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AMERICAN IMMUNIZATION  
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# Address Cleansing – Bringing Data Back In, and Putting It To Use

AIRA Discovery Session

October 22<sup>nd</sup>, 2018

4pm Eastern

# Agenda

- Opening Welcome
- Project Overview – Reintegration Guidance
- Address Cleansing in the Wild
  - Texas
  - Rhode Island
  - Michigan
- Discussion/Questions



# Today's Speakers:

- Kelly McDonald, Consultant, AIRA
- Kevin Allen, IIS Manager, Texas ImmTrac2
- Mike Berry, Senior Project Manager, HLN
- Josh Hull, Senior Developer, Michigan MCIR
- Lynsey Kimmins, Epidemiologist, Michigan MCIR



# Address Cleansing Project Overview

Kelly McDonald





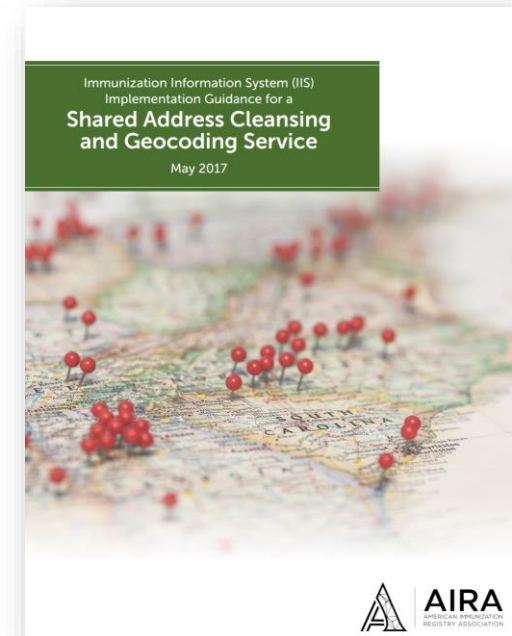
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# IIS Guidance: Reintegration of Cleansed Addresses and Geocodes

Kelly McDonald

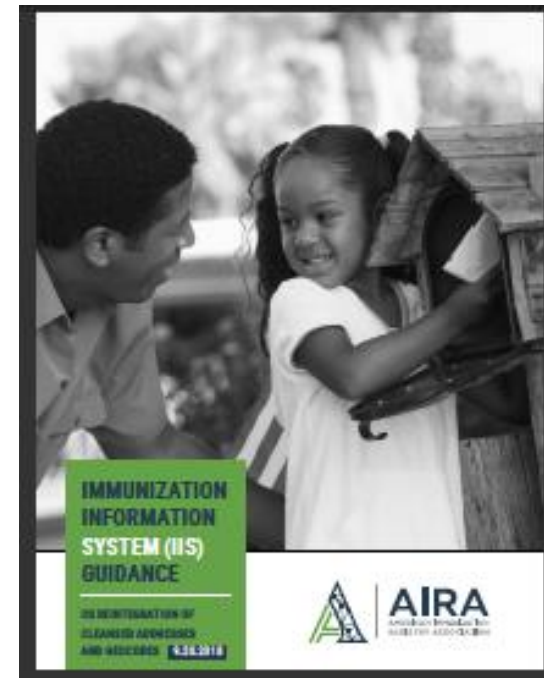
# Background: 2014-17

- 2014 – AIRA awarded funds to support joint development efforts
- JDI Workgroup
  - Initial joint development concept = centralized address cleansing and geocoding service
  - SmartyStreets
  - Implementation Guidance, May 2017



# Background: 2018

- February – Contracted to gather and document experiences/best practices
- March-April – Interviews, workgroups, other IIS outreach
- May-August – Writing, revising
- September 30th – Complete!



# What is Address Cleansing?

**Standardization** – The process of changing an address to adhere to USPS standards.

Example:

INPUT

616 ivory  
rio rancho NM, 87214-3042

STANDARDIZED

616 Ivory Rd SE  
Rio Rancho NM 87214-3042

**Validation** – The process of verifying that the address matches an address in the official USPS database.





# Benefits of Address Cleansing

- Improved reminder/recall success
- Patient-level deduplication
- Quality and accuracy of reports run by address and geographic parameters (e.g., AFIX and other coverage assessments)
- Household grouping functions
- Reductions in the number of manual reviews required by IIS staff



# Geocoding

- A geocode provides the GPS coordinates (i.e., latitude and longitude) of a physical location
- Geocodes can be leveraged to improve mapping capabilities:
  - Rates aggregated by city, county, or ZIP code
  - Number/types of provider organizations
  - Coverage rates during VPD outbreak
  - Other special projects



# Getting Started

- Establish purpose
- Get to know the codes
- Select essential fields
- Establish business rules
- Test it out!



# Example Output and Use

	SMARTYSTREETS FIELD NAME	DEFINITION
Delivery Point Validation (DPV)	dpv_match_code	<p>Status of the Delivery Point Validation (DPV). This lets you know if the USPS delivers mail to the address.</p> <ul style="list-style-type: none"><li>• <b>Y</b> – Confirmed; entire address was DPV confirmed deliverable (e.g., 1600 Amphitheatre Pkwy Mountain View, CA)</li><li>• <b>N</b> – Not Confirmed; address could not be DPV confirmed as deliverable.</li><li>• <b>S</b> – Confirmed by dropping secondary; address was DPV confirmed by dropping secondary info (apartment, suite, etc.).</li><li>• <b>D</b> – Confirmed - Missing secondary info; the address was DPV confirmed, but it is missing secondary information (apartment, suite, etc.).</li><li>• <b>[blank]</b> – The address was not submitted for DPV. This is usually because the address does not have a ZIP code and a +4 add-on code or the address has already been determined to be Not Deliverable (returned only as part of the XML response).</li></ul>

BR = IIS only accepts addresses returned as 'Y'



# Implementation & Reintegration

- Establish connection method
  - Manual batch processing
  - Automated batch processing
  - HL7 real-time solution
  - User interface API
- Prepare IIS for reintegration
  - Fields, tables
  - Business rules
- Monitor and evaluate the quality of new address data



# Implementation Challenges

- Competing projects / priorities
- Investment of staff and financial resources
- Adoption of new processes takes time



# IIS Experience with SmartyStreets

- *“SmartyStreets works great. I’m really happy with the speed and their customer service.”*
- *“We have definitely benefited from address cleansing already through reduced returns on our reminder/recall postcards.”*
- *“Geocodes give our epidemiologists a whole new playground to have fun with.”*



# Planning Support

## APPENDIX A CHECKLIST

The checklist below is intended to provide assistance to IIS programs in discussing the steps involved to implement address cleansing. Given the variations in IIS program structures and staffing, as well as network architecture, the order of these steps may vary. There may also be additional or alternate steps for jurisdictions to consider.

- ☐ Establish the purpose(s) for address cleansing. Does the IIS program wish to:
  - Standardize addresses
  - Confirm addresses as deliverable
  - Create and store geocodes to map patient or provider organization data
  - Other: \_\_\_\_\_
- ☐ Sign the Partner Agreement and receive a token for access from AIRA staff.
- ☐ Notify the IIS vendor or IT support of plans and the timeline for address cleansing implementation, if applicable.
- ☐ Read and follow SmartyStreets documentation to set up testing and plan for implementation and reintegration.
- ☐ Test SmartyStreets to become familiar with functionality.





# Interested in Address Cleansing and Geocoding?

- Visit AIRA's address cleansing webpage:  
<https://www.immregistries.org/address-cleansing>
- View guides in AIRA's Resource Repository:  
<http://repository.immregistries.org/>
- Sit in on Address Cleansing and Geocoding User Group meeting
- Contact Maureen at [mneary@immregistries.org](mailto:mneary@immregistries.org)



Kelly F. McDonald, MPH | Kelly McDonald, LLC

[km@kellymcdonaldllc.com](mailto:km@kellymcdonaldllc.com)

541-419-0136



# Texas – ImmTrac2

Kevin Allen





TEXAS  
Health and Human  
Services

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Texas Department of State  
Health Services

# Texas Immunization Registry

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***Address Cleansing Implementation***

***Presenter: Kevin Allen***

# Overview



TEXAS  
Health and Human  
Services

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Texas Department of State  
Health Services

- Implementation
- Phase I, II, III
- Daily Batch Processing
- Outcomes & Benefits
- Future Enhancements

# Texas Immunization Registry

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## Implementation: Phase I

Production on June 21, 2018

- Organization Addresses
  - ~40,000 records
  - 89% corrected
    - 1,600 Zip codes updated
    - 860 City name updated



**TEXAS**  
Health and Human Services

Texas Department of State  
Health Services

# Texas Immunization Registry

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## Implementation: Phase II

Identified DQ issues with specific counties

- Legacy vs. FIPS county code
- Cottle county
  - Pop. 1,500
  - IIS: 7,000



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Health Services

# Texas Immunization Registry

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## Implementation: Phase III

Remaining client addresses

- 10.3m records
  - 1.2m County corrected
  - 986,500 Zip corrected
  - 640,930 City corrected



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Health Services



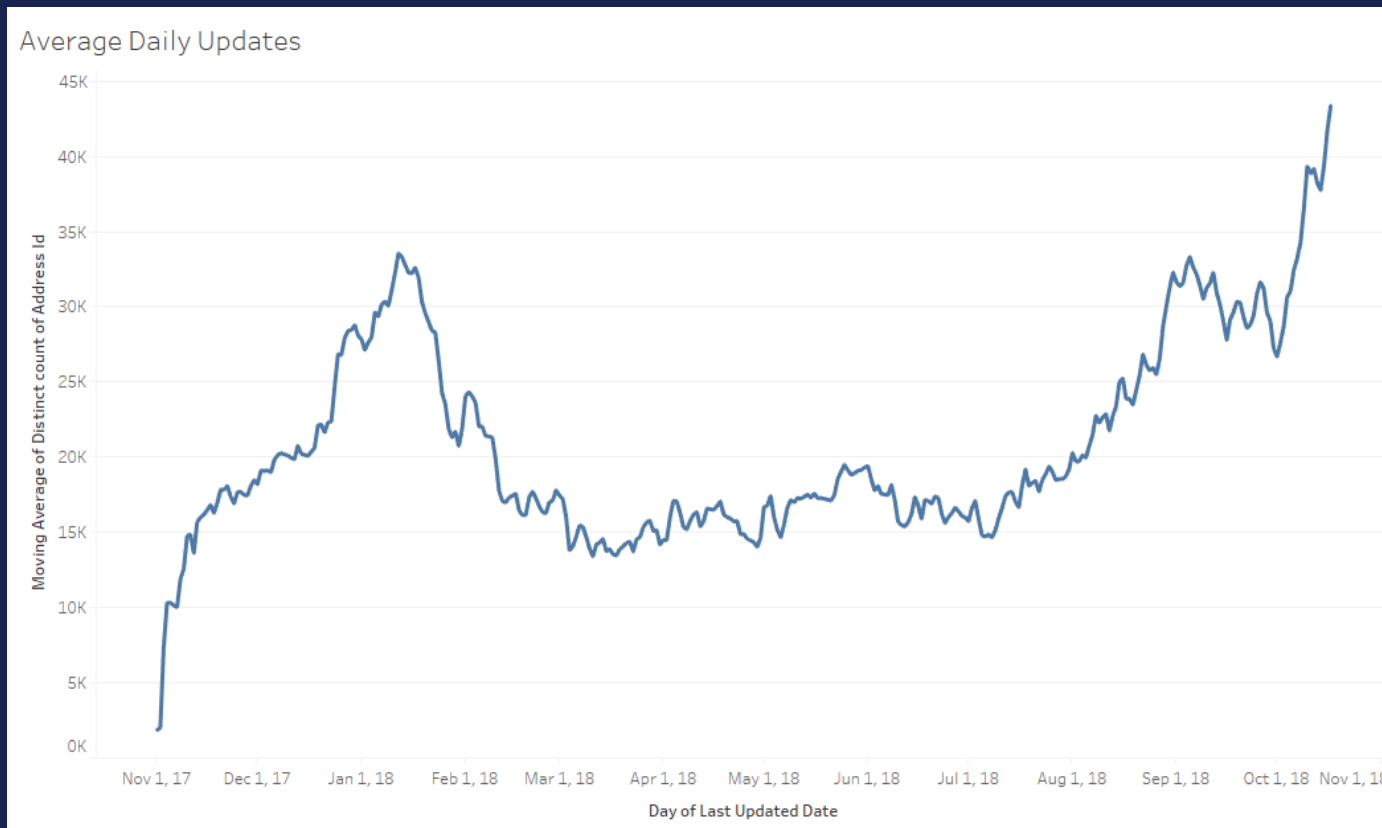
# Texas Immunization Registry

## Daily Automated Batch Update



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# Texas Immunization Registry

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## Anticipated Outcomes & Benefits

- Better data
- More reliable demographics
- Standardization simplifies deduplication
- Populate geocode data
- Cost-savings on postage

In process of evaluation

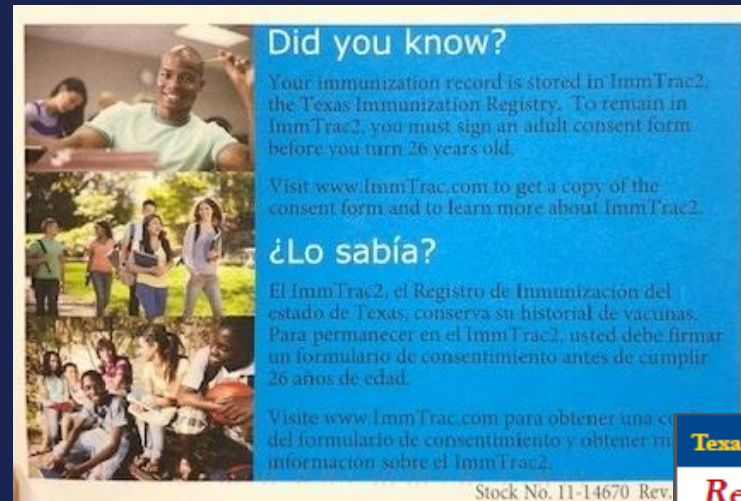


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Health Services

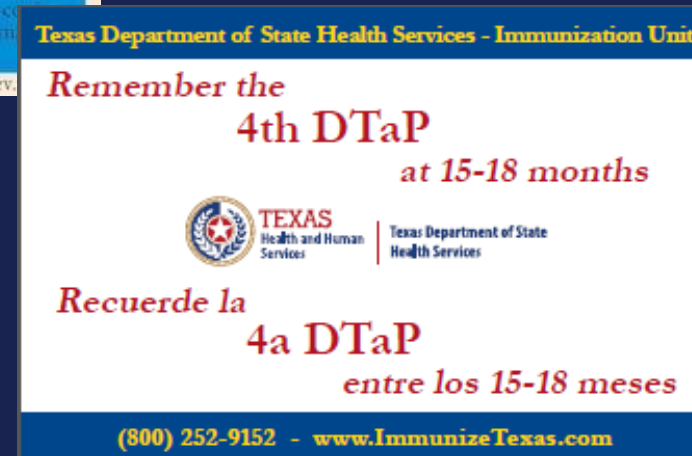
# Texas Immunization Registry

## Postcard Reminders



18 Year Old Consent

4<sup>th</sup> DTaP Reminder



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# Texas Immunization Registry

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## Future Enhancements

- Implement into UI
- Implement into data exchange



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Services

**Texas Department of State  
Health Services**

# Thank you

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**Kevin Allen – IIS Manager**  
[kevin.allen@dshs.texas.gov](mailto:kevin.allen@dshs.texas.gov)

# Rhode Island - KidsNet

Mike Berry, HLN





# Goals for SmartyStreets Initiative in RI

- Improve deduplication of addresses
- Improve quality of addresses for display and mailing
- Improve city identification for school district mapping
- Make geocoding data more accessible

Determine how to best utilize SmartyStreets for all of the above



# SmartyStreets Integration Opportunities

1. Replace existing routines in batch de-duplication
2. Produce geo-coding and postal service metadata
3. Incorporate into existing web-based data entry
4. Clean addresses already in KIDSNET
5. Incorporate into existing data imports





# SmartyStreets-enabled Deduplication

- 123 TORTELLOT HILL ROAD, SCITUATE, RI, 02857
- 123 TOURTELLOT HILL ROAD, SCITUATE, RI, 02857
- → **123 Tourtellot Hill Rd, Scituate RI 02857**
- 123 JOSLIN STREET 1ST FL, PROVIDENCE, RI, 02909
- 123 JOSLIN STREET 1ST FLR, PROVIDENCE, RI, 02909
- → **123 Joslin St Fl 1, Providence RI 02909**
- 123 SAUNDERS BROOKE RD, CHEPACHET, RI, 02814
- 123 SAUNDERS BROOK RD, CHEPACHET, RI, 02814
- → **123 Saunders Brook Rd, Chepachet RI 02814**
- 123 WINTERBERRY RD, SAUNDERSTOWN, RI 02874
- 123 WINTERBERRY RD, NARRAGANSETT, RI 02874
- → **123 Winterberry Rd, Saunderstown, RI 02874**
- 123 MCCARRIE LANE, PORTSMOUTH, RI, 02871
- 123 MCCORRIE LANE, PORTSMOUTH, RI, 02871
- → **123 McCorrie Ln, Portsmouth RI 02871**
- 123 POTTER AVE, PROVIDENCE, RI 02907
- 123 POTTERS AVE, PROVIDENCE, RI 02905
- 123 POTTERS ST, PROVIDENCE, RI 02905
- → **123 Potters Ave, Providence, RI 02905**

- Low-hanging fruit, low-risk – implemented first
- 24,000 pairs of duplicate addresses identified
- Geocodes and delivery metadata stored

# Web-based Data Entry

- Real-time suggestions as the user types
- Demonstration at smartystreets.com

**Step 1:** Pick one US International

**Step 2:** Choose a lookup type address components

**Step 3:** Enter an address

Address line 1:

Address line 2:

City:

State:

ZIP Code:

[Try a sample](#) [View Results](#)

**Step 1:** Pick one US International

**Step 2:** Choose a lookup type address components

**Step 3:** Enter an address

Address line 1:

Address line 2:

City:

State:

ZIP Code:

[Try a sample](#) [View Results](#)

You entered:  
*3 Capitol HI Providence, RI*

✓ Found 1 valid address:

3 Capitol HI Delivery line 1

Providence RI 02908-5034 City, State, ZIP Code, +4 Code

- ✓ Matched street and city and state
- ✗ Confirmed without secondary
- ✗ Missing secondary number

[Show more details ↓](#)

# Web-based Data Entry

- Currently in development in KIDSNET:

**Address for Parent/Guardian CURRENTLY DISPLAYED ABOVE**

☐ Correct Current Address ☒ Moved To New Address

Street:

Apt:  ☒ Good ☐ Bad

City:

**Mailing**

State:  Zip:

Apt:  ☐ Good ☐ Bad

State:  Zip:

**Historical Parent Addresses - Check to Mark as Current Address**

**Address for Parent/Guardian CURRENTLY DISPLAYED ABOVE**

☐ Correct Current Address ☒ Moved To New Address

Street:

Apt:  ☒ Good ☐ Bad

City:

State:  Zip:  ☒ Verified

**Mailing Address** ☐ Same as above Address

Street:

Apt:

City:

State:  Zip:

Address verified! Click to undo.

# Postal City vs. Actual City

- SmartyStreets uses United States Postal Service (USPS) addresses
- USPS city names may not be the actual city in which the property resides
- The example below (a business) resides in and pays taxes to the city of Warwick, RI

You entered:  
4372 Post Rd East Greenwich, RI

✓ Found 1 valid address:

4372 Post Rd  
Delivery line 1

East Greenwich RI 02818-4123  
City, State, ZIP Code, +4 Code

✓ Matched street and city and state

✓ Confirmed entire address

You entered:  
4372 Post Rd Warwick, RI

✗ UNKNOWN ADDRESS

4372 Post Rd  
Delivery line 1

Warwick RI  
City, State, ZIP Code, +4 Code

✗ ZIP+4 did not match

✗ Address not found

You entered:  
4372 Post Rd Warwick, RI 02818

✓ Found 1 valid address:

4372 Post Rd  
Delivery line 1

East Greenwich RI 02818-4123  
City, State, ZIP Code, +4 Code

✓ Matched street and city and state

✓ Confirmed entire address

✗ Unverifiable city/state



# Postal City vs. Actual City (cont.)

- Solution: “Official City” – a calculated field
- Using SmartyStreets coordinates, geolocate USPS address on the map inside the official city boundaries
- Automatically populate (and in the case of web data entry, *show*) the official city
- **Problem:** SmartyStreets precision may be up to a few hundred yards off; houses near municipal borders may land on the wrong side
- **Solution:** Verify with E911 address database
  - If coordinates are less than a half-mile apart, trust E911 city
  - If more than a half-mile apart, trust SmartyStreets-mapped city



# Next Steps

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- Refine and test web-based data entry
  - Implement “Official City” solution
- Back-end address clean-up
  - Consider re-integration best practices and options
  - Important to be aware of potential data loss in cleaned address, e.g.:
    - City name
    - Extraneous info after street address that is not floor, apartment, etc.:
      - 2 WASHINGTON AVE / ***WEST HALL ROOM***
    - Street Address

# Michigan - MCIR

Josh Hull

Lynsey Kimmins



# MCIR Address: Three Statuses



Valid



Invalid



Unknown



## MCIR Online Data Entry

**Country\***

United States

☒ Valid

☐ Keep as Entered

**Street\***

6515 First St

**City\***

Lake Ann

**State\***

MI

**Postal Code\***

49650

**County\***

Benzie



SmartyStreets

## MCIR Database



Valid



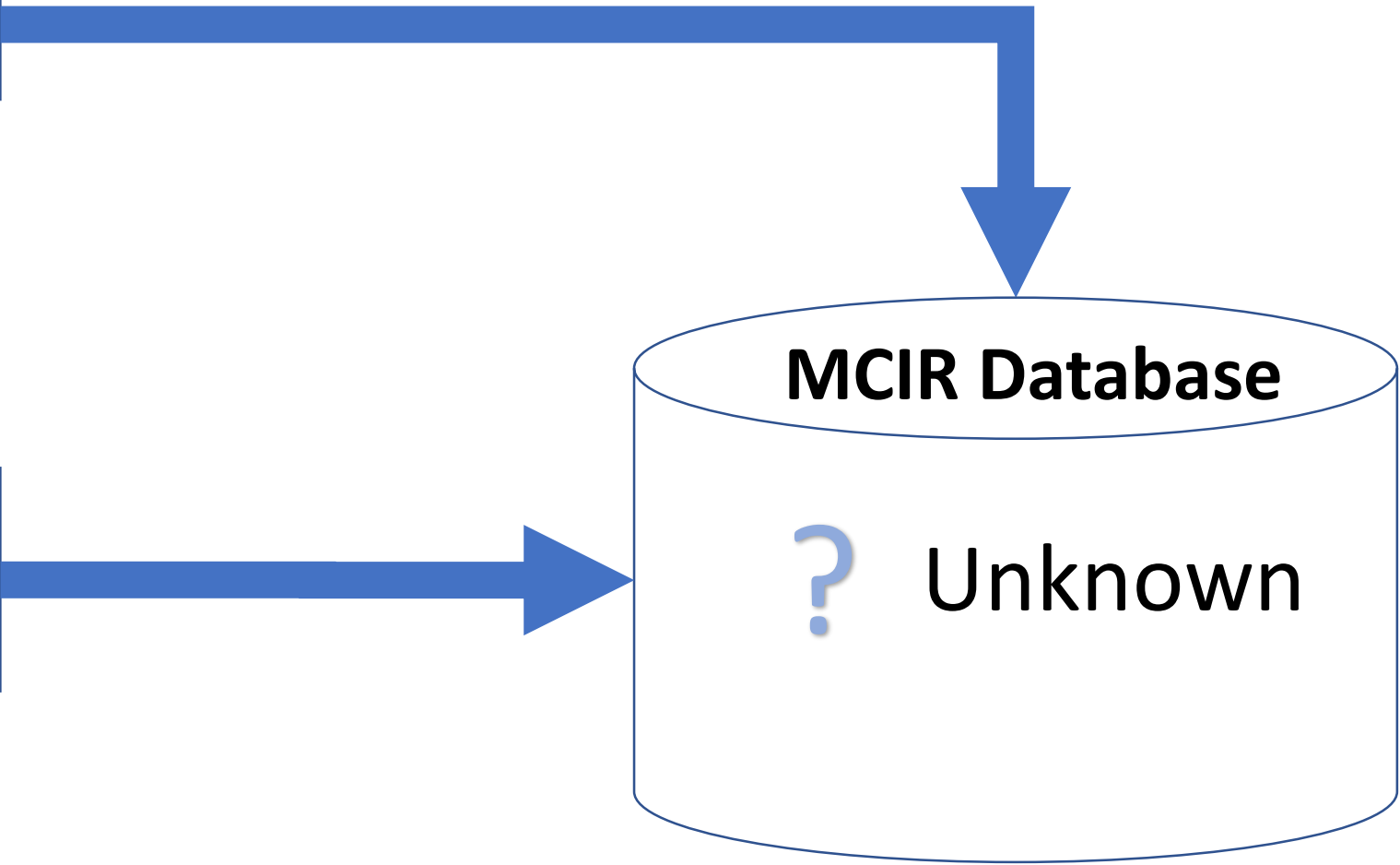
Invalid

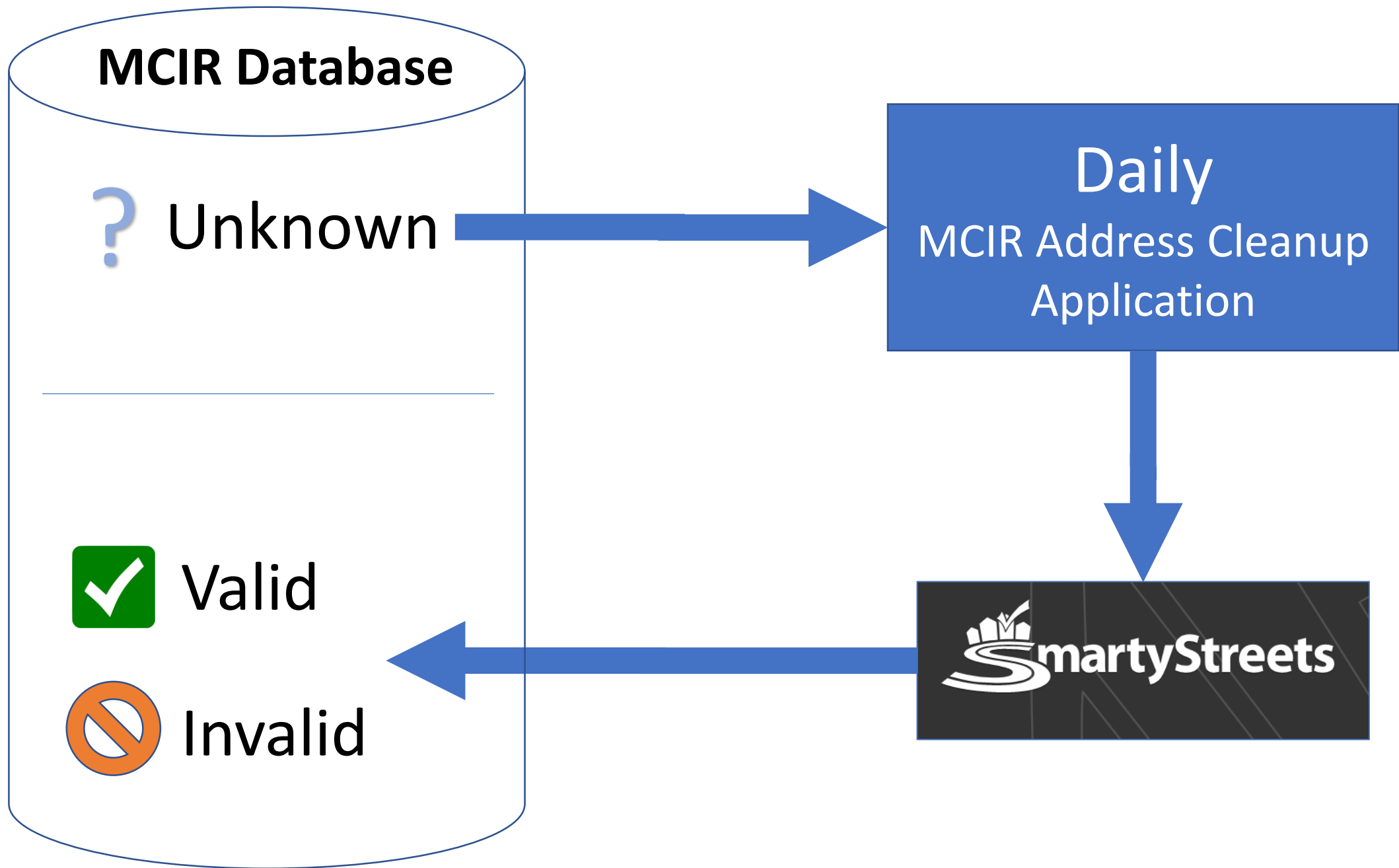
Message Received

```
MSH | ^~\& | | 1255-60-20 | MCIR | MDCH | 20181019150056-0400 | | VXU^V04^VXU_V04 | 3WzJ-A.01.01.2aF |  
PID | | | TEST-694842261^^^AIRA-TEST^MR | | Erasma^Darren^Sadurni^^^^L | Andres^Emmet | 201807  
PD1 | | | | | | | | | | 02^Reminder/Recall - any method^HL70215 | | | | A | 20170301 | 20170301  
NK1 | 1 | Erasma^Emmet^^^^^L | MTH^Mother^HL70063 | 417 Kuhuk Ave^^Lake Ann^MI^49650^USA^P
```

HL7 Interface

Other Data Sources  
(Vital Records, etc)





Actually...

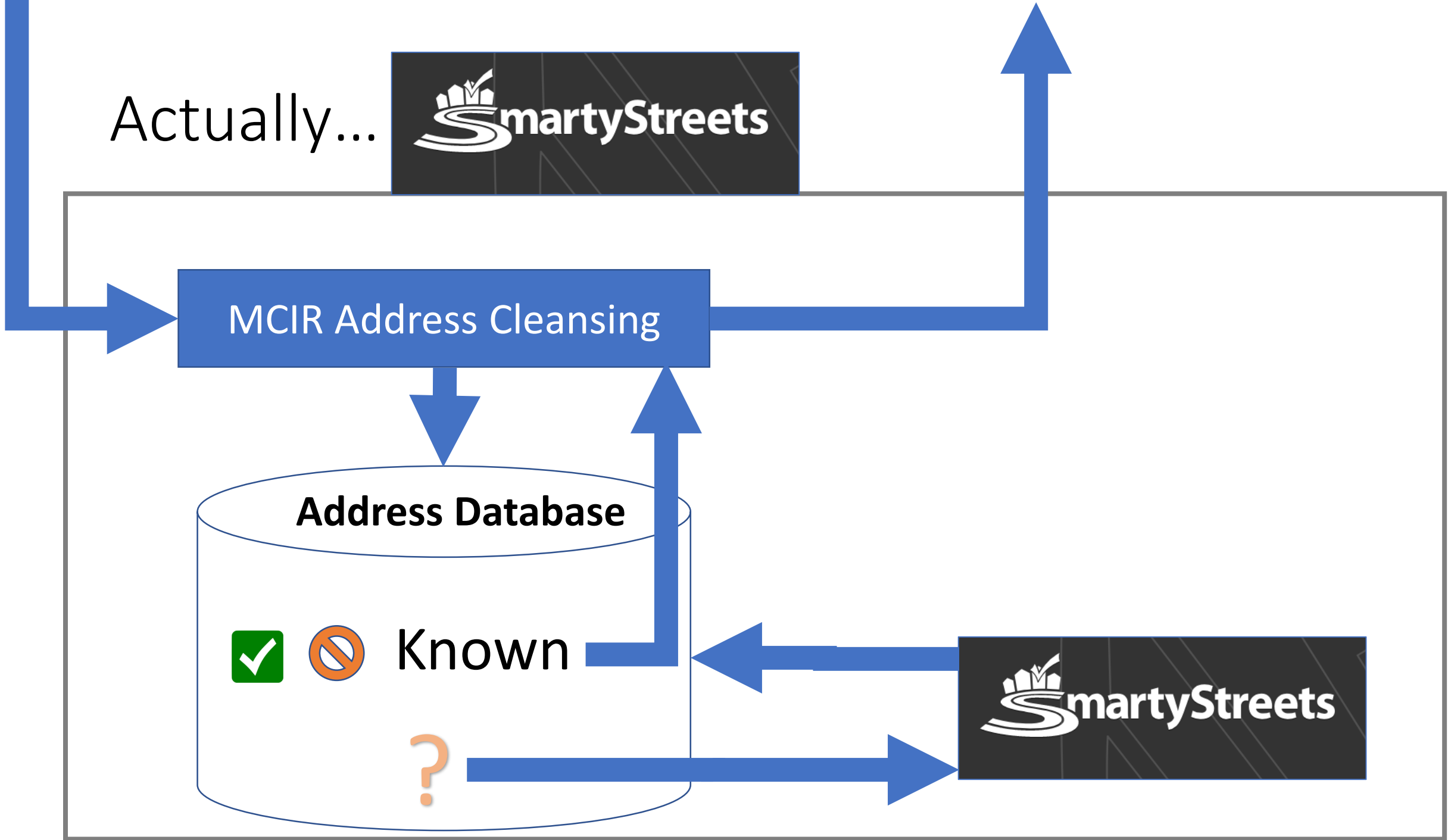


MCIR Address Cleansing

Address Database

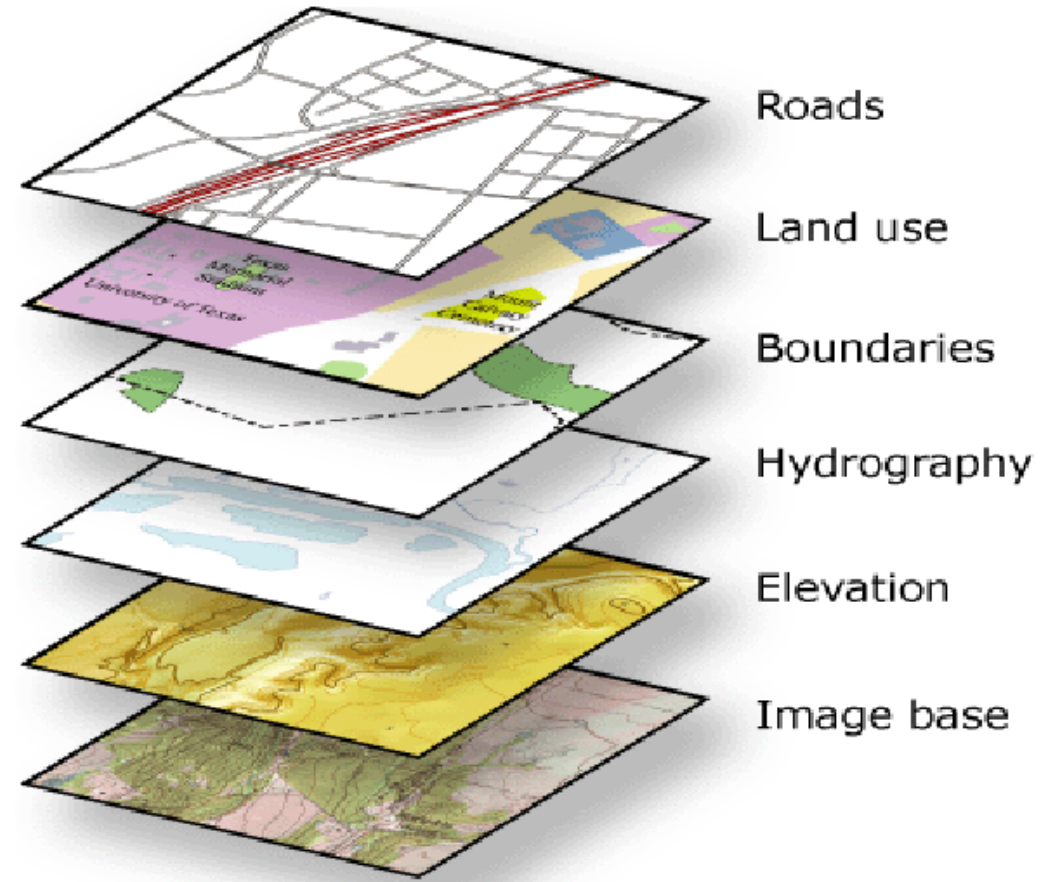


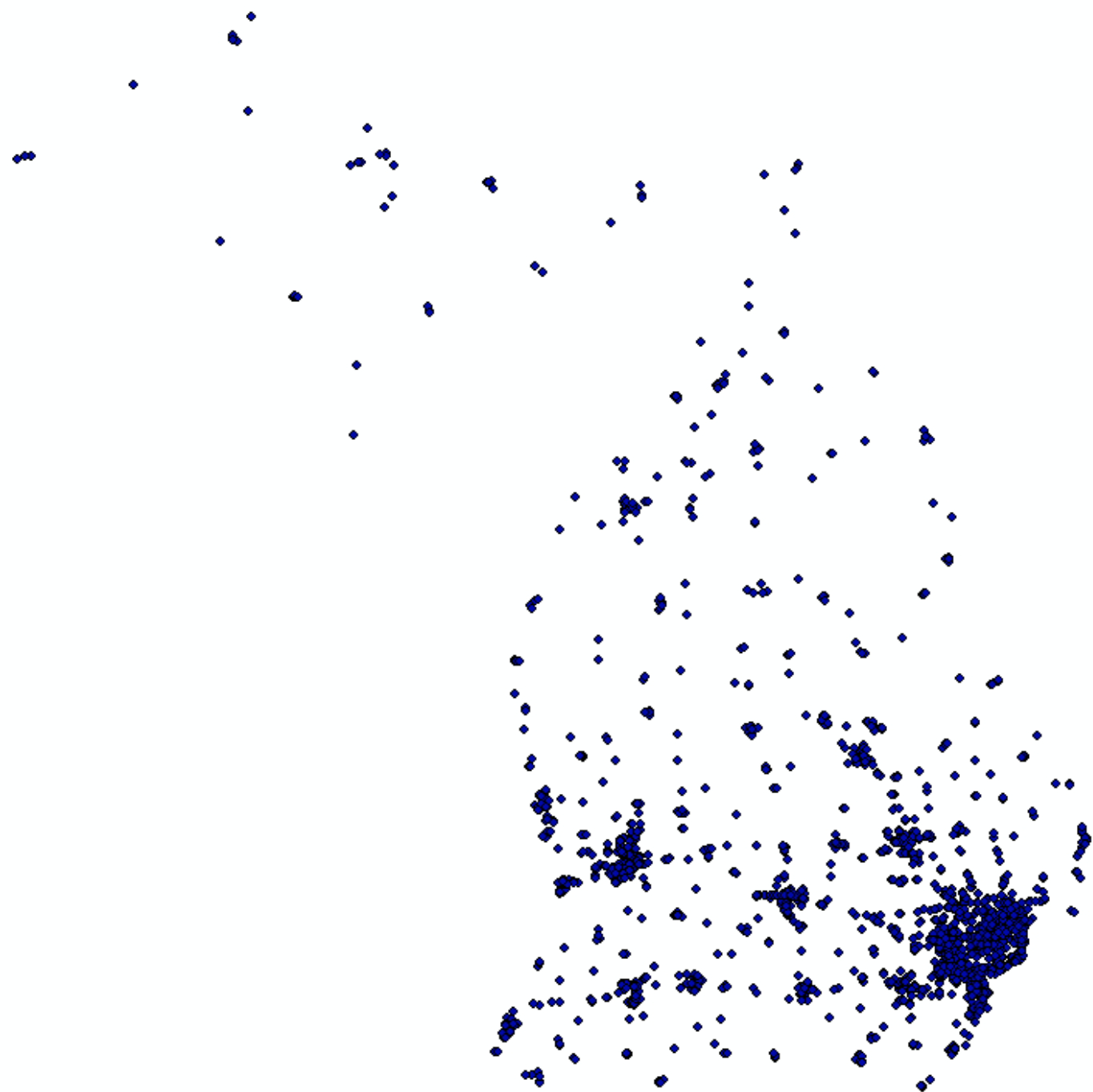
Known

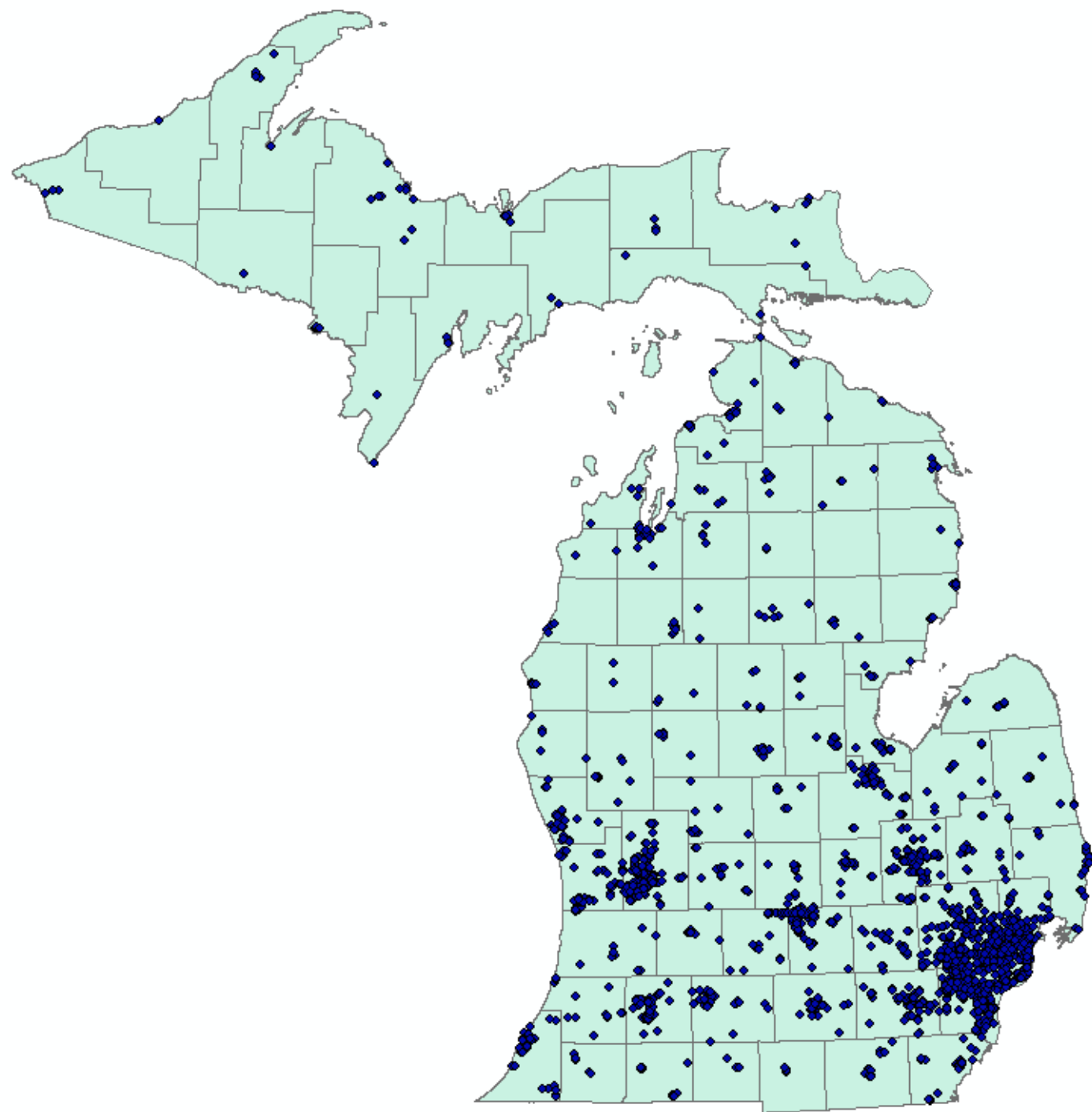


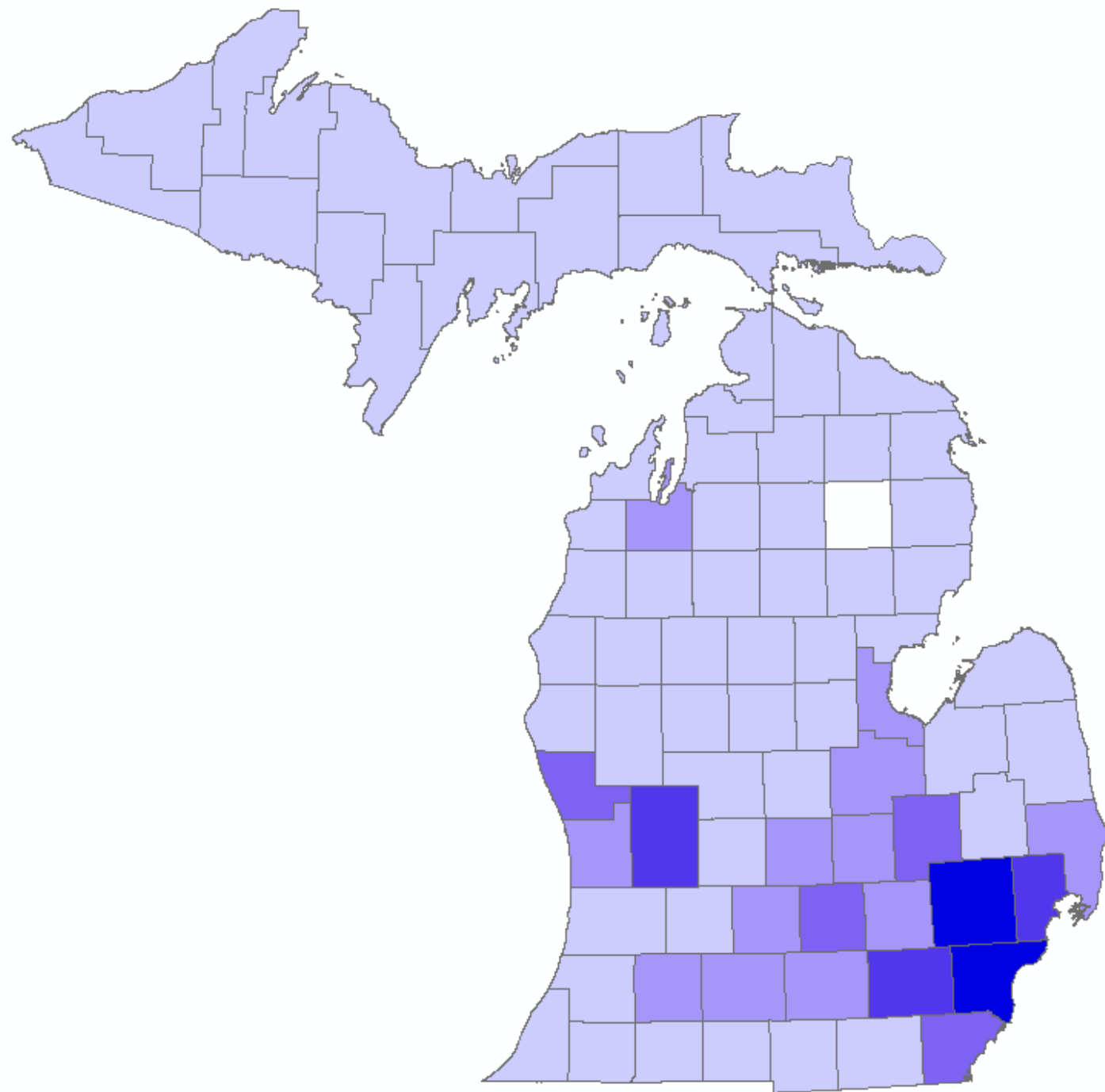
# Geographic Information Systems (GIS)

- Used to capture, store, and display data related to its position on the Earth
- Data is comprised of different components, each stored as a layer
- Visualize patterns and relationships

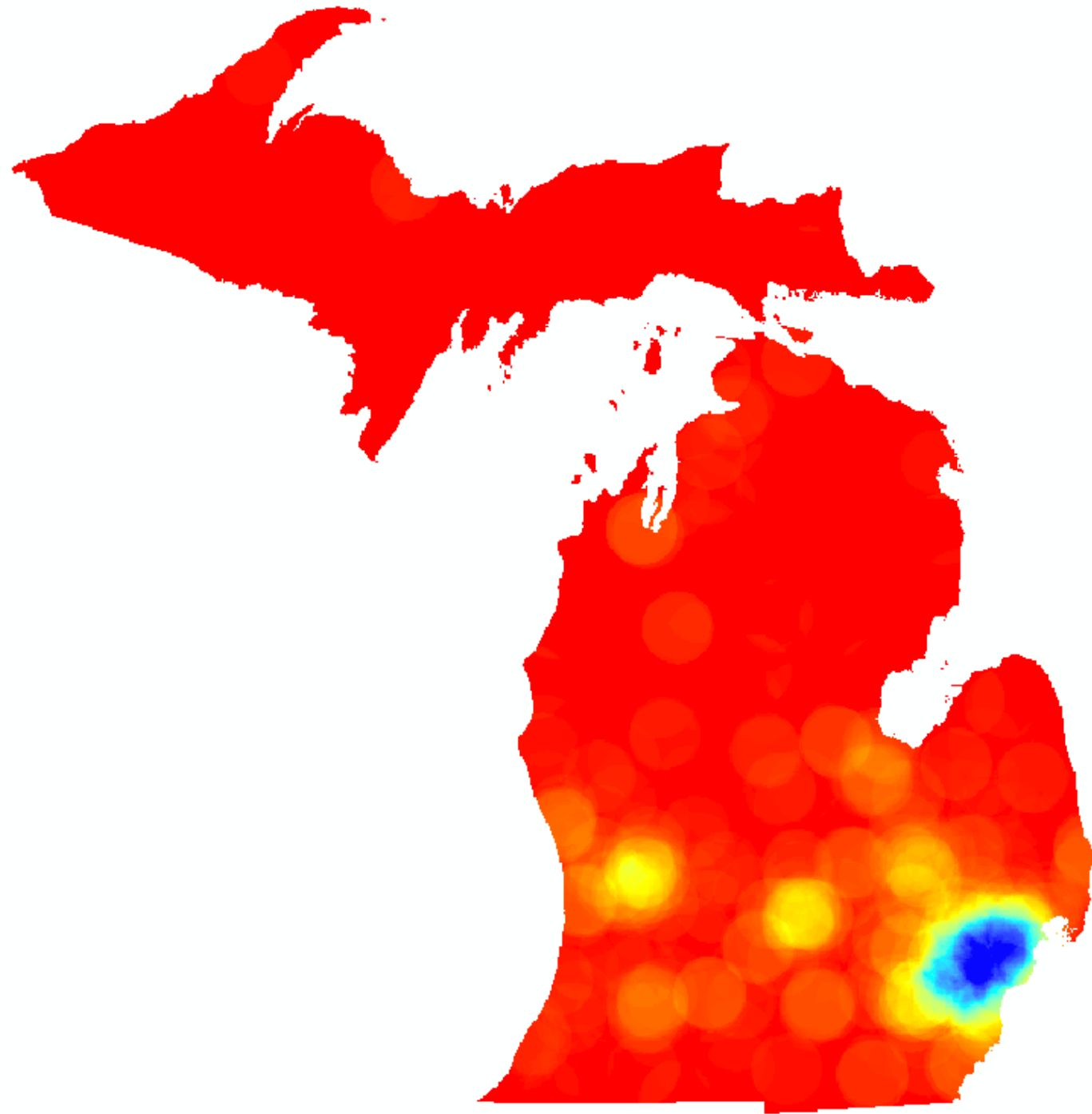










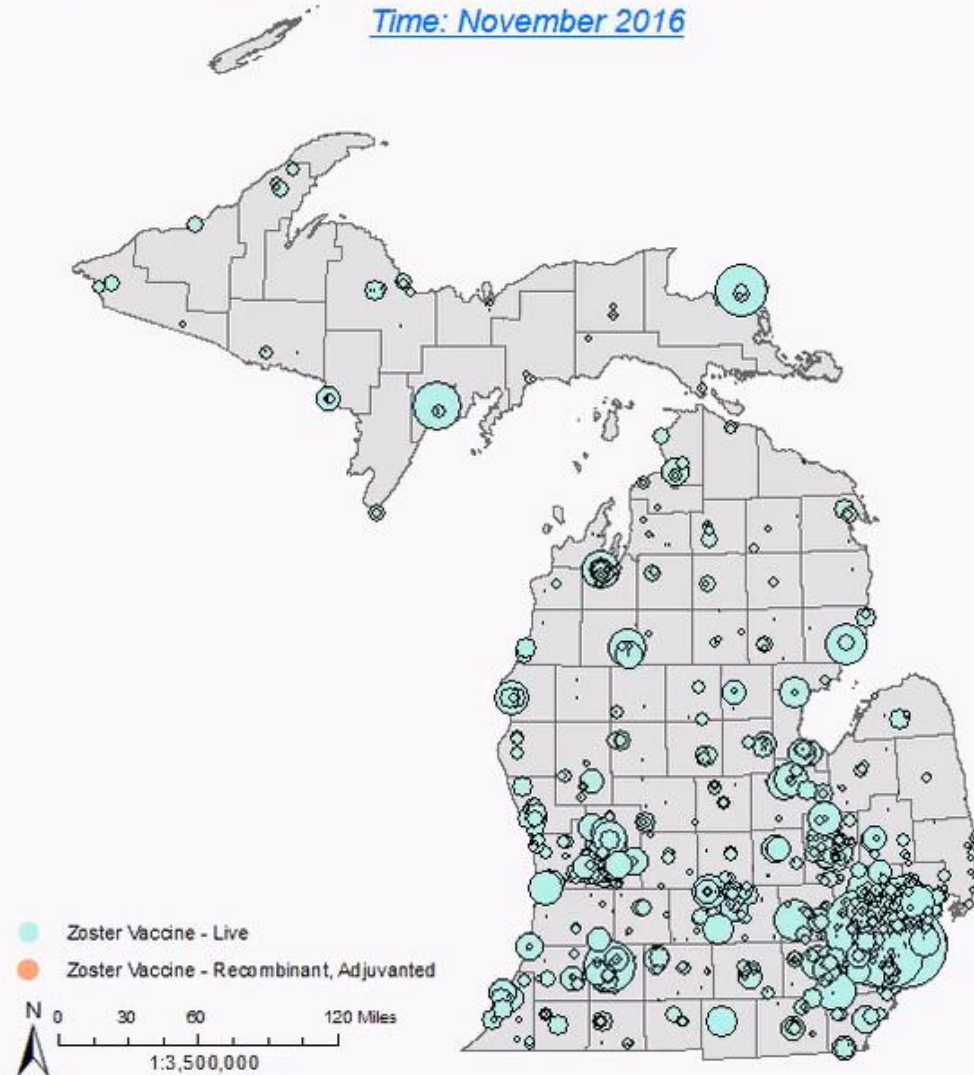


*For animation: view in presentation mode and click the map to play.*

## Zoster Vaccines: An Uptake Explosion by Month

Zoster Doses Administered and Reported to the Michigan Care Improvement Registry (MCIR) for Adults 50+, November 1, 2016 - June 30, 2018 by Facility and Month

Time: November 2016



Vaccine data: MCIR, November 1, 2016, 2016 - June 30, 2018

Michigan boundaries: State of Michigan GIS Open Data

Created by: Lynsey Kimmins; 2018 AIRA Geocoding Contest; July 20, 2018

Projection: Hotine Oblique Mercator Azimuth Natural Origin

Vaccination record submission to the MCIR for adults 20 years and older is strongly encouraged but is not required.

61 sites were excluded that did not have valid SmartyStreets geocodes in the MCIR.

# GIS Software...just to name a few

## **Proprietary**

- ArcGIS (Esri)
- MapInfo (Pitney Bowes)
- ENVI (Harris)

## **Open Source**

- QGIS
- GRASS

Questions, Comments, Discussion?



# Thank you for attending!

- For more information, visit the AIRA website at <https://www.immregistries.org/address-cleansing>
- Both Address Cleansing Guidance Documents are up on the AIRA Repository, and this webinar will be added by later this week
- Questions about using this no cost Address Cleansing service? Contact Maureen Neary, AIRA Project Manager, at [mneary@immregistries.org](mailto:mneary@immregistries.org)
- Watch for a survey about today's webinar – thank you in advance for providing input/feedback!

