Data Driven Approaches to Crime *and* Traffic Safety (DDACTS)

Geographic Information Systems (GIS) in Transportation Safety

National Transportation Safety Board

December 4, 2012

Presented by the Baltimore County (MD) Police Department

Captain Woodland Wilson

Lieutenant Stephen Troutman

Sergeant Joseph Donohue

Traffic Analyst Emily Varga

"INTEGRITY FAIRNESS SERVICE"

What is DDACTS?

DDACTS is an operational model that uses the integration of location-based crime and traffic data to establish effective and efficient methods for deploying law enforcement and other resources.

"INTEGRITY...FAIRNESS...SERVICE"

Why DDACTS?

- **Crime and Crashes Often Occur in Close Proximity**

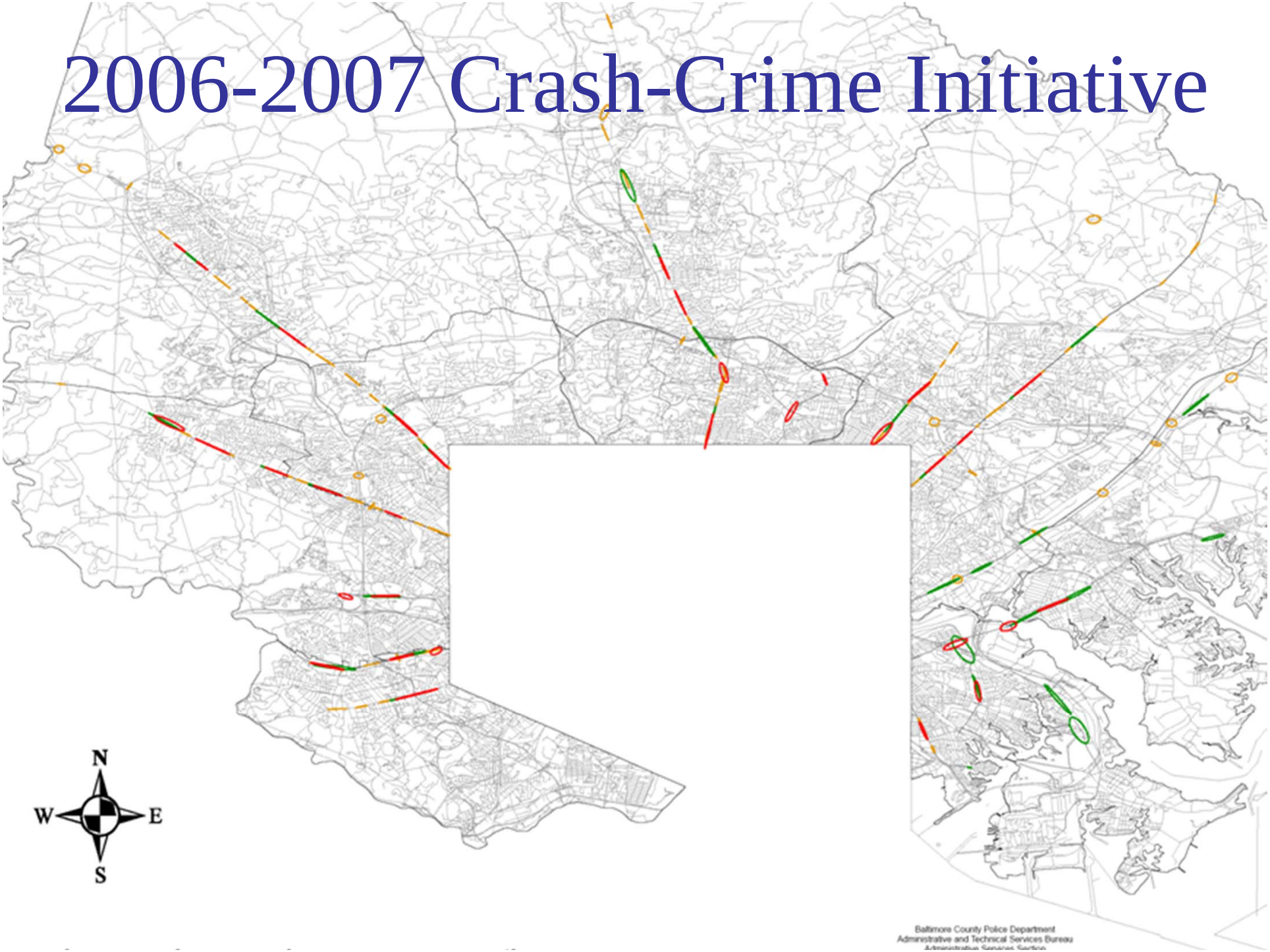
POLICE
BALTIMORE COUNTY
MARYLAND
"INTEGRITY...FAIRNESS...SERVICE"

2007-2008 Crash-Crime Initiative

- In 2006 department analysts discovered an overlap between crime hotspots and crash hotspots
- The initial focus was along several primary thoroughfares originating in Baltimore City and expanding outward in a spoke-like fashion
- The idea was to direct resources into these overlap areas to have a “two birds with one stone” effect on both crashes and crime

"INTEGRITY...FAIRNESS...SERVICE"

2006-2007 Crash-Crime Initiative



Why DDACTS?

- **Crime and Crashes Often Occur in Close Proximity**
- **Increasing Demands and Limited Resources**
- **Conflicting / Competing Demands for Service**
- **Crimes Often Involve a Motor Vehicle**
- **Renewed Emphasis on Traffic Safety**

POLICE
BALTIMORE COUNTY
MARYLAND
"INTEGRITY...FAIRNESS...SERVICE"

DDACTS Guiding Principles

Partners / Stakeholder Participation

Data Collection

Data Analysis

Strategic Operations

Information Sharing and Outreach

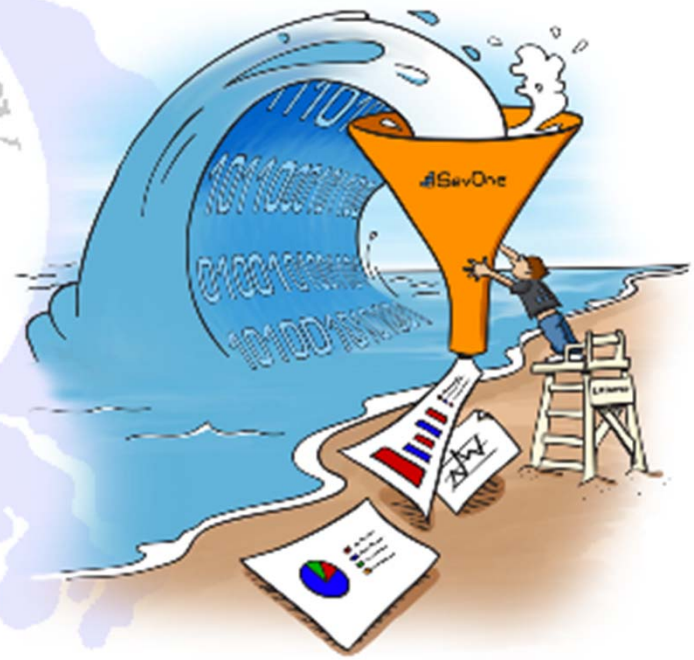
Monitor, Evaluate and Adjust

Outcomes

"INTEGRITY...FAIRNESS...SERVICE"

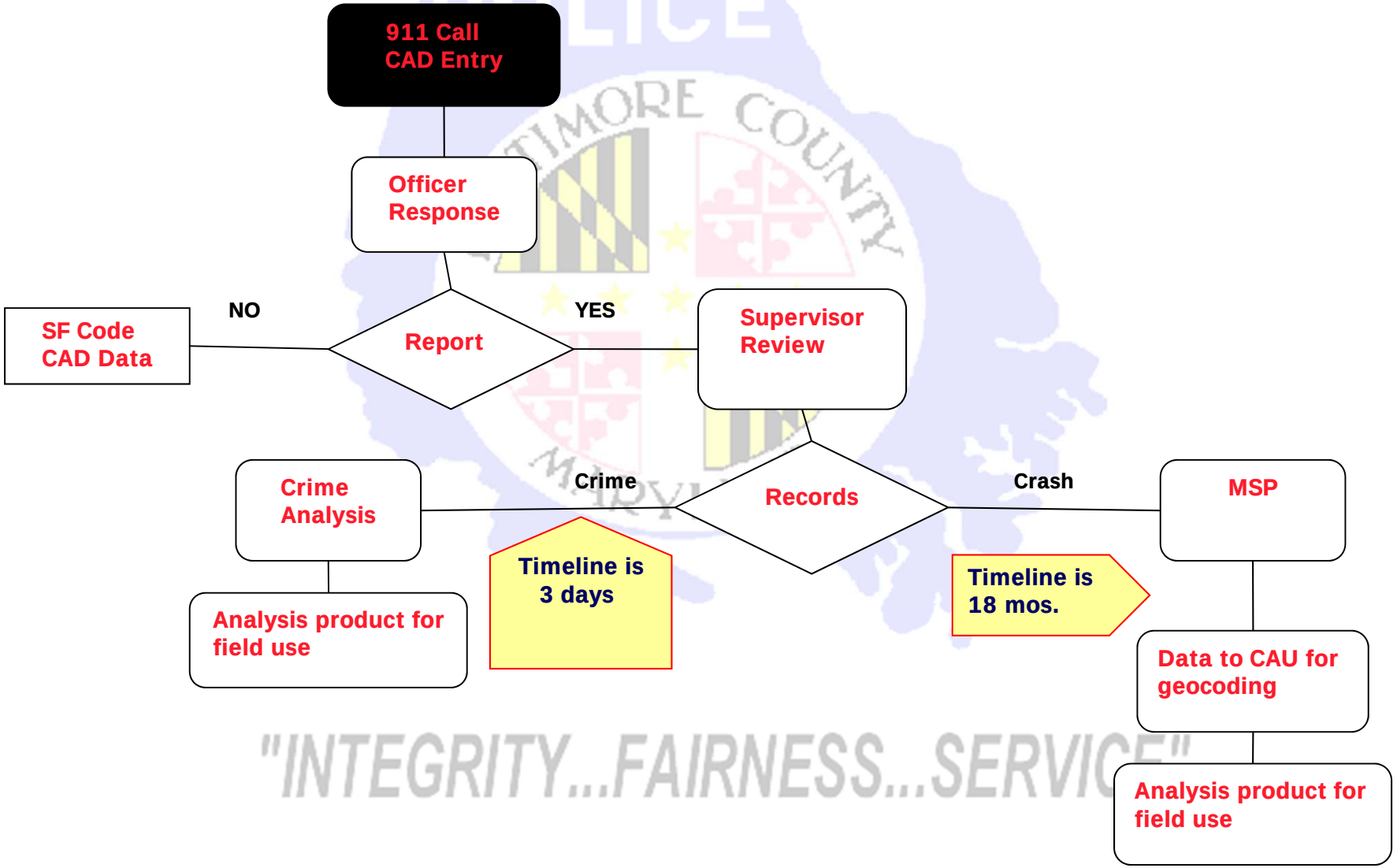
Data Collection

- Crash Data
- Crime Data
- Calls for Service
- Community Complaints



"INTEGRITY...FAIRNESS...SERVICE"

Data Collection Flow



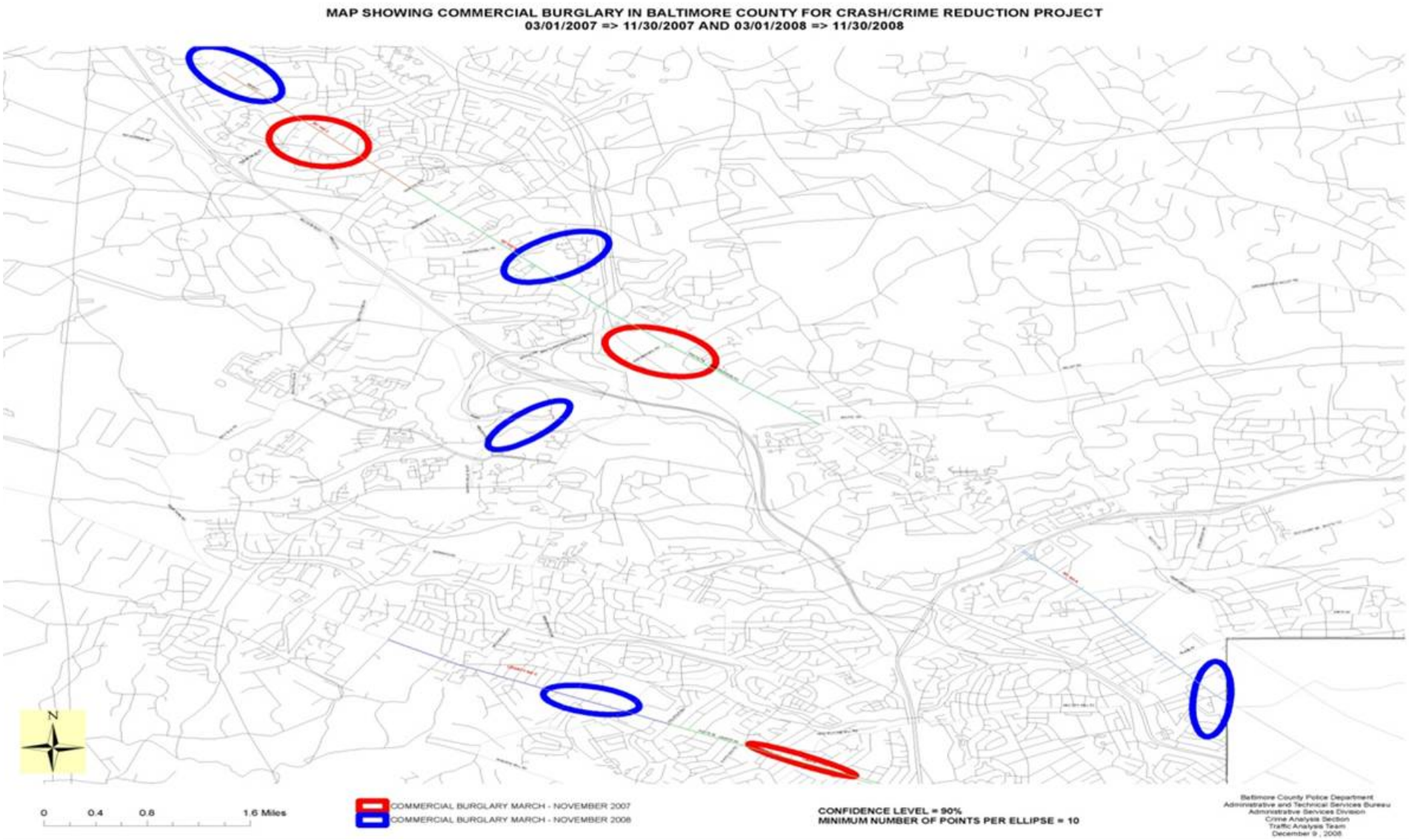
"INTEGRITY...FAIRNESS...SERVICE"

Difficulty Geocoding Crash Locations

- Road name misspelled
- Road name missing
- Multiple designations of interstate highways
- Hit rate about 83% for MAARS (Maryland Accident Analysis Reporting System) data

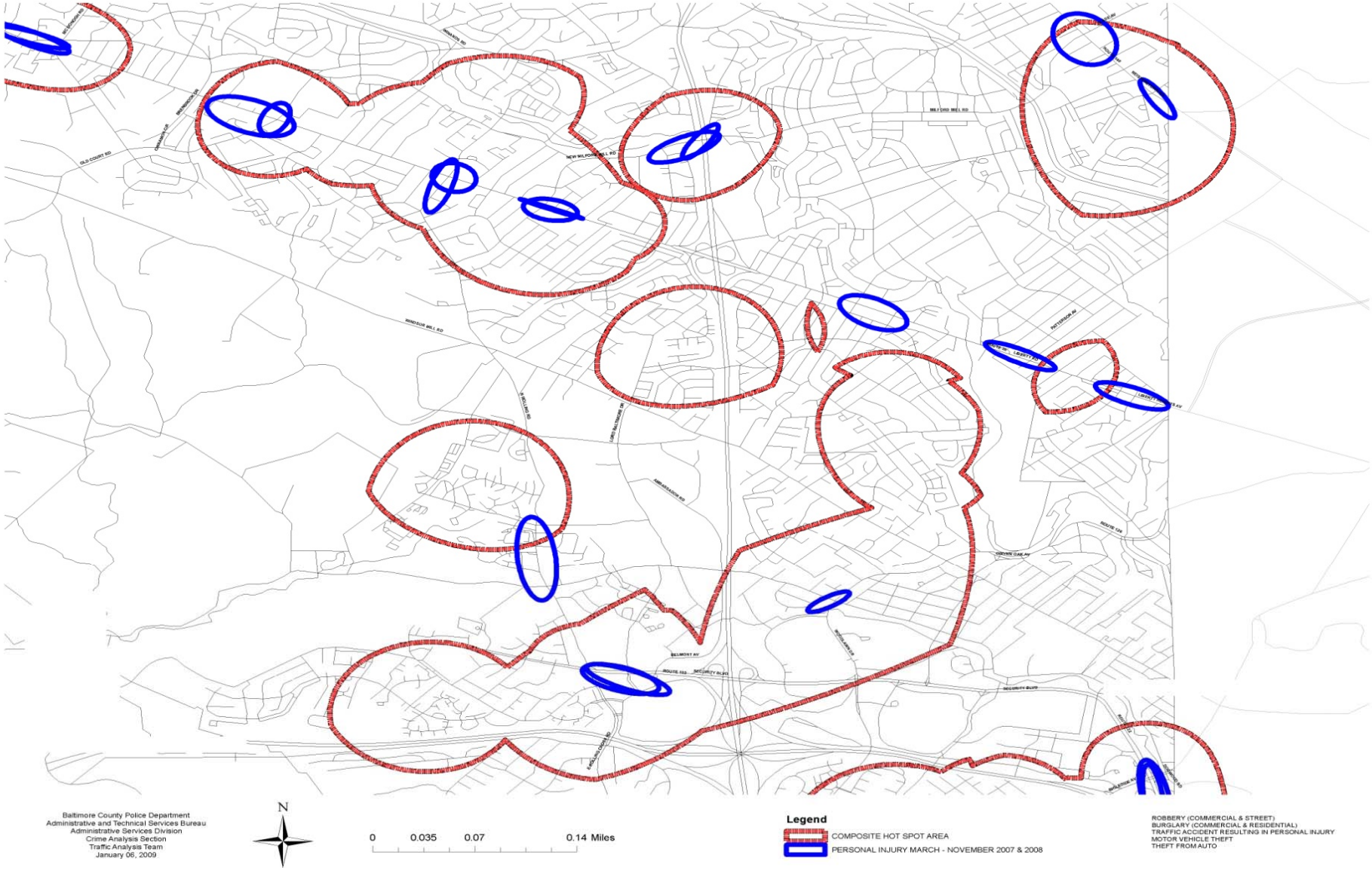
"INTEGRITY...FAIRNESS...SERVICE"

Crime Hot Spot Areas

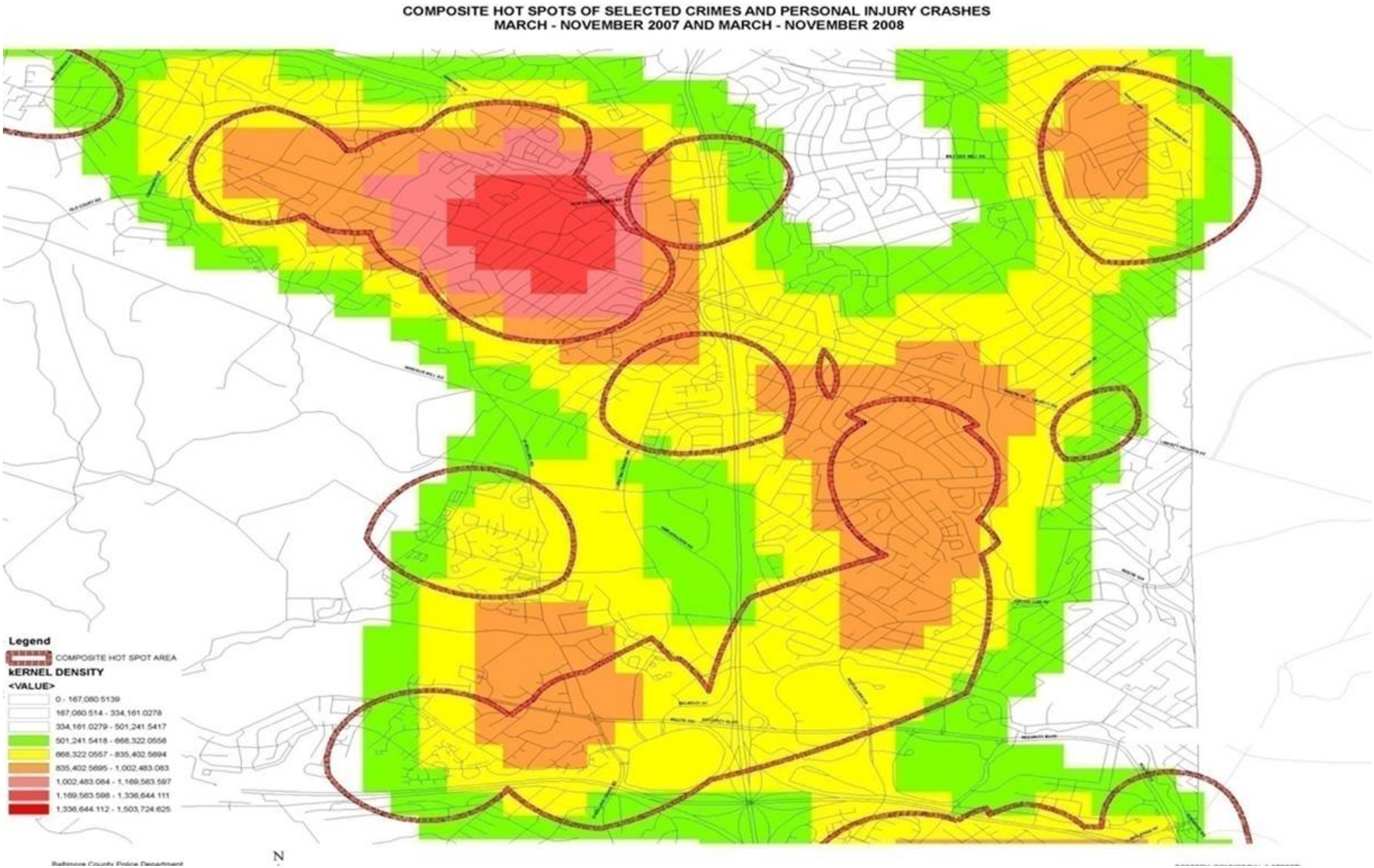


Composite Hot Spot Areas

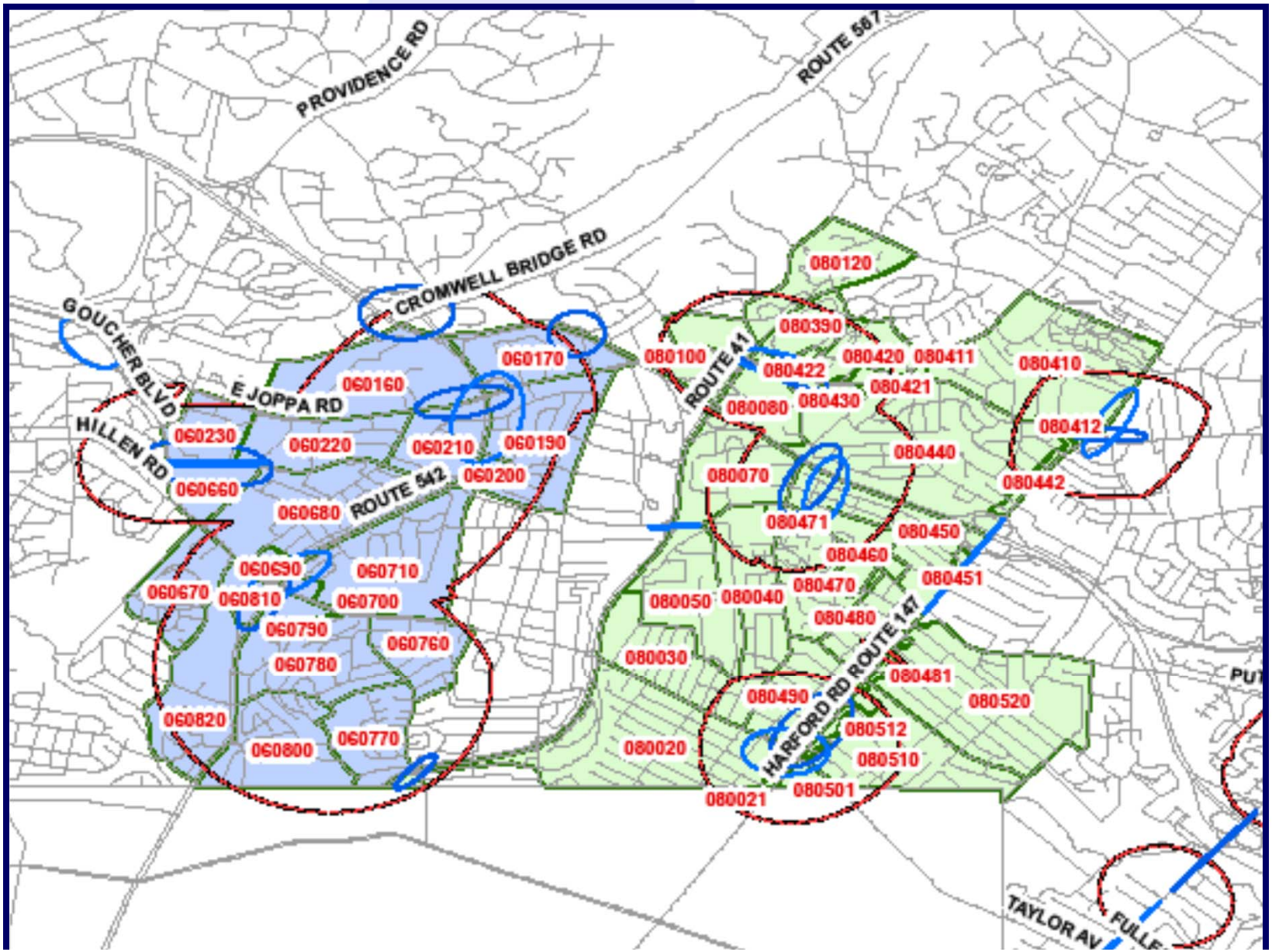
COMPOSITE HOT SPOTS OF SELECTED CRIMES AND PERSONAL INJURY CRASHES
MARCH - NOVEMBER 2007 AND MARCH - NOVEMBER 2008

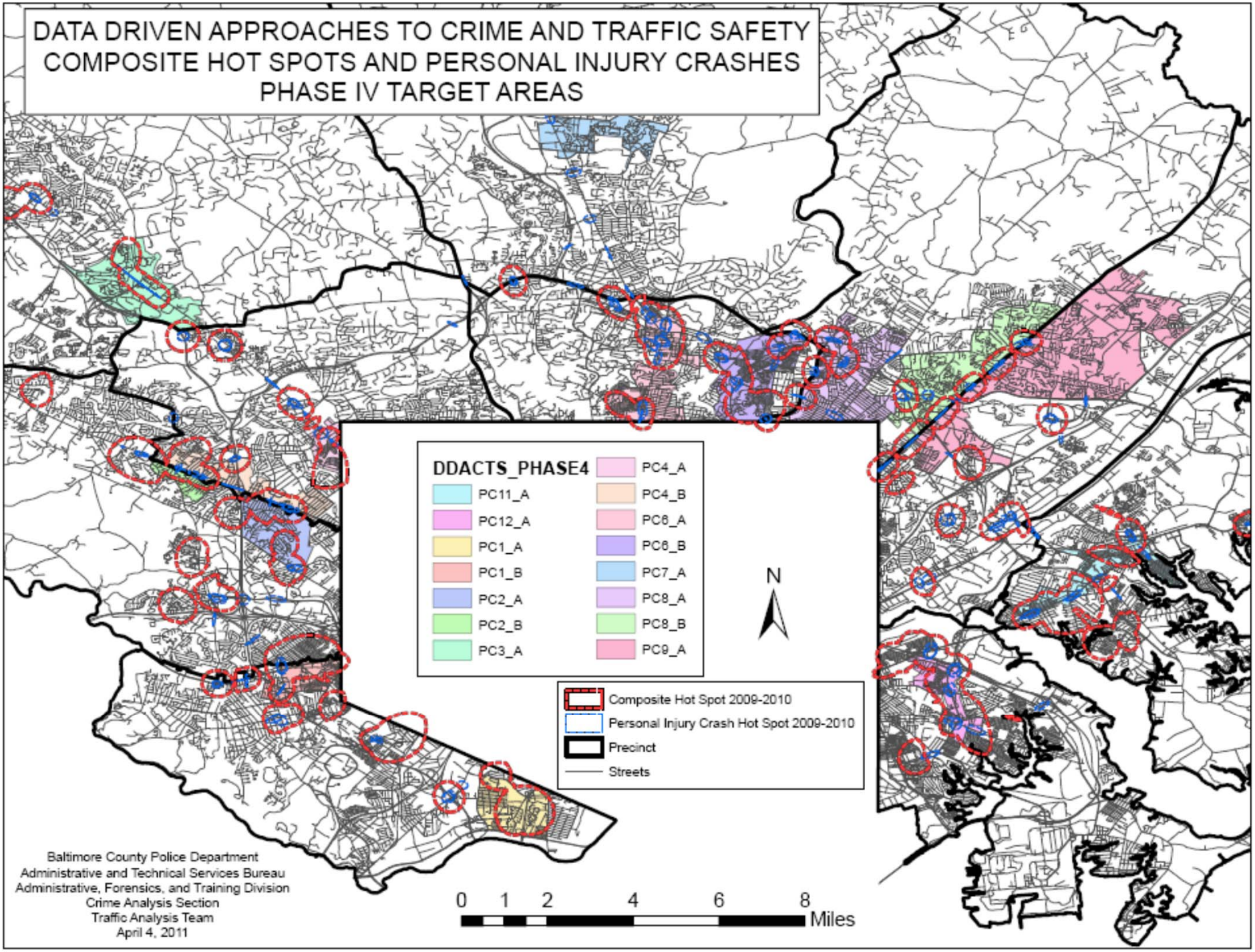


Composite Hot Spot Areas



Developing Target Areas




DATA DRIVEN APPROACHES TO CRIME AND TRAFFIC SAFETY
COMPOSITE HOT SPOTS AND PERSONAL INJURY CRASHES
PHASE IV TARGET AREAS
DDACTS_PHASE4
PC11_A
PC12_A
PC1_A
PC1_B
PC2_A
PC2_B
PC3_A
PC4_A
PC4_B
PC6_A
PC6_B
PC7_A
PC8_A
PC8_B
PC9_A
N
Composite Hot Spot 2009-2010
Personal Injury Crash Hot Spot 2009-2010
Precinct
Streets
0 1 2 4 6 8
Miles
Baltimore County Police Department
Administrative and Technical Services Bureau
Administrative, Forensics, and Training Division
Crime Analysis Section
Traffic Analysis Team
April 4, 2011

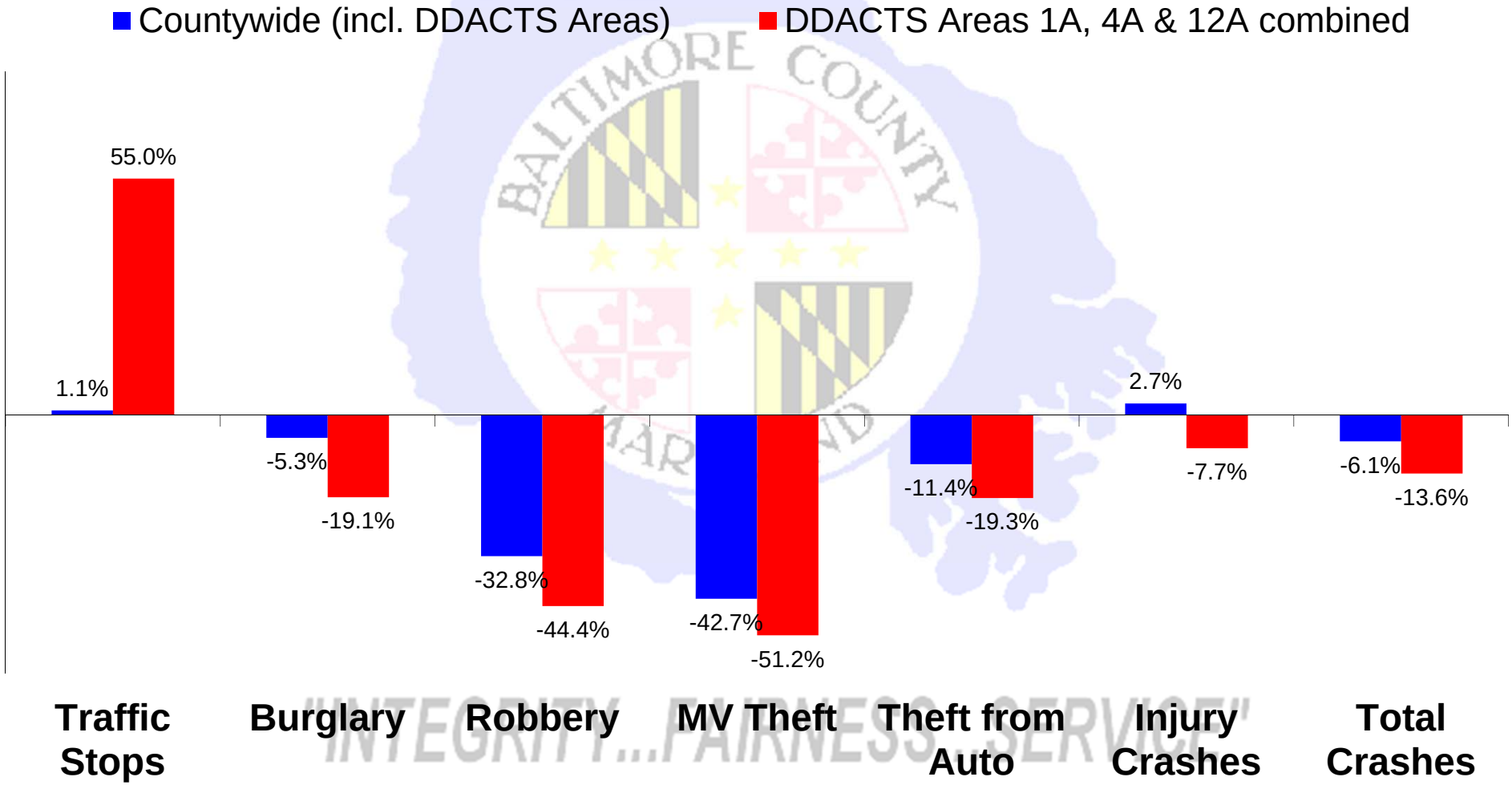
Evaluation Considerations

- Establish criteria ahead of time
- Identifying pre- and post-periods
- Averages instead of individual data points
- Methods of measuring change
- Control areas
- Statistical tests and significance
- Displacement and diffusion

"INTEGRITY...FAIRNESS...SERVICE"

The Long-Term Effects

3 Target Areas have remained the same since DDACTS was started in 2009



Change between April to November 2006-2008 yearly average (pre-DDACTS) and 2011

POLICE

BALTIMORE COUNTY

MARYLAND

"INTEGRITY...FAIRNESS...SERVICE"