MIND THE GAP

Resolving Pennsylvania Addressing & Sub-Addressing Issues in NG911

JMT | TECHNOLOGY GROUP

INTRODUCTION – JMT Technology Group

Nick DiPaolo

- More than 20 years of experience working on Technology and Geospatial Information Systems (GIS) projects
- Member of the NENA GIS Model V2 Working Group
- Volunteer fire fighter of over 19 years

Agenda

- Addressing in NG911
- Define Sub-Address
- Project Lessons Learned
- Tools to Fill Addressing Gaps
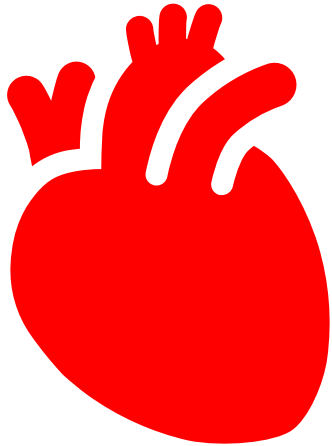- Developing Addressing Protocols to Maintain Data

WHY is NEXT GEN 911 NEEDED?

Delivery and service-oriented apps can find your location more quickly and accurately than emergency services – that's a problem.

IN an EMERGENCY – EVERY SECOND COUNTS

According to the American Heart Association, chance of survival decreases by 7% - 10% for every minute without defibrillation.

Reference: https://pubmed.ncbi.nlm.nih.gov/8214853/

ADDRESS ACCURACY for EMERGENCY RESPONSE

- Locating the incident
- Improved Dispatch and Routing
  - One route significantly shorter

911: What is your emergency?

Caller: Someone is having a heart attack, in Foot Locker at the King of Prussia Mall

WHAT IS A SUB-ADDRESS?

- NENA refers to as a "unit" within a building or structure

NENA Standard for NG9-1-1 GIS Data Model
NENA-STA-006.1.1-2020, February 18, 2020

4.138 Unit

Description: A group or suite of rooms within a building that are under common ownership or tenancy, typically having a common primary entrance.
Domain: None
Example: Apartment C2; Penthouse; Suite 710

- Not just a field in the attributes

- Each unit requires a unique point in the Site Structure Address Point Layer

- Ideally point placed at unit entrance

- Not always reflected in ALI

- Can account for up to 25% of address points

PA NG911 PROJECTS

- Addressing Authority with individual municipalities for each project
  - Required significant stakeholder communication and coordination
- Both projects consisted of multiple-phases funded through PEMA's Interconnectivity Grant
  - JMT provided assistance with estimates for grants
- **Montgomery County, PA**
  - Create NENA Format Address Point GIS Layer for county (325K points)
  - Develop Best Practices Document to define County-wide Addressing Protocol
  - Web-based Address Verification Toolkit to support Best Practices
  - MCM Consulting Group assisted with QC and address point creation
- **Berks County, PA**
  - Update address points to include sub-address in City of Reading
  - 27k address points before project, added 13k points (50% increase)
  - Phase 2 expands project to 34 additional municipalities
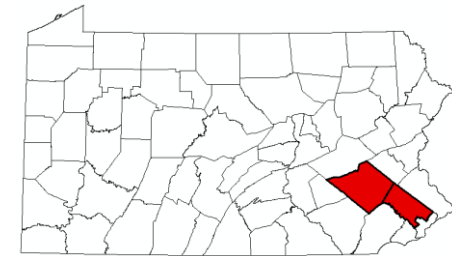
HOW WE GOT THERE

Stakeholder Engagement

Identified opportunities for stakeholder interaction

Meet face-to-face (if possible) may bring stakeholders together for first time

Creation of Address and Sub-Address Points

Utilize multiple data sources to update address points. Develop standards for editing common address scenarios in GIS

Address Protocol

Develop formal guidance to establish workflows

In PA, many municipalities have addressing authority but County responsible for maintaining the NG911 GIS data

Tools to Support Maintenance

Provide tools and training for stakeholders to follow address protocol

Web-based (if possible) for easier deployment and access

CAST a WIDE NET

- No one data source will provide all sub-address detail

- Identify all Local Stakeholders to acquire data
  - Police: SPAD details
  - Fire: preplans
  - Public Works: waste pickup
  - Code Enforcement: Inspections/permits
  - Voter Registration
  - USPS: Carrier Sheets
  - Utilities (water, sewer, gas and electric): Premise Locations
  - TELCOM: ALI (Intrado)
  - Housing Authority: Floor plans
  - Tax Board: Parcels
  - Property Managers/Landlord: Unit info, Floor plans

- Get people talking
  - Many local departments still operate in silos
  - Hold workshops
  - Online Surveys

- Help make connections between stakeholders

- Stay connected but be patient

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OVERLAY to IDENTIFY PATTERNS

- Identify where multiple data sources are consistent
- Discrepancies in datasets may identify other concerns

Hard copy building/layout inspection plans

Tabular and other non-spatial data

Comparison of datasets identifies sub-addresses
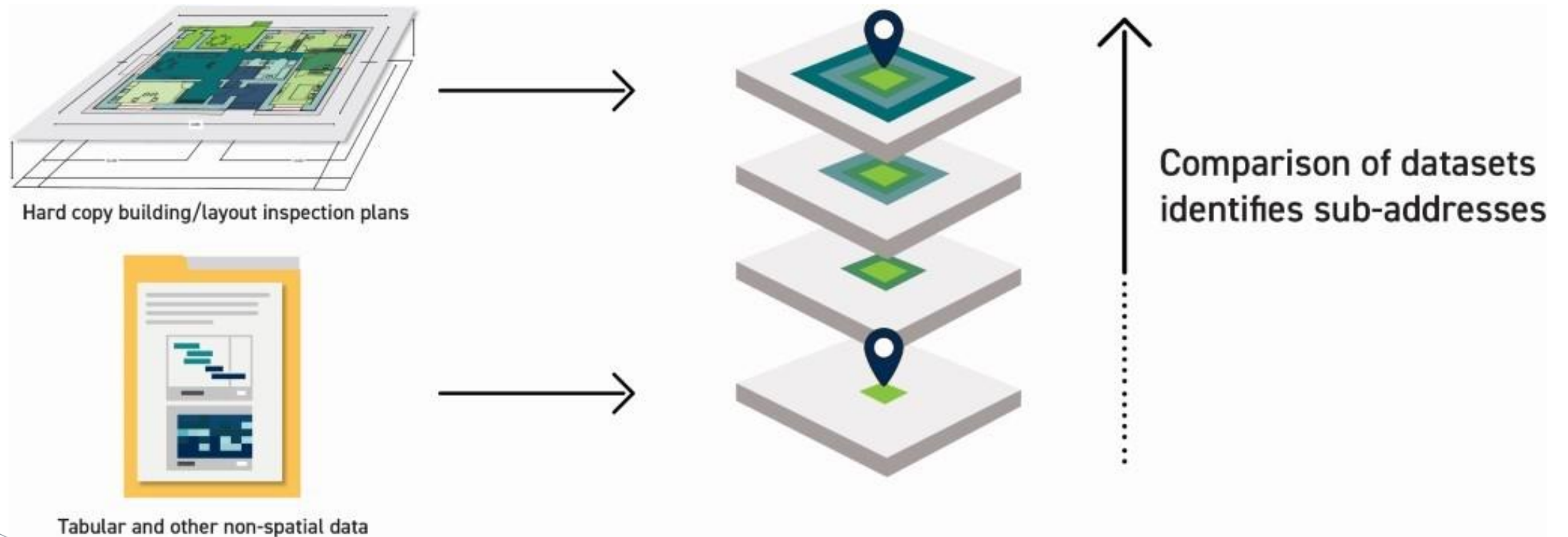
FINDING the PATTERNS
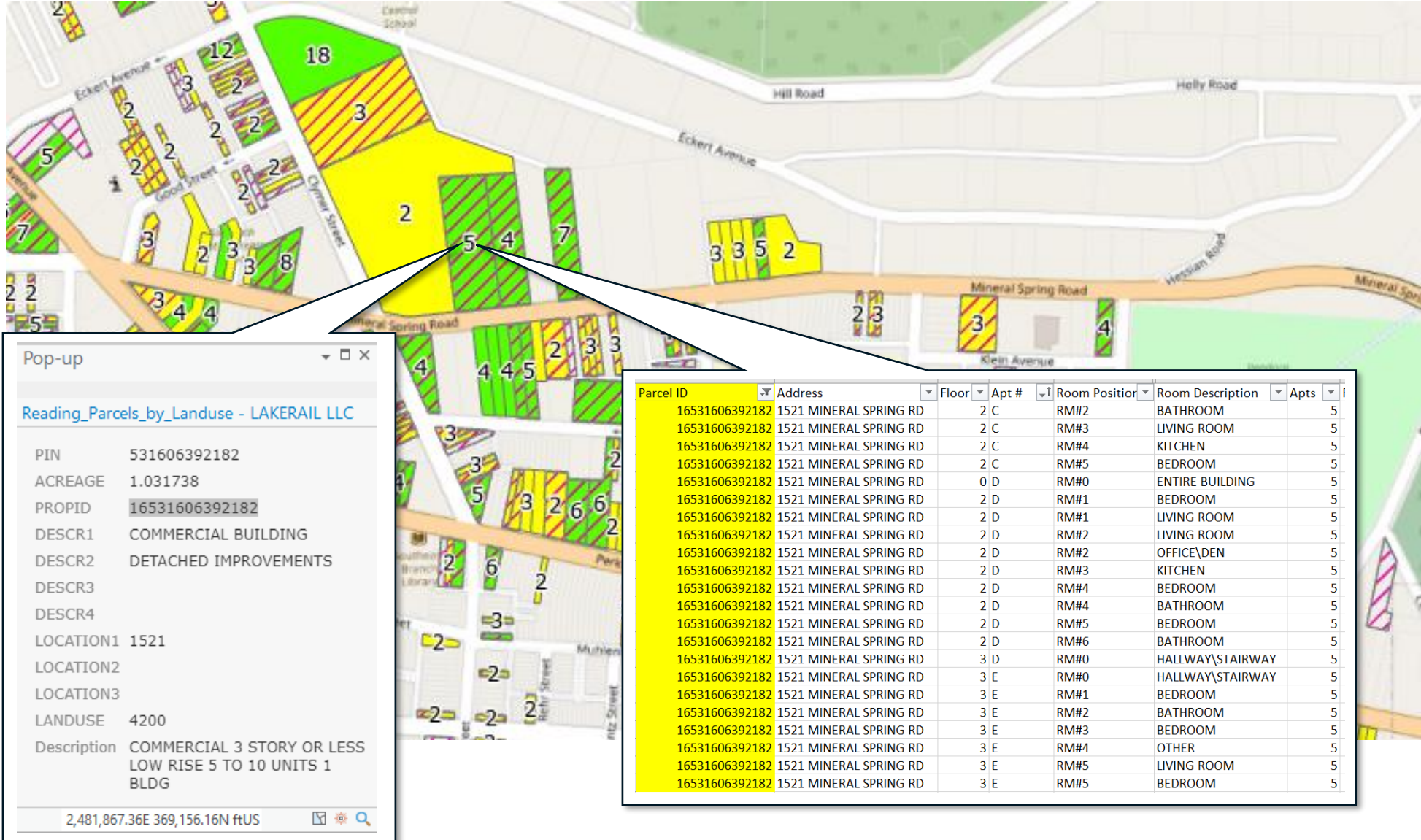
• Example: Using Parcel and other Municipal sources

STAKEHOLDER ENGAGEMENT

SURVEY

Online Surveys/Polls

Report/ Dashboard

Workshops (In-Person if possible)

Field Reviews

- Incorporate engagement opportunities into all stages of project

- Probably more stakeholders than you originally think

- Stakeholder participation may require several communication "points of contact"

- Some stakeholders may not be as engaged as you anticipate

STAKEHOLDER COORDINATION

Municipal Data

Property Management

USPS

USPS Carrier Sheets – Key to Success

- Authoritative Source for Zip Code
- Lists all carrier routes within the Zip Code
- Contains all addresses & sub-addresses USPS delivers to
- Not easy to get but worth their weight in gold

USPS 05-6889
SAN MATEO IBSSC
REPORT LFA220P2

U.S. POSTAL SERVICE – ADDRESS MANAGEMENT SYSTEM
ROUTE LISTING REPORT

DATE: 3/16/2021

PAGE: 1

ZIP CODE: 19608   ROUTE: C042   BUNDLE TYPE: ONE BUNDLE

SEQ #	PRIMARY ADDRESS	COMPLETE STREET NAME	SECY ABBR	SECY UNIT #	DELV TYPE	USG CODE	NO STAT	VAC IND	ADDR SORT	L|F CELL	S|I	DR OP	NDD SMTWHFS	CO NG	RLY #	ADDR MKR	+4 CODE	ADDITIONAL INFO	ALTERNATE ZIP / RTE
**R1																			
1	3911	PENN AVE			OTH	B				½				06			1167	FABRIC MART	
2	3998		UNIT	A	OTH	B				"							1168		
3	3998				OTH	B				½							1168	CASE/ST FARM	
4	3996		APT	A	OTH	R				"							1168	A	
5	3996		APT	B	OTH	R				½							1168	B	
6	3992		STE	1	OTH	B				"							2203	1	
7	3992		APT	2	OTH	R				½							2203	2	
8	3992		APT	3	OTH	R				"							2203	3	
9	3992		STE	4	OTH	B				½							2203	4	
10	3992		STE	5	OTH	B				"							2203	5	
11	3992		APT	6	OTH	R				½							2203	6	
12	3992		APT	7	OTH	R				"							2203	7	
13	3992		STE	8	OTH	B				½							2203	8	
14	3992		APT	10	OTH	R				"							2203	10	
15	3992		APT	11	OTH	R				½							2203	11	
16	3986				OTH	B				"							1168	LIGHT SATELITE	
17	3984		OFC		OTH	B				½							1144		
18	3984		APT	1	OTH	R				"							1144	1	
19	3984		APT	2	OTH	R				½							1144	2	
20	3978		APT	B	OTH	B				"							1146	OFC,STE1,APT1	
21	3978		STE	A	OTH	B											1146		
22	3978		APT	C1	OTH	R											1162		
23	3976		OFC		OTH	R			T	½							1168	FRONT	
24	3976		SIDE		OTH	R				"							1168	SIDE	
25	3968		APT	1	OTH	R				1							2204	1-8	
26	3968		APT	2	CENT	R											2204		
27	3968		APT	3	CENT	R											2204		
28	3968		APT	4	CENT	R											2204		
29	3968		APT	5	OTH	R											2204		
30	3968		APT	7	OTH	R											2204		
31	3968		APT	6	OTH	R											2204	6&8	
32	3968		APT	8	OTH	R											2204		
33	3966				OTH	R				½							1168		
34	3964				OTH	R				"							1168		

15

Maximize USPS Sheets

- Conversion to excel results in "compressed records"
- Multiple lines from sheet compressed into 1 line in Excel
- Hidden extra spaces, white space, etc. appear in Excel
- Unable to geocode

Convert PDF to GIS

- In-house extraction tool to process export to Excel
- Resolves most compressed records
- Unresolved records saved in error log
- Auto-populates gaps in Complete Street Name
- Geocode table
- Symbolize by Secondary Abbreviation field
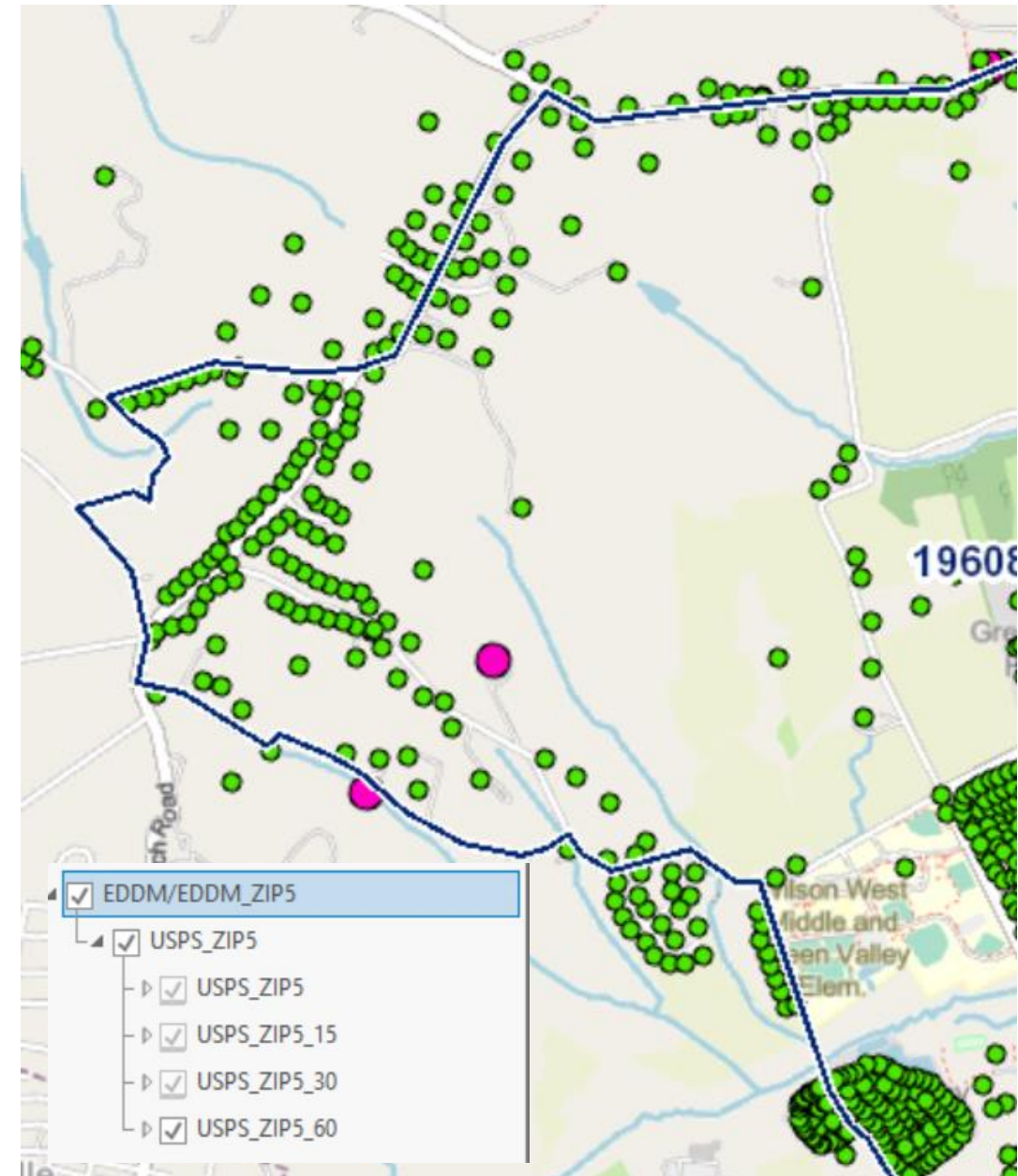 - Sub-address designators (unit, apartment, suite, etc.)
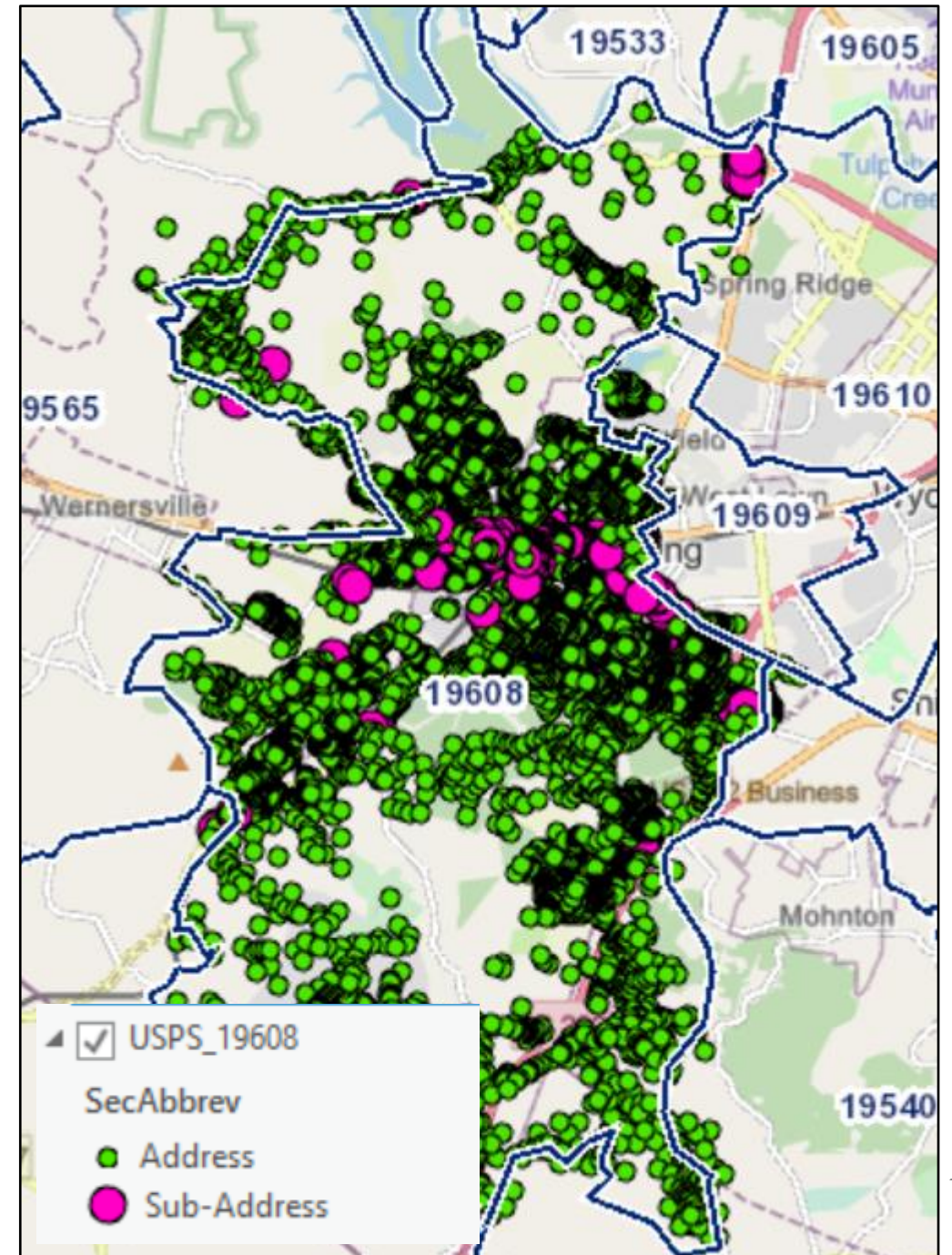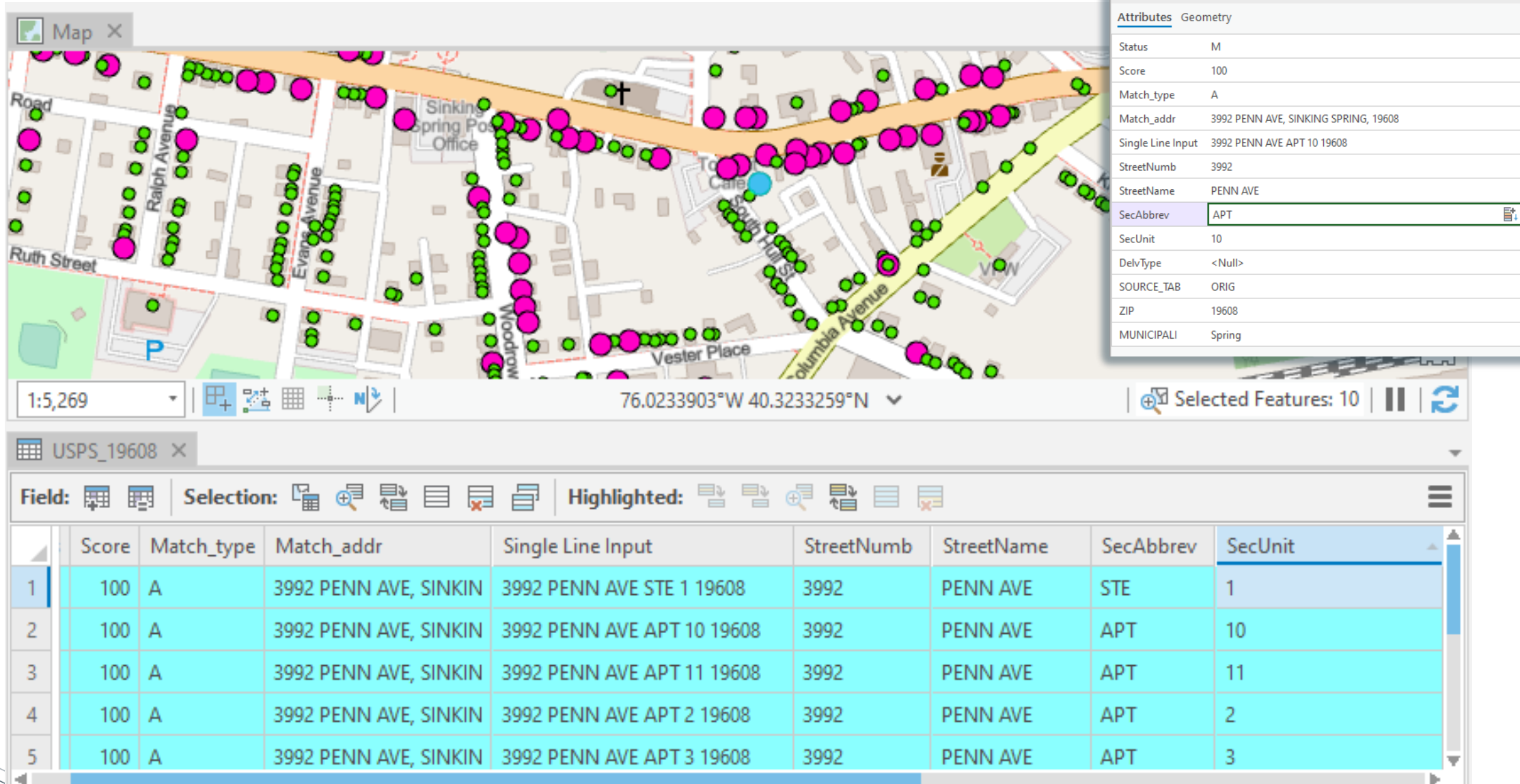
Value in the Conversion

- Reminder – Carrier sheets are authoritative dataset for Zip Codes
- USPS Every Door Direct Mail map service does not match exactly geocoded carrier sheet
  - Carrier Routes frequently updated
- Update Address Points
- Identify Sub-Address with Unit #
- Additional Value Add
  - Confirm Left and Right Zip in Streets
  - Confirm Zip in Parcel, Voting, etc.

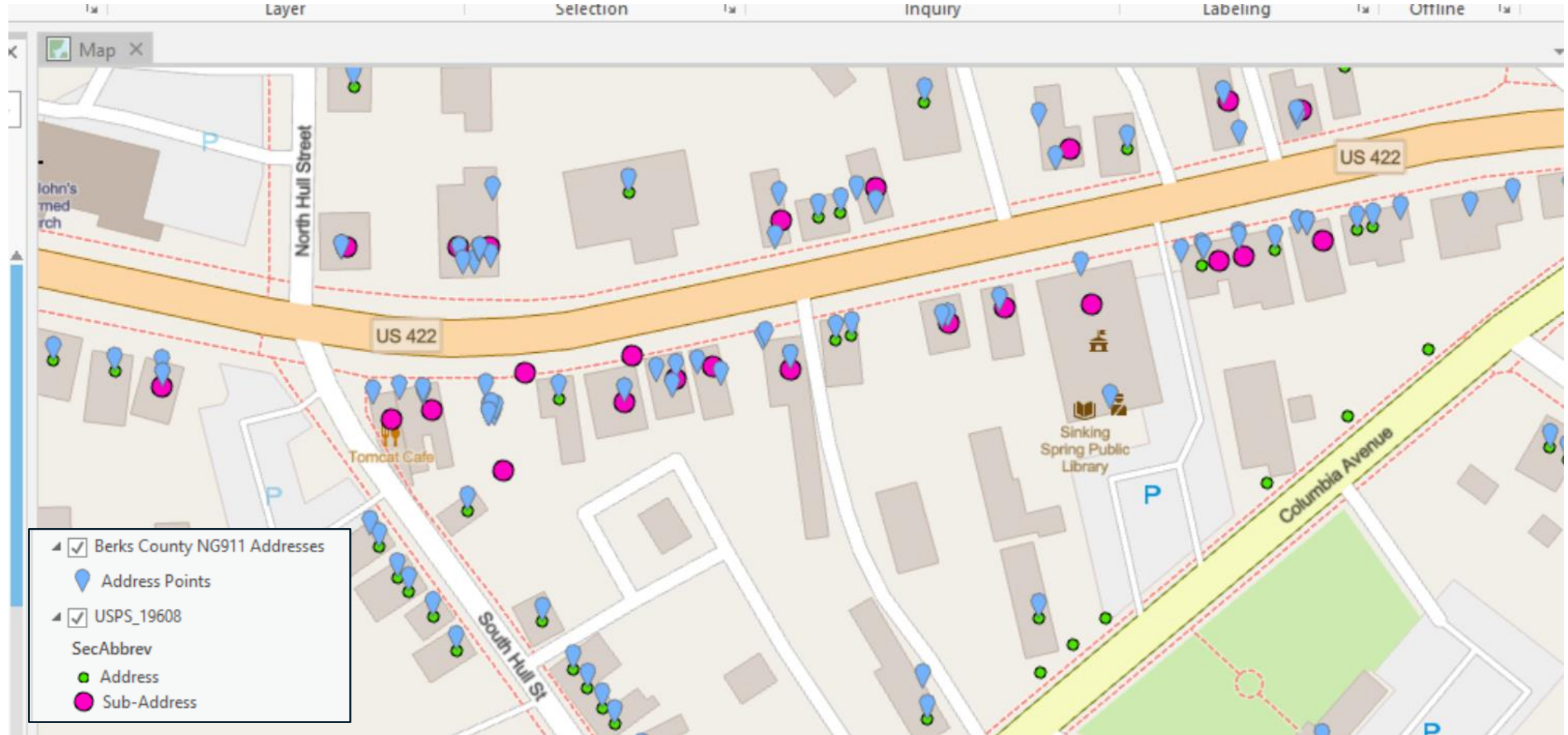| Data Source	Set Data Source...
Data Type	ArcGIS Map Service
Server	https://gis.usps.com/arcgis/rest/services/EDDM/EDDM_ZIP5/MapServer
Service Name	EDDM/EDDM_ZIP5
Is Cached	No
Vertical Units	Meter

☑ EDDM/EDDM_ZIP5
  ☑ USPS_ZIP5
    ▷ ☑ USPS_ZIP5
    ▷ ☑ USPS_ZIP5_15
    ▷ ☑ USPS_ZIP5_30
    ▷ ☑ USPS_ZIP5_60

Identify Sub-Addresses

Update SSAP with Sub-Addresses
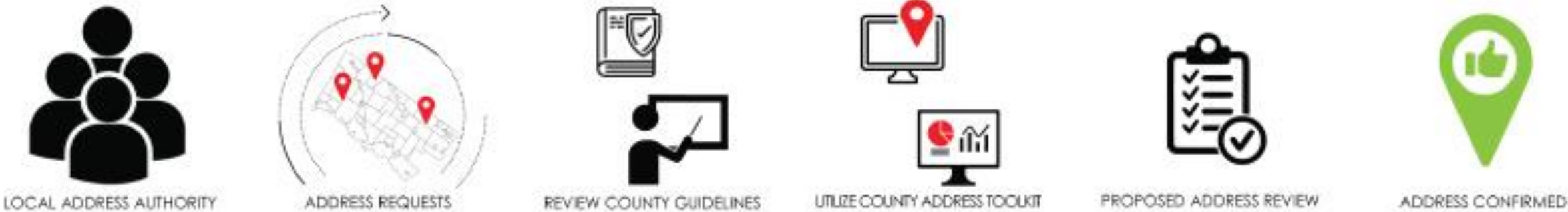
RESULTS in CITY of READING, PA
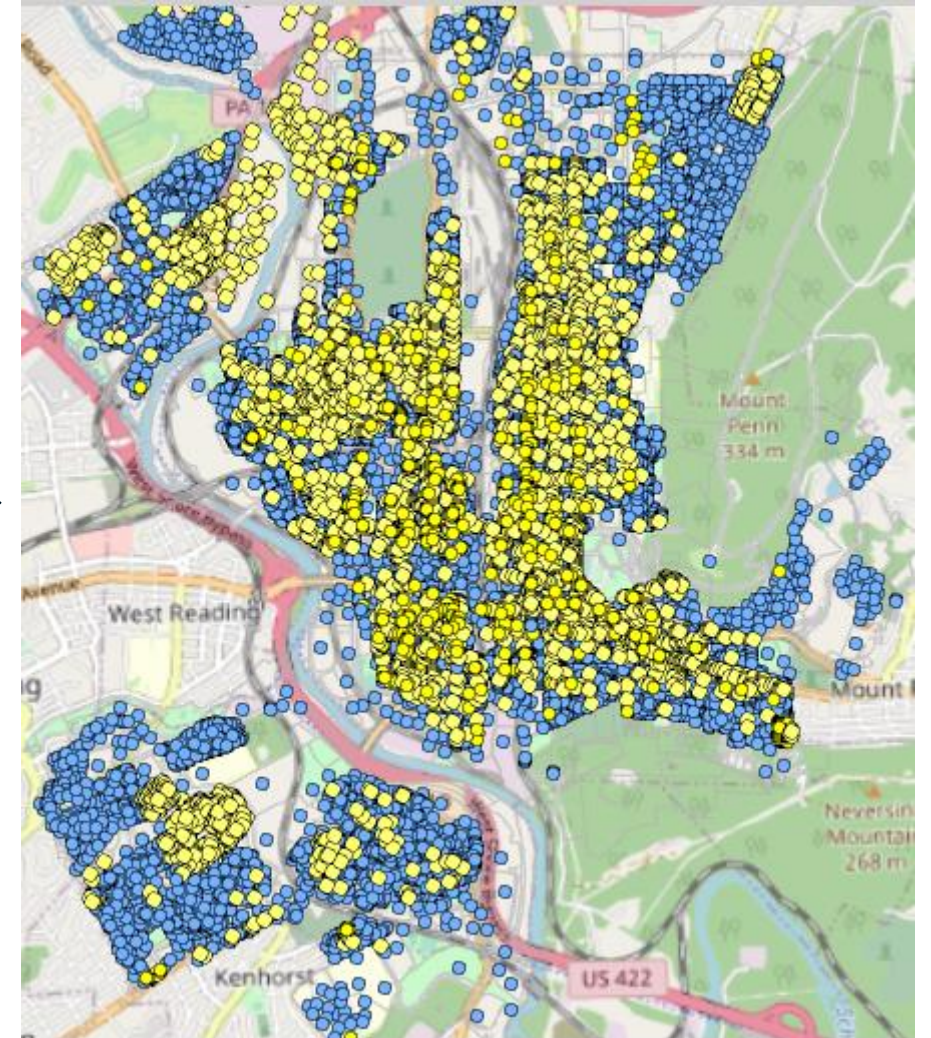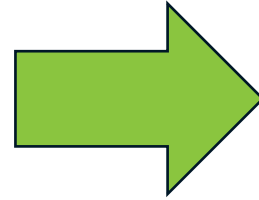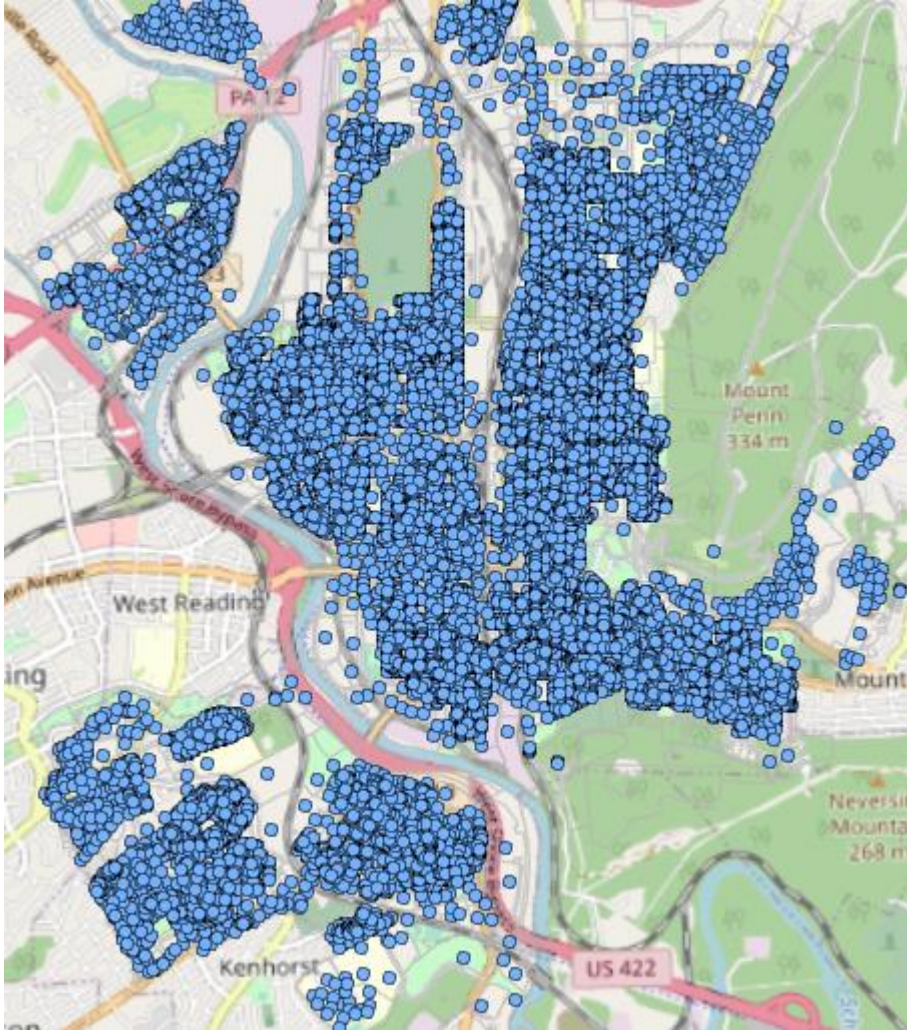
- Initially 26K address points
- 28k unique ALI records
- 98% match rate to Street Centerlines

- Created 10K sub-addresses
- Updated 5K addresses with unit details

ADDRESSING PROTOCOL SNAPSHOT

LOCAL ADDRESS AUTHORITY

ADDRESS REQUESTS

REVIEW COUNTY GUIDELINES

UTILIZE COUNTY ADDRESS TOOLKIT

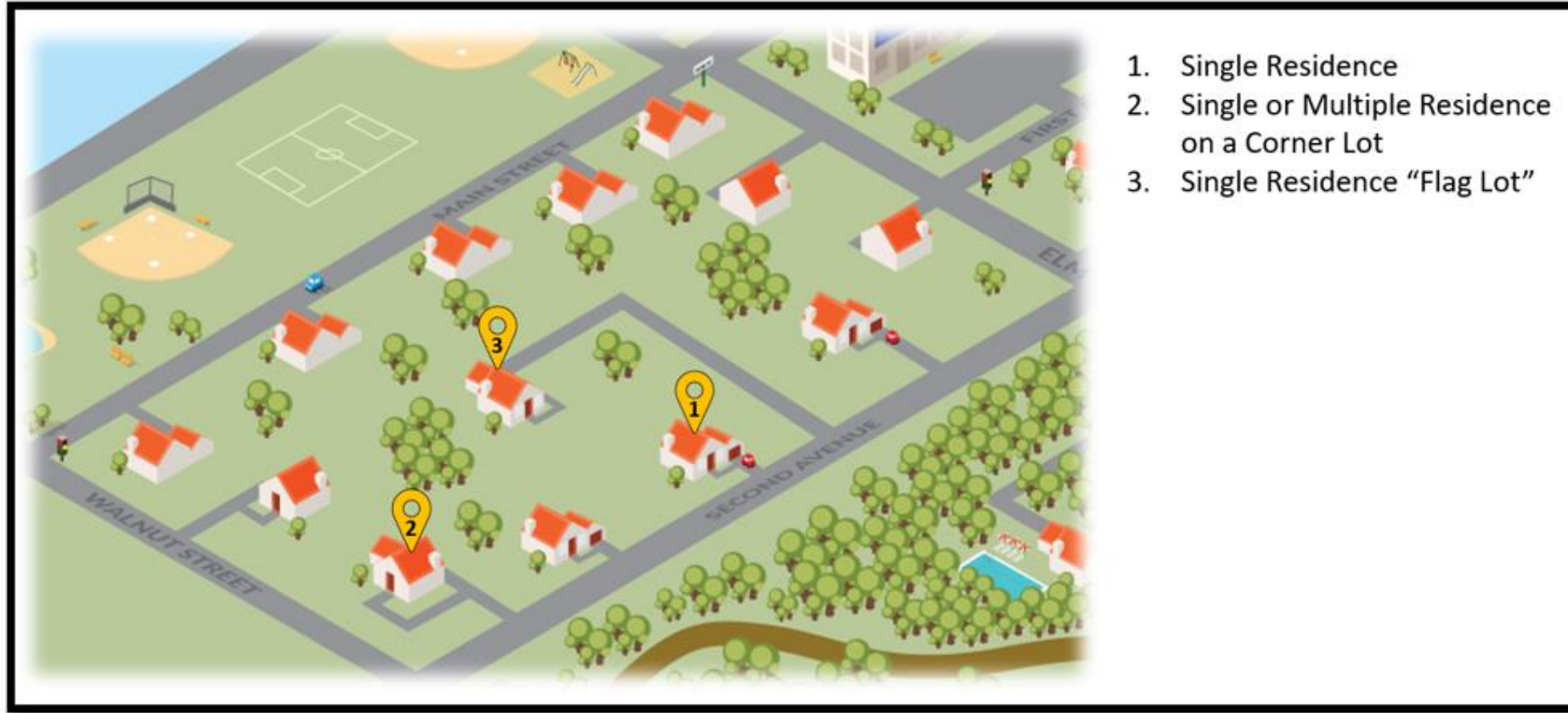PROPOSED ADDRESS REVIEW

ADDRESS CONFIRMED

BEST PRACTICES GUIDANCE

- Build on NENA and PEMA guidance

- Focused on scenarios specific to PSAP

- Pictogram developed to visualize guidance

BEST PRACTICES GUIDANCE - EXAMPLE

1. Single Residence
2. Single or Multiple Residence on a Corner Lot
3. Single Residence "Flag Lot"

Residential Addressing Scenarios

Single or Multiple Residence on a Corner Property Lot
- Example: Driveway connects to side street on addressed street, but the primary entrance is facing another street (usually a larger road)
- Placement: Place address point at primary entrance to structure (front door of the house, regardless of which street addressed on)
- Numbering: Primary Address Numbering

PROJECT TRACKING
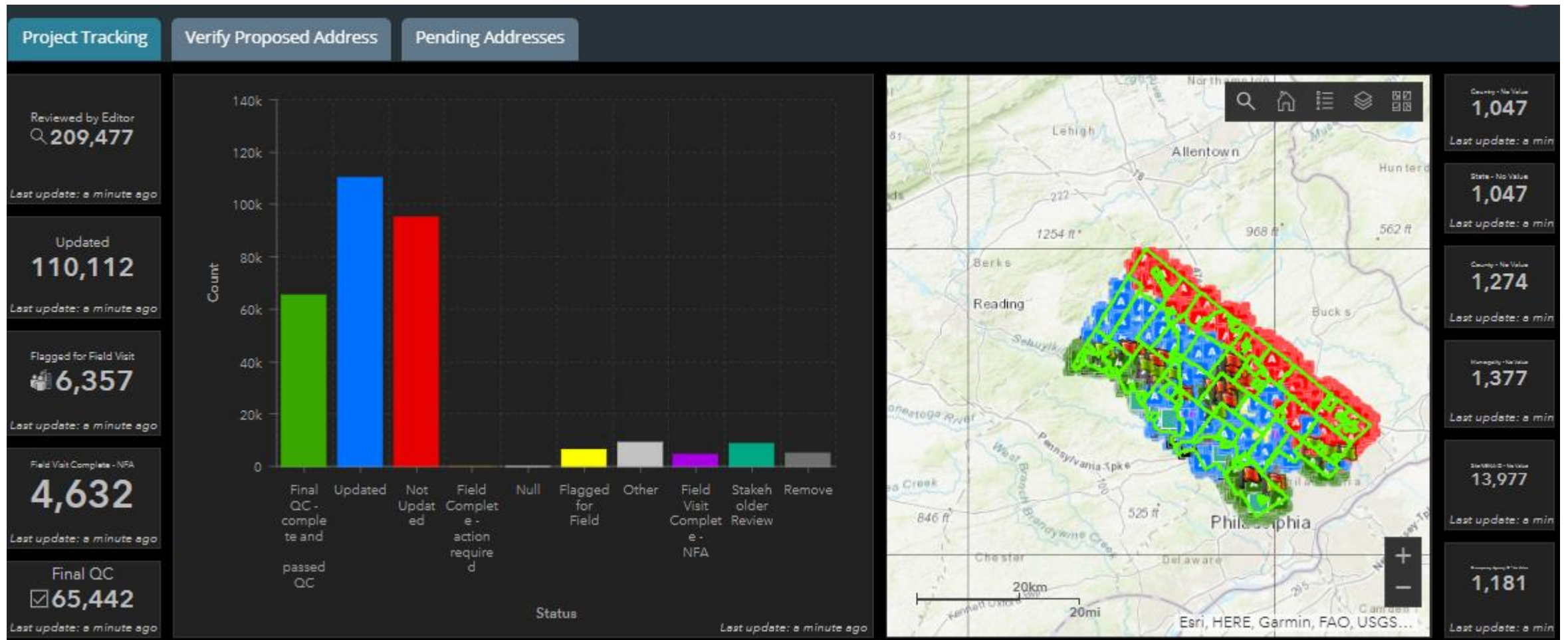
- Dashboards in ArcGIS Online
- Provide access to stakeholders
- Track progress and provide transparency
- widgets can perform critical data checks

ADDRESS WEB TOOLKIT

- Proposed Address verification
- Validates address uniqueness
- Generates NENA-Compliant Address
- Establishes Stakeholder Review Process
- Easily deployed to stakeholder
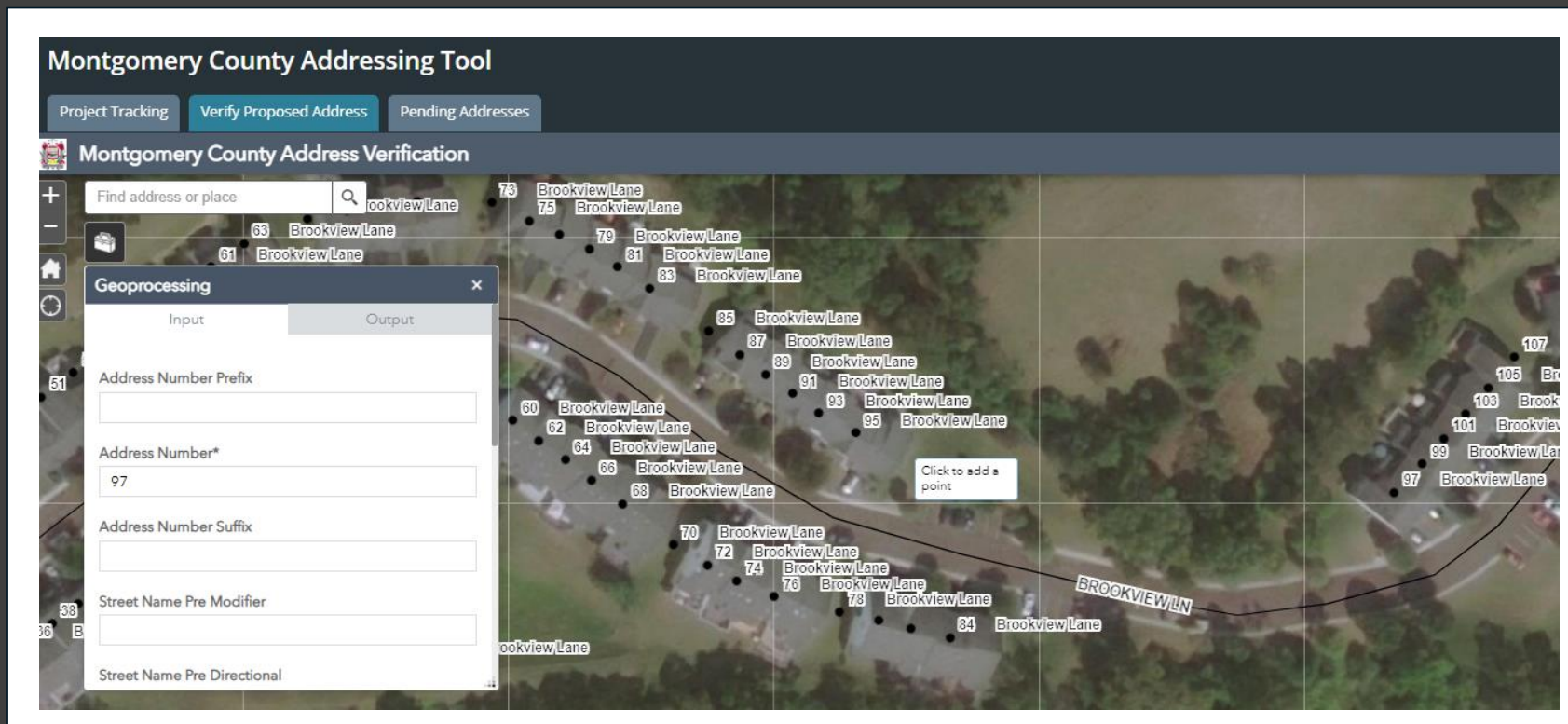
THANK YOU

- Reach out to discuss your NG911 needs and plans, from technical requirements to grant estimating, or GIS generally
- Sign up for periodic updates from JMT Tech Group
- https://rebrand.ly/JMTUpdates
- Let's stay connected:

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QUESTIONS?