001

- # Loss of 400-900 Workers in 2001
- # Loss of 1-400 Workers in 2001
- # Gain of 1-400 Workers in 2001
- # Gain of 400-900 Workers in 2001

Source Data: LED Prototype OD Matrix 9/2003
 LED Pilot OD Table 1999 Data
 2000 Census Tract Population Centroids,
 U.S. Bureau of the Census

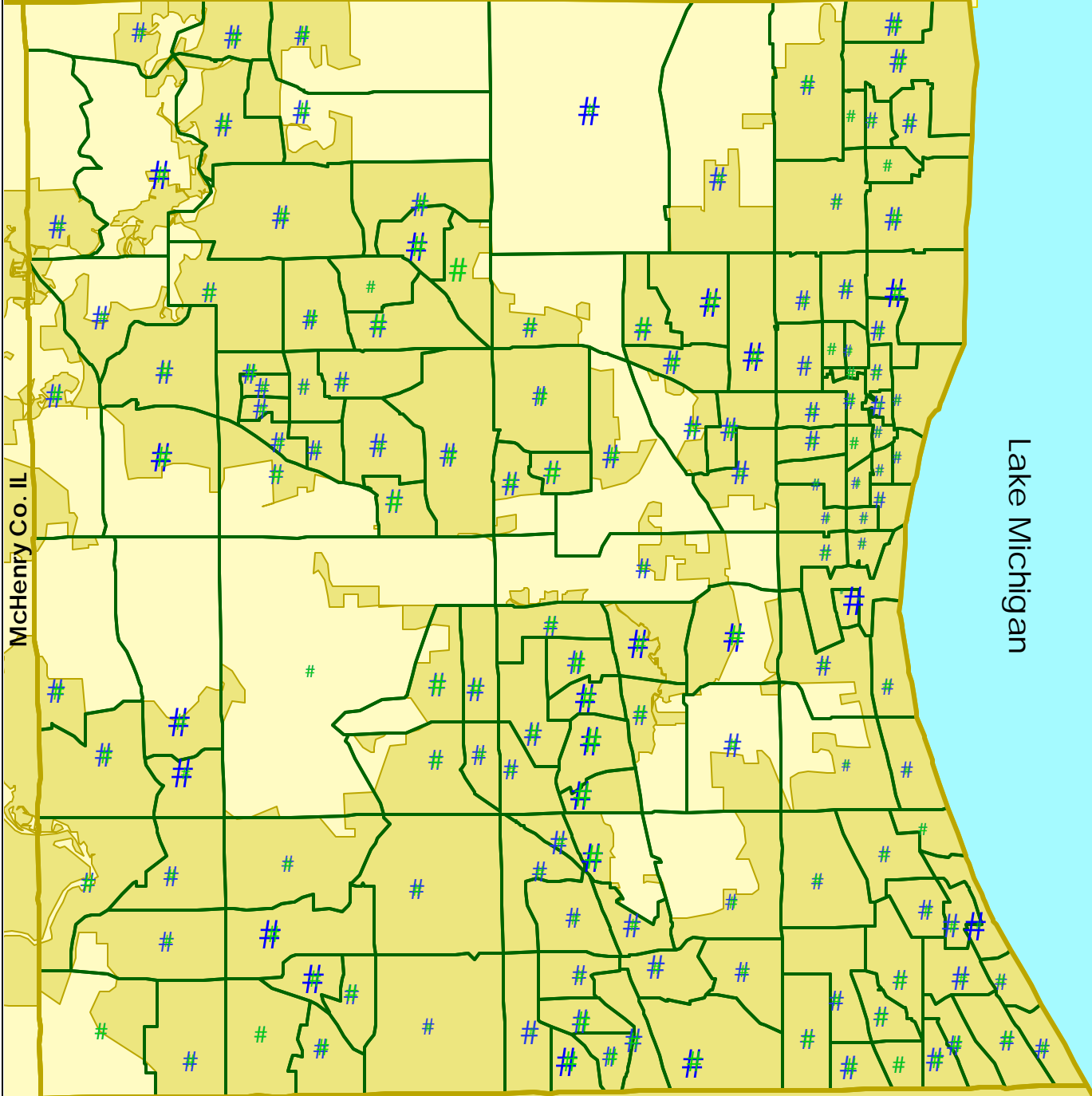


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What about Integrating Census 2000 Data?

- How does it compare?
 - Ratio of workers to population pretty good. Would be better if LED OD table **NOT** tabulated at the BLOCK level.
 - More LED worker totals fall within the 90% Confidence interval around the Decennial estimate when taken from the Home Block Characteristics File
 - **HOWEVER**, the distribution of low, medium, and high wage workers appears more realistic using LED data.

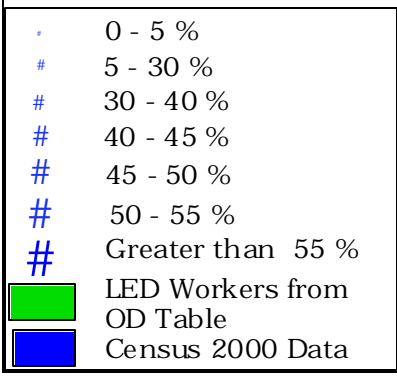
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McHenry Co. IL

Lake Michigan

Cook Co., IL



Ratio of Workers * to Total Population

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
 2000 Census Tract Population Centroids,
 Summary File 3
 U.S. Bureau of the Census



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McHenry Co. IL

Lake Michigan

Cook Co., IL

LED HB Workers

- # Significantly LESS than Decennial Estimate
- # No Different from Decennial Estimate
- # Significantly MORE than Decennial Estimate

LED OD Workers

- # Significantly LESS than Decennial Estimate
- # No Different from Decennial Estimate

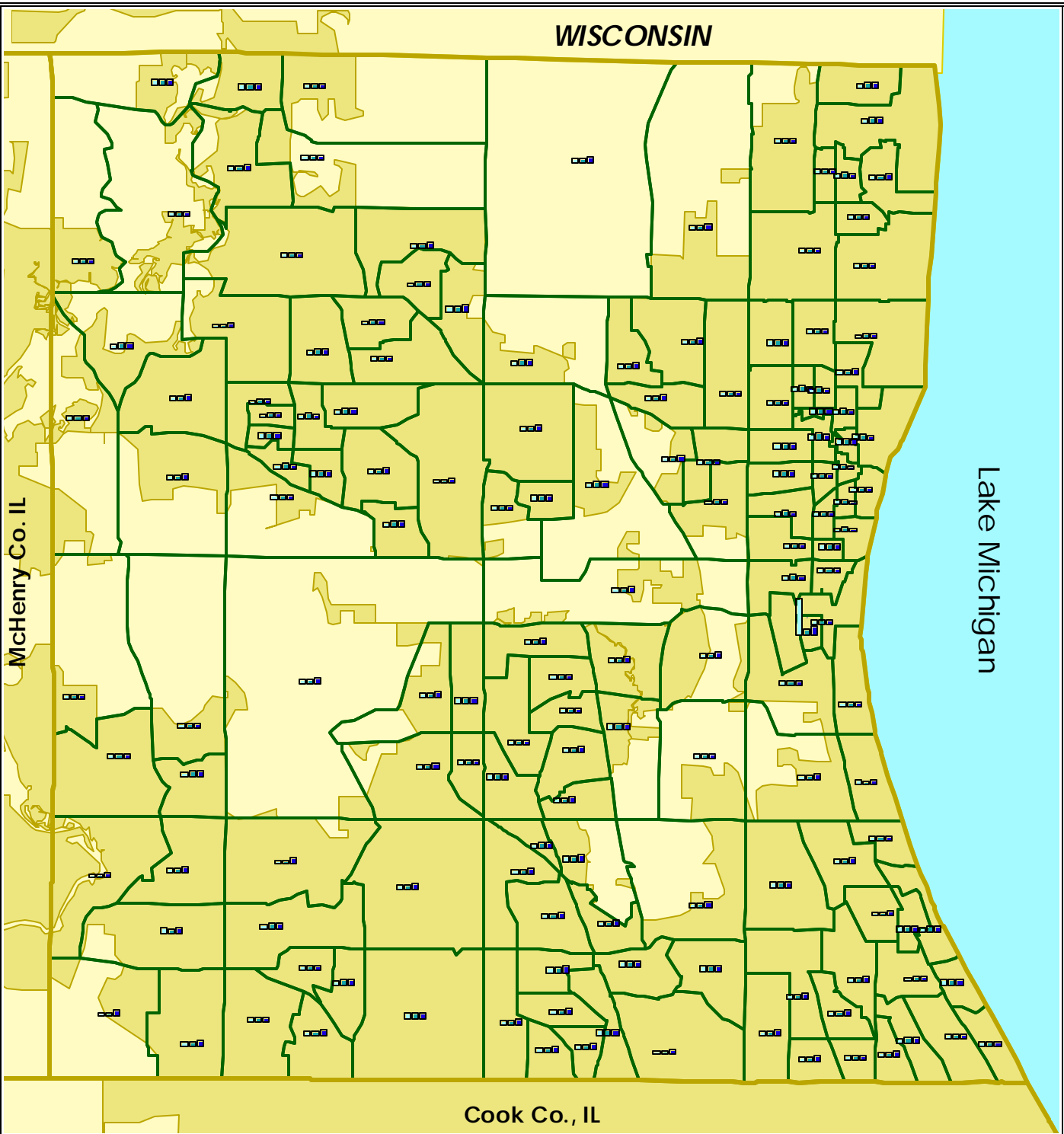
(90% Confidence Interval calculated for the Decennial estimate of total workers)

Comparison of LED Workers and Decennial 2000 Workers at Place of Residence

Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids, Summary File 3
U.S. Bureau of the Census

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




McHenry Co. IL

Lake Michigan

Cook Co., IL

Proportion of Workers
in Living in a tract
with average earnings

-  Less than \$12,500
-  Between \$12,500 and \$35,000
-  Greater than \$35,000

Census 2000 Average Earnings by Tract of Residence Lake County, Illinois

Source Data: LED Prototype OD Matrix 9/2003
2000 Census Tract Population Centroids,
Summary File 3,
U.S. Bureau of the Census



What's Next!

- Have participating states work on cleaning the entire ES202 files.
- **Have states incorporate multi-units into their systems and maintain these as multi-units.**
- Make better use of SIC codes for look-up and validation.
- **Bring the MPOs into the look-up process as soon as possible**

Contacts

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