Estimating Employment with Parcel Data

Des Moines Area MPO
July 30, 2014

Presentation Overview

- Employment Data
  - What do we use it for?
  - Where do we get it?
  - What are the issues?
- Des Moines Area MPO approach
  - What did we do?
  - How is it going?
- Q & A

Employment Data

- Why do we need it?
  - Part of socioeconomic data that feeds the Travel Demand Model
  - Employees drive number of trips made

Employment Data

- Sources of employment data we explored:
  - Iowa Workforce Development
  - InfoGroup (via Iowa DOT)
  - US Census *On the Map* Database

Iowa Workforce Development

- Historical source of employment data

- Business-specific data

Firm Name	Employees	NAICS
Joe's Electrical Company	10	5169
Kum & Go	15	5541

- Data aggregated to TAZ

InfoGroup Data

- Data purchased by the DOT

- Business-specific data

| Firm Name	Employees	NAICS
Joe's Electrical Company	10	5169
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- Data aggregated to TAZ

InfoGroup Data

- The good…
  - Site-specific business information
  - Updated regularly

- The bad…
  - Data not collected for this purpose; results in duplicates, omissions, and wrong locations
  - Issues with multiple businesses at one site
  - Time consuming to check data for accuracy

Example Problems

- John Deere – Ankeny

- 1,200 or so jobs – record puts the jobs in the residential area to the west
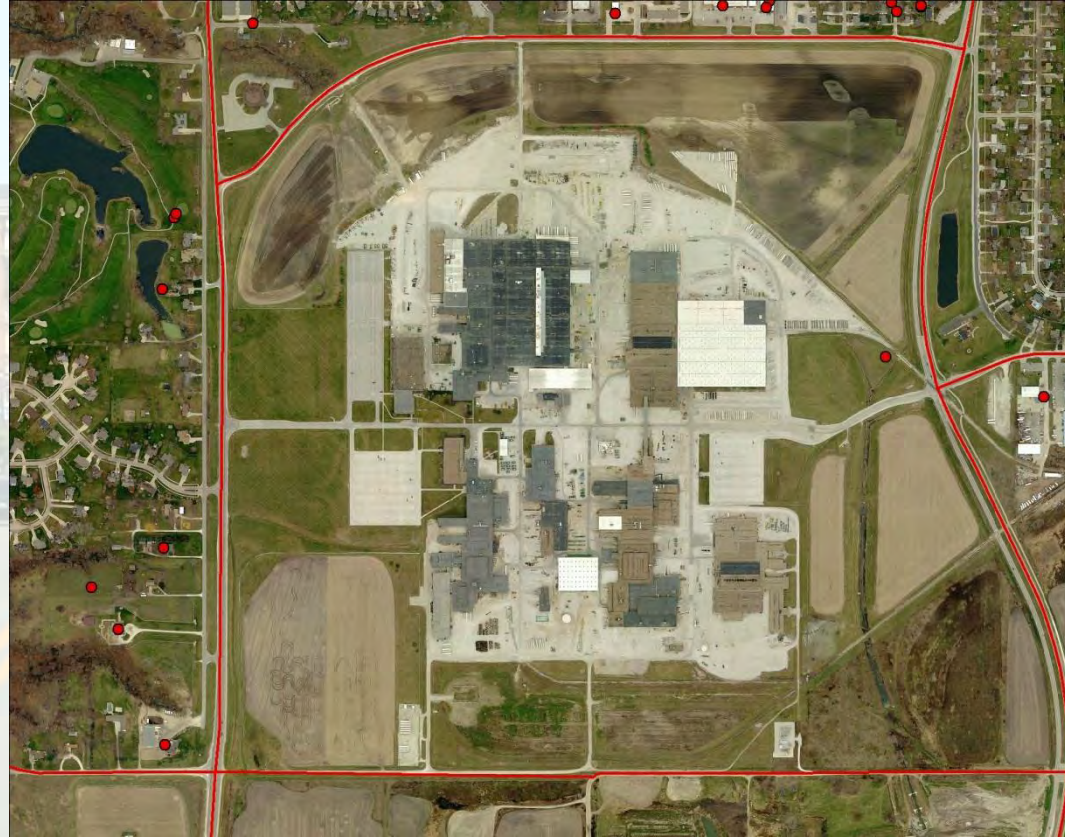
Example Problems

- Mercy Medical Center – Downtown

- 6,851 employees but each doctor office, department, etc., counted individually

Example Problems

- Target – West Des Moines
- 4 entries here:
  - Store: 100
  - Pharmacy: 5
  - Starbucks: 10
  - Security: 4

Example Problems

- Target – Altoona
- 3 entries here:
  - Store: 0
  - Pharmacy: 0
  - Starbucks: 16

Other Examples

- Redboxes: 4 employees for each

- NAICS Code Issues:

  - Firestone Ag Tire manufacturing plan listed as a tire dealer

  - Menards listed as residential remodelers

Census On the Map

- Part of Longitudinal Employer-Household Dynamics

- http://onthemap.ces.census.gov/

- Not site based, but exportable to various geographic sizes (e.g., TAZ, block group, city, etc.)

- Includes NAICS breakdown, as well as age, sex, etc.

Census On the Map

- The good…
  - Web-based, easy to acquire

- The bad…
  - Not much documentation on how data collected
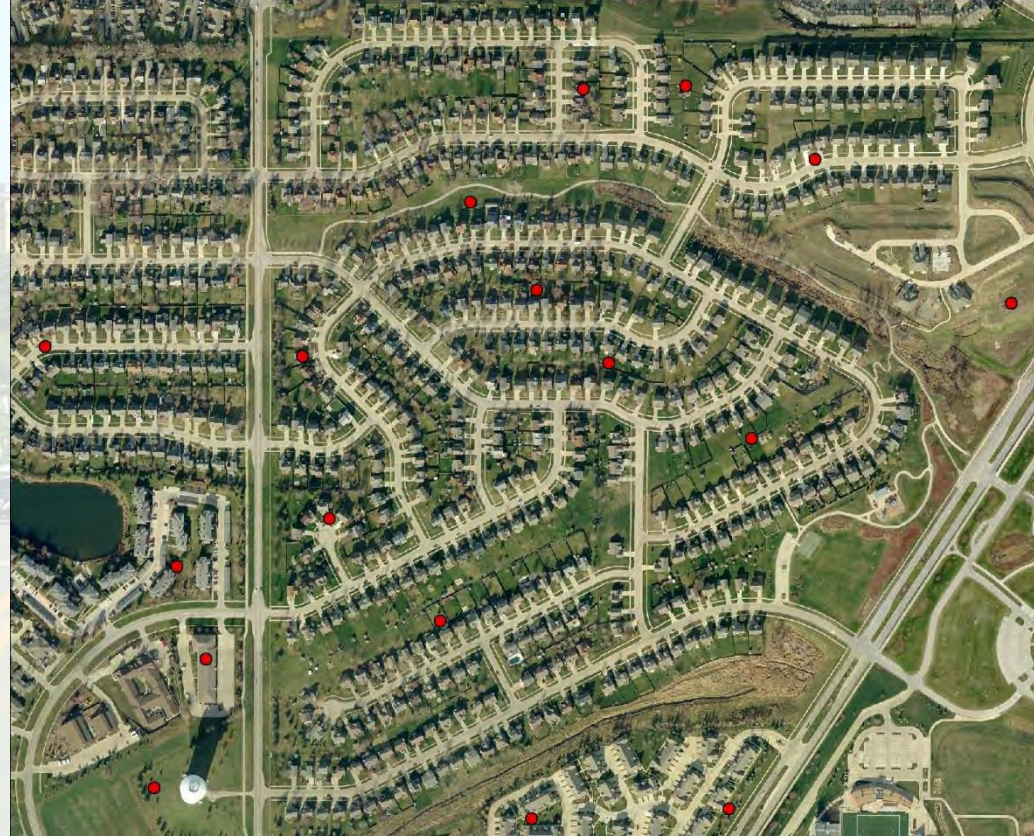 - Not tied directly to business or address
  - Leads to siting issues

Example Problems

- I-35 and Mills Civic

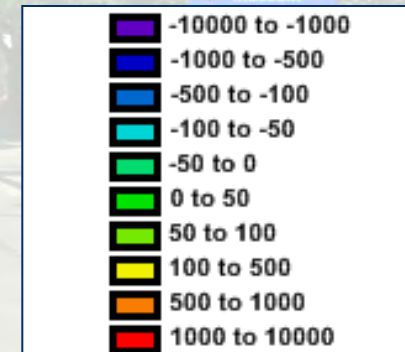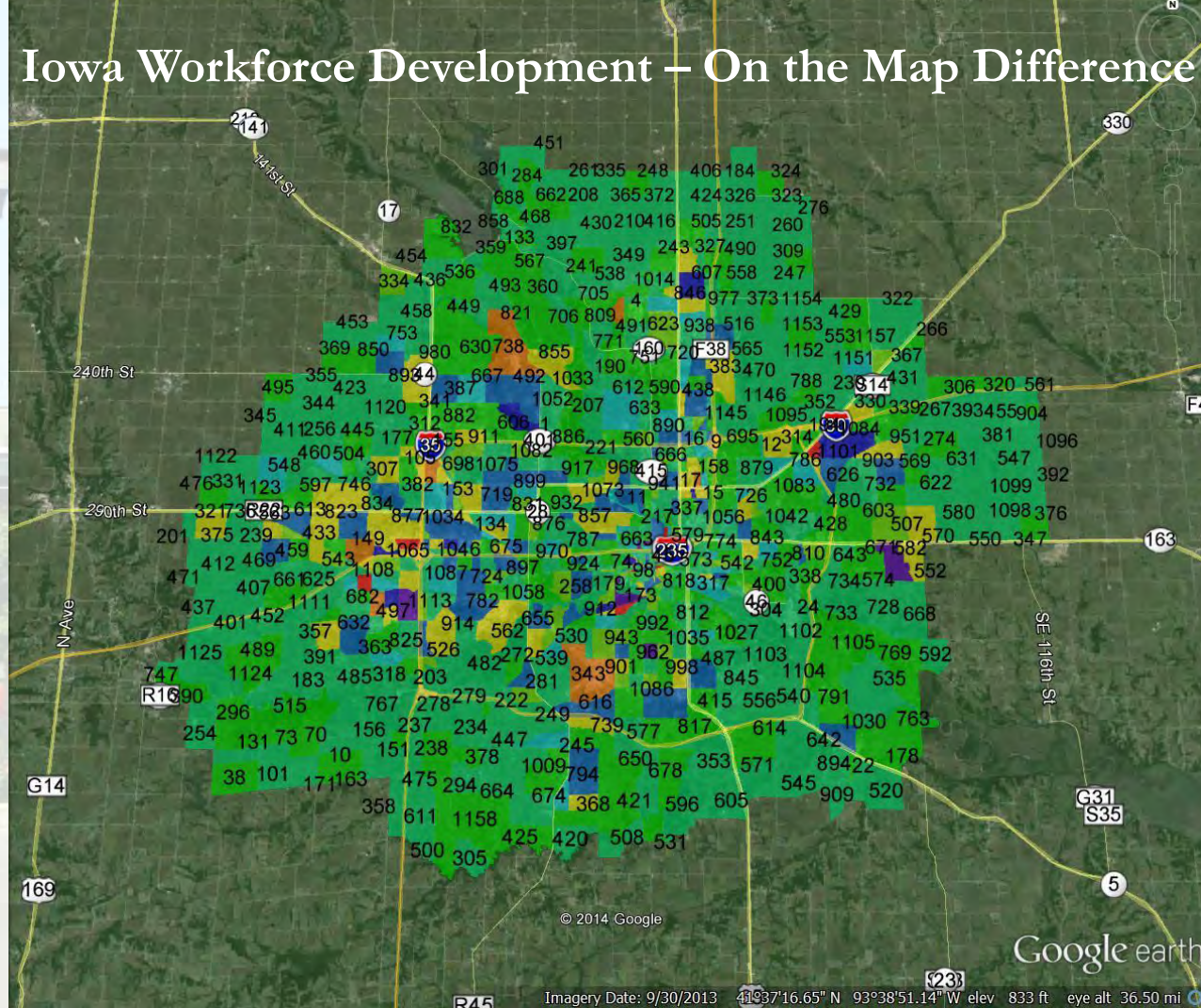- Where to jobs in circle come from?

Example Problems

- Jobs in residential area: 200 jobs?

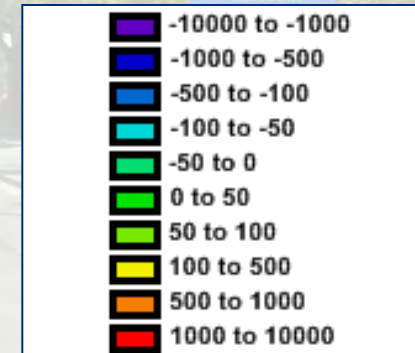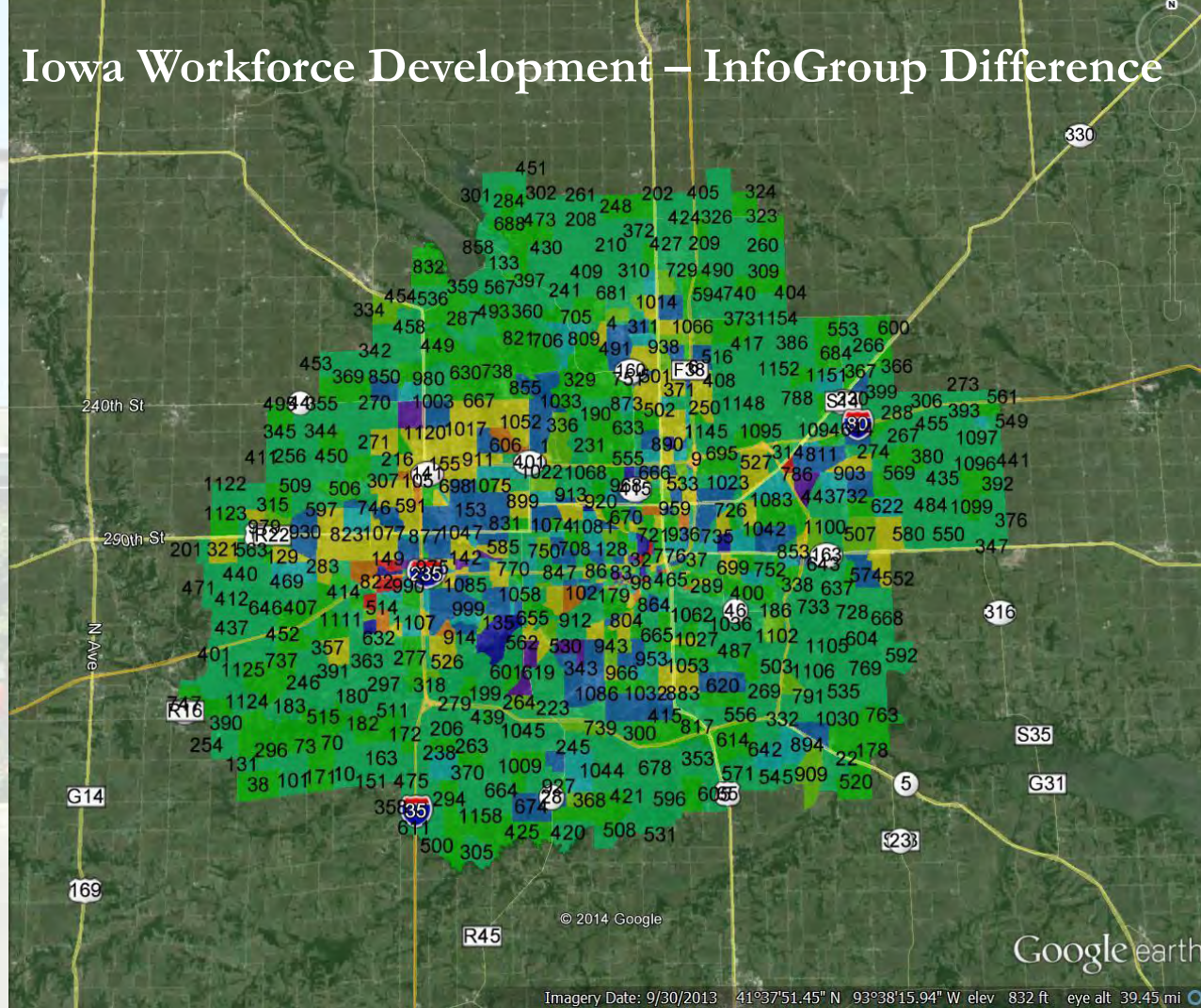# Comparing the 3 Sources

Data Source	Employment Total
Iowa Workforce Development	284,832
InfoGroup	304,544
InfoGroup (primary only)	257,439
On the Map	287,731

Iowa Workforce Development – InfoGroup Difference

Des Moines Area MPO Approach

- Estimate employment from parcel information

- Tie parcel-based employment to REMI control totals

- Work with local jurisdictions to ensure estimates reflect local knowledge

Step 1: Determine Data Available

- Des Moines Area MPO located in parts of 4 counties
  - 3 of 4 counties have sufficient parcel information for exercise; 4th county is all agricultural land
- Data needed for each parcel:
  - Detailed Use
  - Building square foot
  - Number of floors

Example: Polk County Parcel Info

- Data in attribute table:
  - Parcel ID & address
  - Parcel size
  - Use (e.g., residential, commercial, industrial, etc.)
  - Occupancy (e.g., auto repair, grocery store, bank, etc.)
  - Building area
  - Height
  - Age

Step 2: Identify Jobs per Square Foot

- Each use type was given a jobs/square foot ratio
- Ratio based on industry standards
  - US Energy Start standards
  - US Office of Energy standards
- Uses lumped into 10 categories

Use Category	Jobs/Square Foot Ratio
Education	969
Hospital	385
Hotel	3,000
Manufacturing	750
Office	250
Public Assembly	1,400
Religious Worship	2,000
Retail	500
Senior Care	1,000
Warehouse/Flex	1,250

(Building area x number of floors) Divide building area by jobs/sf ratio for employment

Step 3: Account for Mixed-Use Buildings

- Identify mixed-use buildings
  - By zoning and/or parcel information
- Determine area and/or floors for each land use type
- Assumptions made to streamline
  - Example: If retail and residential, assumed first floor was retail and others were residential

Step 4: Account for Public/Civic Buildings

- Some counties don't include buildings in the assessor/parcel records if they are tax-exempt
  - Schools
  - Municipal buildings
  - State/federal buildings
- Must find these manually

Example

- City of Des Moines office building (missing)

- City Hall (included)

Step 5: Calculate Employment

- Building area x number of floors = total area
  - Remember to take into account any mixed-use buildings

- Total area x jobs/sf ratio = employment

Step 6: Index to REMI Control Total

- Issue: Employment calculated by parcel likely will not equal the REMI control total for the area

- Solution:
  - Calculate each parcel's percent share of the total employment
  - Multiply each parcel's share by the REMI control total

Example

Parcel	LU EMP	Share	REMI EMP
1	10	0.17	12.75
2	15	0.25	18.75
3	5	0.083	6.225
4	30	0.50	37
Total	60	1.0	75

Assume REMI control is 75 but calculated employment is 60.

Step 7: Spot Check/Verify

- Review large employers and other uses that posed problems to other data sets (e.g., large retailers)

- Review with local government staff as well to identify locations

  - Example: industrial/warehouse uses took several iterations before we were comfortable

Optional Steps

■ Determine any subareas for region – may change the REMI number

■ Work-from-home and agricultural jobs may need to be considered

Benefits of this Work

- Travel demand model refinement
  - Previous model only had retail and non-retail breakdown; new model will have 10 different employment types plus special generators
- Consistent source of data for region
- Tied to REMI control totals
- Data ready for scenario tools like Envision Tomorrow

Envision Tomorrow

- Free scenario tool

- Uses parcel information. Each parcel must have employment and dwelling unit

- Parcels are 'painted' with different land uses

  - Acreage of parcel x development density (employment and/or population) = new pop/employment for parcel

Shortcomings of this Work

- Does not account for vacant buildings
- Up-front data collection may be tricky
- While employment numbers are close and good enough for travel modeling, they likely are not exact

Questions

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