Where Are The Police Cars?

Using Automated Vehicle Location Data To Compare Patrol Presence Against Demand

Superintendent Owen Weatherill
Hertfordshire Constabulary

CAMBRIDGE
Police Executive Programme
AVLS capability and data

Deployed in Hertfordshire - 2008

Now equipped - 361 patrol vehicles

Regular data transmissions - every 10 secs to 5 mins (dependent upon speed)

5 years historic data saved - not previously analysed
Principle Questions

How much “available” time do patrol units have during each day?

Where do they spend that time, in relation to demand?

(Note: Demand for this research = incidents and crimes)
Methodology

April 2012 – March 2013

3 towns analysed – Stevenage, Hertford & Watford

One weeks data per month – due to data volume

Uniform 24/7 marked patrol vehicles analysed

Recorded incidents and crime mapped for corresponding periods of AVL data analysis
2012/13 - 15 million AVL data points countywide

Stevenage – 232,517 data points
Hertford – 167,987 data point
Watford – 216,699 data points

Analysis – 617,203 data points in total
Approx 25% of data for each town
4.1% of total data points available for 2012/13 countywide

Data points were then weighted to assign them a time value at each location, based upon speed.

So what does the data tell us about “Available time”?........
Raw AVL vs Crime data comparison
Positive police presence mismatch?
Negative police presence mismatch?
Stevenage – Incidents
Hertford - Incidents
Watford - Incidents
Demand concentrations

Percentage of demand in 3 highest demand wards of each town (as % of total)

- **Stevenage**
  - Incidents: 48.2
  - Crime: 53.0

- **Hertford**
  - Incidents: 39.2
  - Crime: 53.2

- **Watford**
  - Incidents: 51.0
  - Crime: 56.7
How much “available” time do patrol units have during each day?

Total “Available” patrol time each day in each town of all vehicle types analysed

Stevenage: 6 hrs 43 mins

Hertford: 4 hrs 16 mins

Watford: 9 hrs 33 mins

But where exactly is that “available time” spent?......
Demand vs Available patrol time

Stevenage

Hertford

Watford

Percentage of total

Incidents  Crime  % of Available patrol time "Yankee" call-signs  % of Available patrol time "Golf" call-signs
But excluding time at Police stations…

- **Stevenage**
  - Incidents: 48.2%
  - Crime: 53%
  - % of Available patrol time "Yankee" call-signs: 52.9%
  - % of Available patrol time "Golf" call-signs: 58.85%

- **Hertford**
  - Incidents: 39.24%
  - Crime: 53.2%
  - % of Available patrol time "Yankee" call-signs: 43.51%
  - % of Available patrol time "Golf" call-signs: 40.1%

- **Watford**
  - Incidents: 50.98%
  - Crime: 56.7%
  - % of Available patrol time "Yankee" call-signs: 19.3%
  - % of Available patrol time "Golf" call-signs: 39.5%
Where is “Available” time spent, in relation to demand?

3 wards account for 50% of recorded crime in each town

Mixed alignment of “Available” patrol time to 3 highest demand wards in each town

Consistent levels of “Available” patrol time throughout the year - by town and by month

However – significant time at police stations

Conversely – indications of patrol failing to meet crime demand (Note – AVL does not currently extend to foot and cycle patrols)
Outcomes & Implications

1. **Understand the gap** - Trial commenced to track foot and cycle patrol delivery

2. **Supervision** - greater understanding needed of where resources are

3. **Opportunity** - Mobile data terminals, patrol zones & “geofencing”

4. **Tasking, Briefing and Patrol strategy**

5. **Resource apportionment across county**