

IBM



**The Value of Smarter Public Safety
and Security.....**

or

“We can all do better....”

**Chief Superintendent Keith Bentley
(retired)**

**A Great Success Story... but how do we
do it ALL Day and EVERY Day ?**



IBM

POWERPC

Spending Review 2015-16

Intelligence Led Policing



POLICING and JUSTICE

- Budget cut of "less than 6%" for police
- Counter-terrorism budget protected
- Home Office resource budget cut by 6%
- Justice resource budget cut by 10%
- Prison costs to be reduced by £180m and court costs by £200m



IBM

Mr Speaker, with the weight of the new evidence in this Report, it is right for me today as Prime Minister to make a proper apology to the families of the 96 for all they have suffered over the past 23 years.

Indeed, the new evidence that we are presented with today makes clear that these families have suffered a double injustice.

The injustice of the appalling events - the failure of the state to protect their loved ones and the indefensible wait to get to the truth.

And the injustice of the denigration of the deceased – that they were somehow at fault for their own deaths.

On behalf of the Government – and indeed our country – I am profoundly sorry for this double injustice that has been left uncorrected for so long.

Cop who was cleared of killing newspaper seller during G20 riots to be sacked

PC SIMON HARWOOD, who admitted using unnecessary force when he hit Iain Tomlinson and forced him to the ground during the riots in 2009, is to be dismissed from the police.



Project Sapphire



**METROPOLITAN
POLICE**

Working together for a safer London

Search

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Project Sapphire

Project Sapphire

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- ▶ [Staying safe](#)
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What is Sapphire?

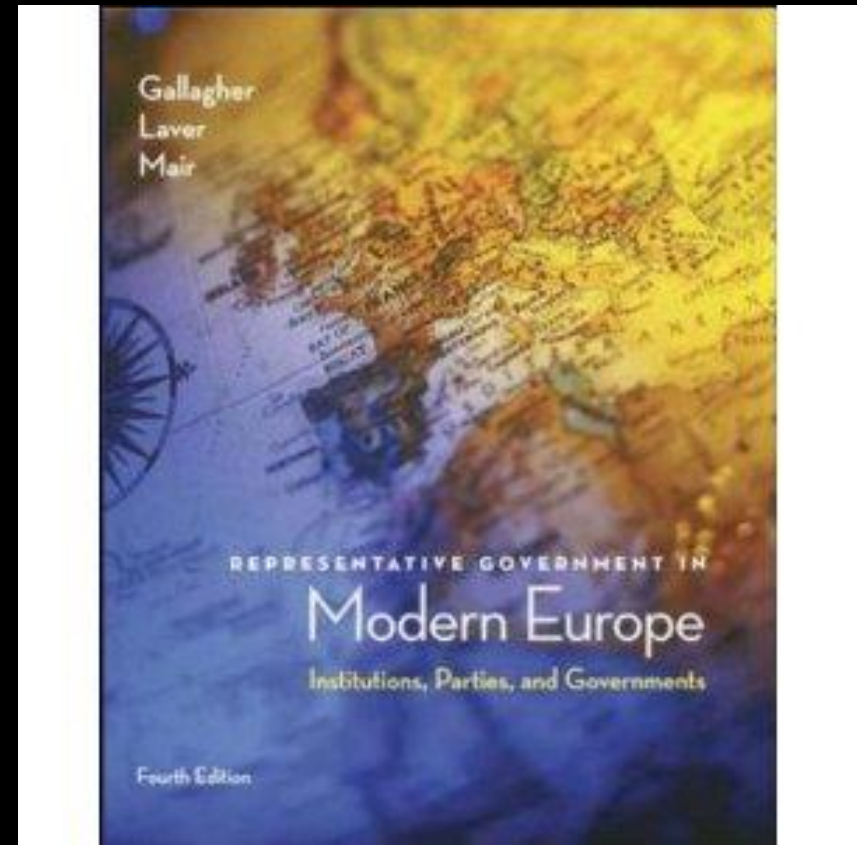
Project Sapphire specialises in investigating rape and sexual assault cases and to provide victims with the support and care they need.

Each borough has a dedicated Sapphire team which has specially trained officers to investigate rape and look after victims, ensuring they are provided with the information they need including the details for any partner agencies and kept up to date with any developments.

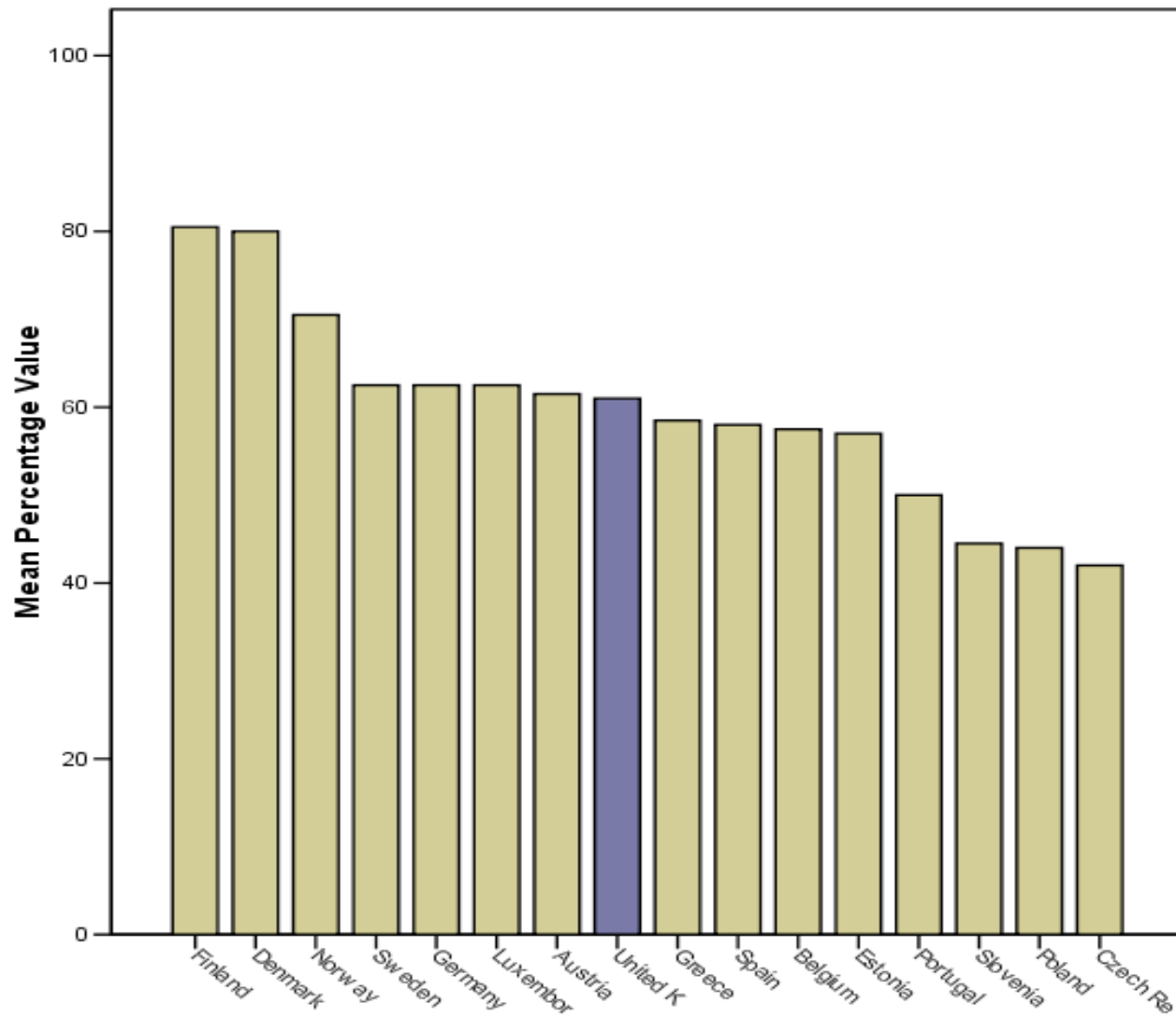
Project Sapphire has helped to continually improve the services offered to victims and developed a corporate approach to tackling rape, which will be communicated to all staff.

But ... standard investigations can go very wrong

Many studies conducted during the last 20 years have uncovered a trend which coincides with fragmentation and political de-alignment across society



M. Gallagher et al. 2007



Trust in the Police - 16 European Countries

Kääriäinen (2007)
*European Journal of
Criminology* 2007; 4; 409

Trust in the leading professions

	Doc %	Tea %	Prf %	Jud %	Cle %	Sci %	TV %	Plc %	Ord %	Pls %	Civ %	TU %	Bus %	Gov %	Jou %	Pit %
Tell the truth																
1983	82	79	n/a	77	85	n/a	63	61	57	n/a	25	18	25	16	19	18
1993	84	84	70	68	80	n/a	72	63	64	52	37	32	32	11	10	14
1997	86	83	70	72	71	63	74	61	56	55	36	27	29	12	15	15
1999	91	89	79	77	80	63	74	61	60	49	47	39	28	23	15	23
2000	87	85	76	77	78	63	73	60	52	46	47	38	28	21	15	20
2001	89	86	78	78	78	65	75	63	52	46	43	39	27	20	18	17
2002	91	85	77	77	80	64	71	59	54	47	45	37	25	20	13	19
2003	91	87	74	72	71	65	66	64	53	46	46	33	28	20	18	18
2004	92	89	80	75	75	69	70	63	55	49	51	39	30	23	20	22
2005	91	88	77	76	73	70	63	58	56	50	44	37	24	20	16	20
2006	92	88	80	75	75	72	66	61	56	51	48	41	31	22	19	20
2007	90	86	78	78	73	65	61	59	52	45	44	38	26	22	18	18
2008	92	87	79	78	74	72	66	65	60	48	48	45	30	24	19	21
2009	92	88	80	80	71	70	63	60	54	45	44	38	25	16	22	13



Police

Oldham Division covers an area of 55 square miles



The Oldham Borough has a population of around 230,000 people which includes a significant black and minority ethnic community







“I shut my door
and hope that nothing
touches me”

A Resident



About communities identifying & prioritising local crime and disorder issues which they tackle together with the police and public services, to ensure neighbourhood security



What matters most in your street?

The National Intelligence Model



WHAT IS NIM AND HOW IS IT USED ?

A business model used by the police service, and increasingly by other partners, to ensure that policing is delivered in a targeted manner through the development of information and intelligence



High Level Overview



WHAT IS NIM AND HOW IS IT USED ?

EXAMPLES.....

- **Direct patrols**
- **Target Prolific and Priority offenders**
- **Work effectively with partners**
- **Drive problem solving**
- **Improve road safety**
- **Manage priority issues and locations**
- **Guide Neighbourhood policing**
- **Understand Criminality**



HOW DOES NIM WORK ?

Works at 3 Levels

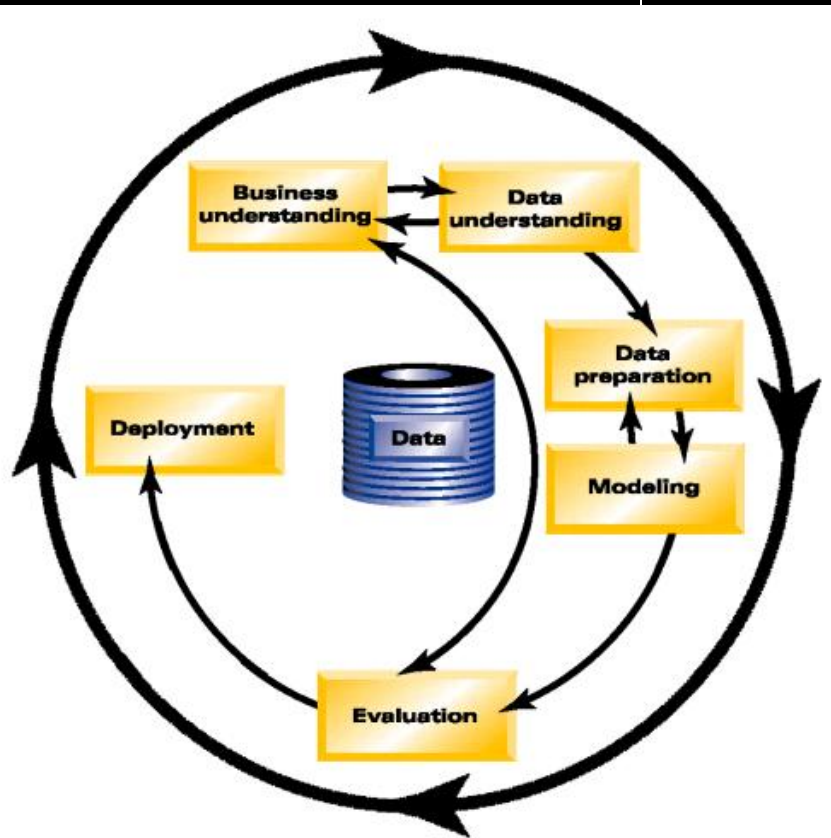
Local

Regional

National

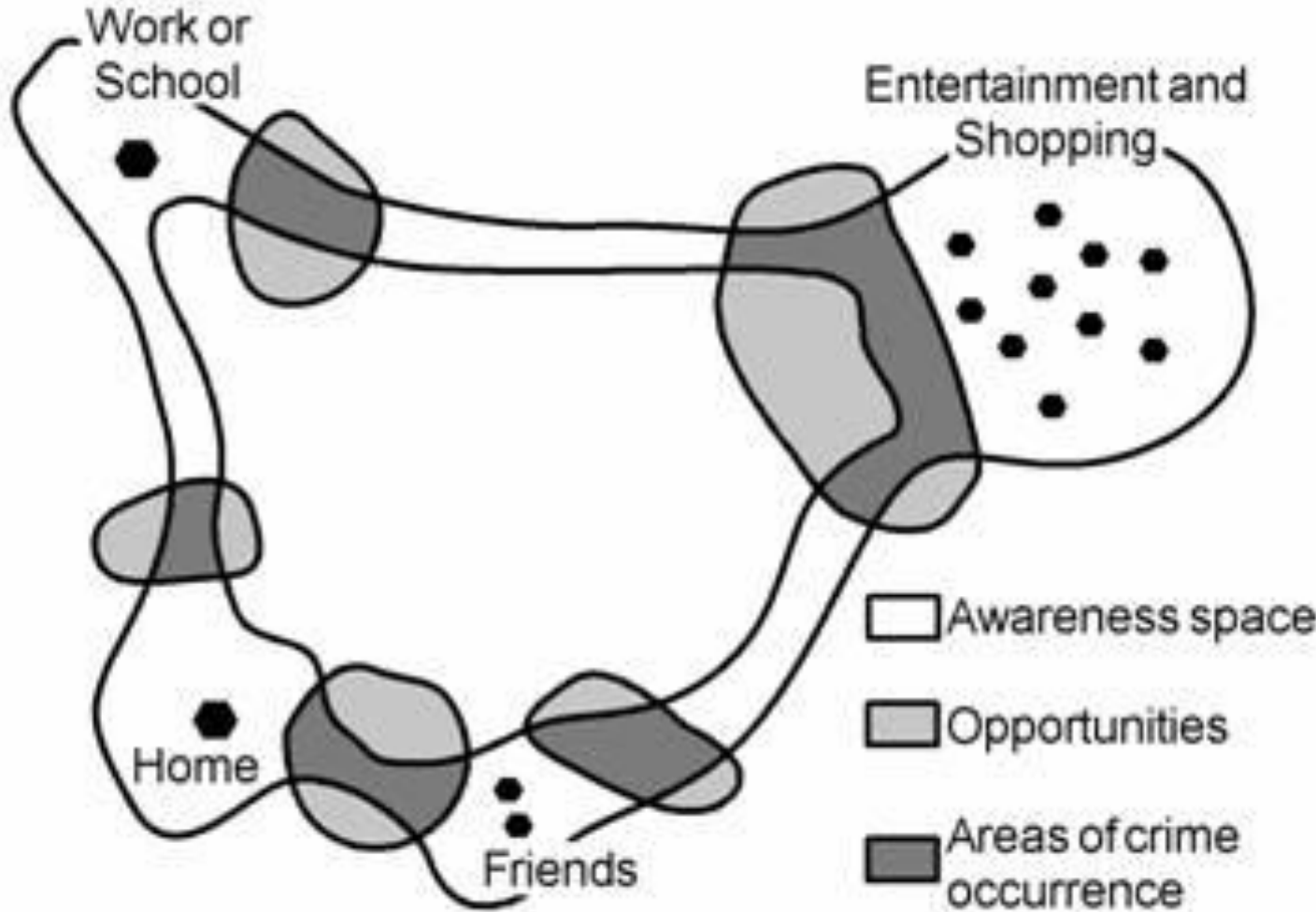


CRISP-DM



- Routine Activity Theory
- Crime Pattern Theory
- Graphical Information
- Accountability

Routine Activity Theory



available at

are absent from
or all of the

are present at
time

dated
ender

Suit
Targ



Criminals have lifestyles which determines their knowledge of the world

They will choose areas that give them best chance of “escape”

Their crimes will be in locations that mix their routine activities and their awareness spaces (1 and 2 above)

They will learn from & instruct others

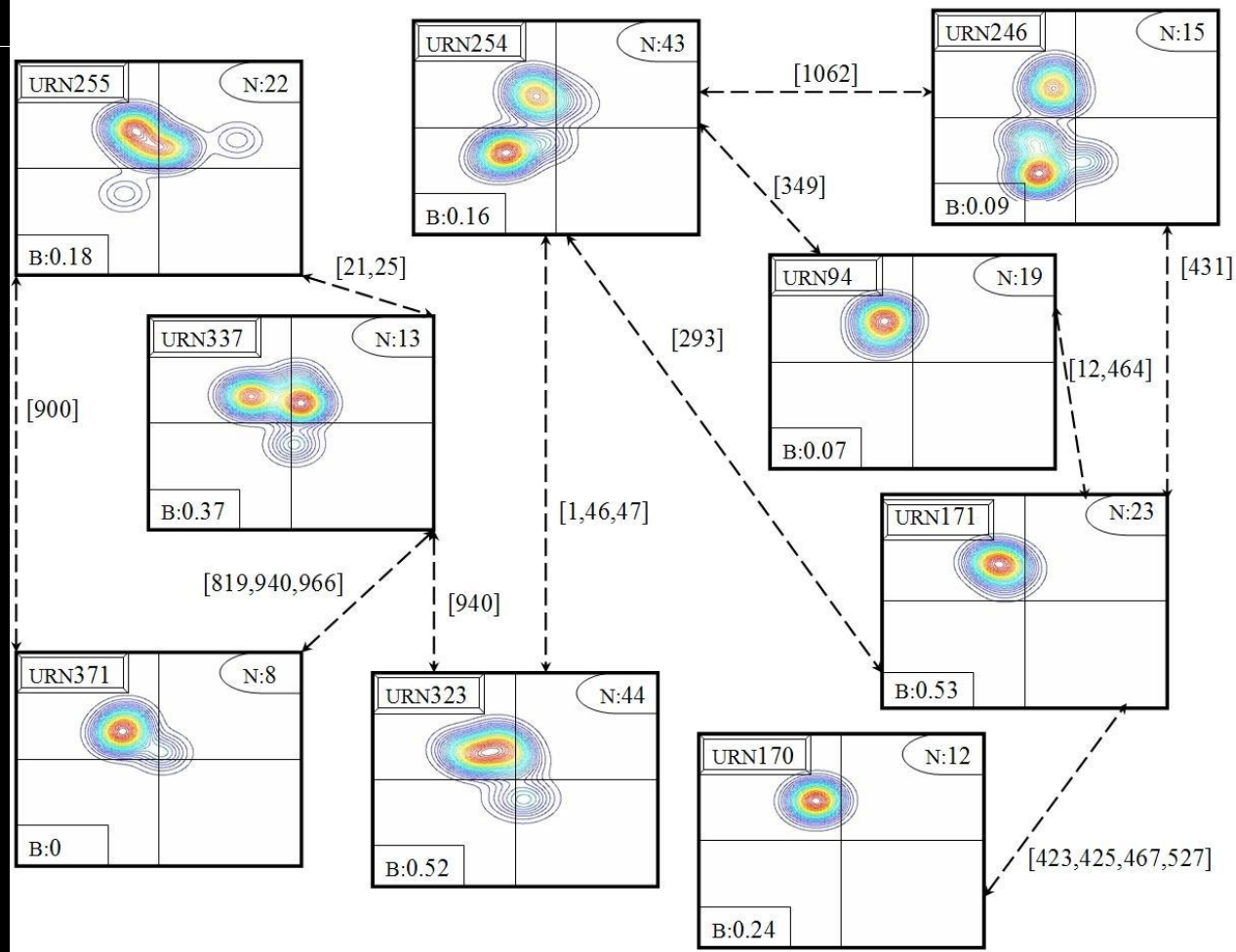
Fundamental **PROBLEM** with Crime Pattern Theory

The lack of theory that is incorporated into crime analysis products, such as failing to describe **why** hotspots are persistent in certain areas (rather than just describing the fact that a hotspot exists in an area), means that analysis products can often lack substance and tend to be merely **descriptive**



Crime Theory Offender Networks

Combination Network and Spatial Analysis



Vulnerable Localities Index



711 Census Output
Areas for Oldham
Borough

Microsoft Excel - Oldham VLI Mapping Version 1

File Edit View Insert Format Tools Data Window Help

Type a question for help

J2 0

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O
1	name	ref	OA	All_People	All_House	BD	BD_Rate	BD_Index	CD	CD_Rate	CD_Index	INCOME	Income_In	EMPLOYM	EmployeLe
2	00BPFT00	00BPFT00	00BPFT00	206	89	5	56.1798	235	0	0	0	0.031245	18	0.059852	41
3	00BPFT00	00BPFT00	00BPFT00	293	118	4	33.8983	142	0	0	0	0.179567	102	0.158471	108
4	00BPFT00	00BPFT00	00BPFT00	290	135	2	14.8148	62	0	0	0	0.030758	17	0.073033	50
5	00BPFT00	00BPFT00	00BPFT00	321	130	3	23.0769	97	0	0	0	0.179567	102	0.158471	108
6	00BPFT00	00BPFT00	00BPFT00	237	167	2	11.976	50	2	11.976	55	0.179567	102	0.158471	108
7	00BPFT00	00BPFT00	00BPFT00	245	101	0	0	0	0	0	0	0.030758	17	0.073033	50
8	00BPFT00	00BPFT00	00BPFT00	312	109	2	18.3486	77	1	9.17431	42	0.031245	18	0.059852	41
9	00BPFT00	00BPFT00	00BPFT00	241	124	0	0	0	0	0	0	0.179567	102	0.158471	108
10	00BPFT00	00BPFT00	00BPFT00	331	145	1	6.89655	29	1	6.89655	31	0.077673	44	0.108583	74
11	00BPFT00	00BPFT00	00BPFT00	288	121	3	24.7934	104	7	57.8512	264	0.179567	102	0.158471	108
12	00BPFT00	00BPFT00	00BPFT00	312	112	3	26.7857	112	0	0	0	0.031245	18	0.059852	41
13	00BPFT00	00BPFT00	00BPFT00	335	145	1	6.89655	29	1	6.89655	31	0.077673	44	0.108583	74
14	00BPFT00	00BPFT00	00BPFT00	354	117	4	34.188	143	1	8.54701	39	0.030758	17	0.073033	50
15	00BPFT00	00BPFT00	00BPFT00	296	105	1	9.52381	40	0	0	0	0.031245	18	0.059852	41
16	00BPFT00	00BPFT00	00BPFT00	328	118	2	16.9492	71	1	8.47458	39	0.030758	17	0.073033	50
17	00BPFT00	00BPFT00	00BPFT00	314	120	1	8.33333	35	7	58.3333	266	0.147524	84	0.112424	76
18	00BPFT00	00BPFT00	00BPFT00	241	124	2	16.129	67	0	0	0	0.077673	44	0.108583	74
19	00BPFT00	00BPFT00	00BPFT00	291	127	4	31.4961	132	2	15.748	72	0.077673	44	0.108583	74
20	00BPFT00	00BPFT00	00BPFT00	307	141	2	14.1844	59	1	7.0922	32	0.147524	84	0.112424	76
21	00BPFT00	00BPFT00	00BPFT00	261	129	4	31.0078	130	1	7.75194	35	0.147524	84	0.112424	76
22	00BPFT00	00BPFT00	00BPFT00	347	133	2	15.0376	63	1	7.5188	34	0.031245	18	0.059852	41
23	00BPFA0C	00BPFA0C	00BPFA0C	356	138	12	86.9565	354	6	43.4783	198	0.305001	173	0.223261	152
24	00BPFA0C	00BPFA0C	00BPFA0C	375	150	8	53.3333	223	5	33.3333	152	0.251165	142	0.174525	119
25	00BPFA0C	00BPFA0C	00BPFA0C	828	143	0	0	0	4	27.972	127	0.408211	231	0.178238	121
26	00BPFA0C	00BPFA0C	00BPFA0C	100	87	0	0	0	3	34.4828	157	0.240907	137	0.224068	152
27	00BPFA0C	00BPFA0C	00BPFA0C	324	142	15	105.634	442	10	70.4225	321	0.240907	137	0.224068	152
28	00BPFA0C	00BPFA0C	00BPFA0C	270	115	8	69.5652	291	2	17.3913	79	0.240907	137	0.224068	152
29	00BPFA0C	00BPFA0C	00BPFA0C	305	124	6	48.3871	202	2	16.129	74	0.240907	137	0.224068	152
30	00BPFA0C	00BPFA0C	00BPFA0C	351	144	4	27.7778	116	2	13.8889	63	0.240907	137	0.224068	152
31	00BPFA0C	00BPFA0C	00BPFA0C	303	144	9	62.5	261	3	20.8333	95	0.305001	173	0.223261	152
32	00BPFA0C	00BPFA0C	00BPFA0C	306	114	4	35.0877	147	7	61.4035	280	0.305001	173	0.223261	152
33	00BPFA0C	00BPFA0C	00BPFA0C	313	143	10	69.9301	292	8	55.9441	255	0.305001	173	0.223261	152
34	00BPFA0C	00BPFA0C	00BPFA0C	263	138	7	50.7246	212	9	65.2174	297	0.508724	288	0.285669	194
35	00BPFA0C	00BPFA0C	00BPFA0C	314	121	5	41.3223	173	5	41.3223	188	0.391913	222	0.266567	181

Oldham VLI Mapping /

Microsoft PowerPoint ... Vulnerable Index Microsoft Excel - Oldh... Type to search 14:51

Crime
Housing
Employment
Education
Income

Bring the DATA together to help

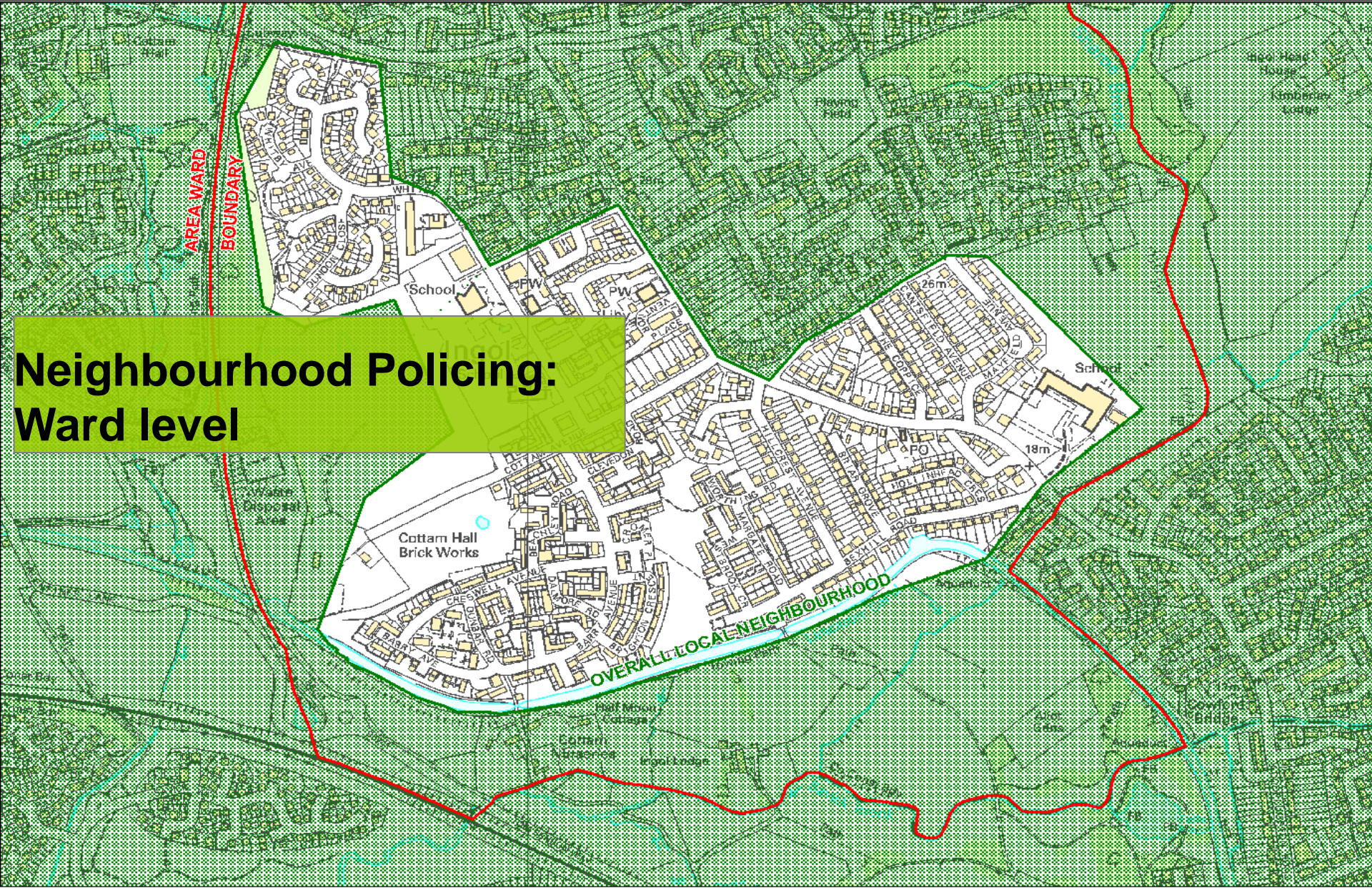
deploy Resources effectively



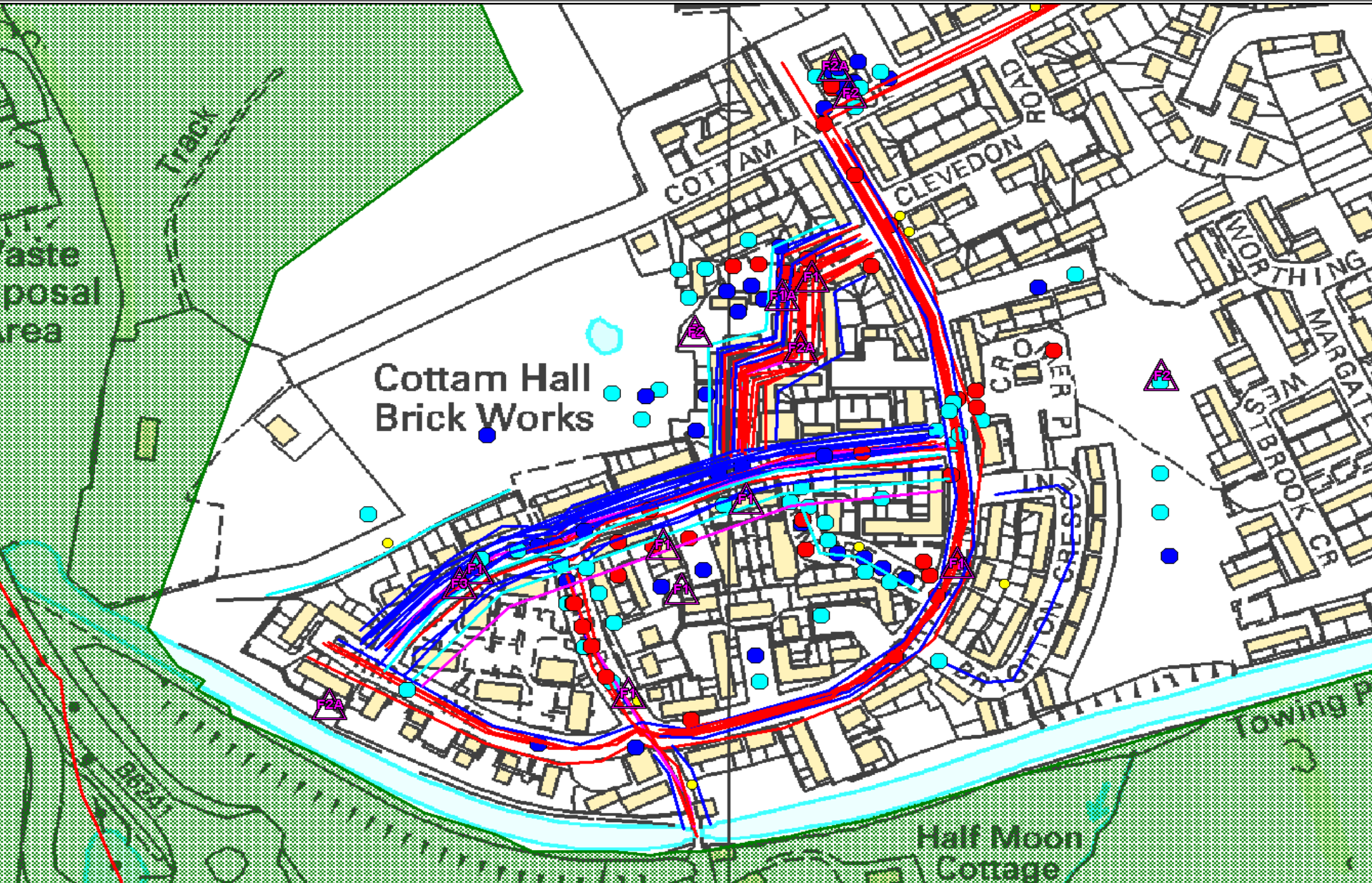
AREA WARD
BOUNDARY

Neighbourhood Policing: Ward level

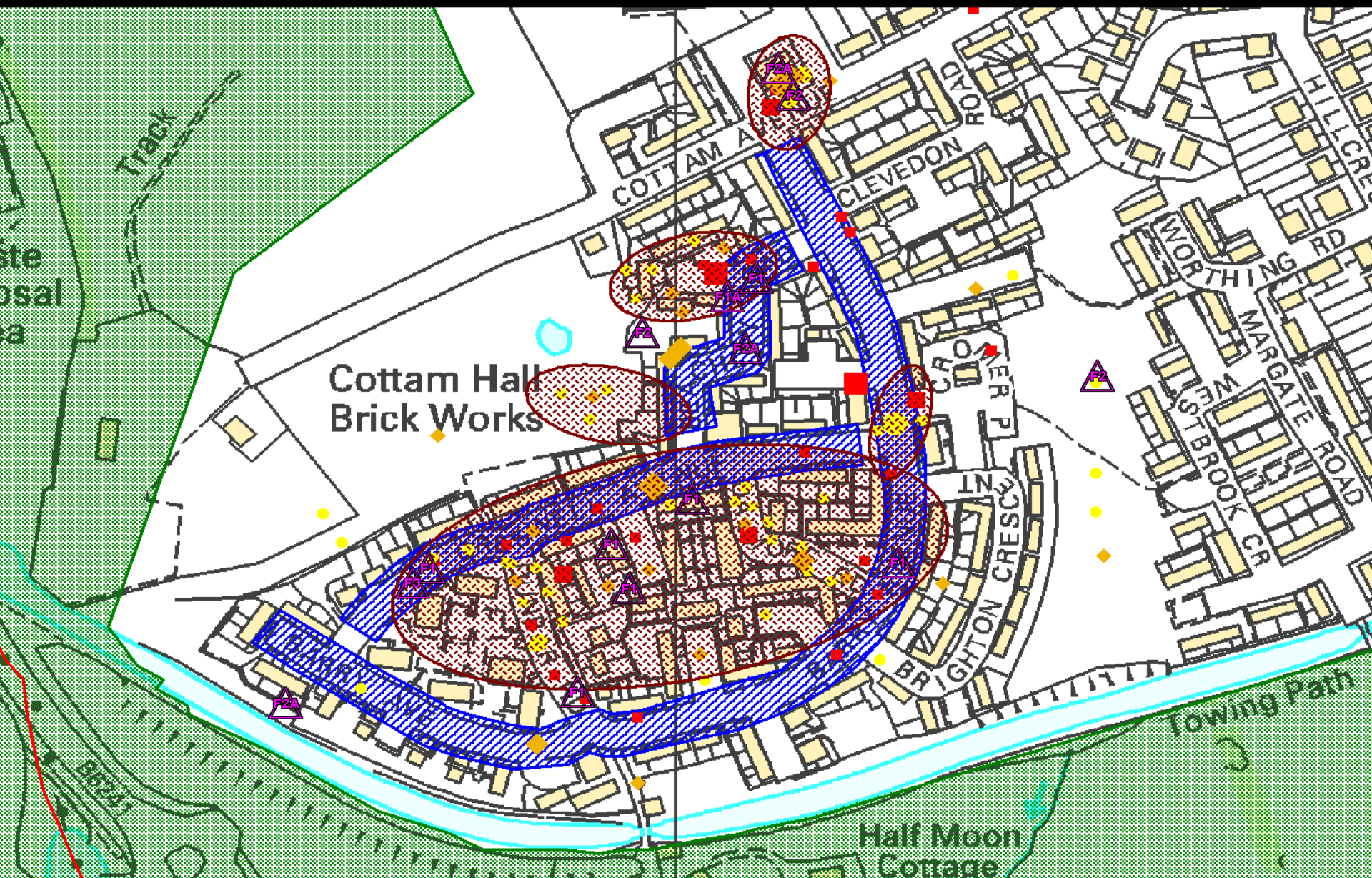
OVERALL LOCAL NEIGHBOURHOOD



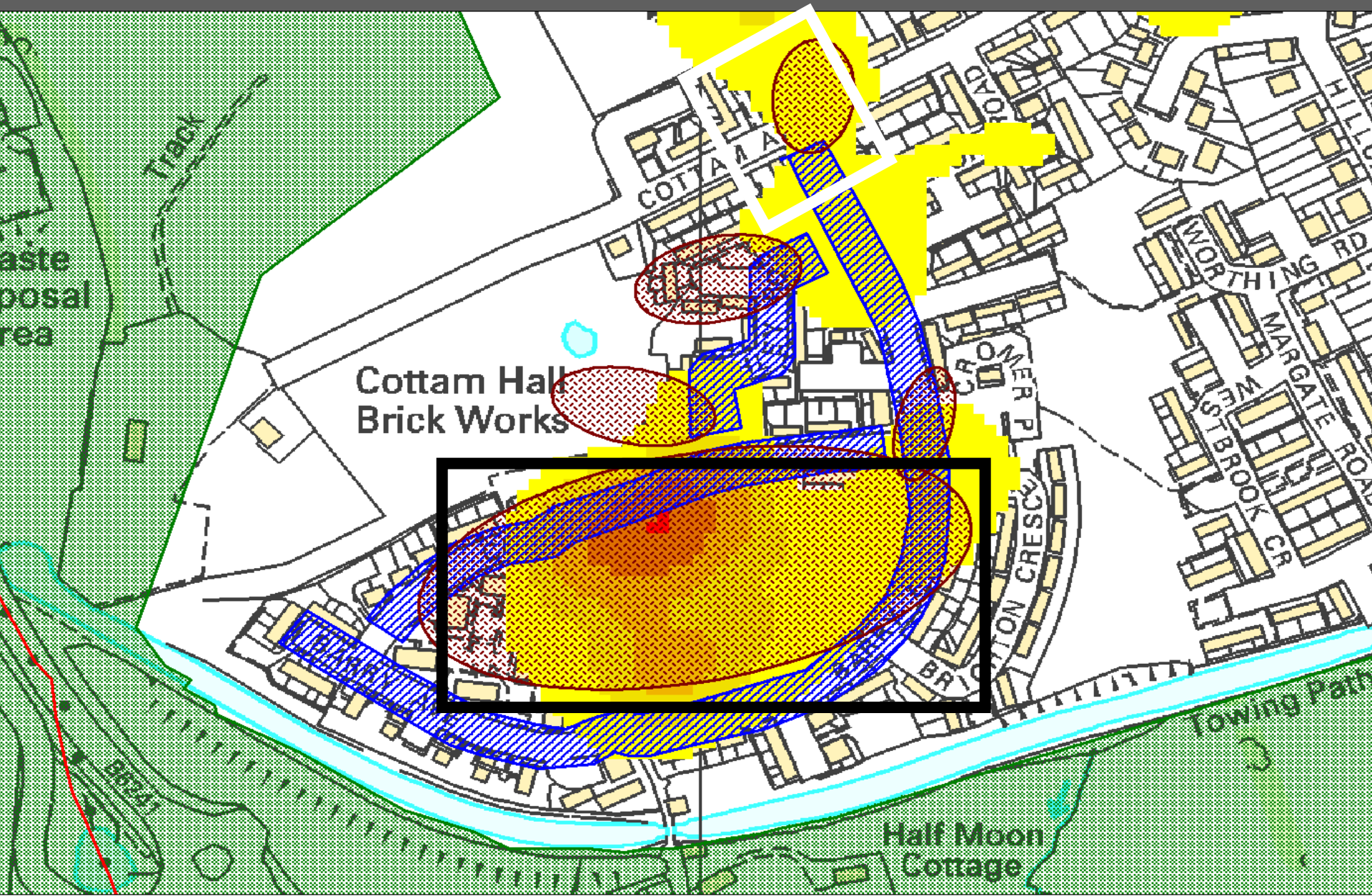
Risk Perception Data



Neighbourhood Partnership Data



Combine with Recorded Crime Data





**IBM SPSS Statistics and Modeler used to
research Cold Case Violent
and Sexual Criminal Offences**

Dr. Gene Abel – 1980s research

232 child molesters admitted
55,000 incidents of molestation
against **17,000** victims

561 general sex offenders,
admitted **291,000** offences
against **195,000** victims !



- **National Crime Faculty Database for Serious Sexual Offences**
- **Violent Crime Linkage Analysis System (ViCLAS)**
- **Facts Relating to the Crime**
- **Offender - Behaviour - Traits**
 - **Approach - Speech - Precautions**
- **Index Case enquiry**
 - **SQL Searching**
- **National Intelligence Model**
 - **Offender and Target Profiles**

Police Force Crime Recording System Intelligence

- **Facts Relating to the Crime**
 - **Free Text** *Modus Operandi*
 - **Free Text** **Offender Descriptions**
- **Patterns of Crime**
 - **SQL Searching** **Spatial and Temporal**
 - **Reactive Policing Operations**

Integrate ViCLAS and Force Crime Data

- March 2000 to June 2005
- **2370** Recorded Crimes
- **3310** Offenders
- **1015** of the 3310 are “Known” Offenders

NB. “Known” offender is someone arrested for the parent crime but *may* have committed other sex crimes

Get the DATA into IBM SPSS Modeler



The screenshot displays the IBM SPSS Modeler interface. The main workspace contains the following text:

- Dimensions Metadata
- SPSS files
- Range of database & Excel imports

Below the text is a row of nine data source icons with labels:

- Enterprise View
- Database
- Var. File
- Fixed File
- SPSS File
- Dimensions
- SAS File
- Excel
- User Input

The right-hand pane shows the project structure:

- Streams: Stream1
- CRISP-DM Classes:
 - (unsaved project)
 - Business Understanding
 - Data Understanding
 - Data Preparation
 - Modeling
 - Evaluation
 - Deployment

The bottom of the interface features a navigation bar with tabs: Favorites, Sources, Record Ops, Field Ops, Graphs, Modeling, Output, and Export. Below this is another row of data source icons and labels, identical to the one above.

Approach

29 variables

- 3 Mutually exclusive dichotomous variables

Precautions

22 variables

- 4 Mutually exclusive dichotomous variables

Verbal Themes

28 variables

- 7 Fuzzy dichotomous variables

Police Force Area

K Means Node (Classification & Clustering)

Location Variables

- Spatial Information & Building Types

Train Net Node

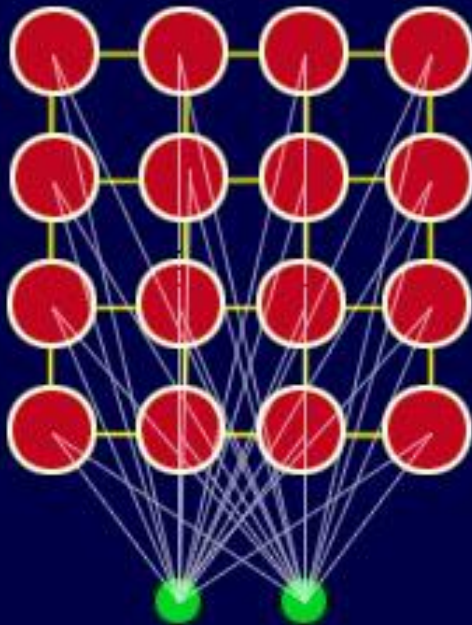
MO Variables

- Including Temporal Information and K Means Results

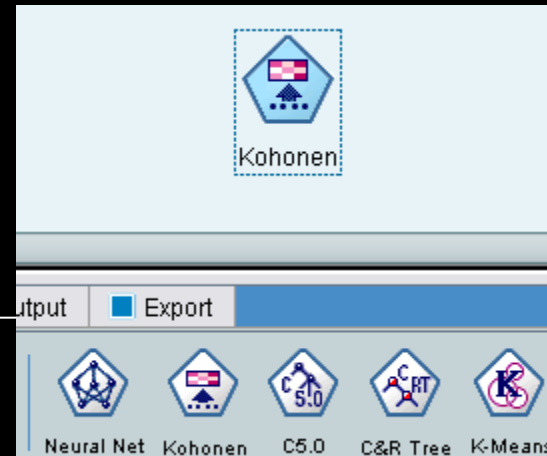
Kohonen Node

Matching above with Known Clusters

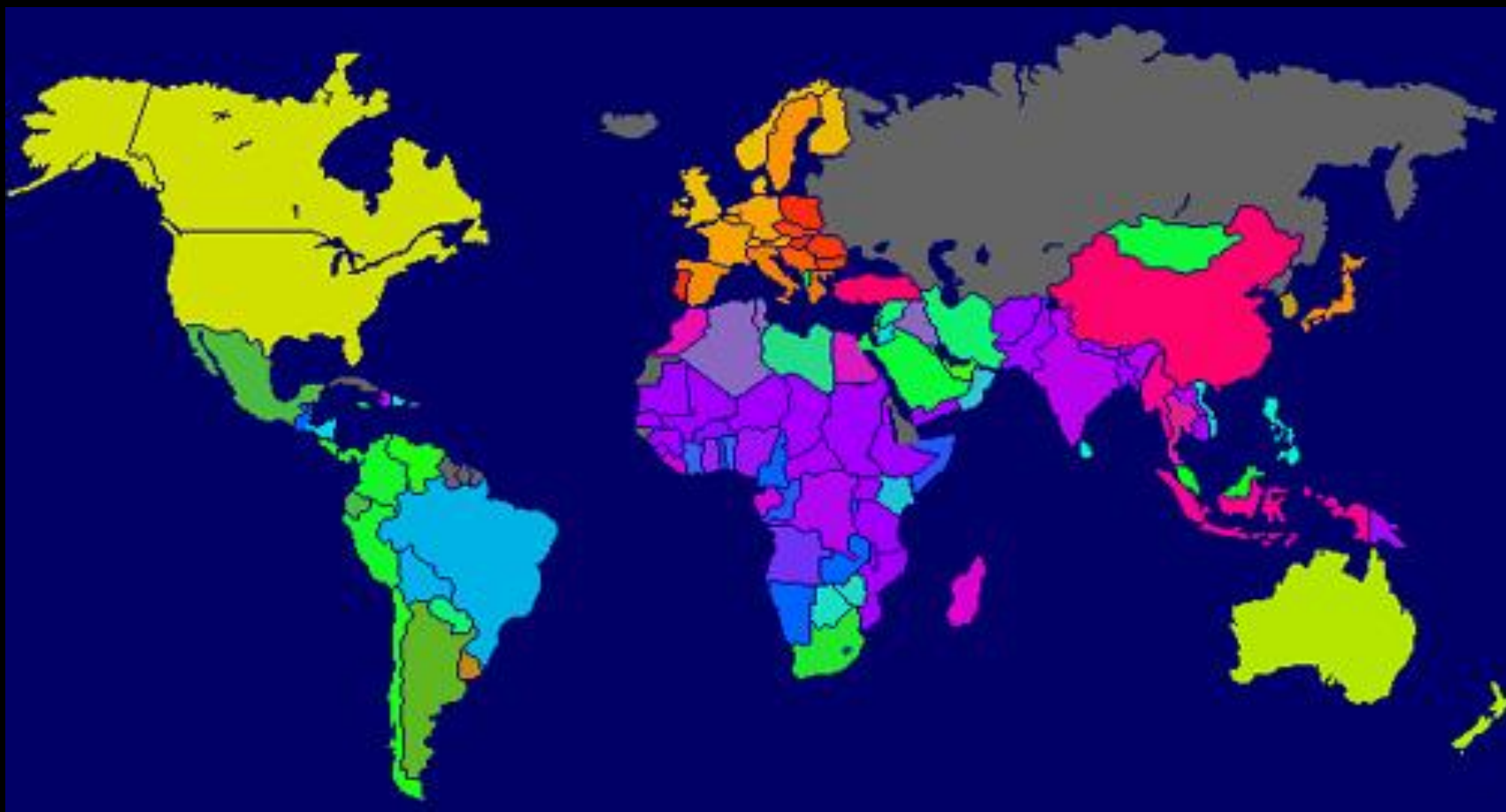
Teuvo Kohonen Modelling provides a way of representing multi-dimensional data in much lower dimensional spaces – usually 2 dimensions. It is a process of vector quantisation.



The Kohonen algorithm learns to classify the training data without external supervision



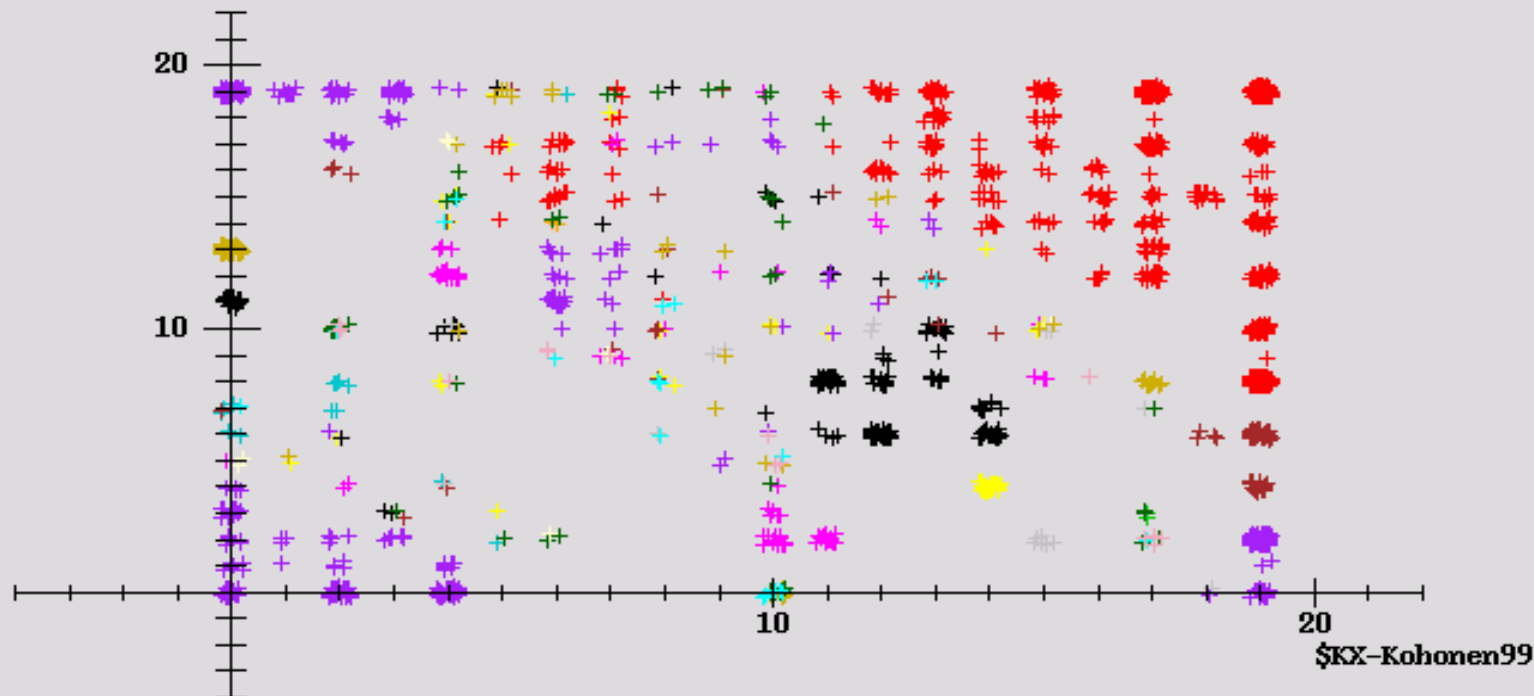
Kohonen Modelling used to classify statistical data describing various 'Quality of Life' variables on World Poverty



Separated on Police Force Areas



\$KY-Kohonen99



AGENCY_ID

+ 01 METROPOLITAN POLICE

+ 01 Metropolitan Police

+ 03 Cumbria

+ 04 Lancashire

+ 05 Merseyside

+ 06 GMP

+ 06VV GMP

+ 07 Cheshire

+ 10 NORTHUMBRIA

+ 10 Northumbria

+ 20 West Midlands

+ 30 Derbyshire

+ 40 Bedfordshire

+ 50 Devon & Cornwall

+ 60 North Wales

+ 70 Dumfries & Galloway

+ 80 Tayside Police

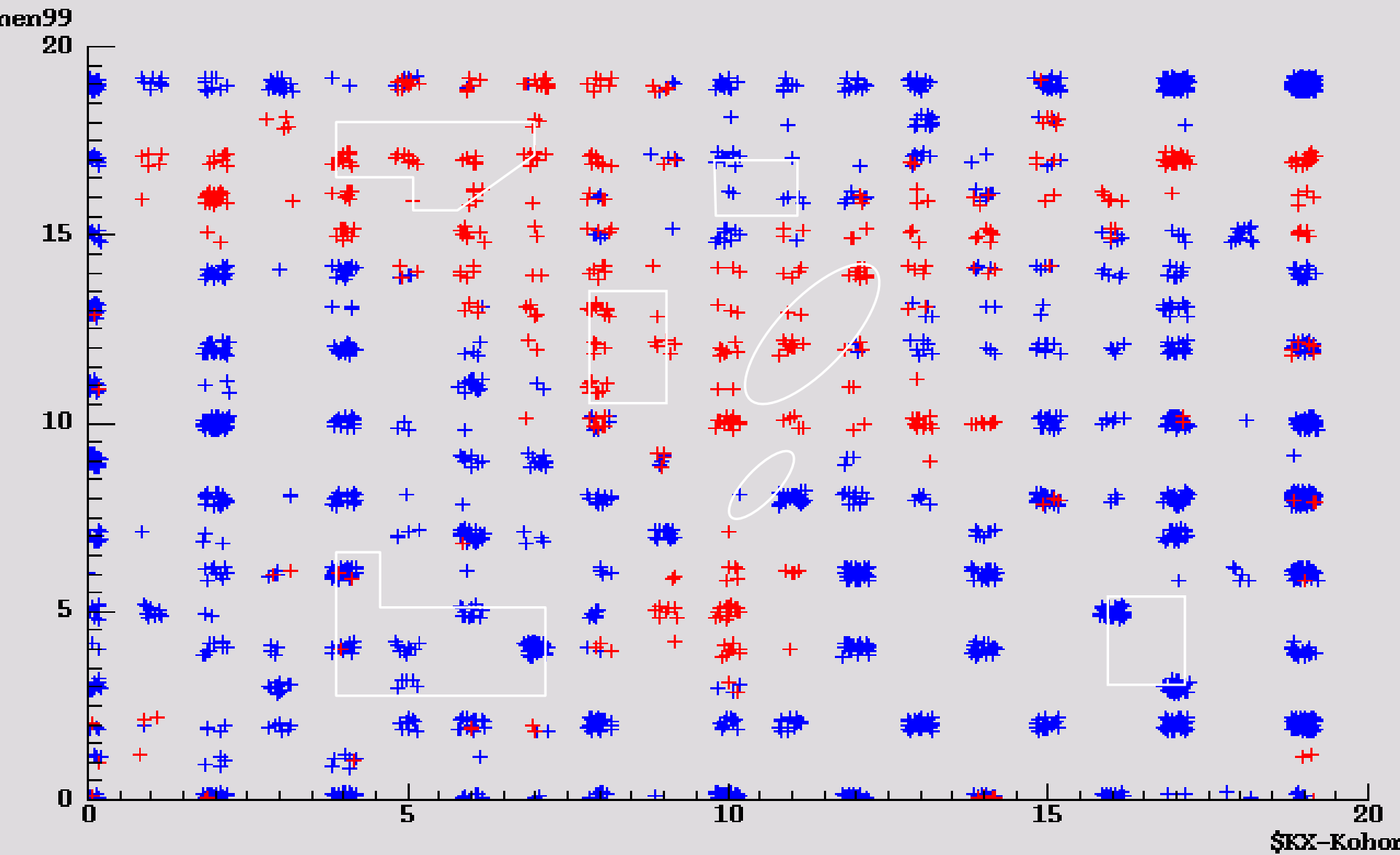


Offender Approach

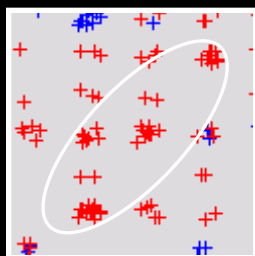
&

**Offender Precautions
Used**

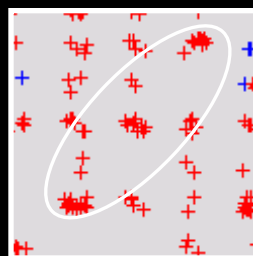
Offender Safety



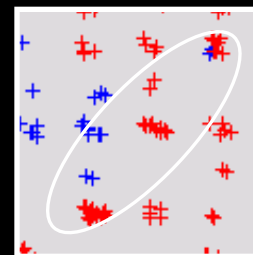
Consistency of Offending



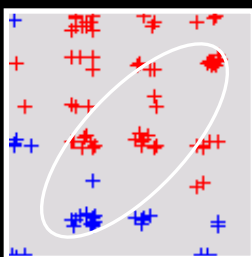
Offender Safety



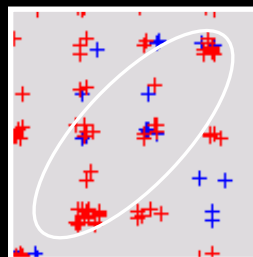
Pleasure & Ego



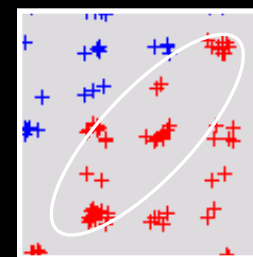
Intimidate Victim



Getting to Know Victim



Reassurance & Intimacy



Using a "Con" Approach

Evaluation of Results

Best Hit was 19 of 22 Crimes in a Single Series identified

12 Offenders subsequently received prison sentences

2 Crimes clarified with the offender using a different approach MO

8 Clusters of different detection precautions taken

1 Crime in a Neighbouring Force Area detected

Questions and Discussion



Building Communities, Beating Crime

A better police service for the 21st century

