





# Standardizing Rhode Island Addresses: Smarty Implementation Outcomes

**Mike Berry, Senior Project Manager,  
HLN Consulting, LLC**

**Danielle Woods, MBA, Immunization Interface Manager,  
RIDOH**

# Background



- **KIDSNET/RICAIR (Rhode Island Child & Adult Immunization Registry)**
  - Started in 1997
    - Integrated Child Health Information System
      - Screening, diagnostic, and referral data for over a dozen public health programs
    - Lifelong Immunization Information System (IIS)
  - 1.6 million patient records
  - 21 million immunizations
  - 2.3 million patient addresses
  - 2.3 million parent/next-of-kin addresses



# Background - Smarty



- Smarty - third party Software-as-a-Service (SaaS) address standardization, cleaning, validation, and geocoding service
- AIRA provides Smarty at no cost for all member IIS programs
- Smarty offers several ways to use:
  - Web interface
  - Batch API
  - User Interface API
- Smarty integration in KIDSNET/RICAIR since 2018
- But use was deliberately narrow:
  - Only as an input signal to existing address deduplication service
  - Reluctant to let Smarty rewrite the address of record, especially the city

# Background - Address Standardization



- Take a messy, human-entered address and return a single canonical form
- Fix typos, expand abbreviations, validate against a reference database
- Using Smarty, the reference database is USPS (via Smarty)
- Goal: two people who live at the same place end up with the same standardized address string

# Background - Address City



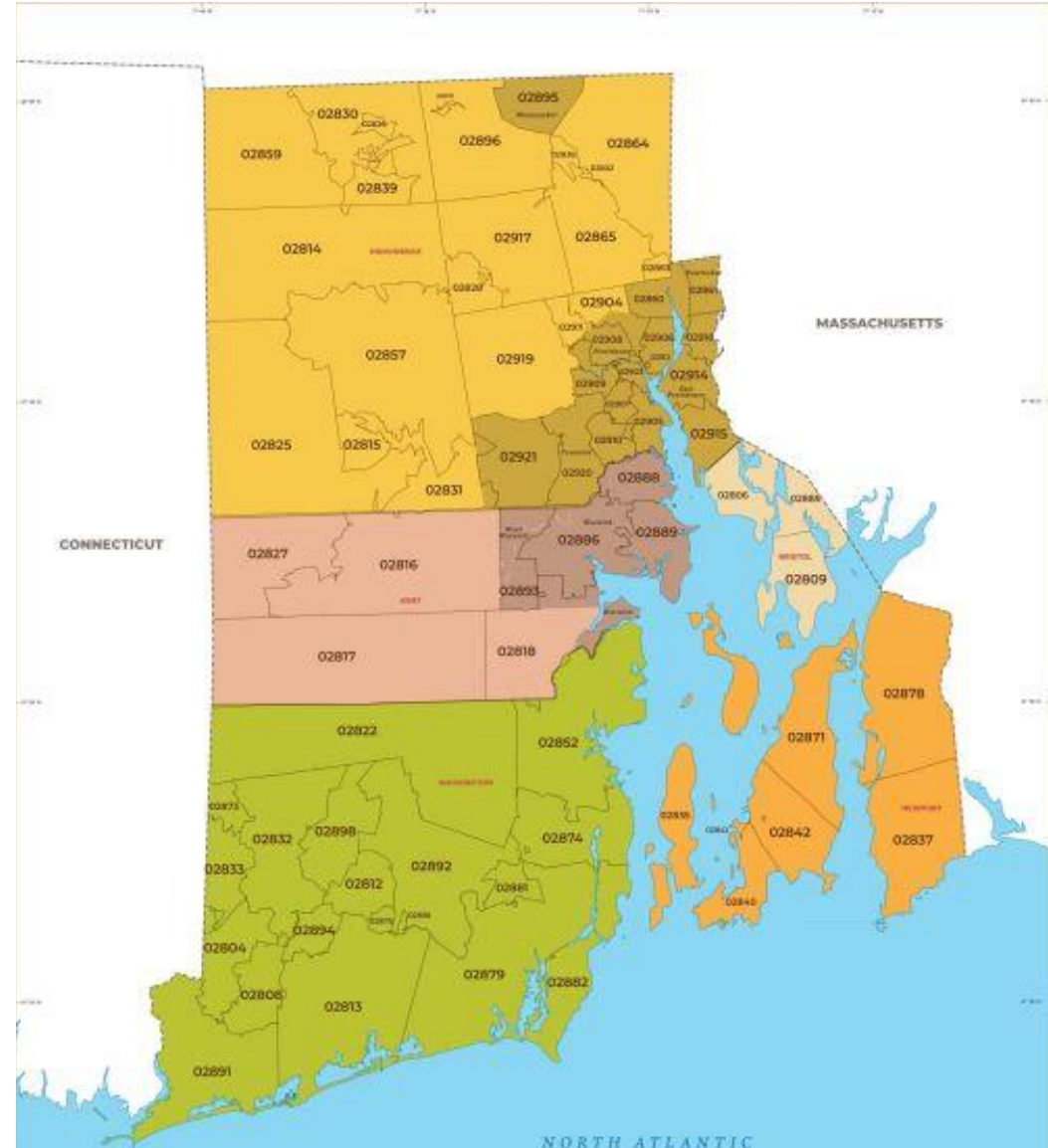
- Most people assume the city line is "the place I live"
- In a USPS address, the city line is the USPS preferred city name for the ZIP code
- USPS city names exist to route mail, not to identify jurisdictions
- The Census Bureau warns that the USPS "city" in a mailing address may differ from the legal municipality

# Rhode Island: Small State, Many Villages



- RI has exactly 39 municipalities (cities and towns)
- But RI also has dozens of villages: named communities inside (and sometimes across) municipalities
- Villages are cultural/historical places, not units of government
- USPS frequently uses the village name as the preferred city on the mailing address, because the village is where the post office is
  - Saylesville is a village in the town of Lincoln
  - A resident's mail says "Saylesville, RI" — but legally they live in the Town of Lincoln and their kids go to Lincoln Public Schools

# Municipalities vs. Postal Boundaries



# Municipality Strategy



- Run every address through Smarty to standardize it
- Before accepting the standardized result, compare the municipality of the input city to the municipality of the output city
- If the municipality is the same → accept the standardization (typos fixed, ZIP+4 added, etc.)
- If the municipality would change → reject the standardization and keep the address as entered

# An Alternative: Geocoding the Municipality



- Instead of comparing city names, geocode the address and do a point-in-polygon test against the 39 municipality boundaries
- In principle, this is the more "correct" approach: jurisdiction is a geographic question, so answer it geographically
- But “Rooftop” geocoding is needed for accuracy near borders
- AIRA’s Smarty license does not currently include Rooftop geocoding

# Enhanced vs. Strict Matching



- October 2024: AIRA transitioned to new Smarty license including **enhanced matching**
- Smarty's US Street API exposes a match parameter that controls how aggressively it tries to match an input address
  - **strict**: return detailed output only if a valid match is found
  - **enhanced**: "a more aggressive matching mechanism" that also draws on "a more comprehensive address dataset beyond just the postal address data"

# Enhanced Mode Results



- Enhanced matched 1% more addresses than strict
- But the extra matches were not all correct (more willing to guess)
- A small number of correct matches under strict mode came back incorrectly under enhanced mode
- Wrong address considered worse than an unmatched one
- Decided to keep KIDSNET/RICAIR on strict matching and use enhanced only as needed

# Results



- Processed and cleaned 3.8 million addresses through Smarty
- Eliminated approximately 800,000 duplicate records
- Demonstrated that the expanded integration is safe to run at scale
- Improved the quality and reliability of Rhode Island's IIS data.
  - Better patient matching
  - Better communication
  - Looks better!
- Stay with “Strict” matching for now; “Enhanced” as needed

- AIRA Repository (Search on “Smarty”) – <https://repository.immregistries.org/>
  - Smarty Implementation Guidance
  - Smarty FAQ
  - Smarty Orientation
- Smarty API
  - <https://www.smarty.com/products/apis/us-street-api>



Thank you!

Contact: [berrym@hln.com](mailto:berrym@hln.com) or [Danielle.Woods@health.ri.gov](mailto:Danielle.Woods@health.ri.gov)