DVRPC Information Resource Exchange Group Meeting

GIS Applications for Public Safety in Philadelphia

Kevin Thomas, Director of Research & Analysis, Philadelphia Police Department

U.S. Grant Ervin, Public Safety GIS Program Manager, DM Office of Public Safety

Philadelphia Public Safety GIS Enterprise Group

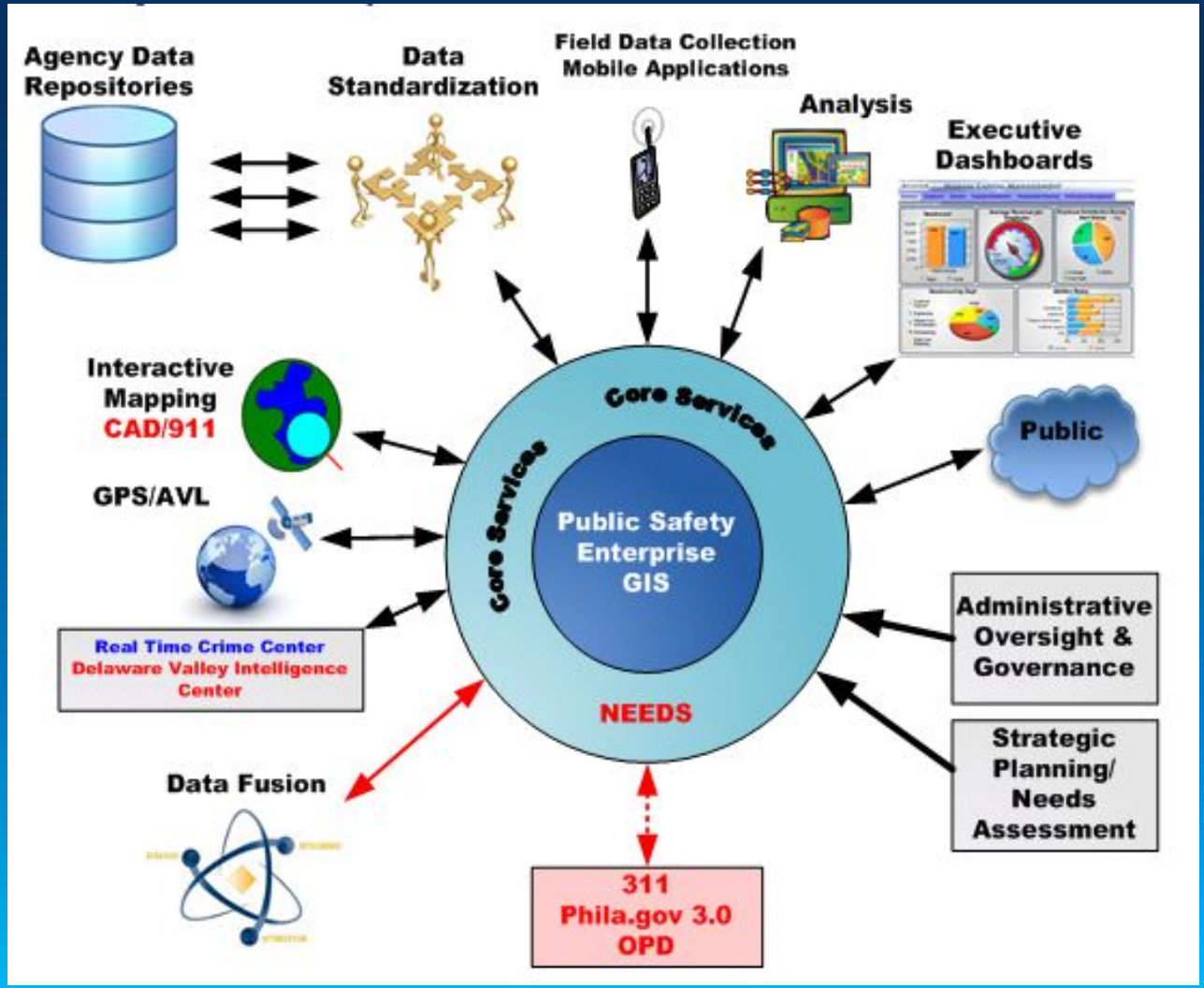
- Building the Enterprise was undertaken at the end of 2009 based on the need to upgrade/create geospatial functionality within and across the city's big 3 public safety agencies (Police, Fire and Emergency Management)

- Enterprise is shared across all Public Safety agencies.

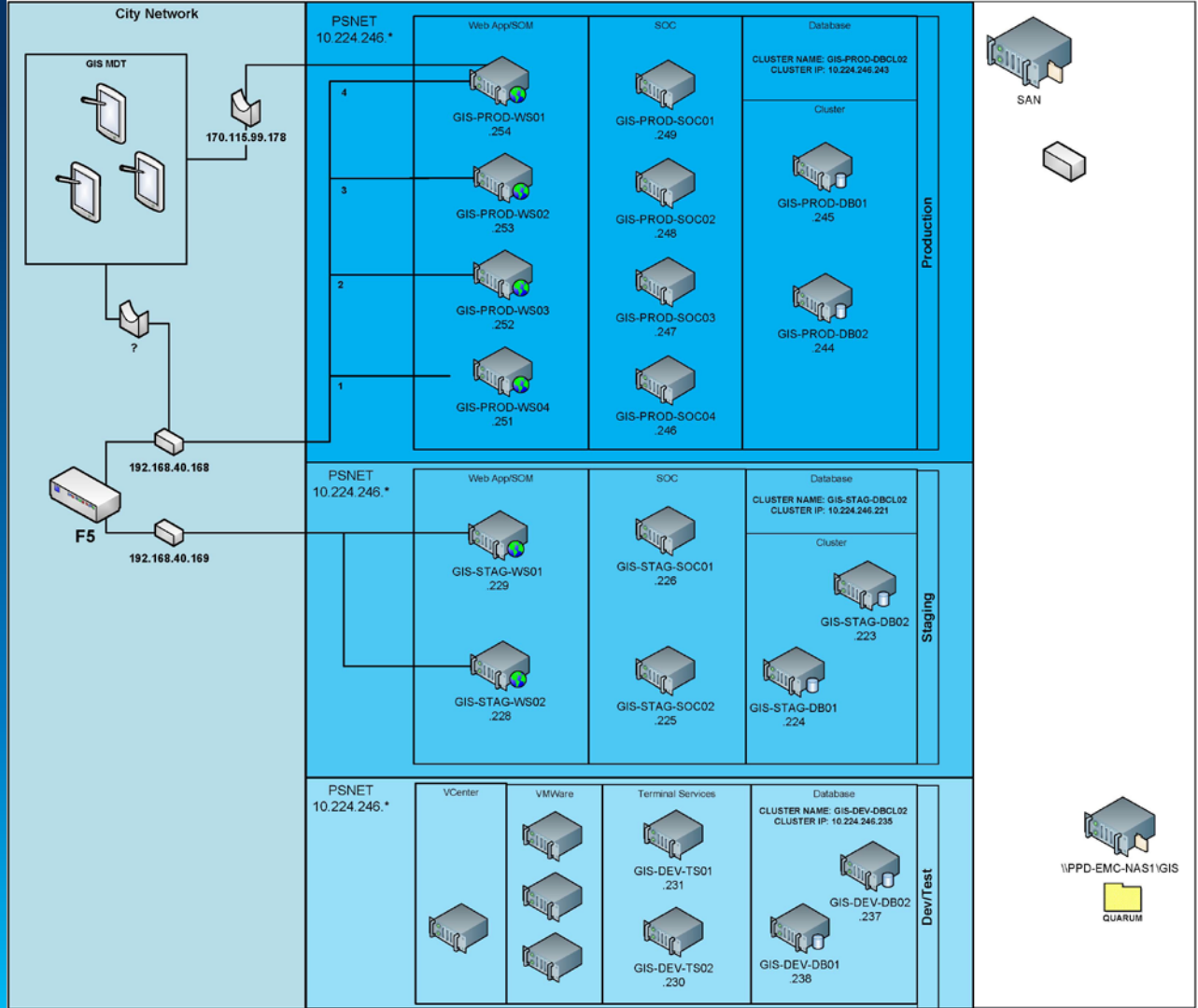
- Serves as the GIS Environment for the Delaware Valley Intelligence Center, a regional fusion center.

ArcGIS Server used as a platform

- Ensure everything flows thru the GIS environment. Like the “Force”.
- Leverage ArcSDE and Microsoft SQL Server Spatial for Data.
- Integration of video, sensors, public/private feeds, etc…

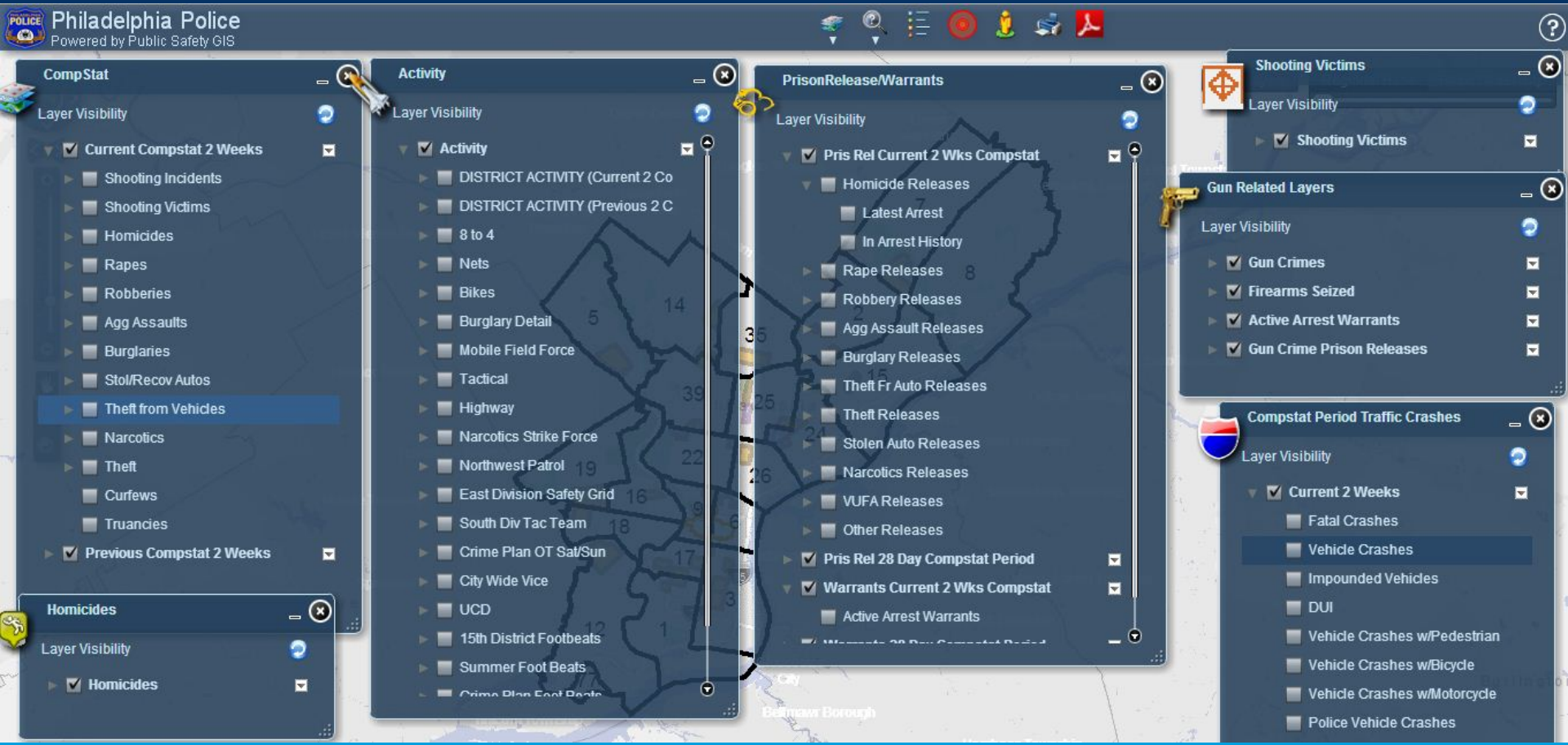

Agency Data Repositories
Data Standardization
Field Data Collection Mobile Applications
Analysis
Executive Dashboards
Interactive Mapping CAD/911
GPS/AVL
Real Time Crime Center Delaware Valley Intelligence Center
Core Services
Core Services
Public Safety Enterprise GIS
NEEDS
Public
Administrative Oversight & Governance
Strategic Planning/ Needs Assessment
Data Fusion
311 Phila.gov 3.0 OPD

- 24 Physical Servers
- 20 TB of storage
- ArcGIS Version 10.0, 10.1 and 10.2 environments.
- Performance tuned using Apache JMeter

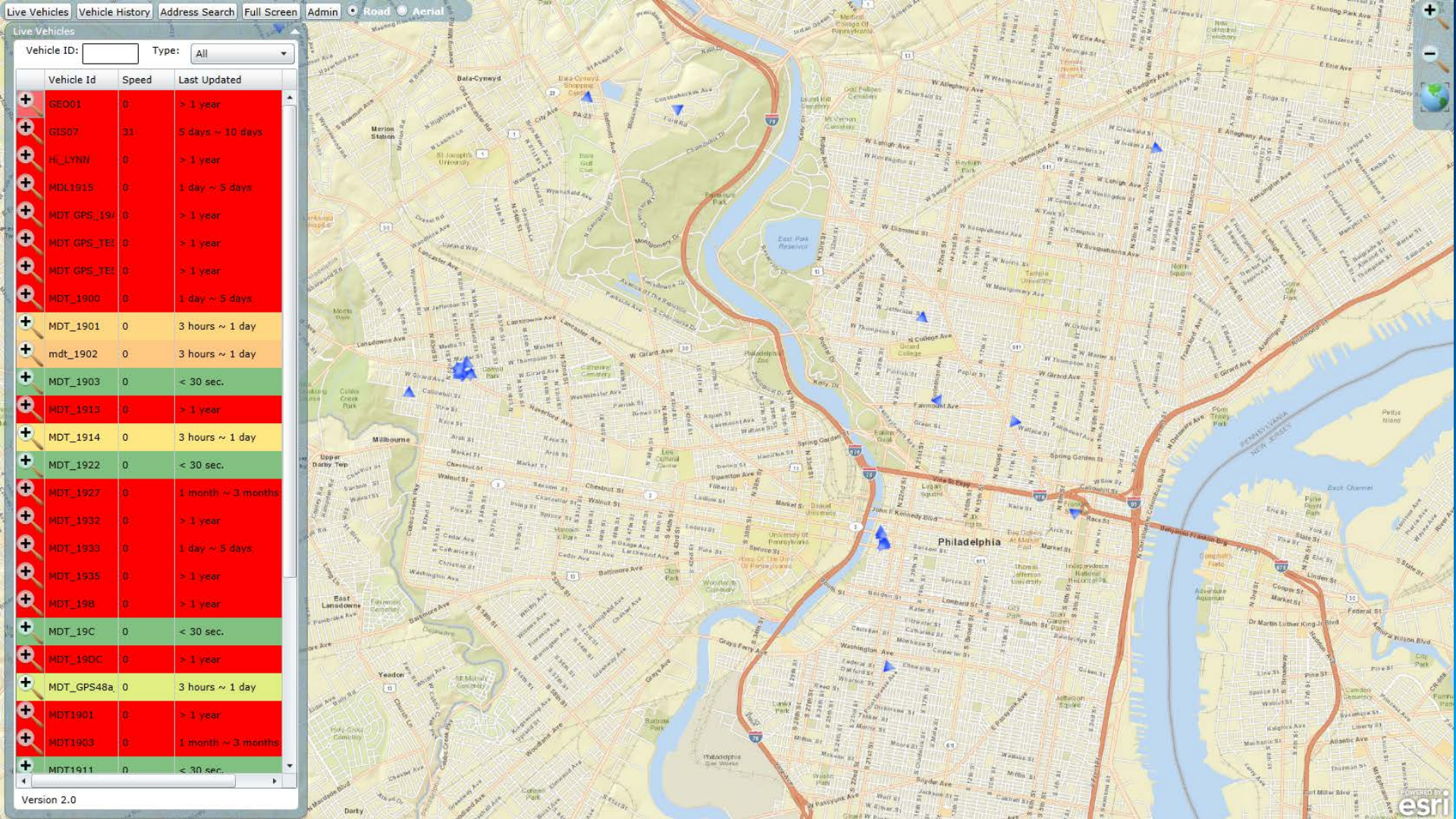


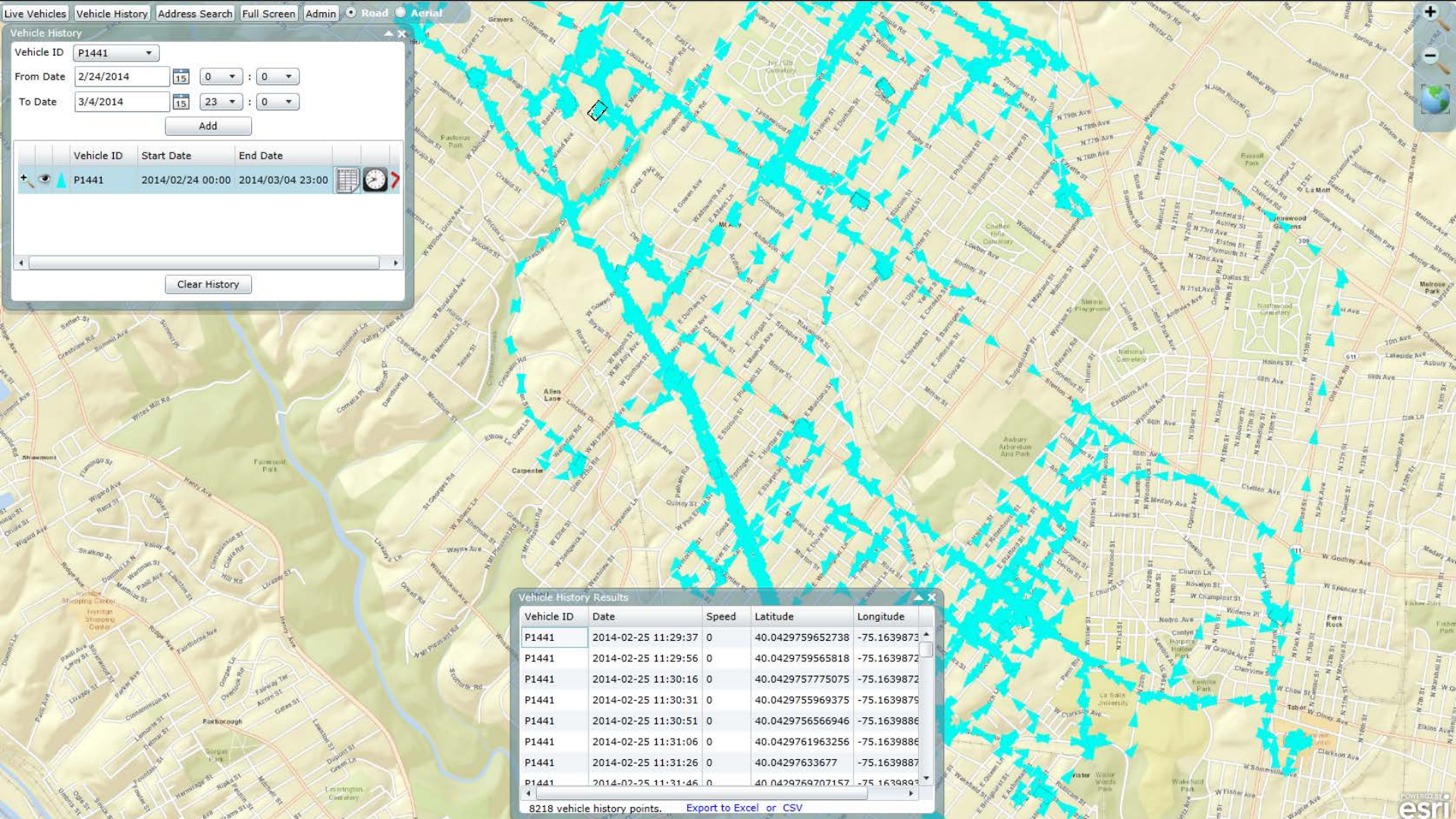
Police

- Crime Mapping & Analysis Application
- Crime Briefings (COMPSTAT)
- GPS/AVL
- SMART Policing: District Analyst Coordinators


Philadelphia Police
Powered by Public Safety GIS
CompStat
Layer Visibility
Current Compstat 2 Weeks
Shooting Incidents
Shooting Victims
Homicides
Rapes
Robberies
Agg Assaults
Burglaries
Stol/Recov Autos
Theft from Vehicles
Narcotics
Theft
Curfews
Truancies
Previous Compstat 2 Weeks
Homicides
Layer Visibility
Homicides
Activity
Layer Visibility
Activity
DISTRICT ACTIVITY (Current 2 Co
DISTRICT ACTIVITY (Previous 2 C
8 to 4
Nets
Bikes
Burglary Detail
Mobile Field Force
Tactical
Highway
Narcotics Strike Force
Northwest Patrol
East Division Safety Grid
South Div Tac Team
Crime Plan OT Sat/Sun
City Wide Vice
UCD
15th District Footbeats
Summer Foot Beats
PrisonRelease/Warrants
Layer Visibility
Pris Rel Current 2 Wks Compstat
Homicide Releases
Latest Arrest
In Arrest History
Rape Releases
Robbery Releases
Agg Assault Releases
Burglary Releases
Theft Fr Auto Releases
Theft Releases
Stolen Auto Releases
Narcotics Releases
VUFA Releases
Other Releases
Pris Rel 28 Day Compstat Period
Warrants Current 2 Wks Compstat
Active Arrest Warrants
Shooting Victims
Layer Visibility
Shooting Victims
Gun Related Layers
Layer Visibility
Gun Crimes
Firearms Seized
Active Arrest Warrants
Gun Crime Prison Releases
Compstat Period Traffic Crashes
Layer Visibility
Current 2 Weeks
Fatal Crashes
Vehicle Crashes
Impounded Vehicles
DUI
Vehicle Crashes w/Pedestrian
Vehicle Crashes w/Bicycle
Vehicle Crashes w/Motorcycle
Police Vehicle Crashes

Philadelphia Police
Powered by Public Safety GIS
Incidents by ...
Date range:
01/01/2013
to
07/01/2013
Hours:
00
to
23
Day(s):
All M T W Th F Sa Su
Include in query:
Incidents
Arrests
Both
By Crime Type
By Ucr List
Nature Code = DRUGS
Selection area:
Current View Area
Hide points
Clear map on every query
?
Run Query
Incidents Found: 3825
Map Layers
Regional Base
Basic Street Map
W Tioga St
W Ontario St
W Westmoreland St
W Allegheny Ave
W Clearfield St
W Indiana Ave
W Somerset St
W Lehigh Ave
W Huntingdon St
W Cumberland St
W York St
W Dauphin St
N American St
N 6th St
N 7th St
N 4th St
N 3rd St
N 2nd St
E Tioga St
E Ontario St
E Allegheny Ave
E Westmoreland St
E Somerset St
E Cambria St
E Huntingdon St
E Lehigh Ave
Jasper St
Emerald St
Amber St
Aramingo Ave
Tulip St
Cedar St
Gaul St


Live Vehicles
Vehicle History
Address Search
Full Screen
Admin
Road
Aerial
Live Vehicles
Vehicle ID:
Type:
All
Vehicle Id
Speed
Last Updated
GEO01 0 > 1 year
GIS07 31 5 days ~ 10 days
Hi_LYNN 0 > 1 year
MDL1915 0 1 day ~ 5 days
MDT GPS_19/ 0 > 1 year
MDT GPS_TE! 0 > 1 year
MDT GPS_TE! 0 > 1 year
MDT_1900 0 1 day ~ 5 days
MDT_1901 0 3 hours ~ 1 day
mdt_1902 0 3 hours ~ 1 day
MDT_1903 0 < 30 sec.
MDT_1913 0 > 1 year
MDT_1914 0 3 hours ~ 1 day
MDT_1922 0 < 30 sec.
MDT_1927 0 1 month ~ 3 months
MDT_1932 0 > 1 year
MDT_1933 0 1 day ~ 5 days
MDT_1935 0 > 1 year
MDT_19B 0 > 1 year
MDT_19C 0 < 30 sec.
MDT_19DC 0 > 1 year
MDT_GPS48a 0 3 hours ~ 1 day
MDT1901 0 > 1 year
MDT1903 0 1 month ~ 3 months
MDT1911 0 < 30 sec.
Version 2.0
Philadelphia
Bala-Cynwyd
Millbourne
Yeadon
East Lansdowne
Upper Darby Twp
Darby
esri


Live Vehicles
Vehicle History
Address Search
Full Screen
Admin
Road
Aerial
Vehicle History
Vehicle ID
P1441
From Date
2/24/2014
0
0
To Date
3/4/2014
23
0
Add
Vehicle ID
Start Date
End Date
P1441
2014/02/24 00:00
2014/03/04 23:00
Clear History
Vehicle History Results
Vehicle ID
Date
Speed
Latitude
Longitude
P1441 2014-02-25 11:29:37 0 40.0429759652738 -75.1639873
P1441 2014-02-25 11:29:56 0 40.0429759565818 -75.1639872
P1441 2014-02-25 11:30:16 0 40.0429757775075 -75.1639872
P1441 2014-02-25 11:30:31 0 40.0429755969375 -75.1639879
P1441 2014-02-25 11:30:51 0 40.0429756566946 -75.1639886
P1441 2014-02-25 11:31:06 0 40.0429761963256 -75.1639886
P1441 2014-02-25 11:31:26 0 40.04297633677 -75.1639887
8218 vehicle history points.
Export to Excel or CSV
esri

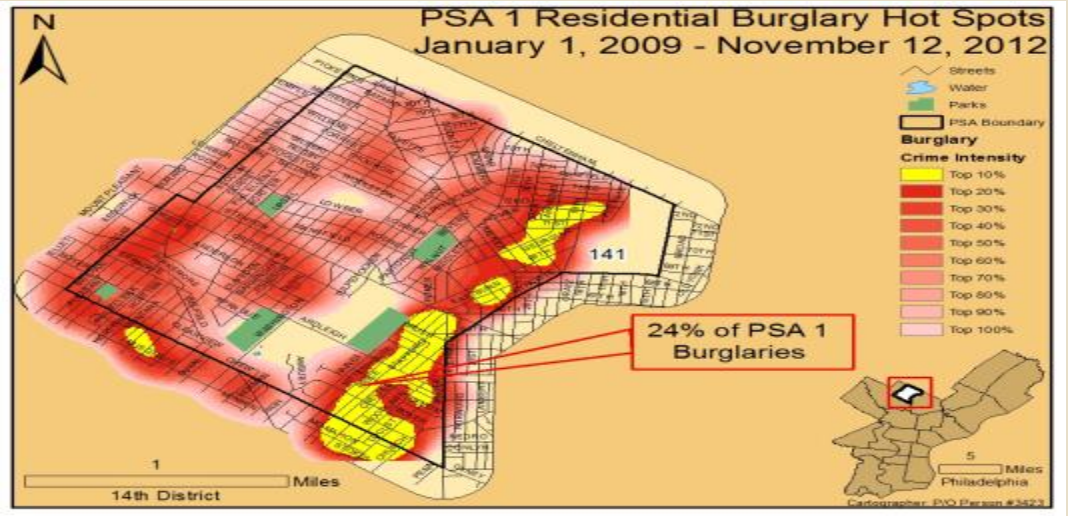
SMART Policing

14th

Eric Person

Executive Summary

- Residential burglaries in the lower part of Police Service Area 1
  - There were 279 residential burglaries during the analysis period
- 10% of them were committed by repeat burglary offenders
- Likely entry point in the rear of the property, by force
- Many homes in the focus area have the same layout
  - Rear driveways and breezeways
- The items craved were overwhelmingly electronics because they are easier to sell for quick cash



Problem Statement

- Residential burglaries in Police Service Area (PSA) 1
  - Burglaries were concentrated in the area of Stenton Ave to Chew Ave, Haines St to Wister St
  - Burglaries mostly committed using forced entry
  - Burglaries concentrated on weekdays
  - Burglaries concentrated during the day
  - Academic literature and past experience would suggest that repeat offenders may be responsible

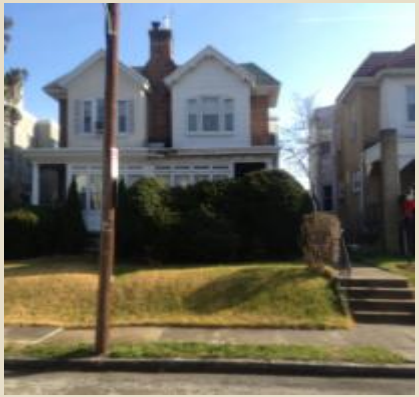
Hypotheses

- Residential burglaries occur during the daytime when people are away at work.
- Burglaries happen when people forget to secure their property correctly.
- Residential burglaries are committed by a group of focused individuals looking to flip items for quick cash.

Major Analysis

- Environmental survey
  - Looked at the property landscape in the focus area
    - Most had rear driveways and breezeways
    - Some had brush obscuring front and rear of properties

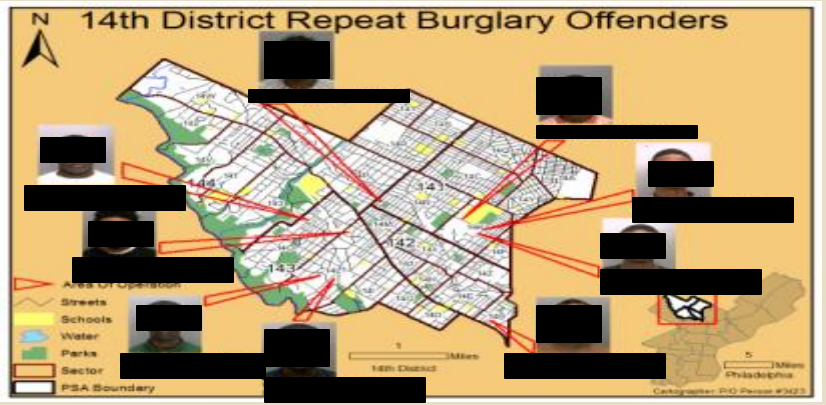
Front of the houses



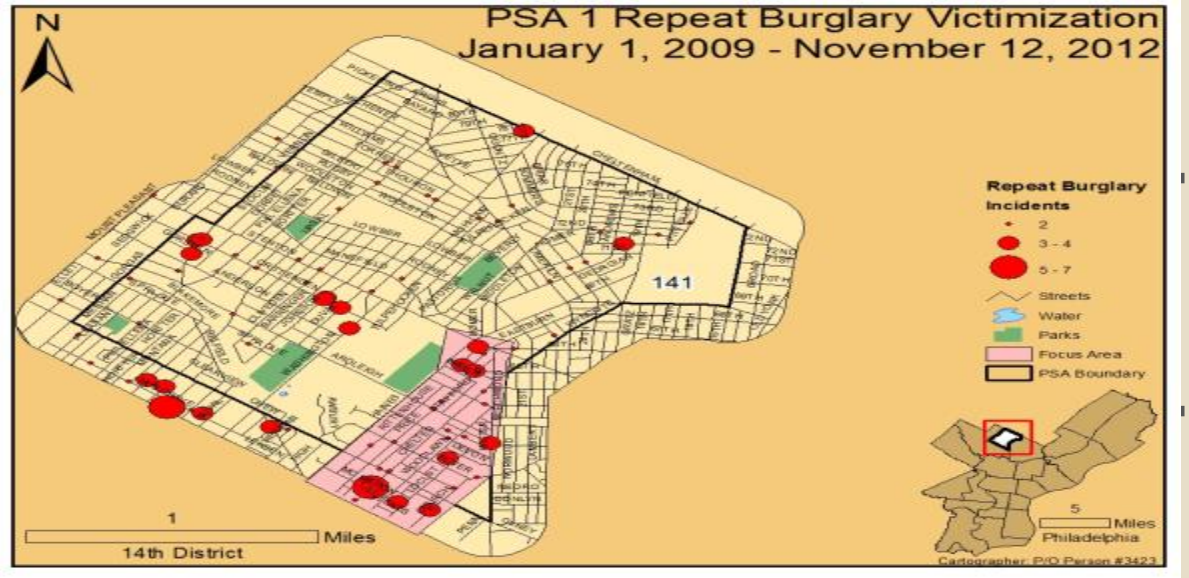
Rear of the houses

Major Analysis Continued

- Entry method
  - Determined that most were forcible entry
  - Most occurred in the rear of property
- Prolific offenders
  - Looked at the repeat burglary offenders in the focus area to try and make a connection
  - Determined that 10 % of the PSA's burglaries were done by repeat offenders



Secondary Analysis



- Hot spot maps
  - Focus area experienced an increased number of incidents
- Repeat victimization
  - Showed that many of the burglaries in the focus area were repeated offenses
- Analyzed the burglary proceeds
  - Electronics were the most craved items

Recommendations

- Home security surveys
  - To evaluate the property for weak points
- Prevention strategies
  - Cocoon neighborhood watch
    - Notifies nearby homeowners when a burglary occurs and flyers are given to homes in the focus area
- Operation ID
  - Help track stolen goods
- Increase patrol
  - During high crime time
    - To deter crime and gather intelligence
    - Burglary bulletins given to patrol officers

Philadelphia Police Department
14th District PSA 1
Bulletin # 1
Released: November 1, 2012
Hot Spot: Residential Burglaries in PSA 1
Number of Incidents: 377 Incidents
Date Range: January 1, 2009 to November 1, 2012
Time Range: Highest reported times are 1000-1959 and 1300-1959
Property Taken: Electronics, Copper Pipes, Money, Jewelry
PSA 1 Residential Burglary Hot Spots
1-1-09 to 9-24-12
Hot Spot | Location | Tour of Duty | Day | Entry Method
1 | Boyer / Chelten | 8 x 6 | Thursday | Rear
2 | Price / Crittenden | 4 x 12 | Wednesday | Rear
3 | Haines / Woolston | 8 x 6 | Tuesday | Front
4 | Dallas / Andrews | 8 x 6 | Wednesday | Rear
5 | Anderson / Vernon | 4 x 12 | Monday | Rear
14th District Crime Bulletin

Recommendation Implementation

- Prevention strategies
  - Crime prevention officer, burglary teams, and crime scene officers give homeowners and nearby residents tips
  - Officers also conduct home surveys upon request
  - All burglary scenes are being processed for fingerprints
- Operation ID
  - Electronics are being tagged upon owners request
- Increase patrol
  - Burglary teams added to the high crime areas
  - Repeat offenders targeted and tracked
- Results
  - 39 % reduction in district burglaries from 2012 to 2013

19th

Andrew Jenkins

Problem Statement

- Historically known to be a problem location.
- Ranging from narcotics sales and bar fights to robberies.
- Double homicide occurred inside where the offender and victim got into a dispute over narcotics sales inside the bar.

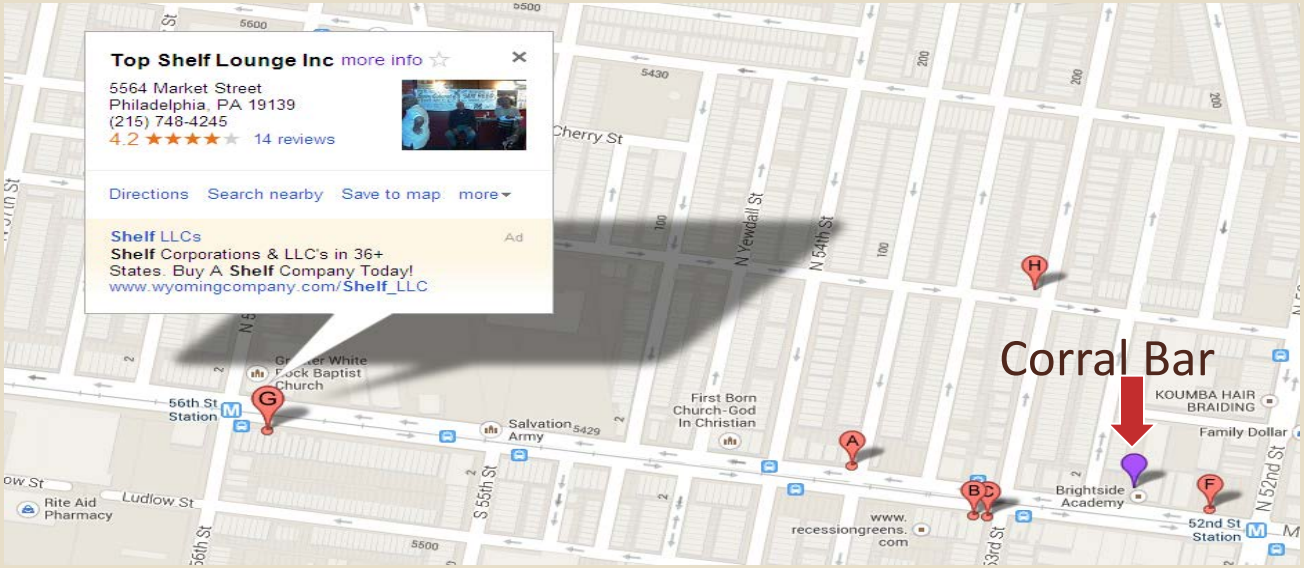
Hypotheses

Corral Bar: 5231 Market St.

- Corral bar had become a safe haven for narcotics sales and other criminal activity.
- This criminal activity is contributing to violence in the bar and in the area outside of the bar.
- Corral bar is more problematic than other bars in the area.

Major Analysis

- Compared the Corral bar to the Top Shelf Lounge.
- Both bars are located on the Market Street Corridor.
  - Less than a half a mile apart.



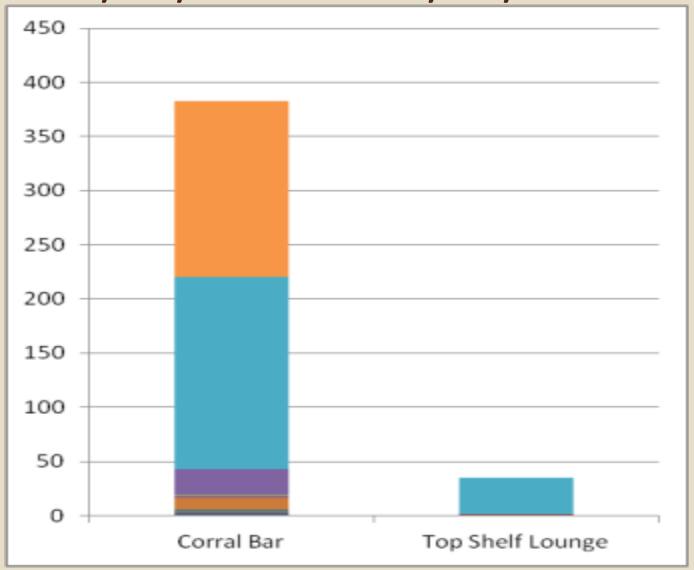
Major Analysis

- Pulled PPD data from area in and around both the Corral Bar and Top shelf Lounge.
- Data was checked and reports were read to ensure accuracy.
- Comparison was made between the two establishments.

Major Analysis

	Corral Bar	Top Shelf Lounge
Homicide	2	0
Aggravated Assault	1	1
Theft	1	0
Assault	1	0
VUFA	1	0
Narcotics Violations	10	0
Gambling Violations - Gambling Device	1	0
DUI	1	0
Public Drunkenness	1	0
City Ordinance Violations	24	0
Investigation of Persons - Investigation of Person	177	34
Minor Disturbances - Disorderly Crowd Dispersed	163	0
All Calls	449	37

Number of Incidents from 01/01/2009 to 05/18/2012



Actions Taken

- Patrols increased for time being & analysis started
- Partnership with DA Nuisance task force & Councilwoman
- Analysis presented at court
- Bar closed and liquor license was sold and may not be transferred to any property within the 16th, 18th, or 19th police districts

25th

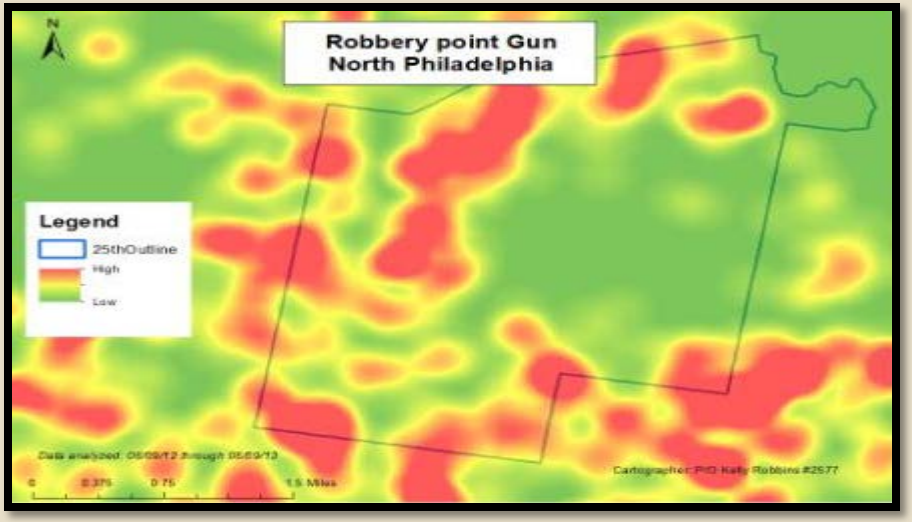
Kelly Robbins

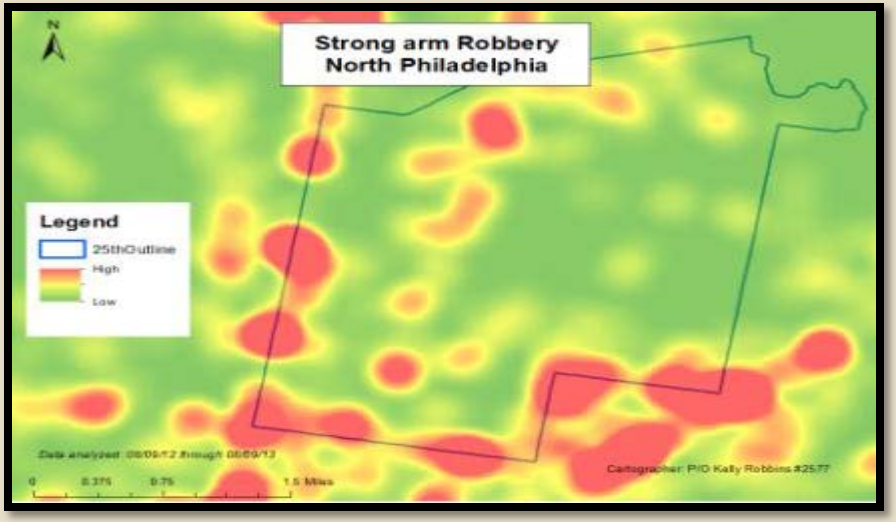
Executive Summary

- A rash of robberies drew attention to the long term problem of robberies in the 25th district.
  - While only 39% of all robberies were committed without a weapon, these strong arm robberies presented with more concentrated hotspots
    - Highly concentrated hot spots suggest a focused problem

Problem Statement

- After a rash of robberies in the 25th district, attention was focused on this crime type for the period of 08-09-12 through 08-09-13; Armed robbery and strong arm robbery were compared
  - The 25th recorded 587 robberies; About 46% (n=272) were robberies point of gun. About 39% (n=231) were strong arm robberies





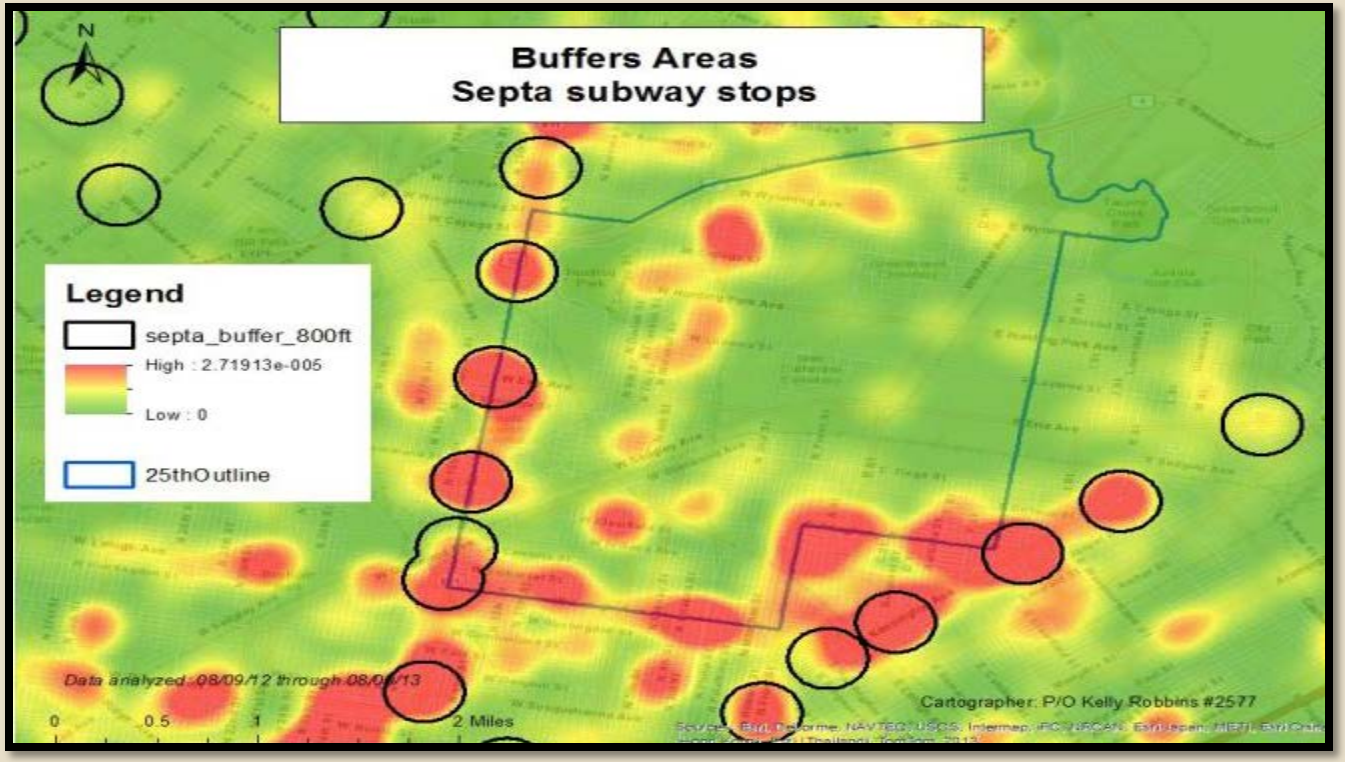
Hypotheses

- There will be significant differences when comparing armed robbery to strong arm robbery
- Armed robberies will occur at specific times and in concentrated areas, making them ideal for targeted treatments
- Strong arm robberies are being committed by school aged offenders
- Offenders will use Septa transportation to help them flee

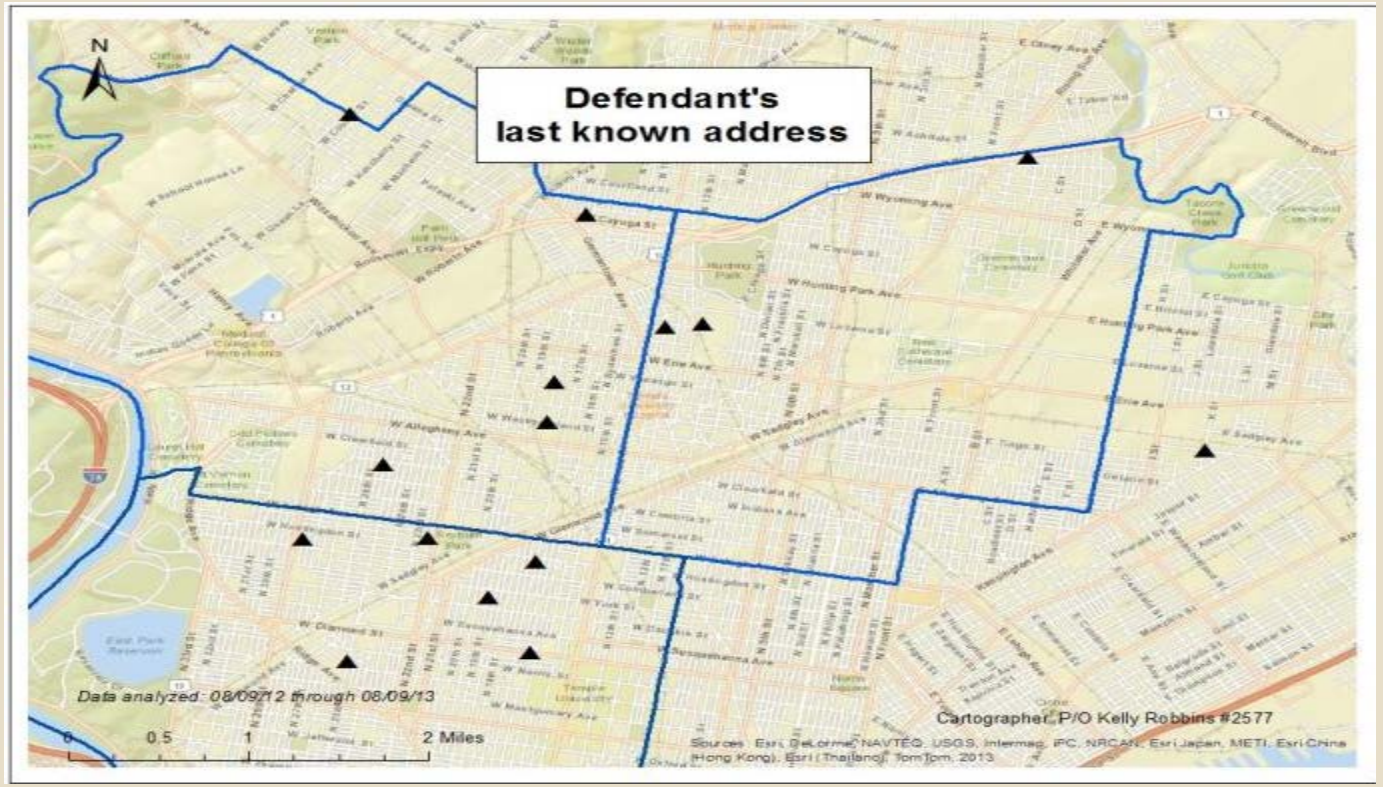
Major Analysis

- Strong arm robberies are concentrated near Septa rail stations
- Strong arm robberies occurred Tues, Thurs and Fri at 11pm, 5pm, and 9pm
- The average victim was 35 years old, Black/Hispanic, and female
- The average offender was 27 years old, Black/Hispanic, and male
- Almost two-thirds of offenders appear to have acted alone
- Almost all were committed at street-level (not on a subway, bus, train or trolley)
  - 77% were committed on the highway (outside)
- In 41% of the cases there was one or more witnesses
- In 70% of robberies, the doer fled on foot and did not appear to use Septa during escape
- Either a phone or US Currency was taken in roughly 60% of robberies

Major Analysis



Major Analysis



Secondary Analysis

- At least 30% of victims are either coming from or waiting for Septa services just prior to the robbery
  - This number may actually be much higher, but it is not often included in the investigation
- Of the offenders arrested for the Broad Street robberies (n=27), 63% had prior arrest records, averaging 5 arrests per offender
- Of the offenders with prior arrest records:
  - 63% had prior drug arrests
  - 37% haad prior crack cocaine (Possession or PWID) arrests
  - 63% had prior theft or robbery charges
  - Arrested in an average of 3.7 different districts over an average period of 5.1 years
    - This may illustrate that offenders committing robberies in the 25th are nomadic rather than establishing a specific hunting ground

Recommendations

- Partnership with Septa Police
  - Awareness campaign
    - Public and permanent ads reminding waiting Septa users to be aware of their surroundings
- Role Call reminders for RTCC utilization
  - CCTV cameras in these areas provide the ability to received quick information on correct flash and direction of offenders
- Holiday Grid Established
  - Months of November and December 2012
  - Foot beats focused on robberies near Septa and businesses
- VUFA Grid Established
  - Established a high police presence to deter violent crime
  - Analysis forthcoming

Fire

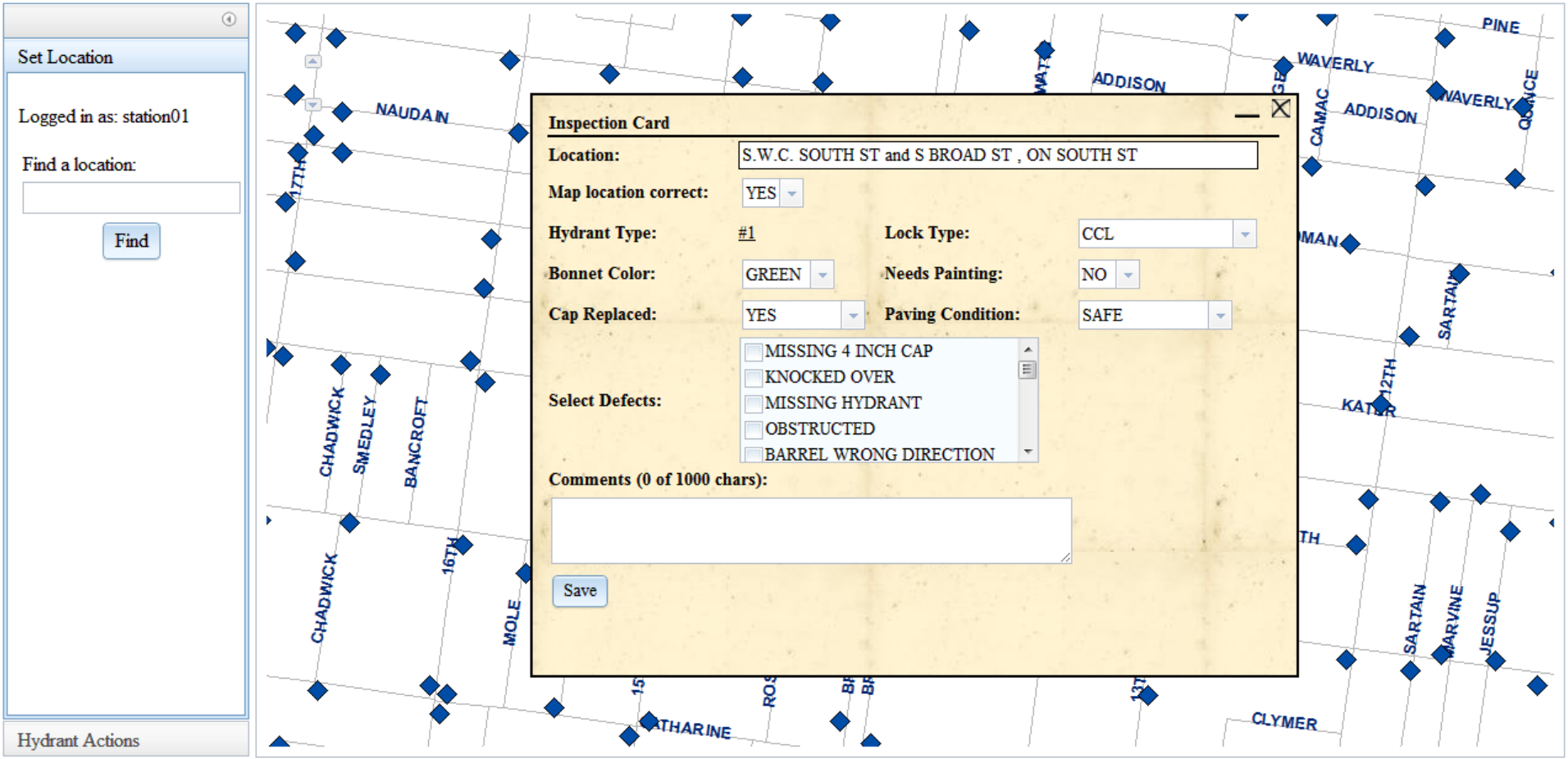
- Hydrant Inspection Application with Philadelphia Water Department
- Battalion Chief Mobile Application
- Internal Fire Map Application

Hydrant Inspection Application

- Update Fire Hydrant information for the Philadelphia Water Department.
- Formerly a paper based survey system to inspect 27,000 hydrants.
- GPS enabled JavaScript based application

Benefits

- Hydrant inspections rose from an average in the mid 60’s to 95 percent.
- Hydrant corrections rose from a month to a week or less.
- Cost savings of $17,000 annually just to print inspection cards
- Updated hydrant information is available in the field.

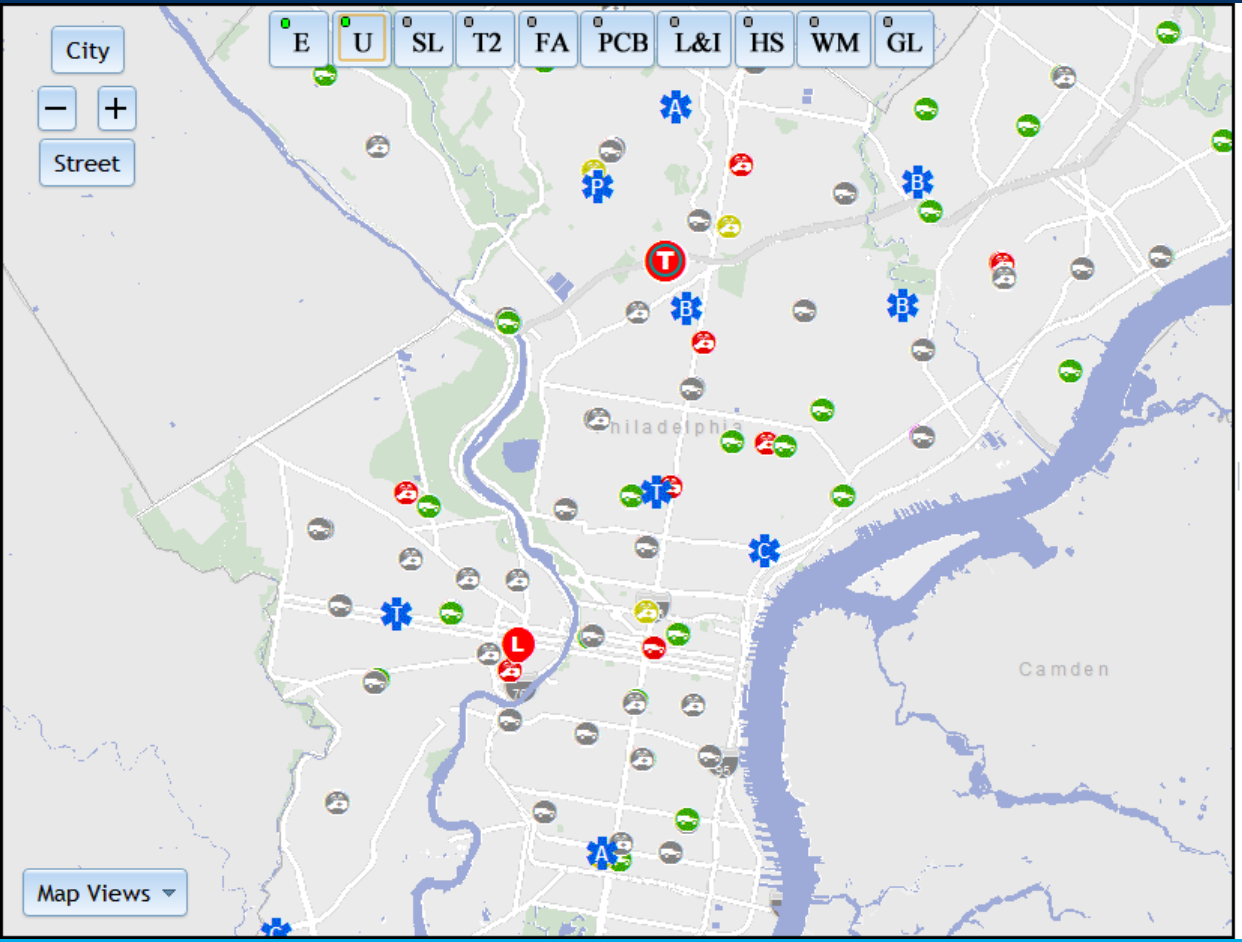

Set Location
Logged in as: station01
Find a location:
Find
Hydrant Actions
Inspection Card
Location:
S.W.C. SOUTH ST and S BROAD ST , ON SOUTH ST
Map location correct:
YES
Hydrant Type:
#1
Lock Type:
CCL
Bonnet Color:
GREEN
Needs Painting:
NO
Cap Replaced:
YES
Paving Condition:
SAFE
Select Defects:
MISSING 4 INCH CAP
KNOCKED OVER
MISSING HYDRANT
OBSTRUCTED
BARREL WRONG DIRECTION
Comments (0 of 1000 chars):
Save
NAUDAIN
ADDISON
WAVERLY
CAMAC
PINE
CHADWICK
SMEDLEY
BANCROFT
16TH
MOLE
SARTAIN
CLYMER

Event Viewer Application

- Provides access to information that was typically sent over the radio
- Current vehicle locations, gas and water infrastructure, Tier 2 facilities, L&I violations, fixed assets, sensitive locations, and calls for service.
- JavaScript based application with access to Pictometry.

Benefits

- Ability to identify current gas and water infrastructure on scene, real time.
- Correctly identify building footprints, determine collapse zones etc..
- Better resource deployment and more effective communication.



Fire | Medical | Other

LOCATION	TYPE	STATUS
3421 WOODLAND WALK	ALARM	Arrived
2016 DENNIE ST	DWG	Arrived
02 PIA	PIA/L	Enroute

DWELLING FIRE

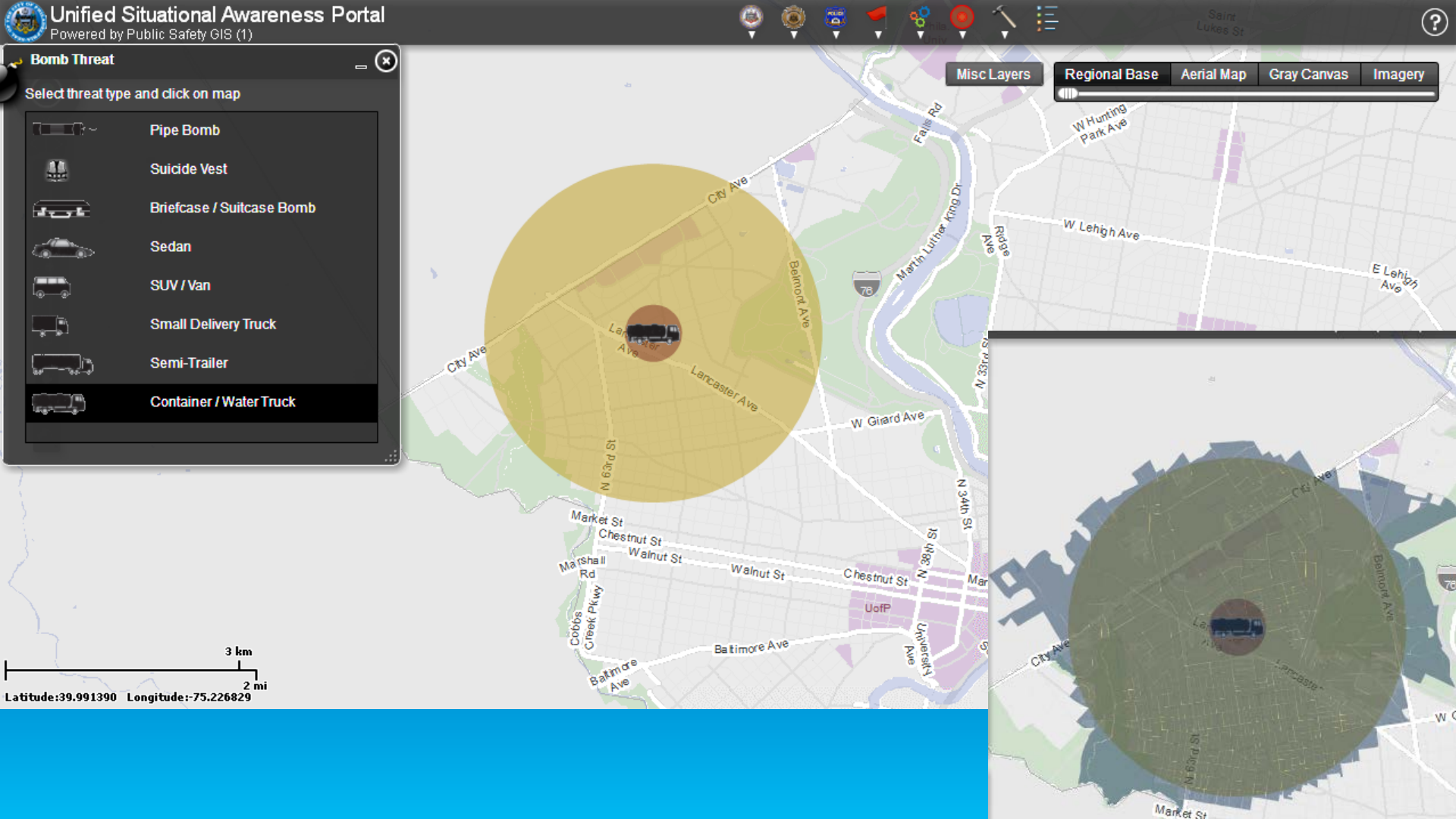
Event ID: 133230781 (Zoom to)
Date: 11/19/13 22:09
Location: 2016 DENNIE ST
Status: Arrived
Priority: 11
Units: L8(Dispatched) B2(Enroute) SQ72(Enroute)
L18(Enroute) E59(On Scene)

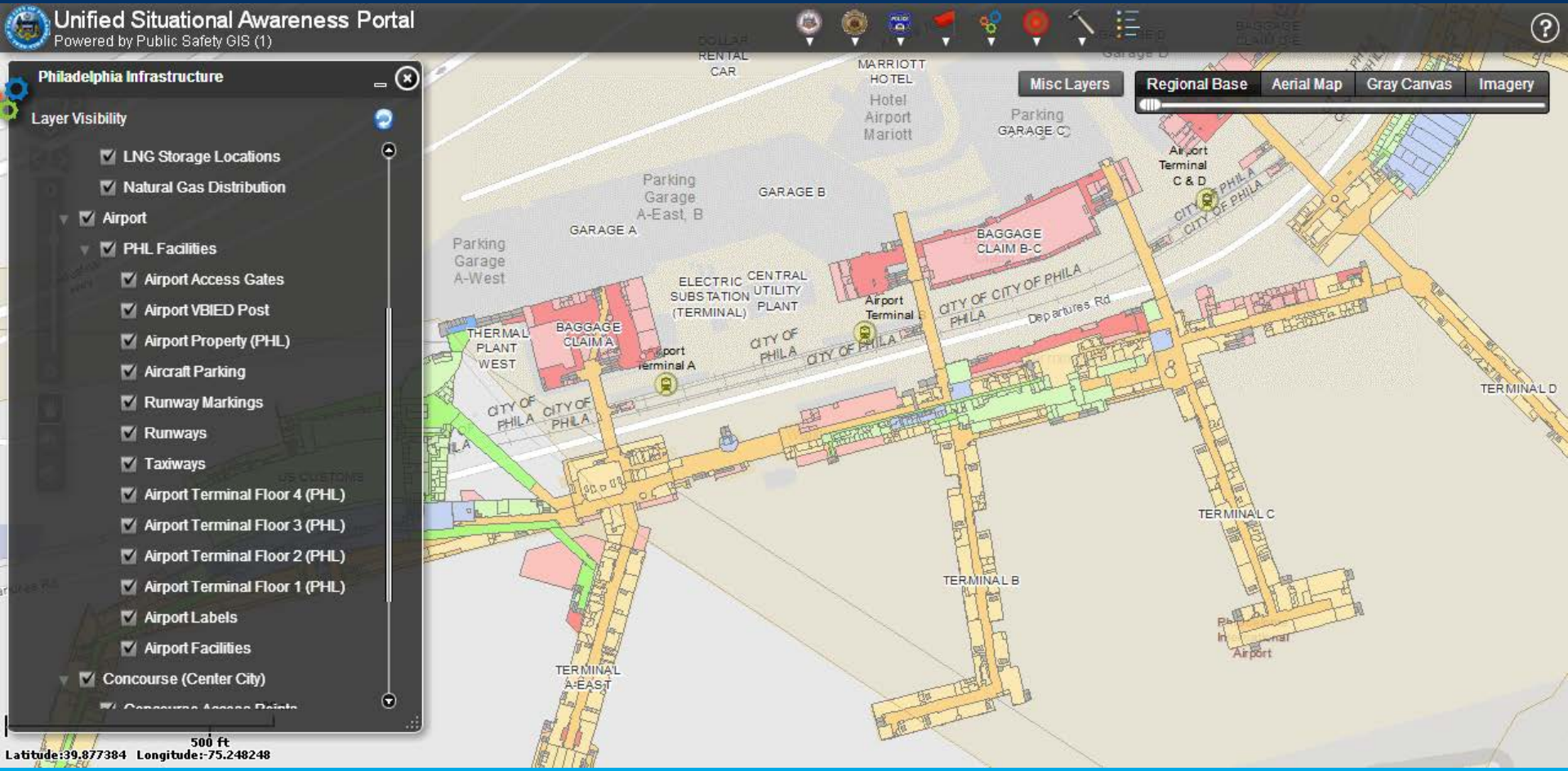
Delaware Valley Intelligence Center (DVIC)

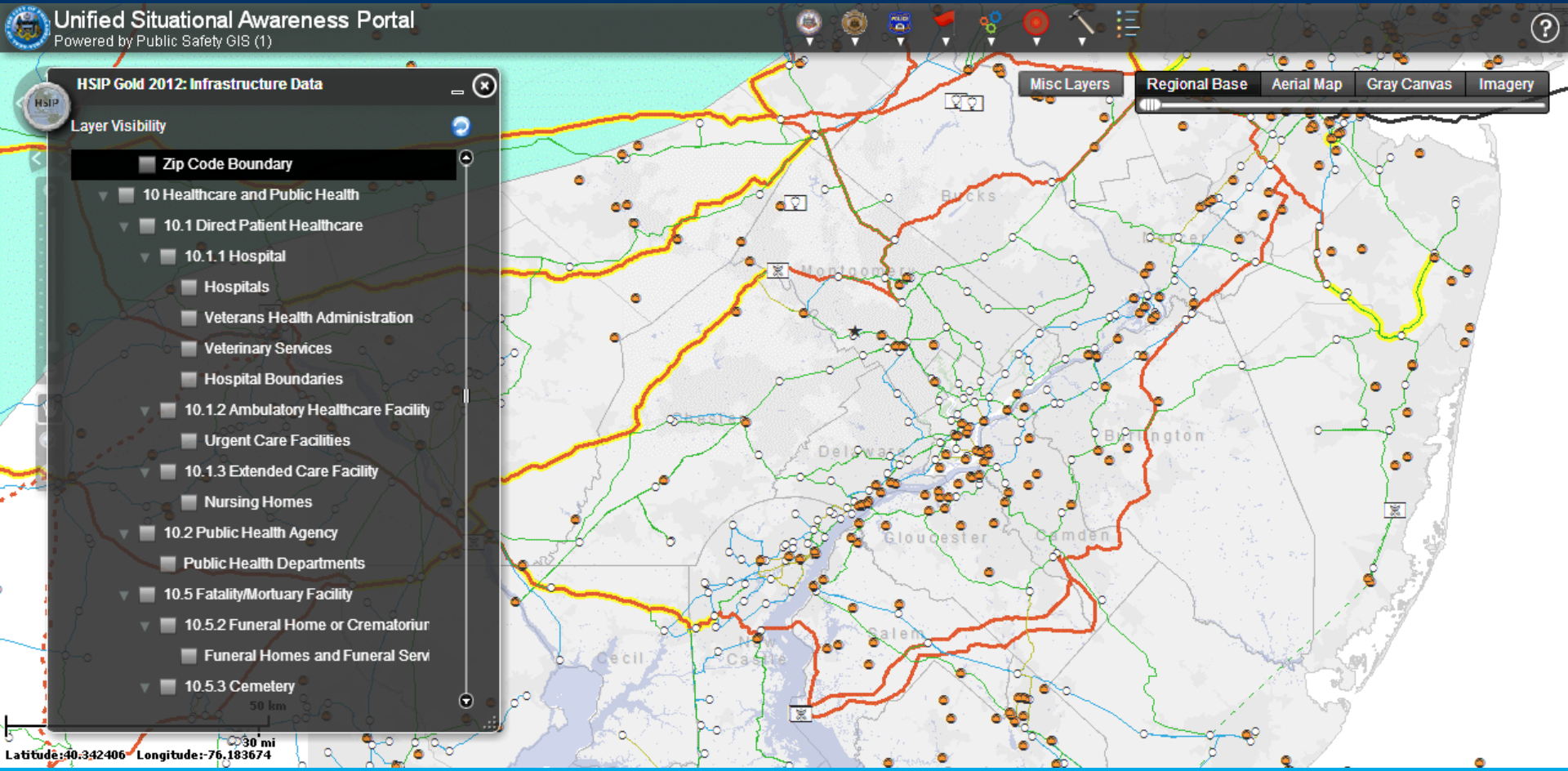
- Department of Homeland Security regional fusion center for the Delaware Valley covering 13 counties from 4 states.
- Currently building (waiting for grant extension) a Situational Awareness Portal for Transit Security Desk at the DVIC.

Emergency Management

- Regional Incident Center Application


Unified Situational Awareness Portal
Powered by Public Safety GIS (1)
Bomb Threat
Select threat type and click on map
Pipe Bomb
Suicide Vest
Briefcase / Suitcase Bomb
Sedan
SUV / Van
Small Delivery Truck
Semi-Trailer
Container / Water Truck
Misc Layers
Regional Base
Aerial Map
Gray Canvas
Imagery
City Ave
Belmont Ave
Lancaster Ave
Fallis Rd
Martin Luther King Dr
Ridge Ave
W Hunting Park Ave
W Lehigh Ave
E Lehigh Ave
N 33rd St
N 63rd St
W Girard Ave
N 34th St
N 38th St
Market St
Chestnut St
Walnut St
Marshall Rd
Cobbs Creek Pkwy
UofP
University Ave
Baltimore Ave
3 km
2 mi
Latitude:39.991390 Longitude:-75.226829


Unified Situational Awareness Portal
Powered by Public Safety GIS (1)
Philadelphia Infrastructure
Layer Visibility
LNG Storage Locations
Natural Gas Distribution
Airport
PHL Facilities
Airport Access Gates
Airport VBIED Post
Airport Property (PHL)
Aircraft Parking
Runway Markings
Runways
Taxiways
Airport Terminal Floor 4 (PHL)
Airport Terminal Floor 3 (PHL)
Airport Terminal Floor 2 (PHL)
Airport Terminal Floor 1 (PHL)
Airport Labels
Airport Facilities
Concourse (Center City)
Misc Layers
Regional Base
Aerial Map
Gray Canvas
Imagery
DOLLAR RENTAL CAR
MARRIOTT HOTEL
Hotel Airport Mariott
Parking GARAGE C
Airport Terminal C & D
Parking Garage A-East, B
GARAGE A
GARAGE B
Parking Garage A-West
BAGGAGE CLAIM B-C
ELECTRIC SUBSTATION (TERMINAL)
CENTRAL UTILITY PLANT
Airport Terminal B
Departures Rd
THERMAL PLANT WEST
BAGGAGE CLAIM A
Airport Terminal A
CITY OF PHILA
TERMINAL D
TERMINAL C
TERMINAL B
TERMINAL A-EAST
500 ft
Latitude:39.877384 Longitude:-75.248248


Unified Situational Awareness Portal
Powered by Public Safety GIS (1)
HSIP Gold 2012: Infrastructure Data
Layer Visibility
Zip Code Boundary
10 Healthcare and Public Health
10.1 Direct Patient Healthcare
10.1.1 Hospital
Hospitals
Veterans Health Administration
Veterinary Services
Hospital Boundaries
10.1.2 Ambulatory Healthcare Facility
Urgent Care Facilities
10.1.3 Extended Care Facility
Nursing Homes
10.2 Public Health Agency
Public Health Departments
10.5 Fatality/Mortuary Facility
10.5.2 Funeral Home or Crematoriur
Funeral Homes and Funeral Servi
10.5.3 Cemetery
Misc Layers
Regional Base
Aerial Map
Gray Canvas
Imagery
Bucks
Montgomery
Delaware
Burlington
Gloucester
Camden
Salem
Cecil
New Castle
50 km
30 mi
Latitude:40.342406 Longitude:-76.183674

Future Direction

- Regional integration for Public Safety
- Dashboards
- Data Management
- Enhanced spatial analytics
- Increase relationships with Private companies
- Mobile
- Training for staff
- Mentoring staff

Questions?

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