Tools for Understanding and Responding to Near Repeat Crimes

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Agenda

• An experiment to prevent residential burglary
  • Calculating NR risk
  • Identifying high risk areas
  • Developing an intervention
  • Evaluating impact
• Understanding NR crime prevention potential
• An integrated NR analysis framework

This presentation will be on my website at ttaniguchi.net
The Tools of NR Analysis

- Near Repeat Calculator (2006)
  - Dr. Jerry Ratcliffe, Temple University

- Near Repeat Area Identifier (2015)
  - Dr. Elizabeth Groff, Temple University
  - Dr. Travis Taniguchi, RTI International
  - Built by Azavea

- Near Repeat Crime Prevention Calculator (2017)
  - Dr. Groff
  - Dr. Taniguchi
  - Built by Center for Data Science, RTI International
What is the near repeat pattern of burglary and why should I care?
• When one house on a street is burgled neighbors are at a greater risk of being victimized
• Distance (< 2 blocks) and time (< 2 months) is short
  • Must take quick action
• More likely where housing type and layout are similar
• The emotional & financial toll of residential burglary
  • Sense of violation
  • Average loss exceeds $2,000
The Experiment - Background

• Why focus on near repeat crimes?
  • Allows targeting scarce police resources
  • Can use as a performance indicator
  • Follow-on benefit of sending police to already high crime places
  • Basis for partnerships with other agencies, citizens, and nonprofit groups
Where was the experiment conducted?
The Experiment - Sites

Baltimore County, MD
Population - 817,455
Burglaries - 1,110
Officers - 1,800

Redlands, CA
Population - 69,916
Burglaries - 353
Officers - 80

Baltimore County, MD
Redlands, CA

Policing Research Program
How is near repeat risk assessed?
The Experiment - Calculating Risk

- Near repeat calculator
  - Over what space-time windows does a statistically significant near repeat pattern exist?
The Experiment - NR Risk

- Baltimore County
  - Significant space-time risk
  - Near repeat pattern exists

<table>
<thead>
<tr>
<th></th>
<th>0-7 Days</th>
<th>8-14 Days</th>
<th>15-21 Days</th>
<th>22-28 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same location</td>
<td>5.18</td>
<td>1.58</td>
<td>0.00</td>
<td>8.14</td>
</tr>
<tr>
<td>1 to 400 ft.</td>
<td>4.46</td>
<td>1.55</td>
<td>1.24</td>
<td>1.09</td>
</tr>
<tr>
<td>401 to 800 ft.</td>
<td>1.64</td>
<td>2.12</td>
<td>1.17</td>
<td>1.30</td>
</tr>
<tr>
<td>801 to 1200 ft.</td>
<td>2.17</td>
<td>1.57</td>
<td>1.07</td>
<td>1.31</td>
</tr>
<tr>
<td>1201 to 1600 ft.</td>
<td>1.27</td>
<td>1.40</td>
<td>1.31</td>
<td>0.77</td>
</tr>
</tbody>
</table>
The Experiment- NR Risk

- Redlands
  - Significant space-time risk
  - Near repeat pattern exists

<table>
<thead>
<tr>
<th></th>
<th>0-3 Days</th>
<th>4-6 Days</th>
<th>7-9 Days</th>
<th>10-12 Days</th>
</tr>
</thead>
<tbody>
<tr>
<td>Same location</td>
<td>5.43</td>
<td>1.58</td>
<td>5.76</td>
<td>0.56</td>
</tr>
<tr>
<td>1 to 400 ft.</td>
<td>2.81</td>
<td>1.85</td>
<td>0.66</td>
<td>0.61</td>
</tr>
<tr>
<td>401 to 800 ft.</td>
<td>2.19</td>
<td>0.70</td>
<td>1.71</td>
<td>1.26</td>
</tr>
<tr>
<td>801 to 1200 ft.</td>
<td>1.46</td>
<td>0.85</td>
<td>1.06</td>
<td>0.82</td>
</tr>
<tr>
<td>1201 to 1600 ft.</td>
<td>1.06</td>
<td>0.54</td>
<td>0.68</td>
<td>1.35</td>
</tr>
</tbody>
</table>
How was the experiment implemented?
The Experiment- Design

- Trickle randomization
  - Randomize as events occur
- Goal of 139 treatment/controls
- Experiment ran from Sept. 2014 to Dec. 2015
- Site differences
  - RPD all automated
  - BCPD run manually
The Experiment- Design

On a daily basis, how do we...

1. Analyze the spatial & temporal patterns of events
2. Identify potential treatment areas
3. Assign areas to treatment or control
4. Deploy treatment providers
5. Track outcomes

We build a tool!
The Experiment- NRAIT

• Doesn’t require R knowledge
  • Program licensed under GNU license
• Contained in two files
  • Config.R.template
  • Experiment.R
The Experiment - Theory

- **High risk zone**
  - Measure outward from burglary along street network to high risk distance threshold

- **Displacement buffer**
  - Measure outward from burglary along street network to high risk buffer distance threshold
The Experiment - Theory

- Burglary
- Randomization
- Treatment
- Control
- Deploy Treatment
The Experiment - In Process

- Burglary
  - In existing area?
    - Yes
      - Count as outcome
    - No
      - Within study area?
        - No
          - Excluded
        - Yes
          - Allowable day?
            - No
              - Excluded
            - Yes
              - Generate high risk areas
  - No
    - Creates overlap (existing)?
      - Yes
        - Mark Unavailable
      - No
        - Creates overlap (new)?
          - Yes
            - Randomly select
              - Exclude others
          - No
            - Exceeds max treatment?
              - Yes
                - Randomly select max
                  - Exclude others
              - No
                - Random assignment
                  - Control
                    - Select addresses
                      - Store addresses
                  - Select addresses
                    - Report treatment area
                      - Deploy treatment

- Treatment
  - Select addresses
    - Report treatment area
      - Deploy treatment
The Experiment- NRAIT

- **System requirements**
  - Windows, Mac, or Linux OS
  - Several GB of storage
  - Access to CRAN package repository and tile.stamen.com

- **Necessary programs**
  - R
  - Text editor
  - GIS (optional)

- **Shapefile requirements**
  - Addresses (points)
  - Streets with connectivity for network analysis (lines)
  - Study area (polygons)
  - Crime (points)
The Experiment - NRAIT

- Tool parameters
  - Working directory
  - Risk and buffer distance
  - Include all touching segments - True/false
  - Overall # Treatment
  - Censored count
  - Max treatments per day

- Network settings
  - Location - File path
  - Unique identifier
The Experiment - NRAIT

- Event settings
  - Location - File path
  - Unique ID
  - Date variable
  - Date format

- Study area
  - Location - File path

- Address settings
  - Location - File path
  - Unique ID
  - Address label (displayed to user)
  - Proximity override (pre-assign addresses to streets)

# Column format for occurrence column [date format string]
# Format strings are passed to the R as.Date function
# Examples:
# "%Y-%m-%d"
# "%Y/%m/%d"
config.data.events.occurredformat = "%Y/%m/%d"
The Experiment- NRAIT

- Cumulative event file
- Cumulative street file
- Daily log of event processing
- Treatment provider form
The Experiment - NRAIT

- **Street(s) with initiator event info**
- **Addresses in treatment zone**
- **Street(s) in treatment zone**
- **Initiator event(s)**
The Experiment- NRAIT

Experiment Zone ID: 150040795, RCT Slot: 122

Zone ID (found in dataset)  Position in the randomization process
The Experiment - NRAIT

- Map of treatment area
- Blue cross on burglarized house
The Experiment- NRAIT

<table>
<thead>
<tr>
<th>StreetSegmentID</th>
<th>Address</th>
<th>Hangtag</th>
<th>Conversation</th>
<th>Referral</th>
</tr>
</thead>
<tbody>
<tr>
<td>3287</td>
<td>1601 ARCATCA DR</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>3315</td>
<td>102 KLAMATH ST</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>3315</td>
<td>1602 ARCATCA DR</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>3315</td>
<td>1605 ARCATCA DR</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>3315</td>
<td>1609 ARCATCA DR</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>3319</td>
<td>104 S DEARBORN ST</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
<tr>
<td>3319</td>
<td>123 S DEARBORN ST</td>
<td>____</td>
<td>____</td>
<td>____</td>
</tr>
</tbody>
</table>

- Treatment address list
- Form for documenting activity at each location
The Experiment- Treatment

What was done in NR high risk areas?
The Experiment- Treatment

Can providing the public with timely information about burglary risk reduce residential burglary?

- Community policing & CPTED
  - Security/safety audits
  - Suggest target hardening (locking windows, deadbolts)
  - Behavioral changes to reduce risk

- Residents becomes partners in security
- Low cost for agencies
- Positive results in several UK studies
The Experiment - Treatment

• Raise awareness of risk
• Deliver information via uniform personnel
• Tools
  • Scripts for field personnel
  • Crime prevention hangtag
  • Security audit
• Ask for criminal intelligence
The Experiment - Treatment Providers
The Experiment- Treatment Providers

• Inform
  • There has been a burglary in the neighborhood
  • They are there as part of a crime prevention program

• Reassure
  • There is an increased risk, but the risk is still low
  • There is no need for alarm

• Advise
  • Crime prevention advice
  • How to secure home
  • Review crime prevention hangtag
  • How to report suspicious activity
How do we evaluate a NR-based initiative?
The Experiment- Evaluation

- Crime
  - Change in burglary
  - Change in other property crimes

- Community
  - Changes in behavior
  - Public perceptions about the program
  - Public support for the program

- Treatment providers
  - Explore impact of treatment on agency volunteers
### The Experiment - Burglary Results

#### Baltimore County

<table>
<thead>
<tr>
<th></th>
<th>1–4 Weeks</th>
<th>1–8 Weeks</th>
<th>1–12 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>120 .06</td>
<td>.07</td>
<td>.07</td>
</tr>
<tr>
<td>Treatment</td>
<td>122 .06</td>
<td>.06</td>
<td>.08</td>
</tr>
</tbody>
</table>

#### Redlands

<table>
<thead>
<tr>
<th></th>
<th>1–4 Weeks</th>
<th>1–8 Weeks</th>
<th>1–12 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>Control</td>
<td>65 .06</td>
<td>.11</td>
<td>.14</td>
</tr>
<tr>
<td>Treatment</td>
<td>68 .06</td>
<td>.10</td>
<td>.10</td>
</tr>
</tbody>
</table>
## The Experiment - Other Crime

*Theft, theft from vehicle, and vandalism*

### Baltimore County

<table>
<thead>
<tr>
<th></th>
<th>1–4 Weeks</th>
<th>1–8 Weeks</th>
<th>1–12 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>Control</td>
<td>120</td>
<td>.26</td>
<td>.44</td>
</tr>
<tr>
<td>Treatment</td>
<td>122</td>
<td>.33</td>
<td>.51</td>
</tr>
</tbody>
</table>

### Redlands

<table>
<thead>
<tr>
<th></th>
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<th>1–8 Weeks</th>
<th>1–12 Weeks</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Mean</td>
<td>Mean</td>
<td>Mean</td>
</tr>
<tr>
<td>Control</td>
<td>65</td>
<td>.09</td>
<td>.15</td>
</tr>
<tr>
<td>Treatment</td>
<td>68</td>
<td>.12</td>
<td>.21</td>
</tr>
</tbody>
</table>
The Experiment- Community

Results based on crime were not great.

How did the community feel about it?
The Experiment - Community

- Was the notification memorable?
  - 56% did not remember receiving a notification
- Most common actions taken in response to notification?
  - Locking doors/windows
  - Watching out for neighbors
  - More likely to report a burglary
- Did treatment increase fear of crime?
  - 86% no change in their perception of burglary
  - 42% more likely to report burglary
- What was perception of the treatment?
  - 82% thought agency was being proactive
  - 100% thought agency should continue program
“Really appreciated the increased BCPD presence during the recent spate of burglaries!”

“I felt reasonably secure when I saw the Officer in uniform and a BCPD car on the street. Nice job. I'm sure you don't hear that enough.”
The Experiment- Treatment Providers

Results of the community survey were positive.

How did the treatment providers feel about it?
The Experiment - Treatment providers

- Treatment providers perceptions of effectiveness
  - 97% successful at engaging the community
  - 89% positive impact on police-community relations
  - 95% community responded positively to the program

- Effect of satisfaction with volunteering?
  - 68% program improved their volunteer experience
  - 58% more likely to volunteer in the future
“There seemed to be a great appreciation of our efforts to not only educate the community on current trends, but also simply to engage residents in a community policing style, rather than only interacting during enforcement actions.”
The Experiment - Summary

- Crime
  - No significant change in residential burglary
  - No significant change in other property crimes

- Residents
  - Positive perceptions of the program
  - Did not create fear in residents

- Volunteers
  - Positive impact on agency volunteers
How can we better understand the spatial and temporal patterns of NR events?

Can we better specify the potential impact of disrupting NR patterns?
NRCPC- Why?

- For practitioners
  - Should we undertake this intervention?
  - Was the intervention successful?
  - Is it worth continuing?

- For researchers
  - Crime prevention potential measured at micro level

- For both research and practice
  - Offers a specific and realistic metric for evaluating program success
Consider the scenario

Two cities have 1,000 burglaries a year and implement an intervention to reduce that number...

Agency A

- Prior to implementation, the number of burglaries that were near repeats is calculated as 100
- Burglaries in program areas go down by 50, a 50% reduction
- Program expanded because of success
Consider the scenario

Two cities have 1,000 burglaries a year and implement an intervention to reduce that number…

- Burglaries go down by 50
- Chief sees burglary down 5%
- New program shelved because low ROI
So what is a near repeat anyway?
NRCPC- Methodology

- Not all burglaries are reported to the police
  - May result in incomplete patterns
- Reporting of burglary is often delayed
  - Poor temporal resolution
  - Potential errors in temporal ordering
- Burglaries that occur on the same day as the originator event are not counted as repeats
  - Not preventable because they occur before pattern is identified
NRCPC- Methodology

• Near repeat criteria
  • Spatial- Within distance threshold
    • How do you calculate distances?
  • Temporal- Within temporal threshold
    • Disregard events that occur on the same day as the event being evaluated
    • Occurs after event being evaluated
  • Each event counted only once

• Event dispositions
  • Originator
  • Repeat
  • Not counted
9 burglaries from January 1\textsuperscript{st} through June 30\textsuperscript{th}

High risk threshold
- 800 feet
- 30 days
Filter on distance threshold

- Only connections within spatial threshold are shown
NRCPC- Example

- Consider timing and identify potential pairs

Example C

(6) April 18
(7) April 19
(8) May 20
(5) March 20

Example A

(4) Feb. 1
(2) Jan. 18
(3) Jan. 18
(9) June 17

Example B

(1- Jan. 3

Examples A, B, and C illustrate the concept of timing and potential pairs in a diagram.
### NRCPC - Example

#### Example A

<table>
<thead>
<tr>
<th>Event</th>
<th>Event</th>
<th>Within Distance?</th>
<th>Different Day?</th>
<th>Within Time?</th>
<th>Event Allocated?</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>9</td>
<td>✓</td>
<td>✓</td>
<td>❌</td>
<td>✓</td>
</tr>
</tbody>
</table>

#### Example B

<table>
<thead>
<tr>
<th>Event</th>
<th>Event</th>
<th>Within Distance?</th>
<th>Different Day?</th>
<th>Within Time?</th>
<th>Event Allocated?</th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>3</td>
<td>✓</td>
<td>❌</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>
No near repeat events in these examples
### Example C

<table>
<thead>
<tr>
<th>Event</th>
<th>Event</th>
<th>Within Distance?</th>
<th>Different Day?</th>
<th>Within Time?</th>
<th>Event already allocated</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>6</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>5</td>
<td>7</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>5</td>
<td>8</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
</tr>
<tr>
<td>6</td>
<td>7</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
</tr>
<tr>
<td>6</td>
<td>8</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
</tr>
<tr>
<td>7</td>
<td>8</td>
<td>✔</td>
<td>✔</td>
<td>✔</td>
<td>✗</td>
</tr>
</tbody>
</table>
Two near repeat events in these examples
How can we automate this process?

We build a tool!
The NRCPC- Methodology

Near Repeat Prevention Tool

- **Input Shapefile**: BurglaryExport/Burglaries.shp
- **Unique ID Field**: INC_NUM
- **Timestamp Field**: DtREPOR
- **Timestamp Format**: yyyy-MM-dd hh:mm:ss
- **Output Directory**: niguchi/Desktop/NRPT Output

**Spatial Distance Metric**
- **Euclidean**
- **Number of Spatial Bands**: 5
- **Spatial Band Width (meters)**: 122.00
- **Number of Temporal Bands**: 5
- **Temporal Band Width (days)**: 7.00

[Optional]:
- Allow events to be repeats for multiple different events
- Allow events to be both originators and repeats
- Allow events on the same day to count as a repeat pair

[2017-09-05 10:55:46]<INFO>: Reading field names from shapefile C:/Users/taniguchi/Desktop/BurglaryExport/Burglaries.shp
The NRCPC - Methodology

Near Repeat Prevention Tool

Input Shapefile
BurglaryExport/Burglaries.shp
Unique ID Field
INC_NUM
Timestamp Field
DtREPOR
Timestamp Format
yyyy-MM-dd hh:mm:ss
Output Directory
nguchi/Desktop/NRPT Output
Road Network File (optional)

Spatial Distance Metric
Euclidean
Manhattan
Network
5
Allow events to be repeats for multiple different events
Allow events to be both originators and repeats
Allow events on the same day to count as a repeat pair

[2017-09-05 10:59:30] <INFO>: Writing bins to file C:/Users/tniguchi/Desktop/NRPT Output\counts.csv
The NRCPC- Methodology

- Manhattan Distance
- Euclidean Distance
- Network Distance
The NRCPC- Methodology

Near Repeat Prevention Tool

Input Shapefile:
- BurglaryExport/Burglaries.shp

Unique ID Field:
- INC_NUM

Timestamp Field:
- DtREPOR

Timestamp Format:
- yyyy-MM-dd hh:mm:ss

Output Directory:
- niguchi/Desktop/NRPT Output

Road Network File (optional):

Spatial Distance Metric:
- Euclidean
  - Number of Spatial Bands: 5
  - Spatial Band Width (meters): 122.00
  - Number of Temporal Bands: 5
  - Temporal Band Width (days): 7.00

Options:
- Allow events to be repeats for multiple different events
- Allow events to be both originators and repeats
- Allow events on the same day to count as a repeat pair

[2017-09-05 10:55:46]<INFO>: Reading field names from shapefile C:/Users/taniguchi/Desktop/BurglaryExport/Burglaries.shp
The NRCPC - Methodology

- Leave this field blank AND select "Network Distance"
  - Program will download and use OpenStreetMap data
- Link to a street file AND select “Network Distance”
  - Program will use your Shapefile
- Leave this field blank AND select other distance metric
  - No street file needed
The NRCPC- Methodology

Near Repeat Prevention Tool

- Input Shapefile: BurglaryExport/Burglaries.shp
- Unique ID Field: INC_NUM
- Timestamp Field: DIREPOR
- Timestamp Format: yyyy-MM-dd hh:mm:ss
- Output Directory: niguchi/Desktop/NRPT Output
- Road Network File (optional)

Spatial Distance Metric
- Euclidean
- Number of Spatial Bands: 5
- Spatial Band Width (meters): 122.00
- Number of Temporal Bands: 5
- Temporal Band Width (days): 7.00

- Allow events to be repeats for multiple different events
- Allow events to be both originators and repeats
- Allow events on the same day to count as a repeat pair

Logs:
- Writing bins to file C:/Users/taniguchi/Desktop/NRPT Output\counts.csv
- Successfully wrote bins to file.
- Writing repeat reports to base path C:/Users/taniguchi/Desktop/NRPT Output\repeat and originator reports to base path C:/Users/taniguchi/Desktop/NRPT Output\originator
- Successfully wrote all reports.
- Run finished successfully.
The NRCPC- Methodology

Option 1- Allows events to be counted in multiple NR chains

Option 2- Allows events to be originators and repeat events

Option 3- Allows same-day events to be counted in NR chains

Robust evaluations would generally require leaving Options 1 & 2 unchecked
The NRCPC- Methodology

1. Review output for excluded cases
2. Ensure N matches crime file

Note 1: Downloading OSM file can be time consuming
Note 2: Binning events is time consuming
Note 3: Calculating network distance can be computationally consuming. Be prepared to wait for 30+ min for complex graphs
NRCPC- Demonstration

• Examining open source data from seven cities (data.policefoundation.org/)
  • Denver
  • Durham
  • Fayetteville
  • Orlando
  • Philadelphia
  • Santa Rosa
  • Seattle
  • St. Louis
### NRCPC - Demonstration

<table>
<thead>
<tr>
<th></th>
<th>Baltimore Co.</th>
<th>Redlands</th>
<th>Denver</th>
<th>Durham</th>
<th>Fayetteville</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>3 Blocks 4 Weeks</strong></td>
<td>5.89</td>
<td>7.76</td>
<td>14.97</td>
<td>14.30</td>
<td>14.51</td>
</tr>
<tr>
<td></td>
<td><strong>Orlando</strong></td>
<td><strong>Philadelphia</strong></td>
<td><strong>Santa Rosa</strong></td>
<td><strong>Seattle</strong></td>
<td><strong>St. Louis</strong></td>
</tr>
<tr>
<td></td>
<td>Baltimore Co.</td>
<td>Redlands</td>
<td>Denver</td>
<td>Durham</td>
<td>Fayetteville</td>
</tr>
<tr>
<td>----------------------</td>
<td>---------------</td>
<td>----------</td>
<td>--------</td>
<td>--------</td>
<td>--------------</td>
</tr>
<tr>
<td><strong>4 Blocks 4 Weeks</strong></td>
<td>8.18</td>
<td>15.24</td>
<td>23.90</td>
<td>21.98</td>
<td>20.53</td>
</tr>
<tr>
<td></td>
<td>Orlando</td>
<td>Philadelphia</td>
<td>Santa Rosa</td>
<td>Seattle</td>
<td>St. Louis</td>
</tr>
<tr>
<td><strong>4 Blocks 4 Weeks</strong></td>
<td>30.77</td>
<td>35.84</td>
<td>16.47</td>
<td>26.31</td>
<td>32.97</td>
</tr>
</tbody>
</table>
The NRCPC- Strategy Development

- Add the Excel file into your ArcMap session
- Join the information from NRCPC to your shp file
  - Identify the originators (Originator_ID)
  - Identify the repeats (Repeat_ID)
- Visually display the pattern of each
- Use the hot spot tool to discover where there are concentrations of near repeat events.

*These are the areas to focus NR prevention efforts*
The NRCPC- Strategy Development
The NR Analysis Framework

- Identify recurring crime and disorder issue
- Near Repeat Calculator to identify global patterns
- Near Repeat Crime Prevention Potential tool to explore local variability
- Develop an intervention
- Respond to NR pattern using NRAIT
- Run as an RCT if desired
- Use output from NRAIT to assess effect
- Conduct additional statistical analyses
Tools for Understanding and Responding to Near Repeat Crimes

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