

Geocoding Public Health Data: The Next Generation

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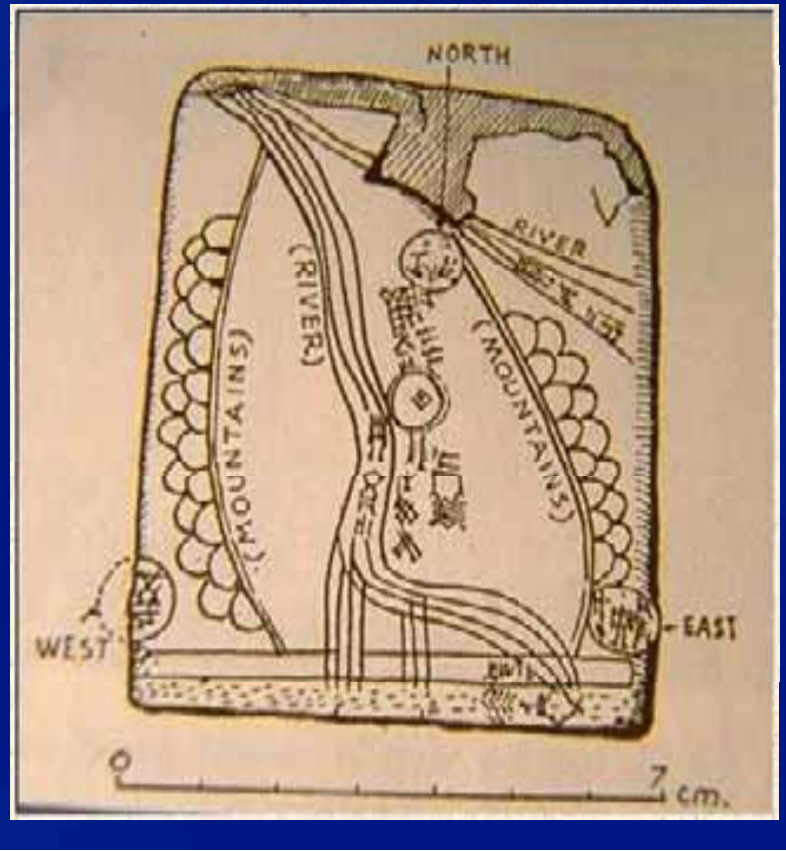
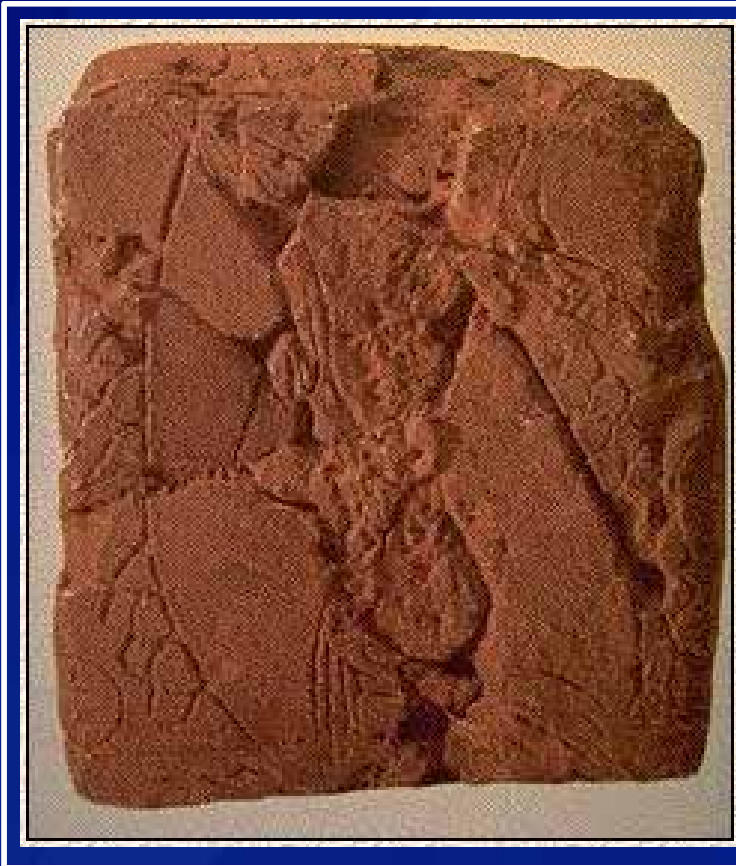
ESRI Health GIS Conference
October 19, 2010

Agency for Toxic Substances and Disease Registry
Geospatial Research, Analysis and Services Program/Division of Health Studies



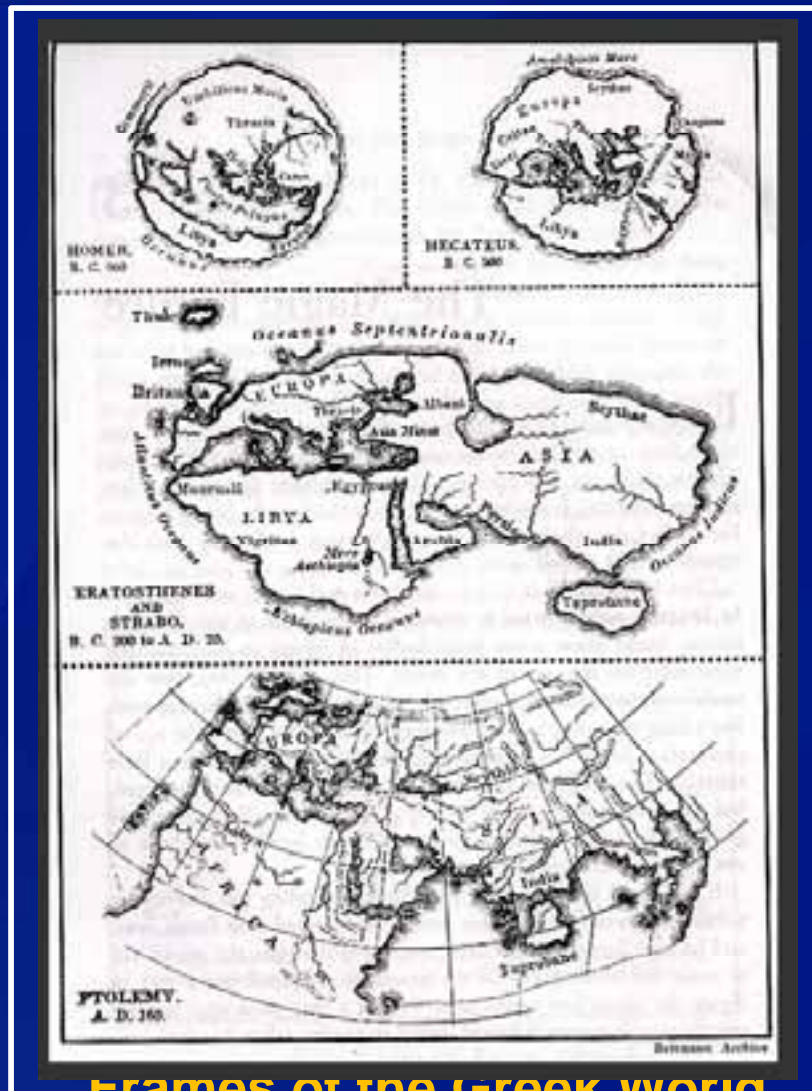
Presentation Overview

- ❑ Project Background
- ❑ Data Acquisition
- ❑ Methodological Issues
- ❑ Next Steps

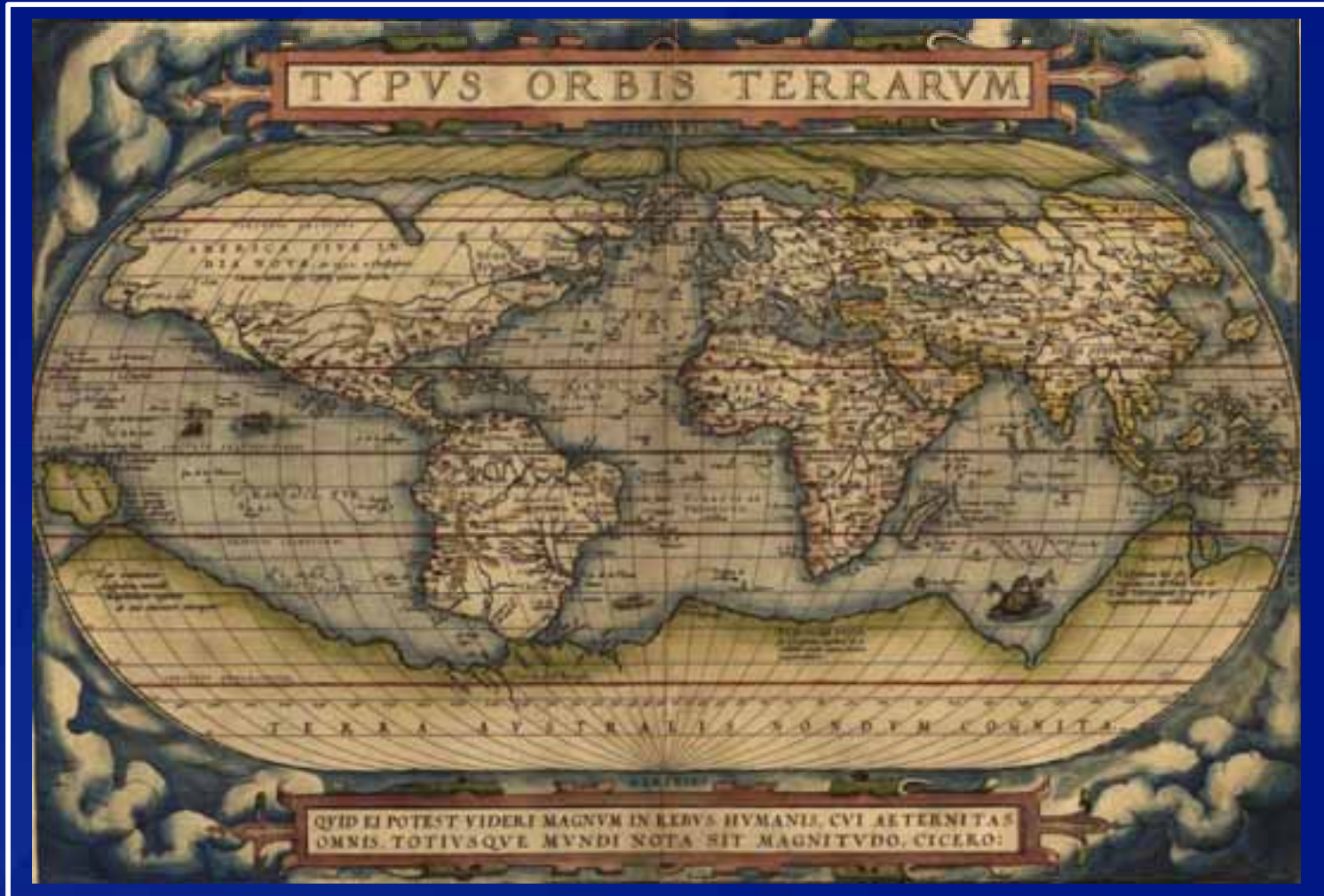


2500 BC
Clay Tablet Map from Ga-Sur

<http://www.henry-davis.com/MAPS/AncientWebPages/100mono.html>



**Frames of the Greek world
Homer, Hecateus, Eratosthenes, and
Ptolemy**



Ortelius Atlas 1570

Definitions

- ❑ **Geocoding is “the process by which an entity on the earth’s surface, a household, for example, is given a label identifying its location with respect to some common point or frame of reference”¹**
- ❑ **Address matching is “A specialized case of feature matching, strictly dealing with matching postal street addresses to features in the reference data source, usually TIGER type street segments or areal unit delineations (Census delineations, USPS ZIP Code de-linations, etc.).”²**

¹(Goodchild, 1984, p. 33).

² Goldberg DW: A Geocoding Best Practices Guide. Springfield, IL: North American Association of Central Cancer Registries; 2008.



Geocoding Systems Options

□ Geocoding options

- Commercial
- Open source
- Build your own



Geocoding Systems Options

□ What option is best?

- Number of records geocoding
- Level of expertise and technology support
- Cost



Previous Geocoding Systems Evaluations and Experiences



- ❑ Previous research describing variability by geocoding software
- ❑ Limited nationally representative data
- ❑ Limited evaluation of match and error codes

Data Acquisition

Jhr frghu4	Jhr frghu5	Jhr frghu6	Jhr frghu7
WhdnDwolvð VvhhwDgguhw udqjh	WhdnDwolvð Vvhhw Dgguhwudqjh	533 ; X V F h q v x v j e x u d x j W L J H U 2 d q h y i h v	WhdnDwolvð Vvhhw Dgguhwudqjh
QDYWHT yvhhhw 5343			QDYWHT Vvhhwyð343
XVSV] Isý: 7	XVSV] Isý: 7	XVSV] Isý: 7 W L J H U	XVSV] Isý: 7

- 2 Commercial
- 2 Open-source
- TeleAtlas 2008

Data Acquisition

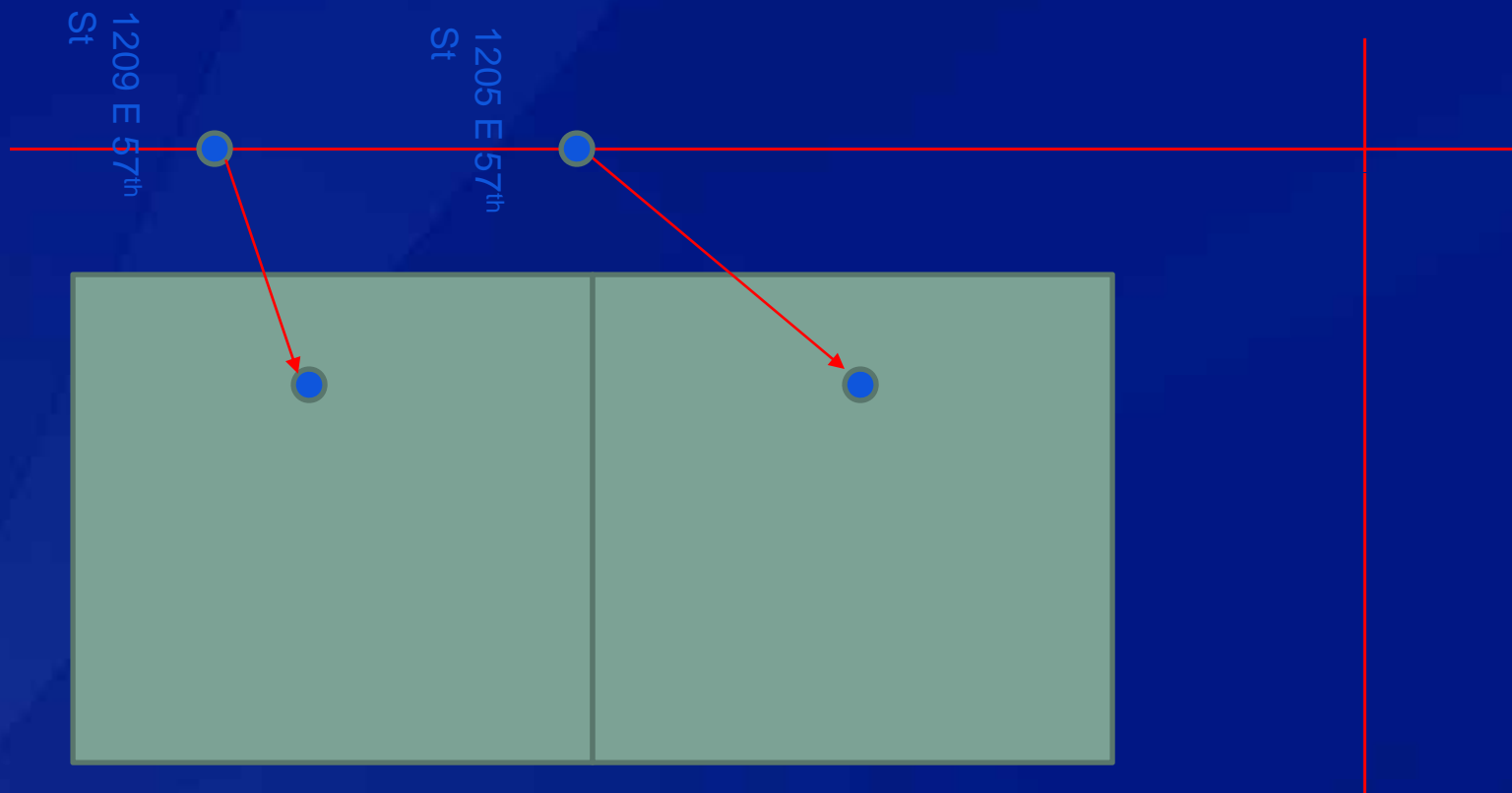
□ Data for evaluation

- Public health focus
- Address level data
- EMS emergency responses to cardiac arrest events
- Residential and business addresses
- Cities across the United States

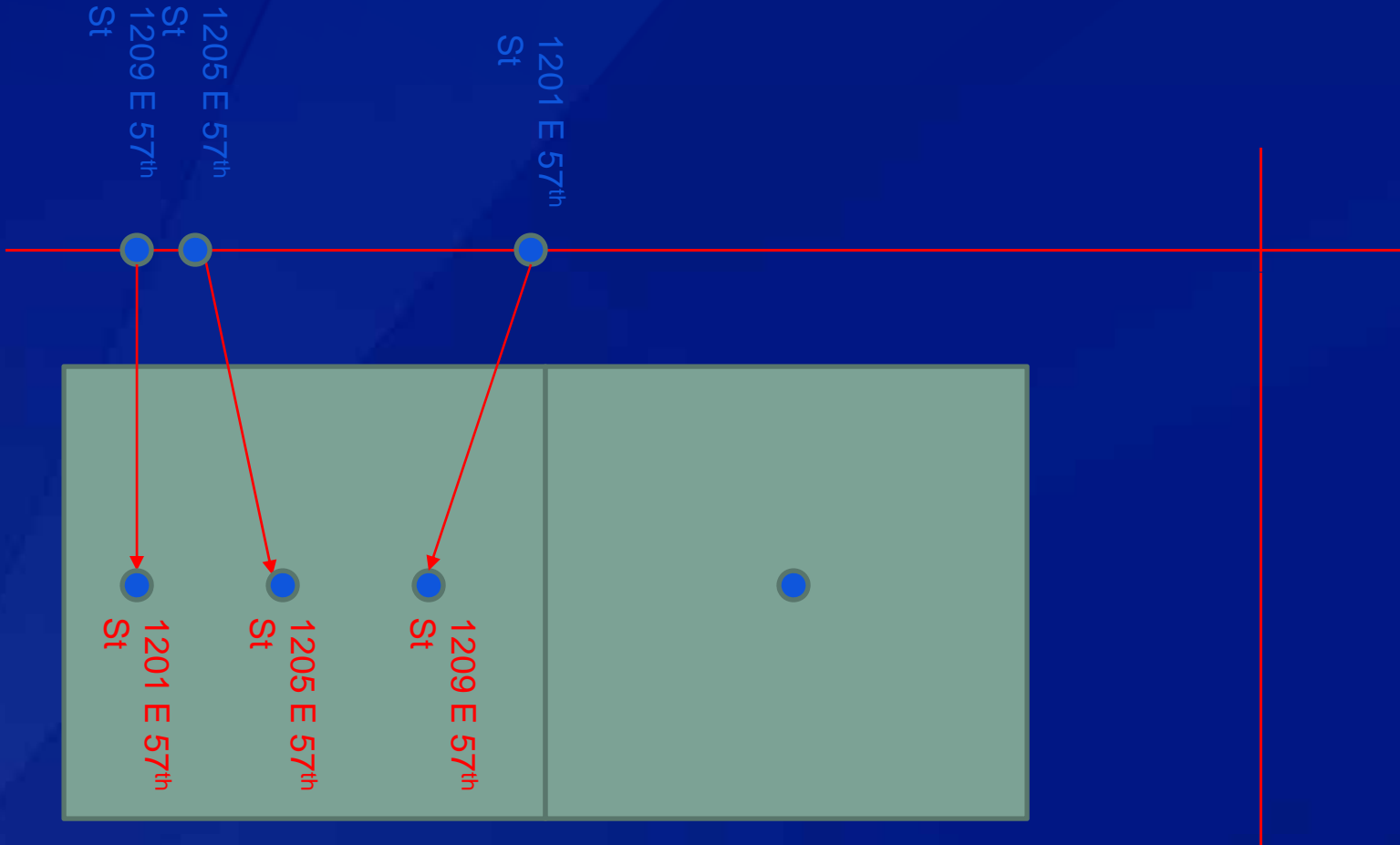
□ Element for comparison

- Tax parcel polygons

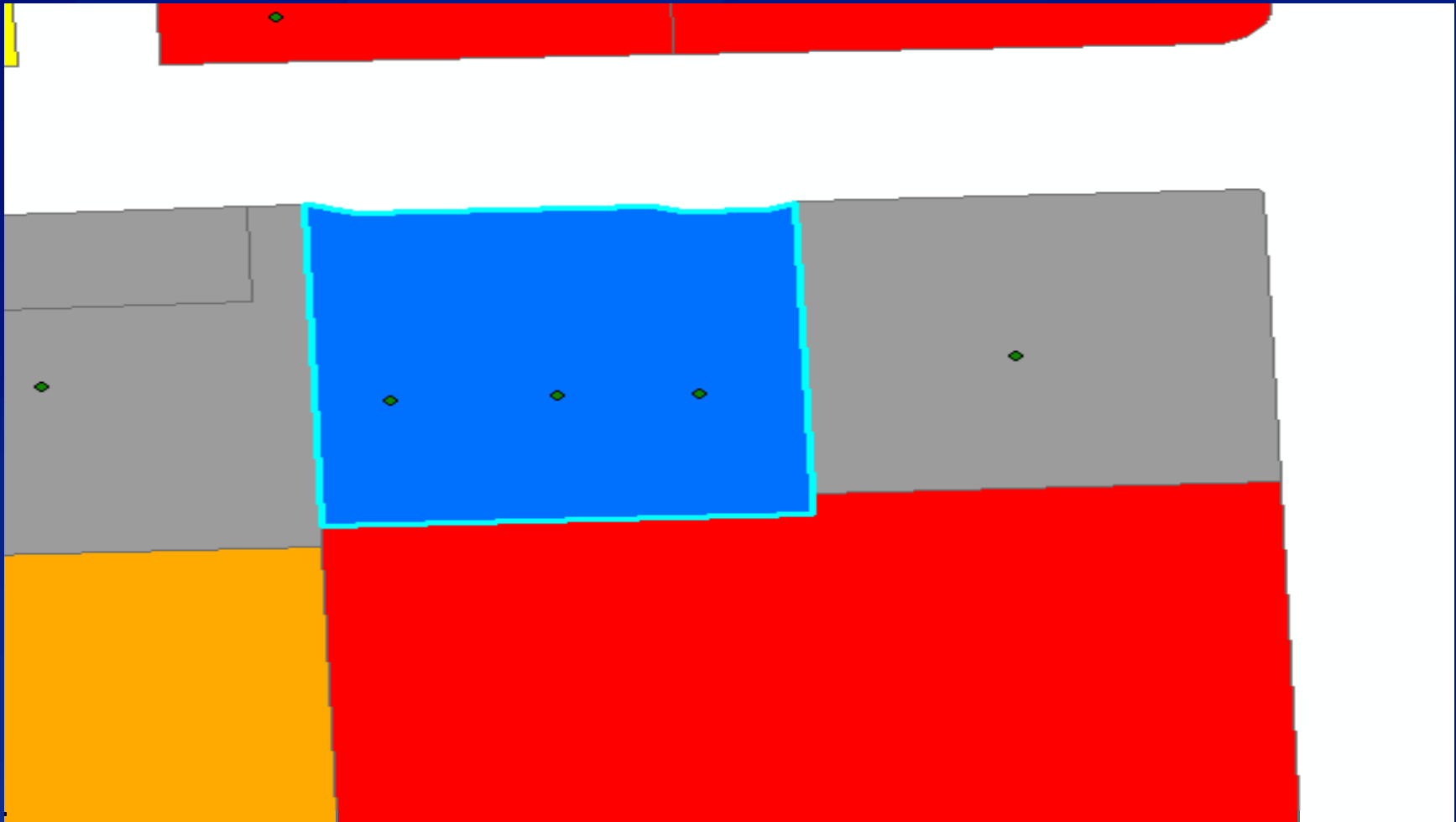
Issues with Geocoding Methodology



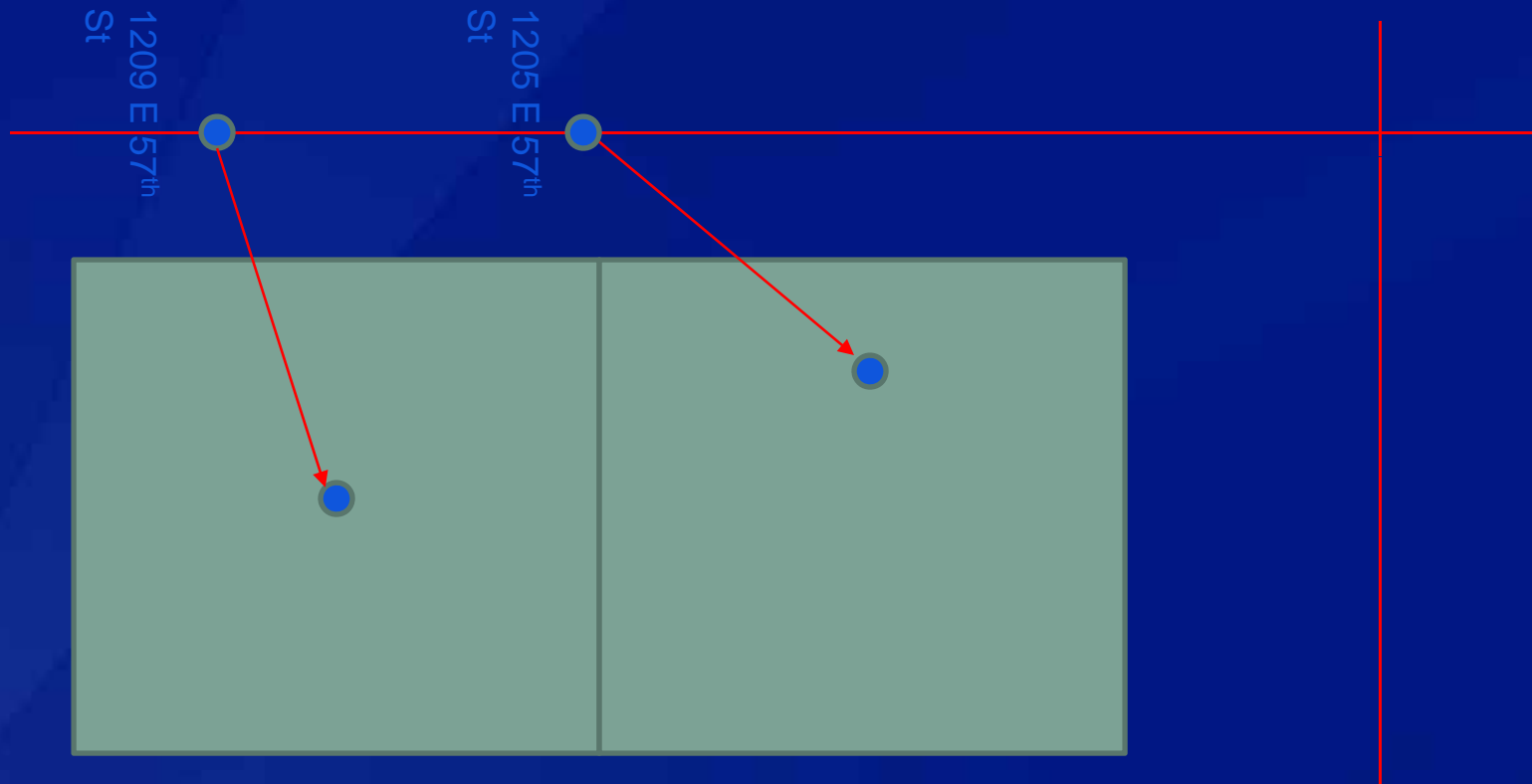
Issues with Geocoding Methodology



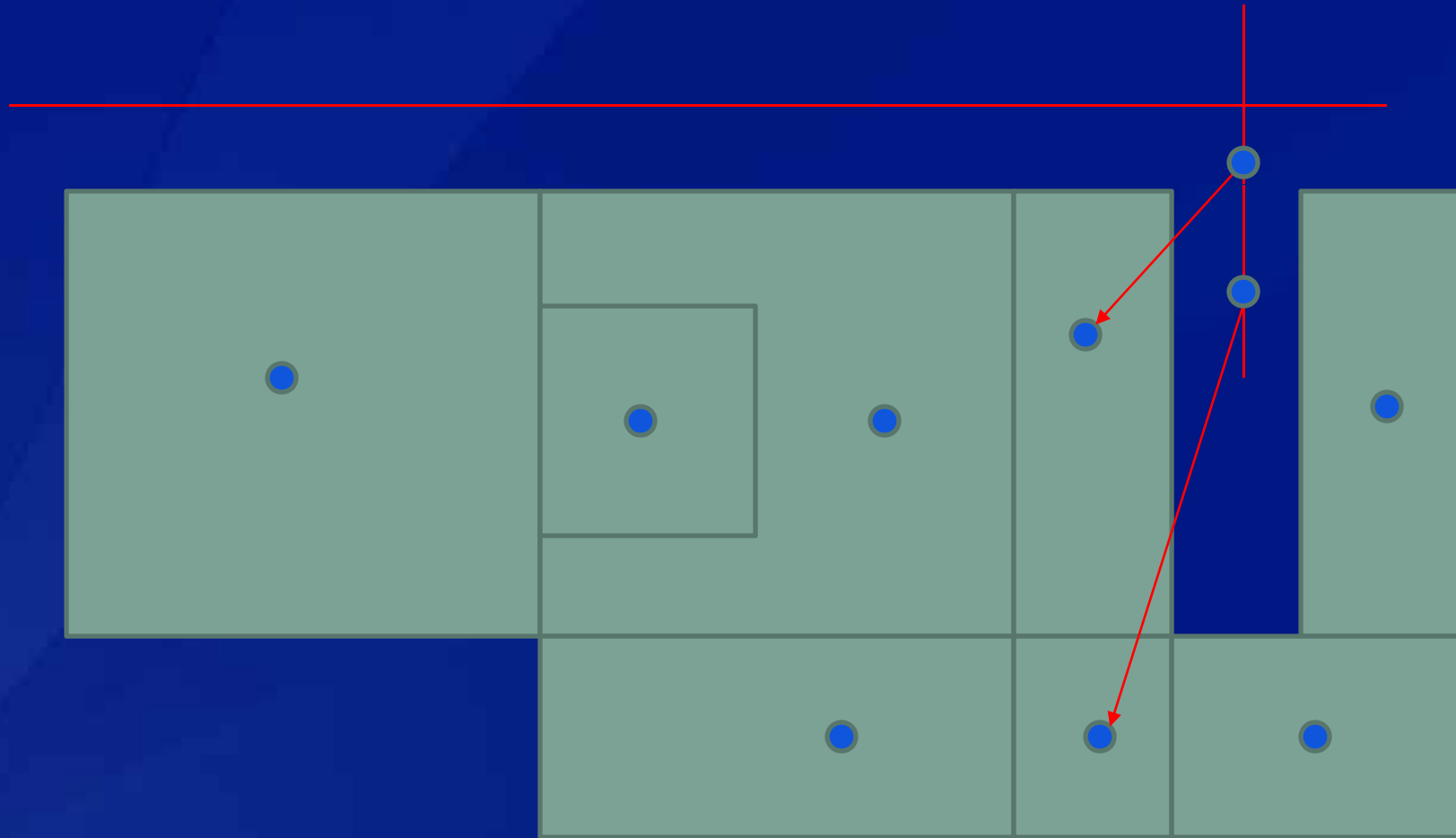
Issues with Geocoding Methodology



Issues with Geocoding Methodology



Issues with Geocoding Methodology



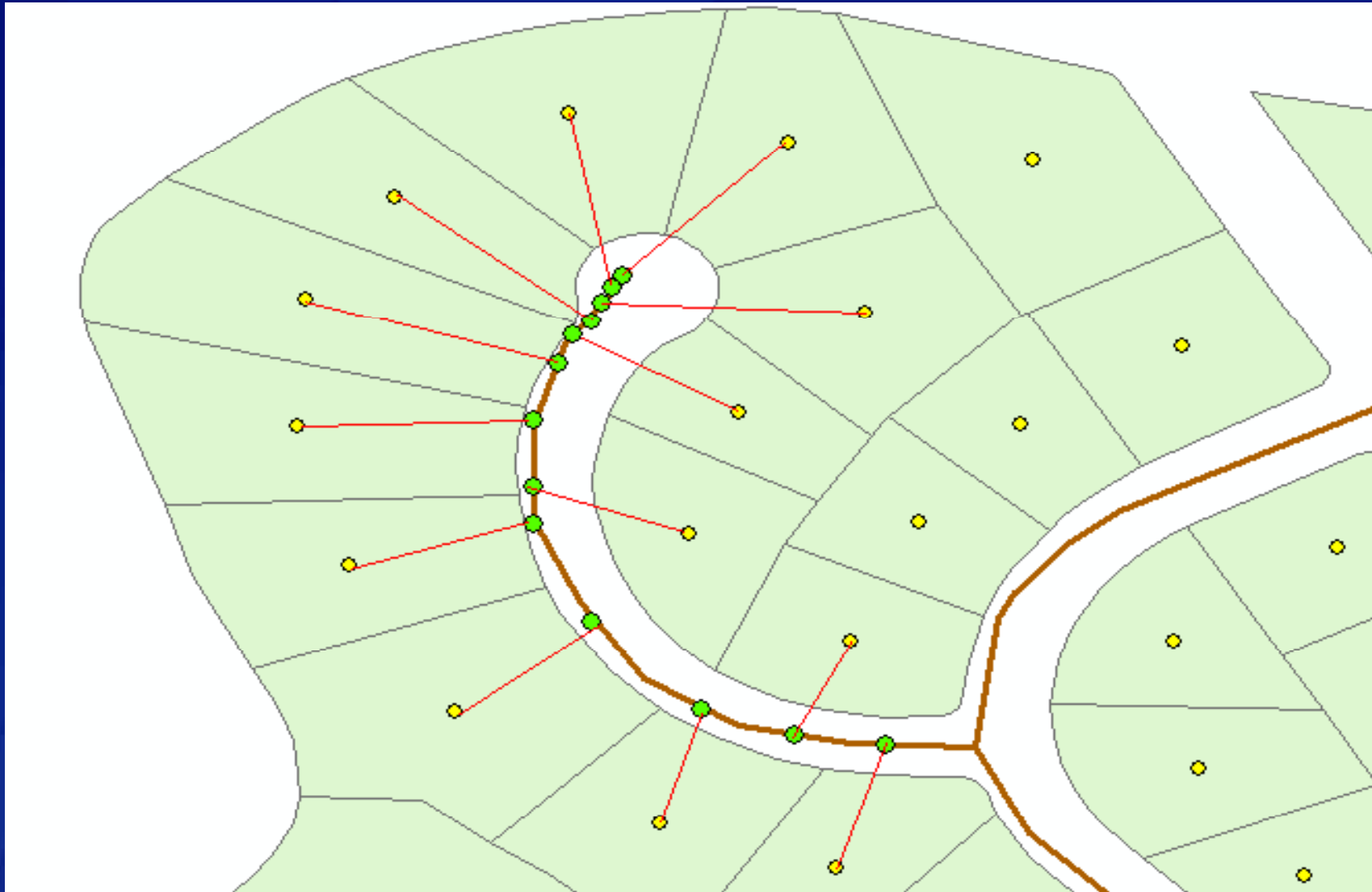
Issues with Geocoding Methodology



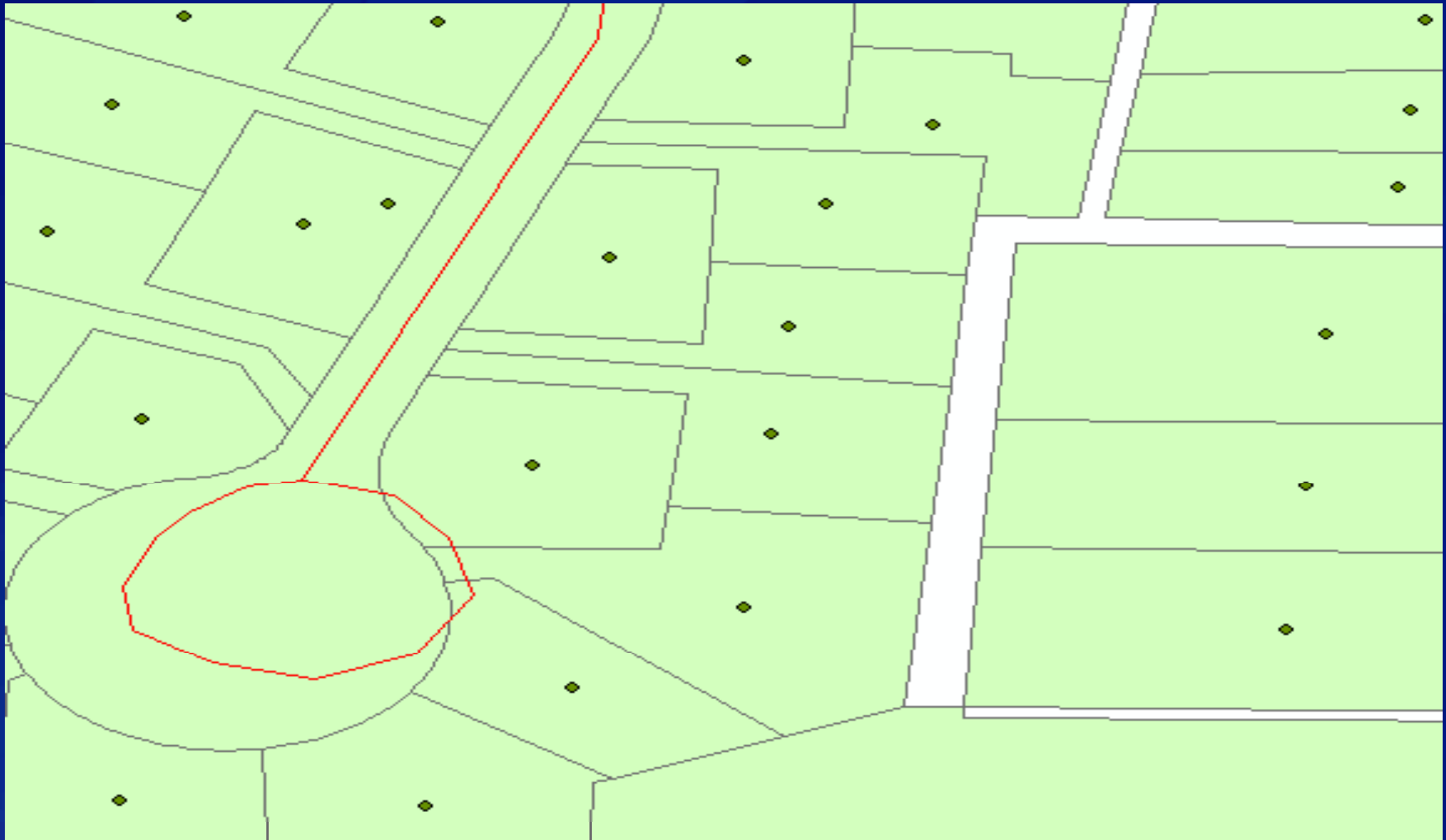
Issues with Geocoding Methodology



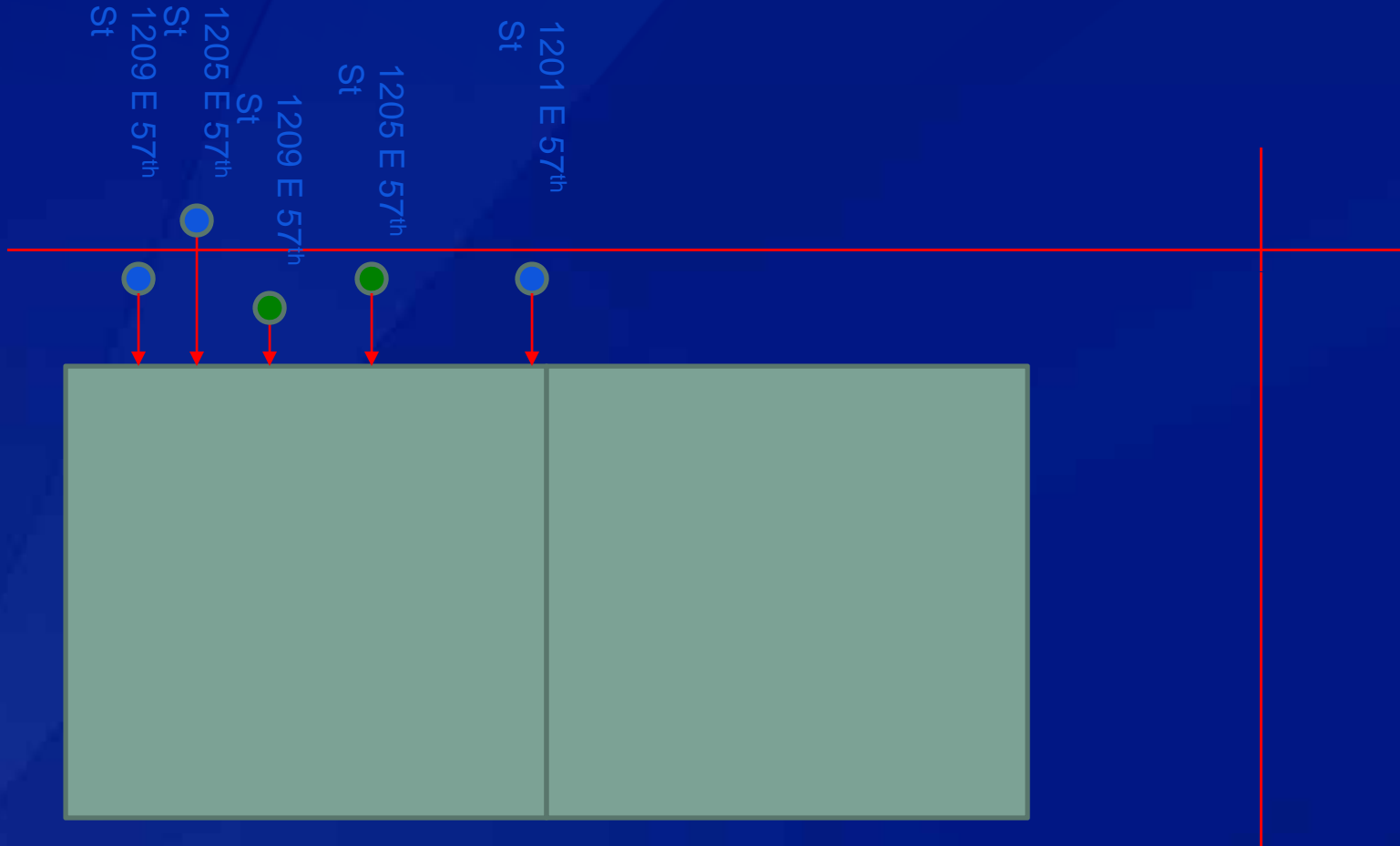
Issues with Geocoding Methodology



Issues with Geocoding Methodology



Solutions for Geocoding Methodology



Next Steps

- ❑ Larger dataset with greater tax parcel polygon and metadata
- ❑ Explore matching tax parcels with street addresses
- ❑ Evaluation of geocoded points to parcel centroids and/or centerline offsets, address ranges
- ❑ Utilization of orthoimagery

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□ GIS Offices

- Anchorage
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- Kansas City
- Las Vegas
- Richmond
- San Diego
- Sioux Falls
- Sterling Heights
- Suffolk
- Travis
- Wake
- Williamson
- Wilmington

The findings and conclusions in this report are those of the authors and do not necessarily represent the official position of the Centers for Disease Control and Prevention.