Review of GIS-based information sharing systems

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Executive summary

Information sharing amongst Crime and Disorder Reduction Partnerships (CDRPs) is essential for supporting the following objectives:

- to enable the initial and periodic review of crime, disorder and other community safety issues;
- to help partnerships become evidence-based, driven by factual information and multi-agency analysis products that can be used to help influence and direct their decision making; and
- to ensure that targets remain valid and that activity is sustained.

The use of GIS-based information sharing systems by CDRPs has been increasing in England and Wales. The first systems began to emerge in 2000 and now there are over 20 systems, operating at either a regional, county or district level.

This study reviewed a representative range of ten of these systems to wholly consider the merits of GIS-based information sharing systems and the community safety partnership business service functions that these systems can most effectively support. In particular, the review aimed to:

- identify the key lessons learned from the nominated systems, for them to be applied to new systems that are developed or to existing systems that are enhanced or expanded;
- identify how the systems can be best used to support the information sharing and analysis functions within the context of an overall CDRP business process model;
- identify common weaknesses of and across the systems that need to be rectified to achieve maximum effectiveness and impact; and
- produce guidelines and recommendations for the achievable, consistent and sustainable development of GIS-based information sharing systems to provide for the needs of all CDRPs nationally.

Not one system offers a single model that others can follow. All have particular strengths, but all also have certain weaknesses and areas that present opportunities for their future development. By reviewing the systems wholly, several key ingredients have been identified that contribute to the effectiveness of a GIS-based information system. These are as follows.

- *An effective partnership business model* - the most effective systems are those that operate in a partnership business environment that is information and evidence-driven, is focused on solving problems, and where multi-agency intelligence is effectively coordinated into the tasking of partnership resources. Partnership business models that are aligned to the Police National Intelligence Model can be particularly effective, especially in terms of generating community safety multi-agency intelligence products that are complementary (in content and timing) to NIM Intelligence Products.
- *A combination of desktop and networked technology* - a combination of local analytical workstations with networked solutions (e.g. Local Area Network, web-based technology) proved to be a particularly effective technology approach for systems. The approach can offer a platform on which an information hub can be hosted, can provide facilities that allow users to access data and disseminate information, and delivers a toolkit that can fully support problem-solving analyses.
- *Data held on the information hub are relevant, of good quality and current* - factors that are important regarding data held on the system's information hub are that they are consistent in content, are available at a high geographic resolution (e.g. at least to postcode), and are frequently updated to ensure relevant currency.
- *Effective resourcing of information sharing processes* - systems that appropriately resource their information sharing processes are those where the sourcing, cleaning, geocoding, validation and management of data delivers information that is relevant, timely, of good quality and easy to interpret.

- *Valuing analysis and generating good quality multi-agency intelligence products* - those systems that are succeeding in the generation of quality problem solving analysis products are those that value the role of analysis and apply an appropriate level of analytical resource within their system. If the analysis facility is not properly resourced, the IT solution can easily become redundant and offer little. For a system to be effective it must be used for the generation of good quality multi-agency analytical products that are explanatory rather than just descriptive.
- *Mainstreamed system funding* – systems that have mainstreamed their funding from local CDRP and other sources, rather than relying on Home Office and other central funds, are those that have clearer and more stable development plans. Uncertainty over funding for those that are not mainstreamed creates uncertainty over the future of the system and stifles any plans for their development.

The systems that are effective have now become an embedded part of community safety partnership working where they operate. Indeed, in some cases the system is seen as the framework or culture in which the partnership is driven into activity.

However, to date, little documented evidence has been collected by the systems that demonstrate the impact they are having in reducing crime and disorder, and the misuse of drugs. All point to how they are contributing to more effective partnership working, but all systems must be more encouraged to record how they are contributing to improving community safety. Examples that were captured that show some impact include the following.

- COSMOS in Birmingham provided the analytical, problem profile and performance review input to ensure that a city-wide Local PSA burglary reduction initiative met its 25 per cent reduction target. Additionally, senior police officers in Birmingham think that the city's recent 25 per cent reduction in all crime is in part due to the support services that COSMOS provides.
- The use of the GMAC system in Oldham has proved to be powerful in supporting Local Strategic Partnership (LSP) solutions for crime and neighbourhood renewal. GMAC activity was fundamental in securing £500,000 per annum from the LSP to fund the development of problem solving 'Neighbourhood Solutions'. A GMAC-generated analysis product has also been fundamental in helping to achieve a 75 per cent reduction in arson in some areas of the conurbation.
- Analysis of a distraction burglary pattern by one of the JUPITER sites revealed that approximately 90 per cent of victims were householders over the age of 70 years. The analysis proved useful in engaging with the local councils' housing departments to target an awareness-raising campaign, plus advice and guidance to this vulnerable group.
- South Wales Police have seen recorded crime fall by 12 per cent since March 2003 to February 2005. South Wales Police claim that this is due in part to the timely and informative crime and partnership data focus that the Project Dragon toolkits provide to front line police officers.

In helping to determine the future development of GIS-based information sharing systems, and support the specification of new systems, four key community safety partnership business service functions have been identified from this review that these systems can most effectively support.

- Delivering a performance review function – this function can support a continual auditing process, monitor performance against targets, perform the strategic review of the impact of targeted reduction initiatives and interventions, support the operational briefing of CDRP practitioners and partner agencies, and support information-driven agendas at partnership meetings.
- Operating a scanning role – this role can identify community safety problems, begin to understand the nature and scale of the problem and hypothesise over its cause. This scanning role also includes identifying and allowing easy access to data that are fit for purpose to enable a detailed problem analysis.
- Providing an analysis mechanism – the analysis mechanism should explain crime and community safety problems and help direct their resolution.

- Interfacing with the public – this role can offer a mechanism for supporting the reassurance agenda (particularly from a multi-agency direction) and can better enable the public to contribute to solving issues of community safety.

Following these business service functions will help enhance existing systems, provide direction to new systems, help introduce consistency which will better enable systems to interact, and provide for a more effective application of these systems nationally for improving community safety.

1. Introduction

The purpose and objectives of this research

GIS (Geographical Information System) -based information sharing systems are increasingly being used by Crime and Disorder Reduction Partnerships (CDRPs) in England and Wales to support their efforts to reduce crime and disorder and improve community safety. 'System' refers not only to an Information Technology solution but also to the structure (including processes and people) within which the IT solution operates, and any resourced information sharing and analytical facilities that are associated with the IT solution.

At present there are in excess of 20 major systems distributed at either the regional, county and/or district level in England and Wales that service CDRPs, with new systems in the planning stages. Significant resources have been spent in the development of these systems (in most cases funded with Home Office support). This review aims to wholly review the merits of GIS-based information sharing systems, and consider the community safety partnership business service functions that these systems can most effectively support. In particular, this review:

- identifies the key lessons learned from the nominated systems, for them to be applied to new systems that are developed or to existing systems that are enhanced or expanded;
- identifies how the systems can be best used to support the information sharing and analysis functions within the context of an overall CDRP business process model;
- identifies common weaknesses of and across the systems that need to be rectified to achieve maximum effectiveness and impact; and
- produces recommendations for the achievable, consistent and sustainable development of GIS-based information sharing systems to provide for the needs of all CDRPs nationally.

The nominated systems included in the review were:
- Amethyst: Devon and Cornwall;
- CADDIE: Sussex;
- COSMOS: Birmingham;
- GMAC: Greater Manchester;
- JUPITER: East Midlands Government Office region;
- LASS: London Government Office region;
- NERISS: North East Government Office region;
- North West Regional Crime Mapping System: North West Government Office region;
- Project DRAGON: Welsh Assembly; and
- SCaDIS: Surrey.

These particular systems were chosen because they were representative of the range that operate at either the regional, county or district level; were systems at different stages of implementation and development; offered an opportunity to explore the portability of systems between areas and how a regional system could operate with local systems; and have taken differing approaches to their technical development, the way in which information sharing processes are managed, and the analytical services they offer.

Barriers to information sharing are now well known (Social Exclusion Unit, 2000, Home Office, 2001, Chainey and Ratcliffe, 2005), and many partnerships are showing good progress in how these can be overcome. This study did not seek to re-visit information sharing issues but did identify examples of how specific information sharing challenges have been tackled. Specific points that were addressed in the review included:

- the manner in which the system had been specified, and how its implementation, development, maintenance and promotion had been administered;
- the content and detail of data that are shared by CDRP partners for identifying, exploring and understanding crime and disorder issues;
- the analytical role that is offered by these systems for the purpose of supporting audit production, partnership problem solving, and monitoring targeted initiatives and interventions;

- the availability and quality of information in each system;
- the technical adequacy of each system, and its fitness for purpose;
- the resourcing, support, and management for each system;
- the governance structure around the use of the information in each system (e.g. who can access the system, and the extent to which information sharing and analysis are embedded into the wider business process model and approach of partnership working);
- how the features, functionality and facilities of the different systems compare, and the usefulness of different approaches;
- the financing of the systems and their sustainability;
- whether the availability of each system is bringing about positive changes in how partnerships operate; and
- whether the system is demonstrating impact in reducing crime, disorder and the misuse of drugs.

Exploring these specific points helped to draw comparisons between the different systems and identify which aspects of each system could be beneficially and realistically more widely adopted by other partnerships.

The review also considered the management of CDRP analysis facilities and their relationship to the Police National Intelligence Model (NCIS, 2000).

Work in other parts of the Home Office on the use of GIS for crime analysis, the development of small area crime datasets, and information sharing is providing additional findings that complement this review. These include:
- Crime Mapping: Improving Performance. A good practice guide for front line police officers, launched in April 2005;
- the use of GIS for crime analysis – a survey of CDRP analysts' and police analysts' use of GIS. Results from this survey will be published in early 2006 in a good practice report on the use of GIS for crime analysis;
- the development and supply of small area crime data to the Office for National Statistics Neighbourhood Statistics Service (NeSS). This work is ongoing, and has the aim of commencing the publication of small area crime data on the NeSS website in 2006; and
- a review of the partnership provisions of the Crime and Disorder Act. The Home Office has also been considering how best to encourage better data and information sharing for the purposes of crime reduction as part of a wider review of the partnership provisions of the Crime and Disorder Act. Proposals from the review will be published in the near future.

The review was carried out between January and July 2005, therefore the system descriptions in this report are accurate to this time period.

Structure of this report

Chapter 2 explains the methodology and the design of the information gathering exercise. Chapter 3 provides a descriptive review of each of the GIS-based information sharing systems. This includes summarising how each is used, resourced, the community safety data it contains, its cost, and the impact it is having. This chapter also offers a commentary of each system's strengths and suggests areas for each to review.

Chapter 4 records the main lessons learned from the implementation and use of the GIS-based information sharing systems. Chapter 5 then goes on to define and recommend the community safety business service functions that GIS-based information sharing systems can most effectively support.

Chapter 6 sets out a template for the specification of GIS-based information sharing systems, and in Chapter 7 recommendations are listed for system managers and prospective system managers, and the support required from the Home Office to promote and develop systems nationally.

2. Methodology

The review was conducted using the following information gathering methods.

- *Sourcing of system project management documentation* – Project management documentation about each system, such as their business case, specification, implementation plan, development and maintenance plans and promotional literature, was sourced from each site where it was available. The purpose of sourcing this material was for providing useful background information on how these systems have come into functioning, and helped assess the level of project management documentation that is typically required to specify, implement and maintain an effective and successfully functioning system. That is, good project management is often closely related to good project management documentation that is not excessive but is appropriate for the task.

- *Site meetings with project managers* – site meetings included a demonstration of the IT components of the system and followed a structured questionnaire. The questionnaire addressed:
    - the functional features of the system – reviewing the system's administration, resourcing and management; IT functionality; details of data held on the system and how it is used to support the needs of the audience the system serves;
    - the information sharing processes;
    - the products and outputs generated by the system – reviewing its analytical functions, the analytical and performance review products that are produced, and how these products are used by CDRP practitioners;
    - the management of the system, reviewing the processes that are in place for the delivery of data, data management, and the organisation and practical use of information and analysis for CDRP business use.

- *Online system review* – Where possible, an additional online review of the system was carried out to help evaluate the system's IT solution.

- *Workshop and Focus Groups with users, stakeholders and data contributors* – Each workshop and focus group consisted of between four to eight people who were either members of the system's team, CDRP practitioners, stakeholders or data suppliers. The workshops were principally designed to gather information about:
    - the management of the information sharing processes;
    - CDRP practitioners' and partner agencies' information demands and requirements from analytical products;
    - how practitioners used the system (both the IT solution and services of the team linked to the system);
    - the impact that the system has had in:
        - improving partnership working;
        - saving time and/or costs;
        - improving the quality of data and intelligence information;
        - securing funding;
        - reducing crime, disorder and improving community safety;
    - the existing problems and future priorities of the system.

This particular methodology was applied as it was seen as the most effective and efficient approach to adopt in the time available and suitable for the volume of information that required gathering. In addition, the authors already had the advantage of being intimate with each system so dialogue with each could be informal, yet direct, unbiased and professional for the benefit of eliciting the information required.

Individuals included from each system in the review were a representative sample of users (i.e. individuals that were not system personnel but were key users for whom the system was designed for, e.g. analysts, community safety officers), stakeholders and data contributors. While stakeholders' opinions could be biased towards the successful functioning of the system, the nature of the information gathering exercise was to qualify these opinions with the input of users. For example, it was the opinions of users that were the main source of examples that described the application and impact of the system.

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The information that was gathered from each system was used to review each system in turn but to enable comparisons between systems. Project management material was useful for identifying the aims and objectives of the system and how it has evolved; the meetings with project managers helped to explain how the system was staffed and funded, and how the information sharing processes operated; a demonstration of each system and its follow-up review helped to identify its functional adequacy; and workshops with users and other contacts helped to determine the system's practical application and fitness for purpose, including identifying the system's strengths and weaknesses.

In particular, a standard approach to information gathering for each system allowed for consistency in the information gathered and for comparisons between systems. This approach allowed for each system to be reviewed independently, the systems to be wholly considered for identifying which community safety business service functions they best support, and for reviewing the usefulness of particular applications of systems where the application was not available in another system. That is, where a system was without a particular function or process, its unavailability could be compared against systems where the function or process was in place. This allowed for identifying the community safety business service functions that these systems could best support.

Staff from each system were also included in the reviewing of earlier drafts of this report. This was to ensure that each system description was factually correct, to help ensure the report was written in style and with content that was useful for practitioners, and to enable each system to identify their strengths and weaknesses and begin adopting recommendations for their further development.

3. Review of the nominated GIS-based information sharing systems

This chapter provides a descriptive summary of each of the nominated systems that were included in the review. It describes each system in terms of:
- what it does and how it is used;
- how it was specified, implemented and has developed over time;
- its functionality, the data it contains and its financing;
- the impact the system is having; and
- comments on its strengths and areas for potential enhancement.

The systems are presented in alphabetical order.

Tables 3.1 and 3.2 should also be read with each system description. Table 3.1 lists the administrative project management documentation of each system. Good system implementation need not be overly bureaucratic, but good project management documentation is often cited as a key success factor in any system's application. Reviewing the project management documentation for each system helps to compare how it has affected the systems implementation, use and development.

Table 3.2 describes and compares the key community safety datasets that are held on each system. The content of each is explained below.
- Police crime records – recorded crime events.
- Police offender records – records of those who have been accused, suspected or have committed a crime.
- Police victim records – victims of crime recorded by the police.
- Police crime incidents – calls for police service, including records of disorder and anti-social behaviour that are responded to by the police (e.g. disturbance in a public place or licensed premise, street drinking, rowdy and inconsiderate behaviour).
- Probation Service – data refer to offenders serving a probation order/licence.
- Youth Offending Team (YOT) – data refer to those serving a youth offending order.
- Fire service incidents – incidents responded to and recorded by the Fire and Rescue Service, including all types of fires (e.g. arson, house fires), bogus calls to the Service, and responses to road traffic accidents.
- Ambulance Service incidents – incidents responded to and recorded by the Ambulance Service.
- Road traffic accidents – this dataset relates to events recorded by the police service.
- School exclusions – local authority records of pupils excluded from school.
- Anti-social behaviour (ASB) – incidents recorded by the local authority, typically including neighbourhood noise nuisance, graffiti, fly tipping, vandalism and abandoned vehicles.

Many other forms of data are held on the systems (e.g. Ordnance Survey mapping products, Census data, Neighbourhood Statistics and locations of service points such as police stations and schools). These types of datasets are not included in the table as each is accessible via existing license agreements or from local authorities, or are free to access via internet sources (e.g. the Neighbourhood Statistics Service). A number of systems are also adding commercially available geodemographic profiles to their information hubs that can be used to understand the lifestyles of those that live in areas, their spending powers and house prices.

Table 3.1: System project management administration and documentation
Dark grey cells indicate existence of full documentation; Light grey cells indicate existence of partial documentation; White cells indicate no documentation.

System	Business case	Requirements plan	Specification	Implementation plan	User guide	Promotional material	Evaluation	Development plan
Amethyst								Plan for IT solution but not for data, staffing and analytical facilities
CADDIE					Includes CADDIE Information Management Strategy		Based on phase one implementation	
COSMOS		Did not specify staffing requirements						
GMAC					Includes a comprehensive GMAC Toolkit			
JUPITER								
LASS		No formal documentation but was scoped via a user consultation		Based on allocation of PDF	Not applicable	Produced for some sites		
NERISS			Not initially but was later scoped via a consultation with CDRPs				No formal documentation but feedback captured via user meetings	No formal documentation but was scoped via a user consultation
NWRCMS		Did not specify staffing requirements					Not applicable	Not applicable
SCaDIS						Case studies written by the IT provider		
Project Dragon[a]								

ªProject Dragon has no formal system documentation, but does consider its development options based on user requests and strategic priorities.

Table 3.2: Core community safety datasets
(Cell descriptions refer to: Geographic resolution of data available from the IT solution: Frequency of update: Lag between system update and recording period)

System	Police crime records	Police offender records	Police victim records	Police crime incidents	Probation Service	YOT	Fire Service incidents	Ambulance Service incidents	Road traffic accidents	School exclusions	ASB (recorded by LAs)	Other
Amethyst	•Postcode •Monthly •2 months		•Postcode •Monthly •2 months	•Postcode •Monthly •2 months	•Postcode •Monthly •2 months		•Ward •Annual •1 year	•Postcode sector •Annual •1 year	•Postcode •Monthly •2 months			Abandoned vehicles (Devon) •Postcode •Monthly •4 months
CADDIE	•Postcode •Monthly •1 month	•Postcode •Monthly •1 month	•Postcode •Monthly •1 month	•Postcode •Monthly •1 month			•Postcode •Monthly •1 month	•Postcode •Monthly •1 month	•Postcode •Monthly •1 month			
COSMOS	•OA •Monthly •2 months	•OA •Monthly •2 months	•OA •Monthly •2 months	•OA •Monthly •2 months	•OA •Monthly •2 months	•OA •Monthly •2 months	•OA •Monthly •2 months	•OA •Monthly •2 months	•OA •Monthly •2 months		•OA •Monthly •2 months	YOT court disposals •OA •Monthly •2 months
GMAC[b]	•Point •Two weeks •16 days	•Point •Two weeks •16 days	•Point •Two weeks •16 days	•Point •Two weeks •16 days	•Postcode •Monthly •18 days	•Point •Two weeks •18 days	•Point •Monthly •18 days	•Point •Monthly •18 days	•Point •Monthly •18 days			BCS* •Postcode •Annual •Not known
JUPITER[c]	•Point •Daily •Next day	•Point •Monthly •2 weeks	•Point •Monthly •2 weeks	•Point •Monthly •2 weeks	•Point •Monthly •2 weeks	•Point •Monthly •2 weeks	•Point •Monthly •2 weeks			•School •Quarterly •1 month	•Point •Monthly •2 weeks	Train incidents •Point •Monthly •1 month; BCS* •Point •Monthly •2 months
LASS	•District •Monthly •3 months				•Probation Office •Monthly •7 months	•Aggregate count •Monthly •7 months	•Point •Monthly •1 month	•OA •Monthly •1 month		•Point •Monthly •1 week		BTP incidents •Station •Monthly •1 month; Bus incidents •Street •Monthly •2 months
NERISS	•Aggregate count •Monthly •3 months	•Aggregate count •Monthly •3 months		•Aggregate count •Monthly •3 months	•Aggregate count •Monthly •7 months	•Aggregate count •Monthly •1 month	•Aggregate count •Monthly •1 month	•Aggregate count •Monthly •1 month				Prison releases • A secure email based system on the destination prisoners released
NWRCMS	•Aggregate count •Monthly •3 months	•Aggregate count •3 months	•Point •Monthly •3 months	•Aggregate count •Monthly •3 months	•Aggregate count •Monthly •3 months	•Aggregate count •Monthly •3 months	•Point •Monthly •3 months	•Aggregate count •Monthly •3 months				
Project Dragon	•Point •Daily •Next day	•Point •Daily •Next day		•Point •Daily •Next day	•Point •Weekly •1-2 days	•Point •Monthly •2-3 days	•Point •Daily •Next day	•Point •Daily •Next day	•Point •Daily •Next day	•Point •Monthly •1 week	•Point •Daily •Next day	Prison release •Point •Weekly •1-2 days
SCaDIS	•Point •Monthly •3 weeks	•Point •Monthly •3 weeks	•Point •Monthly •3 weeks	•Point •Monthly •3 weeks	•Point •Monthly •1 month	•Point •Quarterly •1 month	•Point •Monthly •3 months	•Point •Monthly •3 months	•Point •Quarterly •2 months	•Point •Term •1 months	•Point •Quarterly •3 months	Stop&Search •Point •Weekly •1-2 days

[b] GMAC also holds data from Greater Manchester Passenger Transport on ASB, criminal damage, thefts and substance abuse, and police data on gangs in Manchester, including gang-related incidents/crimes such as shootings.

[c] JUPITER - Each JUPITER site has a slightly different variety of datasets. Data in this table are for Derbyshire and are representative of the datasets available at JUPITER sites

BCS – British Crime Survey perceptions of crime linked to commercial geodemographic profile dataset

Amethyst – Cornwall and Devon

What is Amethyst and how is it used?

Amethyst is an internet-based solution for crime mapping, analysis and depersonalised data exchange across Devon and Cornwall. Amethyst aims to help partners identify the underlying causes of crime, reduce crime and reduce the fear of crime. Amethyst was initially developed in Cornwall and its implementation into Devon has recently commenced. This review mainly refers to the experiences of Amethyst in Cornwall, although the content that relates to the IT solution is inclusive of Devon because the same technology operates within the two counties.

Amethyst (Cornwall) is resourced by a dedicated team based at Cornwall County Council's offices, but all are employed as Devon and Cornwall Constabulary civilian staff. The team consists of an Information Manager, two Assistant Information Officers and an Analyst. The Amethyst team collate and process data from a disparate range of CDRP partners and upload them onto a central information hub. The team also provide the dedicated community safety analytical support to the CDRPs across Cornwall and the Isles of Scilly (see Figure 3.1). Analytical tasks are commissioned by CDRP partners based on identified crime and disorder problems.

Figure 3.1: Cornwall and the Isles of Scilly Community Safety Structure
Amethyst acts as Cornwall's community safety information hub, feeding data and intelligence to the County's decision-making groups.
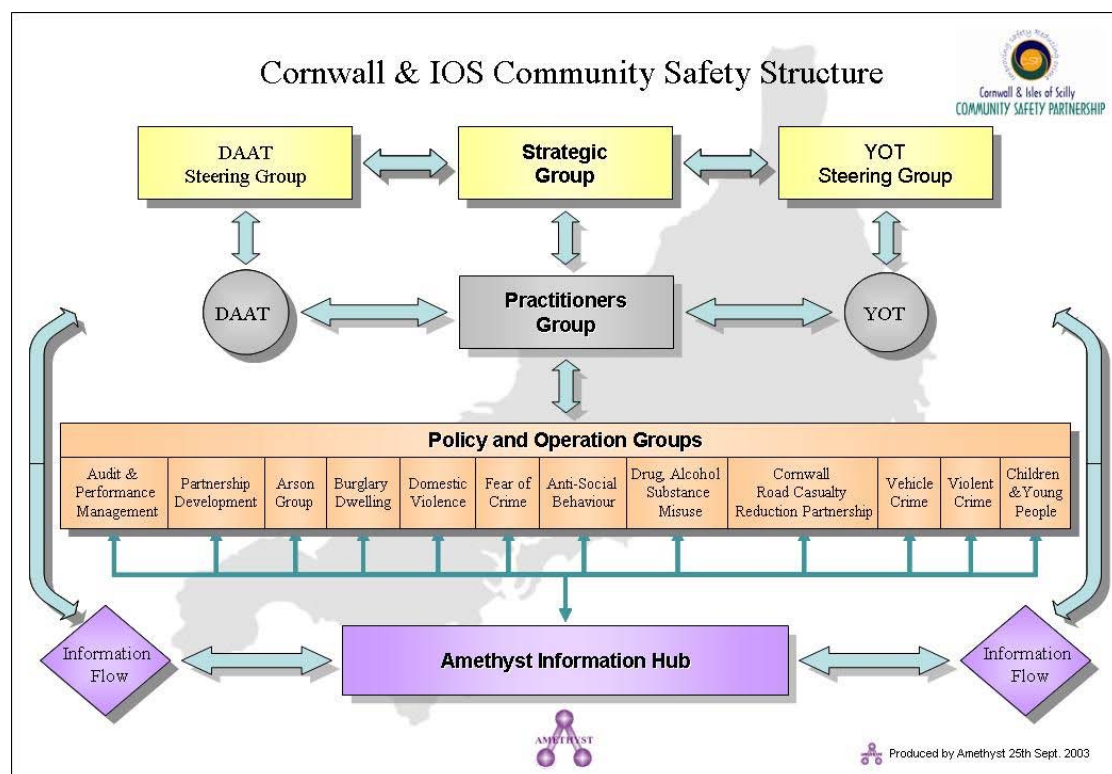
Additionally, the Amethyst team support the county's community safety partnership's working groups, particularly in terms of supporting the delivery of information and partnership communication. For example, the Amethyst Information Manager project manages the work group responsible for the delivery of a six-monthly rolling community safety and drugs audit. The Amethyst analyst provides the analysis support to this audit including coordinating input from the Police's Strategic Assessment.

The Amethyst website provides district level crime data, links to local audits and strategies, and details about local crime prevention and policing initiatives. The website also provides a separate secured authorised access section for viewing partnership data via a dynamic

geographical interface. This interface does not provide complex analytical tools but acts as a portal viewing mechanism and downloading facility for community safety data. This download facility is designed to enable users to analyse crime and disorder issues in more detail by using their more powerful analytical desktop computing tools alongside their awareness of their local areas.

How was Amethyst specified, implemented and developed?

Amethyst began as a project to tackle alcohol-related crime and disorder. Part of this project required the exchange of data, and after an early feasibility study into its data exchange requirements an opportunity was identified to extend the project's information sharing components to all aspects of community safety in Cornwall. This then began with a pilot exercise in two of Cornwall's districts that set out to identify the availability of datasets and their content, challenges to accessing partnership datasets, and how these data could be used to support community safety decision-making. The successful pilot resulted in the adoption of an information sharing framework for Cornwall that was supported with a dedicated analytical facility.

The success of Amethyst in Cornwall has resulted in it being extended as the model for CDRP information sharing in Devon.

Perceived impact of Amethyst

Amethyst has become a central mechanism for supporting the development of partnership working at both the local and pan-Cornwall levels. Its role is helping the Cornwall and Isles of Scilly CDRPs in the following ways:
- supporting the production of audits and the move to a continual auditing process;
- providing better access to a wider range of community safety data, including making it easier to understand and interpret data that are sourced from certain agencies by presenting them in a common visual format;
- offering the partnerships a factual evidence base for their actions and creating confidence and credibility in decisions that are made;
- providing and coordinating analytical support, including supporting Policy and Operations Groups (see Figure 3.1) in their strategies and targets, providing information to support funding bids, and targeting resourcing;
- providing a mechanism for sharing analytical and intelligence outputs including police-generated problem profiles;
- helping to breakdown information sharing barriers by demonstrating how the information is used, and by whom (this process has also helped to source data from partners that were originally sceptical in sharing their information); and
- providing a mechanism to strengthen the partnerships and how partners work.

Commentary on Amethyst

Amethyst offers a strong mechanism for engaging partners, disseminating community safety data and supporting the auditing and analytical requirements of Cornwall's CDRPs. It is one of the earliest developed of the GIS-based information sharing systems so has had to break new ground in overcoming several technical and information sharing challenges. The interactive mapping facility does display crime and community safety data, but requires a reasonable level of technical knowledge and some patience to begin to identify and explore any emerging issues. This means that those who work in a management or decision-making capacity can find the system difficult to use and not able to source information in the format they require.

Amethyst does though offer a number of notable strengths that demonstrate why it has grown to be a focal point for partnership working in Cornwall.
- It has received continued championing from senior stakeholders.
- It is a good example of the necessary resourcing requirements to manage and support a system, that is proportional to the region's community safety issues and the volumes of data that require processing, and is reflective of the analytical capacities across the CDRPs (i.e. none of the six Cornwall or the Isles of Scilly CDRPs have a dedicated

analyst). The individual CDRPs would find it difficult to justify the expense of hiring their own dedicated analysts, but through staffing the Amethyst Team with a multi-agency analyst, their analytical requirements can be supported.

- It demonstrates how information sharing barriers and access to timely, cleansed, quality assured and precise community safety data for analytical purposes can be overcome through an automated download interface.

Amethyst has reached a stage of maturity with good structures in place for information sharing. It is now important for Amethyst to develop its problem-solving analysis capabilities, particularly in terms of ensuring they are explanatory rather than just descriptive in content. Analyses generated from Amethyst has the opportunity to complement the police NIM intelligence products by incorporating a multi-agency view, plus be pan-Cornwall based in their outlook. This may require a realignment of roles in the Amethyst team to be weighted more to analysis rather than just information processing. In turn, the development of the partnership analysis role should help ensure that Amethyst grows in recognition as an analytical resource for supporting CDRP decision-making and links more directly to supporting reductions in crime, disorder and the misuse of drugs.

System	Amethyst	Website	Launched
		www.amethyst.gov.uk	July 2002
System access	IT solution (Internet-based) • Public access to unsecured area • Internet, password-protected access to the secured information hub and mapping interface	System resources • Partnership access to dedicated analytical resources and for specialist data requests	
Number of users	• 400 registered users	• 1000 public hits per day	
Development since initial launch	Development in progress: Expansion of the IT solution into Devon Phase 2: Enhancements to IT solution		

Details of system data	• Updates: Monthly, with a maximum two-month lag for core datasets. Some datasets can only be updated annually.
	• Detail of data: Personal data are provided to the Amethyst Team. Unit postcode precision data of police records, probation records, and traffic accidents are made available for download from the Amethyst site for authorised users. District level data is provided to the public.
	• Data cleaning: Data cleaning is performed on all personalised data supplied by CDRP partners.
	• Metadata facility: A concise description of each dataset including,
	  - Title, date, geographic coverage and frequency of updates
	  - Supplier details, data field content and formats, sample data table		

System IT functionality	• Public internet site: District maps and statistics of crime on the public internet site (updated annually); links to CDRP Strategies and Audits; links to partner and other relevant websites; descriptions of CDRP Working Groups, published with meeting agendas and minutes • Authorised access: Information hub: providing interactive facility to view data, plus download in a GIS data file format; Working Groups list of members; useful documents (e.g. problem profiles), meetings calendar and discussion forum		
Management support	• Amethyst Management Board		
Analytical capacity	IT System • Has the ability to view different data layers, including crime rates at the ward level Staffed resources • Provide input to Audits and rolling audits • Provide dedicated analytical support to the crime-based Policy and Operations Group and other CDRP work groups		
Costs	• IT solution implementation costs (to launch including scoping and pilot studies): £80K • IT solution implementation annual maintenance costs: £7K • Dedicated system staffing costs: £65K for Cornwall staff plus a further £45K to include Devon, per annum • 2005/06 development costs: £94K (cost to extend and replicate the IT system into Devon) • Funding Contributors: Cornwall CDRPs, GOSW, and the Home Office (via the former PBM fund that includes funding drawn from the ONS NeSS for the supply of small area recorded crime data)		

CADDIE (Crime and Disorder Data Information Exchange) Sussex

What is CADDIE and how is it used?

CADDIE in Sussex is an internet-based solution designed to ensure that all 13 CDRPs and partners in the county have access to relevant, accurate and timely information about crime and disorder. CADDIE provides information about where crime and disorder is occurring, describes initiatives and operations that are being targeted to tackle crime, aims to help tackle the public's fear of crime, and improve community safety.

CADDIE is managed by a dedicated Project and Systems Manager based at Sussex Police headquarters and is staffed with five Crime and Disorder Information Analysts. The analysts are equally distributed across the five police divisions in Sussex and support their local CDRPs. Each analyst is a local authority employee, but has been police security checked and given police identification privileges to help overcome data access issues. Each analyst manages the information sharing process between local partners, populates and maintains their division's part of the CADDIE information hub and website, and provides dedicated analytical support to their local CDRPs.

The CDRPs benefit from online access to a secured facility within the CADDIE internet site. This facility includes an interactive map-based method for viewing and scanning community safety data and an automated management performance reporting facility that generates a profile of community safety and demographic data in the geographic area of selected interest.

CDRPs commission the CADDIE analysts to carry out analytical tasks. This is managed through a formal mechanism to ensure the request is relevant to the Crime and Disorder Reduction Strategy, is linked to an action within a strategic objective and has the approval of CDRP colleagues.

CADDIE also provides ward-based crime and disorder data to the public and operates online public polls. The CADDIE internet site also acts as an information portal about crime and disorder reduction initiatives in Sussex.

The CADDIE IT solution is though a commercially packaged solution. It is not 'owned' by any of the Sussex CDRPs, but instead is a solution that is trademarked and owned by Infotech Enterprises Europe. As the proof of concept site, CADDIE in Sussex benefits from royalties of between three to seven per cent for any other sales of CADDIE.

How was CADDIE specified, implemented and developed?

The initial business case and specification for CADDIE emerged as a result of a six-month consultative research exercise by Sussex Police and its CDRP partners. The partnership recognised that for them to deliver crime and disorder reduction there was a need to improve how information was shared across the partnerships. The research exercise involved visiting a number of the other established GIS-based information sharing systems for Sussex to review these against their own requirements.

The outcome of this consultative exercise was an invitation to tender to support the IT build of CADDIE. CADDIE also recognised the need for multi-agency-based analytical support and so established a dedicated team of analysts to support the county's CDRPs requirements. The CADDIE IT solution has since developed through two phases. Phase 1 was launched in October 2002 as a proof of concept with coverage only for Crawley. Its success then led to the development of Phase 2, which when launched in February 2004 achieved coverage of Sussex, including 13 CDRPs. Since this development, the 'CADDIE' IT solution has also been sold into Kent and Hampshire.

Perceived impact of CADDIE

User feedback is showing that CADDIE is helping the Sussex CDRPs to become better informed about crime and disorder problems in their area.

- Providing an easier, more complete and more timely county-wide consistent mechanism for sharing, accessing and visualising partnership data. For example, West Sussex Fire and Rescue Service used CADDIE for their Integrated Risk Management Plan.
- Helping to better identify problem areas and perform detailed analyses to inform partnership decision-making: The CDRPs in Sussex do not have their own dedicated analysts. The appointment of five analysts in the CADDIE team is helping support the CDRPs with their analysis requirements which include helping them to become more evidence-based in targeting their resources. For example, several CDRP practitioners in Sussex state that before CADDIE, many decisions were based on little more than hearsay and guesswork. Analysis by the CADDIE team on evaluating past projects found that initiatives were often targeted to the wrong areas, at the wrong times and at the wrong causes with bias and opinions often shaping decision-making.
- Significantly supporting and improving the auditing process: This has included simplifying the production of audits, and ensuring the audit's content is relevant, rather than being governed by what data are available.
- The timeliness of updates makes it possible for CADDIE to be used in meetings to help inform, enlighten, direct and help make decisions.
- Providing a mechanism to share good practice between the CDRPs.

A useful feature within CADDIE is its online polls that offer a facility for helping inform CADDIE's direction. For example, the online polls have helped reveal:
- the public's fear of crime is 30 to 300 times the actual levels, (i.e. as a result of a survey that asked the public how many crimes they thought occurred in their area, the perceived levels of crime were up to 300 times the actual recorded levels of crime);
- by being better informed about crime and disorder, 56 per cent said they would feel 'safer' or 'much safer' and 27 per cent say they would feel 'no change';
- when the public were asked if they wished to see more detailed crime and disorder data of their area (i.e. below the ward level), 87 per cent said 'yes';
- as a result the next development stage of CADDIE includes providing the public with more detailed and precise crime data.

As well as better informing partnership work, information and services from CADDIE have also helped secure funding to maintain neighbourhood wardens in several areas. In addition, CADDIE analysts claim that targeted interventions that came as a result of CADDIE have all delivered reductions in crime.

Commentary on CADDIE

CADDIE offers a comprehensive community safety information portal for CDRP practitioners, partner agencies and the public. It has commendably grown to provide county-wide coverage and support to CDRP analysis. Its online surveys are a simple yet innovative feature, and the timeliness and quality of its data ensures that all who use CADDIE can be kept informed about emerging issues and targeted initiatives for reducing crime and disorder. This demonstrates that the management of its information exchange procedures operate well.

CADDIE is also one of the best documented of the systems. For example, CADDIE has comprehensively captured how it can be used and its procedures for data exchange and analysis. This type of documentation ensures that there is a clear description of CADDIE, helping all stakeholders and users be clear over their roles and responsibilities, help formalise CADDIE into partnership working, aim to make CADDIE a resource that is effective for supporting CDRP working, and minimises any risks when there are losses in key personnel.

Analysis that is being performed by the CADDIE analysts is demonstrating that it is breaking into a problem-solving focus. Analytical outputs from CADDIE tend to explore the specifics of crime problems and include suggestions and directions on how problems could be tackled. The commissioning process for requesting analytical tasks appears to work reasonably well, but as the success of analytical outputs has grown, there has also been an increase in the demand for analytical support, often leading to a backlog of requests. Care must be taken in how analytical resource is used to ensure that in the effort to meet increased demand, the products do not lose their problem-solving focus. Additionally, documented examples of

CADDIE's impact on actually reducing crime are thin. It is important that these examples are documented to ensure that the significant investments that have and continue to be made in this Sussex-wide system demonstrate that it is being used to its full potential. Added to this is the concern that CADDIE is not being actively used by Sussex Police intelligence analysts. This calls for a better alignment between CADDIE's analytical functions and services and the analytical functions of the police.

The IT solution built within CADDIE includes a range of tools and features that make it a useful information portal to many of its users. Certain key features such as the mapping interface and automated reporting function are however over complicated and would benefit from being streamlined. There is also some concern over the programming design of the IT system. The IT system was developed using open source code. This helped keep licences for software at a minimum but means that the system is not supported by the police or local councils, and that all development and maintenance has to be provided by CADDIE's IT provider. This can mean that development and maintenance costs tend to be higher than other systems, the choice of open source programming code may not actually provide any long-term benefit, and in some cases may be more restrictive than other system designs that offer the same features but at a more financially viable cost.

System summary

| System	CADDIE (Sussex)	Website	Launched
		www.caddie.gov.uk	October 2002
System access	IT solution (Internet-based) • Password-protected access to authorised section • Open access to public section	System resources • Access to dedicated analytical resources for all CDRPs	
Number of users	• 600 registered users • 3000 public hits per day		
Development since initial launch	• Phase 2: Roll out to all 13 CDRPs across Sussex. This included enhancements to CADDIE based on an evaluation and feedback on phase 1 delivery, and the recruitment of four additional analysts • Phase 3: Redesign of CADDIE website, point data provided to the public and remarketing to CDRPs and the public		
Details of system data	• Updates: Monthly, with a maximum one-month lag • Detail of data: Data extraction method delivers unit postcode level depersonalised data to the CADDIE Team. These are also made available (albeit with personal details removed) in aggregate or point level formats on the CADDIE website for authorised users and the public. • Data cleaning: Data cleaning is performed by the CADDIE Team on all data supplied by CDRP partners. • Metadata facility: Metadata details are contained in the CADDIE Information Management Strategy and include, - Title, date, geographic coverage, description of dataset, and frequency of updates - Supplier details, data field content and explanation of content		
System IT functionality	• Interactive GIS-based facility to view crime and community safety data. Authorised users have the ability to access more functions and more detailed data than the public access version. • On-line questionnaire and feedback forms, including information and links for reporting crime and disorder, and crime prevention advice • Details about local CDRPs and their initiatives for tackling crime and disorder, and crime prevention advice • A diary of CDRP and community safety events, plus a CADDIE and CDRP contacts directory • Authorised access: performance review reporting facility; and library containing CADDIE analysis reports		
Management support	• CADDIE Management Board – consists of representatives of the key CDRP partners. The board meet each month and oversee the budgetary, development and marketing agendas of the system		
Analytical capacity	IT System • Has the ability to query and view different data layers over a mapping interface Staffed resources • Provide management reporting, auditing, problem analysis support to the CDRPs.		
Costs	IT System • IT solution implementation costs (Phase 1 and 2): £220K • IT solution implementation annual maintenance costs: £10K • Dedicated system staffing costs: £206K per annum • 2005/06 development costs: Phase 3 - £60K • Funding Contributors: Phase 1: PITO (via Home Office Invest to Save fund), Phase 2: CDRPs in West Sussex, ODPM (via Innovations bid from East Sussex County Council), and GOSE. In 2005/06 CADDIE funding has been mainstreamed into contributions from the Sussex CDRPs		

COSMOS (Community Safety Mapping On-line System): Birmingham CDRP

What is COSMOS and how is it used?

COSMOS is an internet GIS-based community safety tool, designed as a central point of contact for CDRP partner agencies in Birmingham. It provides access to multi-agency data through interactive mapping and data query tools, and through interactive tabular and graphical profiles. COSMOS does not provide complex analytical functions, but provides an interactive performance management and scanning facility (for an example see Figure 3.2) for CDRP practitioners and others from contributing partner agencies.

Figure 3.2: COSMOS reporting profile

The COSMOS reporting 'profile' tool is easy to use and provides concise management information regarding performance. The profiles include a table displaying changes in crime, a map showing the main problem areas, a graph showing crime trends and a table showing crime levels on each day of the week for the selected time period.
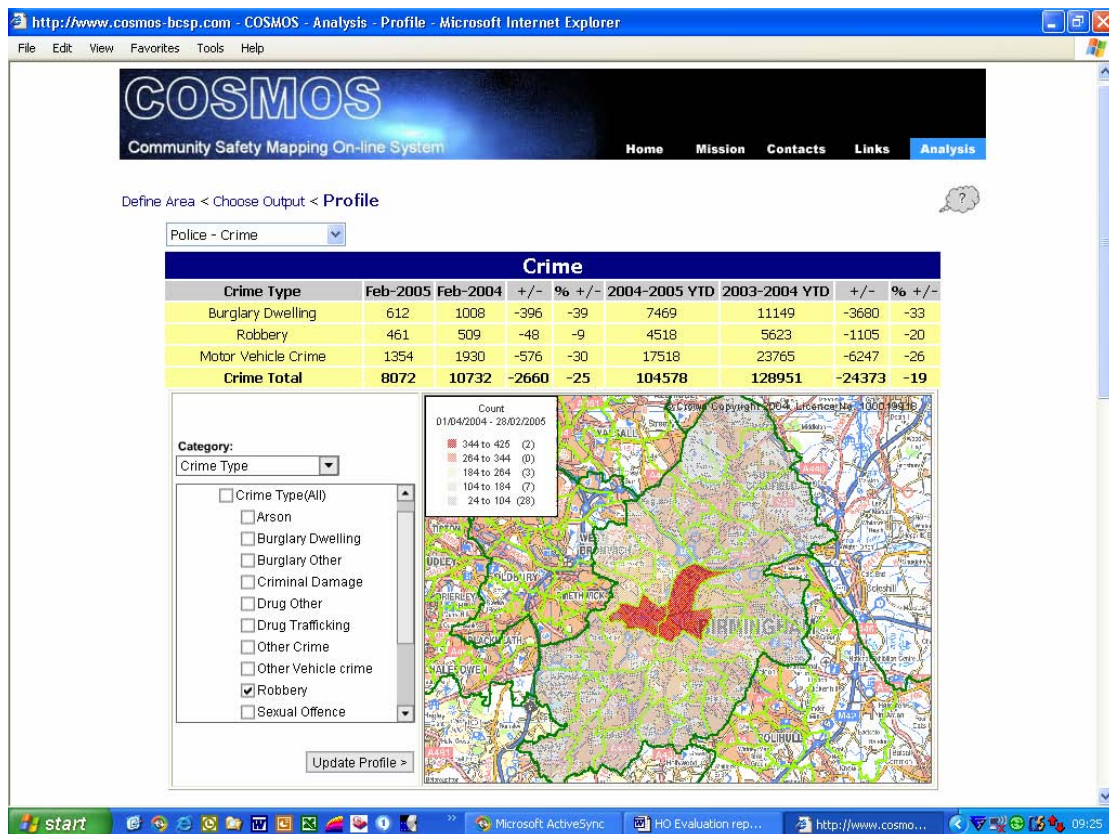
COSMOS is managed and coordinated by the Birmingham CDRP's Information and Intelligence Team (I&I Team). The team consists of an Information and Intelligence Manager and three analysts that apply a multi-agency focus to three support areas – the Community Safety Partnership, DAT, and Fire Service. The I&I Team also support the data, analytical, research and intelligence requirements of the CDRP. These services include:

- supporting the partnership's performance management framework through supporting tasking and coordination, performance monitoring, and providing briefings to area commanders and the CDRP;
- the production of an annual Birmingham Strategic Assessment, and annual assessments for the CDRP's 'Local Delivery Groups';
- performing formally commissioned research and analysis, including bespoke analytical research (e.g. the selection of priority areas for crime prevention initiatives), problem-solving analysis, and identifying new data requirements for COSMOS.

For the purpose of this review, the Birmingham CDRP I&I Team were treated as part of the COSMOS 'system'.

How was COSMOS specified, implemented and developed?

COSMOS was conceived through direct user consultation with the Birmingham CDRP. This process produced a business case and specification, and a design solution in response to an invitation to tender to build the online GIS-based functions of the system. The principal aim of COSMOS has been for it to be focused on building a solid base of key stakeholder information for the Birmingham CDRP, providing key crime and disorder data required by the partnership, in such a way that it is scalable and can be easily expanded to a wider portfolio of multi-agency data.

Perceived impact of COSMOS

COSMOS (including the services of the I&I Team) has enabled the Birmingham CDRP and its partners to visualise and understand the strategic overview of crime in the city. The analytical efforts by West Midlands Police identify crime problems at the local and sub-city level (i.e. BCU and Level 1), but the creation of COSMOS offers a city-wide focus of crime and other community safety issues by contributing to more widely focused analysis, multi-agency problem-solving, and strategic action across the city. For example, COSMOS identified a City burglary problem because it was an across-BCU boundary issue and did not appear as significant when viewed at just the individual BCU level.

Particular benefits that COSMOS has provided include:
- enabling the CDRP partners to start their discussions with the same information, providing for a more information-driven partnership working environment, which has by nature, created a better multi-agency view of partnership community safety issues and response;
- making partnership easier to interpret;
- helping to move towards a better analytical interpretation of crime;
- information and intelligence is much more readily available, helping the partnership to respond more quickly and more factually to questions and enquiries, and respond to issues with a more justified and considered problem-solving focus, e.g. COSMOS was used to identify the worst areas for burglary dwelling and the characteristics within them to help inform and target problem resolutions;
- supporting and monitoring responses and initiatives from other agendas such as neighbourhood renewal and reassurance policing;
- effectively monitoring against targets;
- making the Partnership more effective at posing the right questions to analysts as they have information available to assist in the formulation of better hypotheses. The result has been a better use of the analytical skills available to assist in the decision-making process.

Even though COSMOS is a system that is still in its infancy it is already demonstrating how it is contributing to reductions in crime, disorder and community safety.
- COSMOS provided the analytical, problem profile and performance review input to ensure that a city-wide Local PSA burglary reduction initiative met its 25 per cent reduction target. This included identifying key geographical areas of focus and student victimisation. Meeting this target meant the CDRP benefited from an award of additional government funds.
- COSMOS identified a correlation between burglary dwelling and arson in Sheldon, and subsequently supported a more considered problem-solving approach to the issues in this area.
- Analysis from COSMOS supported Operation Cubit, an initiative targeted towards the problem of abandoned vehicles. As a result the Operation was more effective and helped improve response times for their removal.
- By considering problems between crime and alcohol abuse as a city-wide strategy rather than a Level 1 BCU strategy, COSMOS helped to generate intelligence that led to the selection of an Alcohol Restriction Zone.

In the 13 months from February 2004 to February 2005 Birmingham has seen a 25 per cent reduction in crime. Senior officers in Birmingham think that in part this is due to the support services that COSMOS (and the I&I Team) provides.

Commentary on COSMOS

COSMOS provides a very effective performance management reporting tool and scanning facility to its users. Its ease of use is commendable and central to its strengths. As an IT solution, it provides a very cost-effective mechanism for delivering key information to decision makers in an easy-to-interpret format, without overcomplicating the user with complex analytical and querying functions. Its role, including that of the I&I Team, fits ideally within the business model of the Birmingham CDRP, where assessments, analysis and research are supported by a skilled and dedicated staff. COSMOS and the outputs generated by the Information and Intelligence Team are an example of what can be achieved in a short period of time.

Certain functions of the COSMOS IT solution could be streamlined and further improved to increase their effectiveness. The appointment of a dedicated individual to support its maintenance, development and promotion would benefit the system. This would also help ensure that currency in data was improved by moving to a maximum one-month lag between data being recorded and appearing on COSMOS, rather than the current two-month lag.

System	Website	Launched
COSMOS	www.cosmos-bcsp.com	October 2003

System access	IT solution (Internet-based) • Password-protected access to authorised section • Open access to public section System resources • Partnership support from dedicated I&I Team
Number of users	• 580 registered users • 350 hits per day
Development since initial launch	• 'Management reporting' profile tool • Developments in progress: Technology upgrades, improvements to existing data and inclusion of additional data (e.g. Environmental Quality data and Public Perceptions data through partnership with Encams, and the provision of training courses and training materials)
Details of system data	• Updates: Monthly, with two-month lag • Detail of data: Point level data are used by the I&I Team for the generation of assessments and analysis. Aggregated information from Output Area and above is made available on COSMOS. • Data cleaning: No data cleaning is performed. Data are taken as is from data suppliers • Metadata facility: A brief description of each dataset is provided in the help menu
System IT functionality	• Interactive performance management information on performance via an area profile tool • Interactive production of maps, graphs and statistical tables on crime and key community safety issues, including automated statistical reviews against the partnership's action plans and targets • Descriptions of targeted actions and interventions • Contacts listings and links to partner and other relevant websites
Management support	• COSMOS Management Board, chaired by senior officer (Police Assistance Chief Constable)
Analytical capacity	IT System • Interactive querying of data to identify patterns and problem areas • Interactive monitoring of performance against targets and action plans Staffed resources • Production of partnership-strategic assessments and input to Audits • Performance management statistics to support CDRP and public enquiries • Problem-solving analysis and intelligence products
Costs	• IT solution implementation costs (to launch): £36K • IT solution implementation annual maintenance costs: £6K • Dedicated system staffing costs: £12k per annum (based on 6 days of I&I team resource each month) • 2005/06 development costs: £55K • Funding Contributors: Initial development costs were funded by the CDRP. 2005/06 developments funded through CDRP and Birmingham City Neighbourhood Renewal Funds.

GMAC – Greater Manchester Against Crime

What is GMAC and how is it used?

GMAC is a structure and process framework for delivering partnership working, utilising a strategic analytical capability across Greater Manchester's ten CDRPs. It operates through a business process model (locally termed the GMAC Partnership Business Model (PBM)) to provide a common method for the area's CDRPs to achieve community safety, reduced crime, reduced fear of crime and cohesive communities.

At the heart of GMAC is its system for supporting information sharing and analysis. The GMAC system is staffed with 14 strategic analysts. Eleven of these are distributed between the ten CDRPs (two are based in Central Manchester) and three are positioned at the GMAC central unit. Each analyst is provided with an analytical computer workstation that is linked via a local area network to a dedicated GMAC data hub.

The analysts work in a coordinated 'commissioned' manner to deliver multi-agency analytical products such as strategic assessments and problem analysis outputs that complement Greater Manchester Police (GMP) NIM intelligence products. The centrally located strategic analysts perform pan-Greater Manchester, cross-border or dedicated and specific area-focused analysis. The analysts also support other key agencies such as GMP and the Greater Manchester Fire and Rescue Service.

Figure 3.3: The GMAC Partnership Business Model
Information acts as the fundamental driving mechanism to support the work of the partnership.
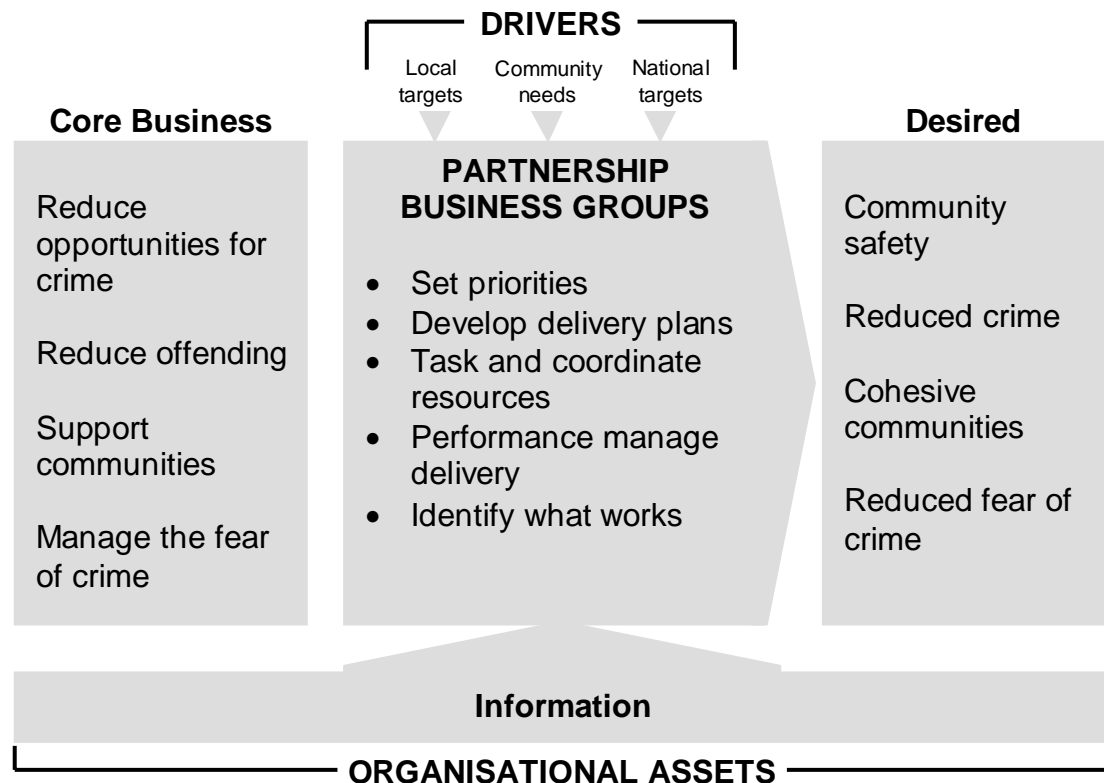
The commissioning approach to analysis helps to ensure that requests are based around the Partnerships' core business functions (see Figure 3.3). Support is offered to analysts and members of the partnerships from a panel of experts, enabling a depth and diversity of skills, knowledge and research to be tapped across GMAC. The analysts and senior GMAC staff also meet through a monthly analyst forum – CADRAD (Crime and Disorder Research and Development group).

GMAC is also staffed with a Project Coordinator and a Partnership Development Officer to support, direct and link the work of the strategic analysts, and ensure the smooth operation of the GMAC IT framework at GMP – the hosts of the GMAC IT solution. The Greater Manchester Crime Reduction Steering Group (GMCRSG) contract the Association of Greater Manchester Authorities (AGMA) Policy Unit to support GMAC by facilitating the information sharing process between partners. The administration of GMAC is supported by a part-time GMAC consultant.

How was GMAC specified, implemented and developed?

In 2003 the GMCRSG commissioned a feasibility report for developing a new partnership approach to strategic analysis. Partnership work at the local CDRP level in Greater Manchester was strengthening but there was call for better strategic functioning over the use of information, intelligence, and analytical techniques, and more effective coordination and tasking of partnership resources that would benefit local CDRPs.

The feasibility study identified the primary elements that were required for creating a Greater Manchester Partnership Business Model (PBM). These included:
- the creation of a new local and conurbation strategic analytical resource;
- the requirement for an IT solution to support information sharing and the generation of analytical products; and
- the need for a revised partnership business process.

Recommendations from the feasibility study were approved by the GMCRSG and in June 2003 the GMAC PBM project was instituted. Three years of funding was secured and a multi-agency GMAC Project Implementation Team was formed to realise the creation of the strategic analysis team, implement the IT requirements and manage the process change to the new PBM. In April 2004 GMAC became operational.

Perceived impact of GMAC

In the year since GMAC was launched it is already proving to have an impact across Greater Manchester. The adoption of its PBM has improved partnership working particularly in terms of re-energising and revitalising CDRPs and partnership groups. The GMAC PBM has helped streamline county structures and better enabled county level business groups to be incorporated into a Greater Manchester strategic focus that delivers tangible added value to local CDRP delivery.

The GMAC information sharing system and analytical facilities are at the heart of this new business approach to community safety in Greater Manchester, developing and providing the foundation for information-led decision-making for the CDRPs. This information is also directly benefiting county-wide organisations that previously had no access to an analytical resource. Other examples of GMAC's influence include:
- helping to improve the audit production process;
- breaking down barriers to information sharing;
- effectively bringing partners together at the scanning and analysis stage (creating relationships across Greater Manchester that did not previously exist), and providing a multi-agency view and exploration of the problem that can then be taken forward into a multi-agency directed response (this has helped partners to work more collectively, to a clearer consensus, and removed the blame culture that previously existed in some areas, plus has made partnership activity more inclusive, more informed in its debates, presenting a shared interest and has helped raise standards);
- providing a well researched and consistent evidence-base on which priorities can be made e.g. the production of the GMAC multi-agency strategic assessments; and
- revealing weaknesses and 'smoking out' those that are not contributing, but in a way that helps to bring them on board.

GMAC analysis outputs are also demonstrating their worth in other significant ways.
- The use of the GMAC system in Oldham has proved to be powerful in supporting Local Strategic Partnership (LSP) solutions for crime and neighbourhood renewal. GMAC

activity was fundamental in securing £500K per annum from the LSP to fund the development of problem-solving 'Neighbourhood Solutions'.

- Certain parts of the Leigh and Wigan areas of Greater Manchester were identified as high-crime areas. A detailed GMAC analysis of the conditions in these areas was instrumental to supporting successful funding bids for area-focused problem resolution projects.
- An analysis of problem fire areas across Greater Manchester revealed these to be the same as many high-crime areas. As a result these areas are now targeted with a coordinated deployment between the police and fire service, the impact being a reduction in violent crime in these areas.
- A GMAC-generated analysis product has been fundamental in helping to achieve a 75 per cent reduction in arson in some areas of the conurbation.

Commentary on GMAC

Partnership activity and multi-agency analysis in Greater Manchester was reflective of a common position amongst CDRPs tackling community safety issues. "*We often just jumped in and started at the response stage in an effort to tackle crime and disorder problems, and our performance showed that we were not being very effective*", was the comment of one of Greater Manchester's main stakeholders in crime reduction. The creation of GMAC has changed this. "*Our approach now is one that starts with a thorough scanning and analysis of the problem before we decide and prioritise our responses, which are also now seen through to assessment*" commented the same stakeholder. GMAC's PBM structure appears to be making a significant difference to CDRP activity across the conurbation.

The GMAC system emphasises the generation of good quality analysis products. To do this GMAC has ensured the ingredients of appropriate resourcing are all in place; skilled and trained analytical staff, and training for decision-makers to ensure they understand the role of analysis; good quality data; and a robust IT solution and appropriate analytical tools. GMAC's commissioning approach for the generation of analytical products is also providing an effective model for working:

- it helps to ensure that the focus of the analytical request is maintained on partnership priorities;
- it ensures that careful and deliberate thought is given to identifying the questions that require answering from analysis;
- it provides direction – the analyst is clear on what information is required;
- it identifies which analytical resource is most appropriate to answer the question, or part of the question;
- commissioning helps to manage the workload of analysts.

From an analyst's viewpoint, commissioning also enables an analyst to identify and collect relevant data and information, identify relevant support from the panel of experts that exists across GMAC, identifies the limitations of data and can help point to the adoption of alternative methods of collating information. The strength in GMAC's analytical framework is demonstrated by the content of its analytical products. These are already showing problem-oriented content (rather than being purely descriptive reports).

GMAC has achieved a great deal in a short period of time. It has commendably captured a clear vision, achieved significant buy-in and enthusiasm from Greater Manchester's CDRP partners and is effectively resourced for supporting the analytical requirements of the partnerships. Its comprehensive documentation provides a strong foundation and its planned evaluation is an example to other systems of the need for regular review.

There do remain certain areas that GMAC could strengthen and develop. These include adopting an automated multi-agency performance review function that is complementary to existing GMP performance review facilities, easy to use online facilities for decision-makers to initially explore the nature of crime and disorder problems (for the purposes of helping to commission analysis) and providing information to the public about crime, disorder and community safety in Manchester.

System summary
See Table 3.1 for details of the system's project management documentation and Table 3.2 for details on the system's datasets

System	GMAC	Website	Launched
		www.gmac.org.uk	April 2004
System access	IT solution (LAN-based) • Public access to GMAC website • Local area network accessible via dedicated computer workstations and authorised access	System resources • Direct and dedicated analytical support to each CDRP in Greater Manchester	
Number of users	• 21 authorised users	• Website launched in April 2005 so statistics not yet available on hits per day	
Development since initial launch	• April 2005: Launch of GMAC website • Development in progress: Consolidate and formalise the informal "Virtual Partnership Team" arrangements		
Details of system data	• Updates: GMP data are updated every two weeks. All other partnership data are updated each month • Detail of data: Data held on GMAC contain point level detail about the event but do not identify individuals • Data cleaning: AGMA Policy Unit are contracted by GMAC to source, maintain and develop information from contributing partners and ensure that all data held on GMAC are fit for purpose • Metadata facility: The GMAC IT solution does not offer a metadata facility, but relies on the training that each of the strategic analysts has received and the GMAC Toolkit to understand the context and use of these data		
System IT functionality	Analysis workstations • Comprehensive analytical toolkit containing a suite of products that facilitates analytical requirements • GMAC data hub that is locally networked to analyst workstations GMAC website • Description about GMAC, details on outputs from analysis products, feedback and comment form, links page		
Management support	• Project Implementation Team – responsible for recruitment and training programme; identifying a suitable IT solution, identifying data requirements; plus planning, implementing and communicating the GMAC business process • GMAC IT Project Team consists of GMAC Team and GMP IT. Also pass progress reports to GMP NIM Project Board		
Analytical capacity	• Dedicated CDRP strategic analysts facilitating the generation of NIM-compliant analytical techniques for generating multi-agency intelligence products; Strategic assessments; Tactical assessments; Problem profiles; Target profiles.		
Costs	Three-year funding secured by GMAC totals £2.7M (2003/04 to 2005/06). • IT solution implementation costs (to launch): £75K (includes £20K one-off costs for server hardware and software) • IT solution implementation annual maintenance costs: £12K • Dedicated system staffing costs: £557K per annum • 2005/06 development costs: None at present • Funding Contributors: ten CDRPs, Home Office (via the NIM Implementation Fund and the Crime Reduction Programme), GONW and GMP.		

# JUPITER – Joined Up Partnerships In The East Midlands Region

What is JUPITER and how is it used?

JUPITER is a GOEM initiative designed to create a data-sharing and analytical problem-solving approach (utilising crime mapping) to issues affecting crime, disorder and social inclusion. It is one of the longest established systems for information sharing in England and Wales (commencing as one of the Home Office national pilot systems for information sharing), formally implemented in April 2001. JUPITER operates via a network of five county coordinated satellite sites – Derbyshire, Leicestershire, Lincolnshire, Nottinghamshire and Northamptonshire. Each site supports the county community safety structure and their local district CDRPs. JUPITER sites also exist in some district CDRPs but are mainly located in the large urban centres in the East Midlands (e.g. Nottingham).

Each of the JUPITER sites, while consistent in their objectives, has grown and developed in slightly different ways. All sites provide a staffing resource that facilitates information sharing and analysis by utilising an IT solution. These IT solutions tend to be desktop based and consist of data-cleaning tools, a GIS, statistical analysis software and database software. Analytical products that the JUPITER sites generate include regular statistical reports on crime and community safety trends, area profiles, and support for auditing.

Figure 3.4: JUPITER in Nottinghamshire public mapping site

JUPITER in Nottinghamshire service an interactive mapping application that the public can use for identifying neighbourhood patterns in community safety. (www.jinpartnership.org.uk)
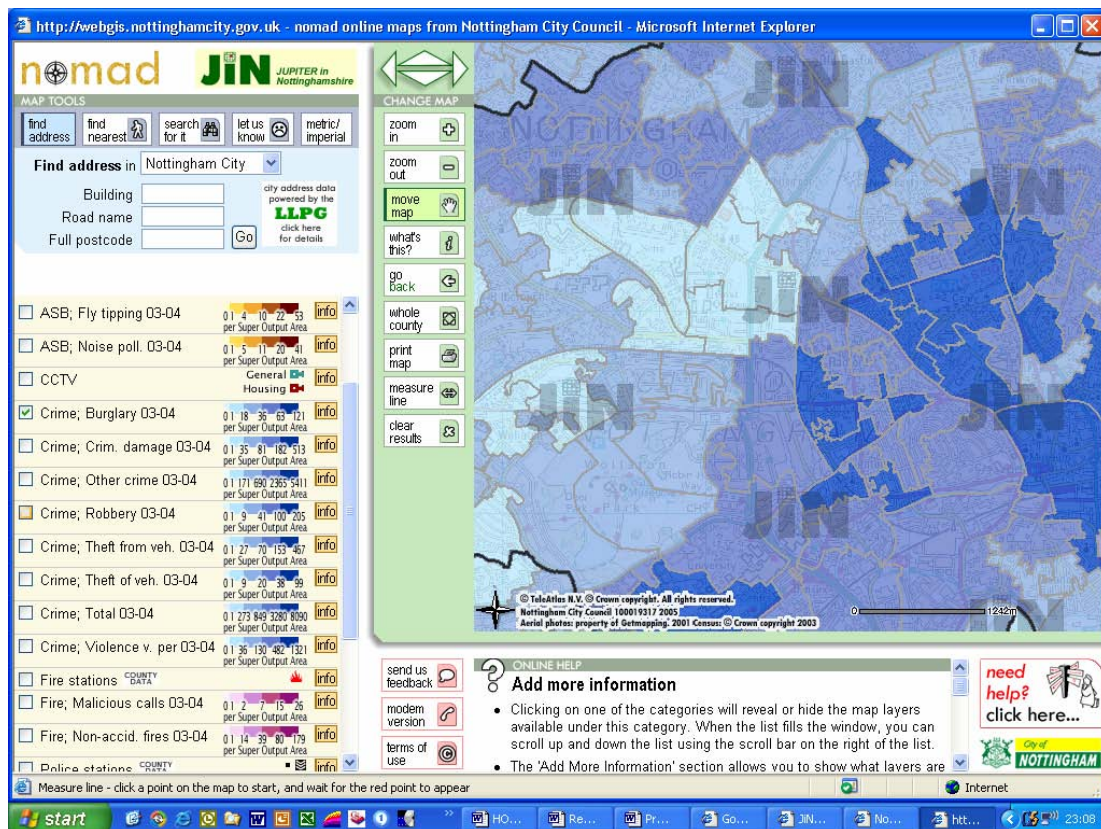
Some sites such as Nottinghamshire have also developed an internet presence, providing an interface that allows the public to visualise and interact with maps that show crime and other community safety datasets such as anti-social behaviour incidents and fire incidents (see Figure 3.4).

How was JUPITER specified, implemented and developed?

JUPITER was one of the first major programmes to be initiated on the creation of the GOEM Home Office Team in 2000. Based on a GOEM vision and desire to support CDRPs in the East Midlands region with a data exchange and crime mapping network, a survey of the partnerships was conducted to review their capacity to map and exchange information. This survey helped inform a requirements plan and model for implementation that was based around establishing county hubs, and was evaluated by an independent feasibility study. While certain aspects of the plan were seen as being over-ambitious and required further consideration, the study endorsed the approach that the East Midlands were planning to adopt. The feasibility study also recognised that:

- IT solutions were required that were achievable, cost-effective and scalable;
- there was a lack of analytical skills, technical expertise and data to support the JUPITER vision and therefore there was the need for improved and consistent data collection and a better understanding of what needed to be collected and exchanged;
- success required shared ownership of the development of processes for exchanging information;
- incentives were important to encourage partnerships to buy-in to the project.

In April 2001 Project JUPITER was implemented. The implementation model followed the three-tier approach with the region's county councils acting as the connecting points for the exchange and analysis of community safety data between their local CDRPs and GOEM. Significant funding was allocated by GOEM to support the provision of a hardware and software infrastructure, and staff (mainly analysts). This financial support helped to initiate the necessary buy-in from the CDRPs and County Council's, encouraging the partnerships to develop an improved information sharing framework and problem-solving approach. At this time JUPITER became a leading light for GIS-based information sharing systems and its experience was a significant contribution to the Home Office guide, 'Data Exchange and Crime Mapping' (available at www.crimereduction.co.uk/technology01.pdf)

Much was achieved in the first few years of JUPITER, however there was little understanding about the real impact that JUPITER was having. An independent evaluation of JUPITER was then commissioned and identified several lessons learned from the project's implementation, including that the take-up of information sharing and analytical resources had been patchy. The evaluation found that the model itself was not in question, but helped provide a clearer steer to JUPITER's second phase (from 2003 to 2005) – that by January 2005 the following should be adopted:
- all five counties to create an information hub;
- an East Midlands Data Exchange Forum should be created where JUPITER analysts and other individuals involved in Jupiter would meet; and
- funding for JUPITER would be mainstreamed into the CDRPs.

JUPITER has achieved these objectives and is now establishing its vision for the next three years to help its continual development.

Perceived impact of JUPITER

JUPITER has had a significant impact in improving information sharing across the East Midlands:
- all five counties now operate and maintain a community safety information hub, resulting in 100 per cent coverage and access to data for CDRPs across the region; and
- all counties are resourced with a dedicated team of JUPITER analysts that provide support to the CDRPs in their county.

The JUPITER sites have developed to be essential tools for brokering information exchange between CDRP agencies and operate as an enabler for providing and interpreting information on crime and community safety.
- JUPITER's impact has included supporting and simplifying the auditing process, including supporting a continual trend review process that is timely for identifying problems.

- JUPITER has been a spur towards supporting a more partnership-based focus and response to crime and disorder issues, helping to overcome many of the previous silo attitudes. This has included helping to raise awareness of the benefits of information sharing and analysis to partners that have previously been poor contributors. For example, statistics generated by a JUPITER site identified that 30 per cent of all violent crime in the area was associated with domestic violence. This evidence acted as a useful persuasive tool to ensure certain partners were engaged in a multi-agency response to the problem.
- It has introduced a more coordinated and consistent approach to analysis.
- It has enabled CDRPs to be better informed, providing a broader and better quality interpretation of community safety problems.
- It has begun to help move the problem resolution approach to be one that is more proactive, rather than simply reactive.

Even though JUPITER has become one of the more mature and established systems, documented evidence on its impact in supporting reductions in crime and disorder and improving community safety are sparse. Examples of analysis products that have helped achieve some successes in the East Midlands include:
- analysis of a drugs problem that was performed by the Northamptonshire JUPITER site provided the supporting evidence to a drugs project funding bid that was successful in being awarded £75K;
- analysis of a distraction burglary pattern revealed that approximately 90 per cent of victims were householders over the age of 70 years which proved useful in engaging with the local councils' housing departments to target an awareness-raising campaign, plus advice and guidance to this vulnerable group.

Commentary on JUPITER

JUPITER has learned many lessons that other systems can benefit from (these are included in Chapter 4). It has been effective in establishing a framework for information sharing and analysis, and in many ways demonstrates its maturity by no longer being considered as a 'system' but a fundamental mechanism and part of the culture to community safety partnership working in the East Midlands. There does though continue to be the need for JUPITER to ensure that core datasets are developed and collected in a standard way and that its focus is oriented towards delivering analytical products that support CDRP responses to community safety issues.

JUPITER's analytical products at present tend to be descriptive rather than problem-oriented and explanatory. Visits to JUPITER sites saw that this was more to do with an evolutionary process to partnership activity and analysis skills development, rather than being a problem that related to data and the level of analytical resources available. Some of this growing maturity is already appearing – spurred by JUPITER, Northamptonshire, Nottinghamshire and Derbyshire were selected as the pilot sites for an innovative Home Office-funded prospective mapping approach that is quickly having an impact on how the local partnerships tackle residential burglary issues.

JUPITER is managing to succeed against an ambitious original agenda, supported in part by the clear championing and vision by the region's Home Office Director. In the future it has great potential to continue to grow as a fundamental mechanism for CDRP activity in the East Midlands, but its true value will be more clearly recognised once it begins to evidence not only how it is improving the way partnerships work, but also how it is an imbedded part of the region's partnership culture.

JUPITER's maturity has also advanced a trend that several other systems are beginning to follow. That is the application of GIS-based information sharing systems can be wider than just supporting community safety. For example, others in GOEM and across the East Midlands are realising what is available via the JUPITER sites and how they can be used to support Local Area Agreements, Local Strategic Partnerships, Neighbourhood Renewal programmes and the Neighbourhood Policing agenda. In part, realising how JUPITER can be used in this way is due to its flexibility where dedicated resources at each of the county hubs

can quickly accommodate local agency requirements. Indeed, it is commendable to see that the JUPITER sites are encouraging these opportunities to ensure that the region's CDRPs are proactive in their engagement with these other government agendas.

System	JUPITER		
		Websites	**Launched**
		www.jinpartnership.org.uk www.research-lincs.org.uk www.compassunit.com www.saferderbyshire.gov.uk	April 2001

System access	IT solution • Local information hubs are accessible via desktop computer workstations and authorised access • Nottinghamshire provide a public access website to crime and community safety data **Websites** System resources • Direct and dedicated analytical support to each CDRP in the East Midlands
Number of users	Access to JUPITER is unlimited to those working within CDRPs in the East Midlands
Development since initial launch	JUPITER has been through a process of continual improvement to the facilities and services offered from each site. This has included the upgrading of tools on computer workstations, additional staffing appointments, and skills development. Future developments in JUPITER will typically be in line with the multi-agency e-Government agenda.
Details of system data (data between JUPITER sites varies. These details are representative of the standards at each site)	• Updates: Police data are updated daily, others are usually updated monthly • Detail of data: Point level data about the event are provided to each JUPITER site but does not identify individuals • Data cleaning: Data cleaning is performed by the JUPITER sites on all point data supplied by CDRP partners • Metadata facility: Metadata is typically made available when data are delivered, but does also rely on the knowledge that each of the analysts has built up to understand the context and use of these data
System IT functionality	Analysis workstations • Comprehensive analytical toolkit containing a suite of products that facilitates analytical requirements • County data hub that is locally networked to analyst workstations
Management support	• East Midlands Data Exchange Forum, chaired by GOEM
Analytical capacity	Staffed resources • Dedicated CDRP support from JUPITER analysts
Costs	Between 2001 to 2003 GOEM allocated approximately £1M in funding to the JUPITER sites. By 2005/06 almost all funding requirements will have been mainstreamed to the CDRPs across all 5 counties. Funding allocation has been different for each site but to illustrate typical costs for the set-up of each county, costs for Derbyshire are provided below. • IT solution implementation costs (to launch): £70K (24 sets of JUPITER hardware and software) • IT solution implementation annual maintenance costs: approximately £6K • Dedicated system staffing costs: £225K per annum (6 dedicated JUPITER staff) • 2005/06 development costs: No planned development. Any development requirements aim to make use of existing mainstreamed resources or are proposed in funding bids • Funding Contributors: Main funding support was initially from GOEM and the Home Office (via the former PBM fund that includes funding drawn from ONS NeSS for the supply of small area recorded crime data), but will be mainstreamed in all sites by 2005/06

LASS – London Analysts Support Site

What is LASS and how is it used?

LASS is an extranet-based system managed by the Government Office for London (GOL) that grew from recognising the needs for quality data to facilitate the information requirements of London's CDRPs and partner agencies. One of the recognised key resources to community safety work in London is the analysis community. Most of London's CDRPs have dedicated analysts, with many also positioned in other local and pan-London partner agencies.

A common problem that analysts in London often face is access to information at the level and quality that matches their agency's requirements. Many of the CDRP analysts can access some datasets locally but often struggle to access data from certain partners, including any pan-London data. An additional problem in London was the level of resource required by pan-London agencies to support data requests. For example, these agencies could receive 33 different requests from the 33 CDRPs, plus many other requests from other agencies. As a result LASS was developed to support and complement information sharing for London's CDRPs and partner agencies, helping to ease the processes of information sharing, reduce the data supply demands on pan-London agencies, and offer a common performance management reporting service in an application-neutral environment to support the analytical community.

LASS is managed by a Project Manager and a Lead Developer, both of whom are staffed at GOL. These two staff are responsible for ensuring that data populated on LASS are fit for purpose, plus also develop and maintain all the technical features of the site. These staff are also assisted by a crime information analyst whose role includes testing for the appropriateness of data that are to be populated in LASS and also help establish priorities for future data demands and the LASS toolset. A project support officer also joined the LASS team in March 2005.

Data held on LASS can be queried and selected by area, time and content through a form-based interface, and downloaded to the analyst's own computer. LASS is also at the stage of prototyping a mapping interface and online analytical tools that include a performance reporting function.

How was LASS specified, implemented and developed?

LASS initially emerged in 2003 as an interim solution to replace the discontinued London Information On the Net (LION) system. LION had failed for a number of reasons (Stockdale *et al.*, 2002), but its demise meant that the information requirements of CDRPs across London remained unmet. A consultative group of six CDRP analysts was formed and was used to identify and specify the demands of a CDRP information support system. The consultation identified the need for a London warehouse of relevant data for CDRP work, with the ability to easily access and query data, automate performance review reports, and download data, allowing analysts to have more time for analytical tasks rather than data processing and performance review tasks. GOL also recognised that the majority of the analyst community already possessed many desktop analytical tools so the need for online data analysis functionality in a system was not a priority.

The initial consultation included a review of the lessons learned from LION and looked to draw benefit from the information content that had been sourced for LION. The review of LION also decided that there would be no benefit in using any of its IT solution. This review and consultation led to the building of LASS. The development of LASS was also alongside a training programme in crime mapping and problem-solving crime analysis for all the CDRP analysts across London.

Perceived impact of LASS

LASS is being used by a wide analytical community in London to help them improve the information content they have for their analytical tasks. LASS has been useful in the following ways:

- has made it easier to access certain partner data that were previously difficult to access, e.g. ambulance service data are proving useful to help explore issues that relate to drugs and alcohol;
- supporting the production of all 33 of London's CDRP audits;
- enabling an easier and more effective comparison and benchmarking approach across London, plus facilitating cross-border analysis, cross-agency analysis and analysis within and between family groups, e.g. LASS supported the production of the London Crime and Disorder Audit 2004;
- providing a data cleaning mechanism that not only adds some quality assurance to the data that are available through LASS but also improves the quality of data for the contributing agency's own use; and
- standardises the data collection process, particularly in terms of only requesting one slice of data from each contributing partner, rather than these partners handling numerous requests from individual CDRPs.

LASS is also helping to facilitate cross-agency work between a number of London's pan-city agencies including a drug treatment and testing order pilot for assessing drug test results per offender, a serious injuries analysis project that is running in six Accident and Emergency departments in London and the preparation of drug intervention programme reports for the police, probation, NTA, GOL, CPS, magistrates' courts, prison service and ODPM.

Commentary on LASS

Access to data continues to be one of the main barriers to partnership information sharing in London, with its knock-on effect affecting partnership activity. LASS has removed much of the demand that was apparent on pan-London agencies for supplying data to each individual requesting agency. LASS's data query and download tools are commendable, delivering an easy-to-use mechanism for analysts to identify, select and source relevant data. The supporting metadata facility is also a particular strength.

However, data that are held on LASS often lack the content and timeliness for many analytical tasks – an issue the LASS team recognise and hope to address. Several datasets are accessible at good resolution for analysis, but it is concerning that the main dataset – police crime records – is only available as aggregate counts to the borough level. This was in part based upon the priorities identified by the original focus group members (many of London's CDRPs already had good information sharing processes in place with their local Metropolitan Police boroughs) and Metropolitan Police sensitivity in pan-London data sharing. Additionally no information on offenders, victims or police incidents are available on LASS – data that are common on other systems. Access to only coarse, aggregated crime information restricts CDRP efforts for cross-border analysis, cross-border partnership working and comparisons with other areas across London. Recent efforts by GOL claim to be attempting to address this issue. Part of this will require GOL to learn from the experiences of other systems – in comparison to other systems the information processing and management role of LASS is under-resourced – and invest in resources to improve the timeliness, content and sourcing of data that are relevant for CDRP activity in London.

The volume of analytical resource across London's CDRPs is impressive (i.e. most of the 33 CDRPs have a dedicated analytical resource), but much of it is still being used for performance review and descriptive analysis, with very little apparent problem-solving analysis. This was evident from the lack of documented examples of LASS's impact for reducing crime, disorder and the misuse of drugs. The CDRP analysts do operate their own Forum to try to build contacts and share good practice, but the lack of analytical resources within LASS compared to other metropolitan systems means that the opportunity to help steer, support and capture the impact of the London partnerships' analytical uses of LASS are being missed. Additionally, while LASS makes pan-London data available to those that use the system, there is very little dedicated analysis resource at GOL for exploring pan-London and cross-border multi-agency issues.

LASS continues to develop and its reporting tool that will be released in the next version offers several useful facilities for semi-automating the performance review requirements of London's CDRPs.

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System summary

System	Website	Launched
System		
System access	LASS	
	Website	**Launched**
	https://195.224.106.162/lass33/	July 2003
	• IT solution (Internet-based) • Password protected access to authorised section	• System resources • Analyst supporting the requirements of CDRP analysts
Number of users	• 150 registered users	
Development since initial launch	• August 2004 – Improved functionality and addition of datasets	
Details of system data	• Updates: Data updates are usually made every month or every two months • Detail of data: Several datasets are available at point level, while others are only available as aggregate counts at OA or local authority level • Data cleaning: Data cleaning is performed by the LASS Team on all data supplied by CDRP partners. • Metadata facility: Comprehensive metadata is automatically generated with any data that are downloaded. This is in addition to the metadata for each dataset that is listed in the online help files. Metadata includes, title, description of dataset, data time period, geographic coverage, frequency of updates; Date, time and name of user that downloaded data; Supplier details, data field content and explanation of content; and terms and conditions of data use	
System IT functionality	• Data query and download facility for datasets held in data warehouse • Dynamic, automated metadata for all data downloads • Dataset status bulletin list, providing updates of data held on warehouse • Forum/library on which useful documents are available	
Management support	• LASS does not have a steering group but funding and expenditure is approved with support of senior staff at GOL	
Analytical capacity	IT System • None Staffed resources • None	
Costs	• IT solution implementation costs (to launch): £175K • IT solution implementation annual maintenance costs: £3.2K • Dedicated system staffing costs: £195K • 2005/06 development system staffing costs: £50K • Funding Contributors: GOL (Home Office Directors Allocation), GOL (Drug Intervention Programme fund – £20K on one occasion), Home Office (via the former PBM fund that includes funding drawn from the ONS NeSS for the supply of small area recorded crime data)	

NERISS – North East Regional Information Sharing System

What is NERISS and how is it used?

NERISS is a Government Office for the North East (GONE) inspired extranet system designed to permit the mapping, interrogation and tabular download of depersonalised crime, disorder and community safety data at an aggregated level. NERISS supports 25 CDRPs, and receives data from three police forces, three probation services, four fire brigades and two ambulance services, the regional Public Health Observatory, as well as Local Authorities and DATs. Its purpose and application is to:

- provide multi-dimensional local area profiling;
- help facilitate information sharing within local partnerships;
- support the production of Crime and Disorder Audits and Crime and Disorder Reduction Strategies;
- enable better monitoring and evaluation of interventions;
- provide evidence in support of funding applications; and
- review performance against best value performance indicators.

NERISS is led by a Project Manager based at GONE. The system's IT development, information sharing and analytical roles are performed via a sub-contracting arrangement between GONE and a number of local and sub-regional agencies. The City of Sunderland Council host, maintain and develop the NERISS IT solution and manage data that are loaded onto the system. A tier of sub-regional public agencies manage the sourcing of data and information processing requirements, plus also provide some analytical support to local CDRPs. NERISS funds approximately ten staff across this support tier of sub-regional agencies.

NERISS users include the CDRPs, LSPs and DATs across the North East, partner agencies, sub-regional research observatories and GONE. Users of NERISS can view and query data via a GIS-based interface and download data as aggregated counts by geographic administrative areas (e.g. Output Areas, wards, police sectors). The system also provides a drawing tool to enable the user to define a geographic area for data interrogation.

How was NERISS specified, implemented and developed?

NERISS began in 2000 as one of the Home Office national pilot systems for information sharing between local partners. Its early development was led for GONE by Sunderland City Council's IT department with support from a contracted GIS systems provider. In time, its development ensured it was more consultative of the North East's CDRP demands and had buy-in from many of the other regional and sub-regional agencies that support crime and disorder information sharing and reduction initiatives. Its development is intended to be based on user demands where feedback is gathered at workshops and via meetings with CDRPs.

Perceived impact of NERISS

NERISS is one of the longest running of the systems included in this review which has achieved various things since its initial implementation.

- It has facilitated the technical process of data exchange across the large geographic area of the North East of England.
- It has dedicated resources to data cleaning to ensure that data published on NERISS are quality assured. This cleaning also benefits the contributing source as they can access the improved data from the sub-regional agency for their own use.
- The organisational framework of NERISS has been effective in helping economise data processing tasks, has improved the availability of data and has helped data become regionally consistent.
- Crime and disorder data quality improvements have assisted the sub-regional agencies in improving the content of their statistical returns to the regional office.
- Supported the production of Crime and Disorder Audits and Strategies, plus also supported the local Fire and Rescue Services in the production of their Integrated Risk Management Plans.

- Helped to improve inter-partner working.
- Acted as a forum to better enable the sharing of ideas between its network of users.
- Helped to more clearly identify the sources and range of datasets that are available for use.
- Provided a single place/mechanism for CDRPs to access data and use them to support their strategic performance role.
- Its inclusive organisational framework of other public sector bodies has encouraged and activated these bodies to better engage and transfer skills and expertise.
- NERISS has provided a number of spin-off benefits for public agencies across the North East. For example, NERISS helped facilitate dialogue for the exchange of gazetteers between local authorities and the police.

The development of NERISS has also been conscious of systems that have also now been developed in the North East, in particular avoiding any reinvention or duplication over systems that may provide for more local agency requirements. These other local systems have been created not to replace NERISS, but complement the regional and cross-border information that NERISS provides.

Commentary on NERISS

NERISS has commendably developed a strong regional information sharing framework for the North East, utilising an IT solution that may not be rich in functionality when compared to other systems, but is streamlined towards accessing and exploring data it holds on its information hub. Indeed, NERISS has evolved to be more than just an IT system and become a structure and process for delivering partnership working in the North East. This has been achieved by tailoring its support services to the varying needs across the region.

The approach of containing the significant task of information sharing processing and the information management role within the sub-regional government agencies in the North East is a cunning and practical solution that has helped achieve buy-in from stakeholders. It has meant that valuable information sharing skills have been developed in the public sector and has created a framework of partnership activity support. Similarly, the control of IT systems development and hosting within a public service in the North East (City of Sunderland Council), albeit with support from a GIS service provider, helps to engineer commitment and active participation in joined-up working. This approach has also achieved good value for money through the creation of public sector posts that support the system, provide direct resourcing support to sub-regional and local agencies across the North East and enables more effective target training and data requirement needs to be addressed. It also provides for a more sustainable platform for information sharing as opposed to relying on local goodwill or committing resource via private consultancy input. The sub-regional agencies are also a good place to pilot new development areas for NERISS. For example, one of these agencies (Tyne and Wear Research) is piloting the use of an online public access facility for viewing and querying community safety information and area trends.

Since its launch NERISS has made use of a data security fob to help protect access to data held in its warehouse. This security fob is a tool that is additional to firewall security that is maintained on NERISS. A number of commentators have regarded the use of security fobs as excessive. For NERISS, what is evident is that these security fobs have offered vital peace of mind to those that are contributing data, and proving to be extremely helpful as a mechanism in initially bringing on board data contributors who are nervous over releasing data. This secure site facility has also made it possible to develop another recent service in the form of a secure bulletin board (GAIN – Government Agency Intelligence Network), which will provide for the initial exchange of unsanitised intelligence between government agencies on a range of issues e.g. drugs and Child Protection.

On the back of this information sharing framework NERISS has built a rich information warehouse. However, certain aspects of the warehouse require refinement and further development. For example, data updates should be monthly with a lag of a maximum of one month, and data downloads by authorised users should contain the detail held in data records and not just aggregate counts. This will ensure that data held on NERISS is much more

applicable for local CDRP needs. Evidence of this problem is in the lack of documented examples that demonstrate in the four years that NERISS has been in operation how NERISS is supporting local crime and disorder reduction.

The use of NERISS for analytical and problem-solving purposes also requires development. At present the role of the sub-regional tier of agencies is dominated by information processing requirements rather than providing a significant analytical role to the CDRPs and other partners. Many CDRPs across the North East cannot afford a dedicated partnership analyst, but the NERISS-funded posts at each of the sub-regional agencies should be encouraged to more actively (and proactively) support these analytical requirements. It will also require the content of analysis outputs to not only be descriptive but more problem-solving oriented and explanatory in their outlook. To do this it will require GONE to encourage and support this direction to crime and disorder analysis, and ensure the information sharing processing role becomes more streamlined and that data held on NERISS are more relevant for supporting local problem-solving analysis.

See Table 3.1 for details of the system's project management documentation and Table 3.2 for details on the system's datasets

System	Website	Launched
NERISS	www.ukdatashare.com	July 2000

System access	IT solution (Internet-based) • Internet, password-protected access to NERISS System resources • Access to analytical support from the sub-regional agencies is on request
Number of users	• 240 registered users
Development since initial launch	• Regional scoping exercise to identify user preferences and workshops to identify system improvements • New, larger server to accommodate increase in users and expanding range of datasets, including the collection of point data • Improved user-friendly interface and improved data input facilities
Details of system data	• Updates: Frequency typically varies from monthly to quarterly for different datasets • Detail of data: Data held on NERISS is at point level but is disseminated in aggregate count format at either the administrative geography level (e.g. OA and above) or for user defined-areas • Data cleaning: Data cleaning is performed by the sub-regional agencies contracted to NERISS. • Metadata facility: Includes: Title, description of dataset, data time period, geographic coverage, and frequency of updates; Date, time and name of user that downloaded data; Supplier details, data field content and explanation of content; Terms and conditions of data use
System IT functionality	• Data query, map view, aggregate tabular view and download of aggregate table • Contacts directory and links page
Management support	• NERISS is managed by a Technical Group and a Strategy Group.
Analytical capacity	IT System • Single and multiple map layer view tools to allow for visual comparisons between data • Spatial data query tool to view table of aggregate information for chosen data layer • Freehand selection tool to allow user to draw specified area and view table of aggregate information Staffed resources • Analytical resources available via the sub-regional agencies that are contracted to support NERISS
Costs	To date, NERISS has cost £1.7M (from 2000/01 to 2004/05) • IT solution implementation costs (to launch): £380K • IT solution implementation annual maintenance costs: £31K • Dedicated system staffing costs: £433K per annum • 2005/06 development costs: £113K • Funding Contributors: GONE (via PDF and Building Capacity Fund), Home Office (via the former PBM fund that includes funding drawn from ONS NeSS for the supply of small area recorded crime data). CDRPs, LSPs and DATs are currently being engaged with a view to contributing to the annual operating costs of £400k – the estimated annual sustainability cost, with all capital developments now in place.

NWRCMS – North West Regional Crime Mapping System

What is the NWRCMS and how is it used?

The North West Regional Crime Mapping System is a Government Office for the North West (GONW) and North West Development Agency (NWDA) funded internet-based system designed to provide a regional data warehouse and crime mapping facility that is directed at supporting strategic decision-making and planning within the NW crime reduction community. Its use is targeted towards three particular groups.

- GONW – to provide a region-wide synopsis of crime patterns that are unconstrained by artificial administrative boundaries, enabling the GONW Home Office team to better target resources and measure progress against Home Office key performance indicators and its Business Plan.
- CDRPs – to enable police forces and other agencies to standardise and safely share their data. A regional system will help to better identify and address cross-border patterns, allow for better benchmarking between the North West's 43 CDRPs by finding the most appropriate comparators irrespective of sub-regional boundaries, and enable the development of 'early warning systems' that alert partners to emergent crime trends in neighbouring areas. Its use is also to provide general access to GIS.
- Other partners – in the longer term to act as a source of depersonalised, aggregate crime data for use by other partners such as universities, business associations, community and voluntary groups.

The NWRCMS was included in this review because its planned launch date was April 2004. However, due to issues that include problems over the data sharing agreements between GONW/NWDA and the North West's police forces, the system has yet to go live. While the NWRCMS was not operational at the time of this review, its planned use, key functional features (including the full IT solution of the system) and an assessment of its information sharing processes could be reviewed in line with the other systems. Its inclusion was also seen as important to review how the content and functionality of a regional system could complement existing local or sub-regional systems (e.g. GMAC).

Fifty-eight registered users of the NWRCMS have been identified and involved in its development through a range of workshops that have been organised by the system's IT developers. These workshops also captured these users' current requirements for information sharing and analysis. These users include at least one user from each of the North West's 43 CDRPs (50 users in total), five from the region's police forces and four users from GONW.

The NWRCMS offers a comprehensive range of GIS-based functions for querying and exploring patterns of crime, offering tools that are usually only seen in desktop PC GIS software. Only police crime records will be available when the system is initially launched.

Currently the NWRCMS is not resourced with a dedicated project manager from either GONW or NWDA and the role of data sourcing and data management is performed by the system's IT service provider. It is currently unclear who will take on the data management role in the future.

How was the NWRCMS specified, implemented and developed?

The NWRCMS has been developed as a result of GONW identifying the need for a regional crime mapping and information sharing system. Local systems in the region, such as CUPS (in Cumbria) and MADE (in Lancashire), had already begun to demonstrate the role that these systems could play in supporting partnership activity. A regional system would aim to complement these local systems, but also aim to provide a solution that would meet the information sharing and crime mapping needs of all the other CDRPs and partner agencies across the NW. The NWRCMS has since been developed based on an invitation to tender.

Commentary on the NWRCMS

The development and implementation plan proposed by GONW and NWDA appears to have been over ambitious. It was initially hoped that all agreements on crime data supply, its

processing and the system's development would be completed in a four to five-month period. Lessons do not appear to have been learned from the development of other similar systems which have taken several years to evolve. This was also compounded by a lack of dedicated system project management from GONW.

The functionality of the NWRCMS IT solution is comprehensive (see System summary for NWRCMS). Its range of features is more akin to a desktop GIS rather than an internet GIS solution. This may make the IT system appear impressive, but experience suggests that the tools on offer are too sophisticated for the majority of the system's registered and prospective users. The solution appears to have been designed and is more suited to the analysis community, but with this lays three problems.

Firstly, nearly half of the system's registered users stated that they never or only rarely use a GIS. Typically, not all the CDRPs across the NW will have dedicated analysts. It is therefore likely that some of these CDRP registered users are not trained analysts but instead are those working in a community safety officer role and have been appointed as their CDRP's user. If the NWRCMS IT solution is going to be used by these users then they will need to be reasonably well versed and practised in GIS techniques. This is ambitious, even if training is provided. It is more likely that they will turn away from the system because they find it too complex to use and it fails to give them quick and easy access to the level of information they require to support the main requirements of their role.

Secondly, there is a problem in the design of the system for the analytical user community. It is likely that many from this community in the North West already have desktop GIS software, therefore the functionality offered by the NWRCMS IT solution only duplicates or is superseded by these desktop analytical tools.

The opportunity that the NWRCMS IT solution may then offer is an information sharing facility that enables easier access to timely and comprehensive data on community safety issues. Here lays the third problem with the NWRCMS. There is currently only one CDRP dataset that is held on the system – police crime records. It is commendable that the North West's police forces' crime data are being brought together into a single data hub, but what is unclear is how these data will be kept up-to-date for analytical requirements (rather than the annual update that is currently performed) and how the loading of other community safety will be managed. This problem of accessing relevant community safety information is compounded by an inappropriate function within the system that applies a threshold algorithm in an attempt to avoid the display and download of personal information. In its attempts to do this it seriously limits the clear identification of problem crime areas.

The NWRCMS was included in this review to explore how a regional system could link to emerging and established local systems in the North West. Using the example of Greater Manchester, evidence suggests that GMAC analysts deployed across this area will have very little use of the NWRCMS because their analytical workstations and their access to community safety data far exceeds that which is provided by the NWRCMS. On its own, that there has been no formal engagement between the NWRCMS's IT developers and GMAC is worrying if the NWRCMS is meant to offer best value. Additionally, the development of an England and Wales small area crime dataset that will be annually updated and publicly published by the Neighbourhood Statistics Service from 2006 again only appears to duplicate many of the intentions of the NWRCMS.

The NWRCMS does offer a wide range of geographical analysis functions that may appear impressive, although experiences from the other systems suggests that this functionality needs to be simplified and that more appropriate features need to be developed if its investment is to prove of value to the intended user community in the North West. The data held on the system also need to move towards being updated monthly if they are to be of any practical use. A first step that needs to be taken to overcome many of these issues is for GONW and the NWDA to appoint a suitably skilled project manager for the NWRCMS.

See Table 3.1 for details of the system's project management documentation and Table 3.2 for details on the system's datasets

System	NWRCMS	Website	Launched
System access	IT solution (Internet-based) • Password-protected access to authorised users	No website System resources • None	Delayed launch since April 2004
Number of users	• 58 registered users		
Development since launch	Not applicable		
Details of system data	• Updates: Data are updated annually • Detail of data: Personal data can be accessed by registered police and GONW users. Aggregate count information (that is subject to a threshold measure that does not reveal values of fewer than ten) are available to other registered users • Data cleaning: Re-formatting of data is performed to ensure data are consistent. Geographic coordinates from source are assumed to be accurate • Metadata facility: Metadata is provided but sparse in content		
System IT functionality	IT solution • Interactive mapping tool that offers many of the functions employed in desktop GIS products • Allows the user to select and view crime data. • Clone map facility allows two maps with different data layers to be compared side by side • Selection tools that allow areas to be selected either by administrative geography or by user drawn/defined area • Interactive interface allows for graph and map features to be selected and viewed simultaneously (e.g. bar of graph is selected and the area on a map that it relates to is displayed)		
Management support	NWRCMS Steering Group (Chaired by GONW)		
Analytical capacity	IT system • Offers a comprehensive range of GIS-based data query, thematic mapping and graphing tools • None Staffed resources		
Costs	• IT solution implementation costs (to launch): £95K • IT solution implementation annual maintenance costs: £6K • Dedicated system staffing costs: None • 2005/06 development costs: Not yet specified • Funding Contributors: GONW and NWDA		

Project Dragon – Welsh Assembly

What is Project Dragon and how is it used?

Project Dragon is the information infrastructure for crime and disorder reduction in Wales. Its principal objective is to help reduce crime and disorder by enabling a rapid and more effective exchange of information between CDRP practitioners and partner agencies. The Project Dragon team, based at the Welsh Assembly, develop and provide custom-built analytical software toolkits which draw from a multi-agency information hub that the team also maintain. The analytical toolkits have been developed and customised to meet particular user requirements and are deployed across the user agency's individual intranets. Data at the information hub are processed according to the users' demands, both in terms of the range of data that are available and their timeliness – for certain applications Project Dragon facilitates daily updates.

The Project Dragon team is headed by a Principal Investigator. The Principal Investigator also programmes much of the software code behind the analytical toolkits and any customised data processing solutions. The team also includes a Senior Analyst (who coordinates the data management requirements) and an Analyst. Two support staff are also contracted, when required, to support certain technical requirements such as the installation of the security features within the toolkits.

Project Dragon identifies three distinctive user groups; strategic; analytical; and operational users. Project Dragon's facilities are used in operational scenarios to support briefings to front line officers, and support responses to particular incidents. The Project Dragon team also supports demands for analysis and technical support.

How was Project Dragon specified, implemented and developed?

Project Dragon has developed out of the desire of the Welsh Assembly to directly support CDRPs and individual partner agencies in sharing information. Rather than turning to commercial solutions, Project Dragon has invested Home Office funding in developing custom-built analytical toolkits. As the toolkits have been developed using Home Office funding, the intellectual property rights and programming code are owned by the Home Office.

Project Dragon has no formal documented needs analysis, specification or development plan that sets out its strategic direction, action plan or milestones. It has been allowed to develop freely, based on its policy of open dialogue with its users and their service requests.

Perceived impact of Project Dragon

The Project Dragon information structure is supporting multi-agency front line requirements as well as the more considered strategic requirements of CDRPs. Examples of its use include:

- The police briefing toolkit is providing both a crime and partnership data view (e.g. prison service releases, probation service orders, and housing voids) of local community safety issues;
- Providing timely support to police operations – for example, Project Dragon supported a police response to a firearm incident, helping to pull information from many different sources to identify the people involved and inform the tactics for the response;
- Identifying anti-social behaviour and environmental crime problems – this has helped develop the need to fast-track service responses to deal with problems such as abandoned vehicles;
- Has actively supported the auditing process, especially in terms of using the information hub as the source of partnership data;
- Supporting community safety strategies;
- Supporting other local programmes – Project Dragon has been used in Cardiff to identify crimes and ASB problems around shopping areas to ensure that resources are aligned to the sustainable communities agenda;
- Project Dragon is supporting a fire and police partnership approach to fire reduction in Mid and West Wales, enabling the identification of cross-agency issues and coordination of tasked responses;

- Providing the South Wales Probation Service with dedicated analytical support for profiling offenders, probation orders and probation licences.

Anecdotal evidence suggests that Project Dragon is helping partnership working to become better informed and indeed South Wales Police claim that the fall in recorded crime by 12 per cent between March 2003 to February 2005 is due in part to the timely and informative crime and partnership data focus that the Project Dragon toolkits provide to front line police officers. However, documented examples that demonstrate this direct impact on crime and disorder are thin.

Commentary on Project Dragon

Project Dragon offers both an operational and strategic information sharing infrastructure between CDRP partners that is not replicated in any of the other systems. Its daily updates of police and other key operational datasets means that it can support an active front line multi-agency approach to crime and disorder issues. While it is not the formal mechanism for police users to deliver NIM Intelligence Products, it is helping agencies such as South Wales Police become more focused in their operational analysis, become more information-driven in their tactical responses and is supporting a mechanism in which CDRP partners can more proactively keep each other better informed on issues that require attention. For example, the timely daily exchange of information between Probation, the Prison Service and the Police helps to monitor prison releases and supports partnership prevention responses to re-offending.

Out of all the systems reviewed, Project Dragon tends to be the most misunderstood. Project Dragon *is* enthusiastically promoted by its team, but its lack of any formal project management documentation and promotional material means that it suffers when it comes to explaining to others what it does, what it achieves, the impact it is having, and how it can be repeated and implemented as a solution elsewhere.

Project Dragon's starting point has been unique. All the other systems are designed to support the strategic functioning of their CDRPs, working at an operational level that typically requires data to be updated only monthly rather than daily. Project Dragon's development to service the daily operational requirement of multi-agency working provides an opportunity for others to learn from a mechanism that can support the increasing front line operational requirements of community safety.

However, the structure of Project Dragon is one that is fragile. This is because it is solely reliant on the knowledge that is held by the key individuals in the Project Dragon Team. '*Project Dragon is a huge pilot that is working extremely well … and to date has not required documentation. But for it to move on from this pilot stage and further develop, it needs formalising*' was the comment of one of its main police stakeholders.

One advantage of how Project Dragon works in comparison to other systems is that any necessary IT development can be performed in house, enabling quick responses and development enhancements based on user requests. This overcomes the need for formally specifying and contracting an IT service provider to make changes – a process that can often have a slow turn around and can be expensive.

Project Dragon is also unique in that it is the only system that has been developed purely on Home Office funding. This creates an opportunity but also a dilemma for the Home Office. The Home Office own the IPR on the analytical toolkits and software modules developed by Project Dragon. This presents the opportunity for other CDRPs in England and Wales to freely source these analytical toolkits and software modules from Project Dragon. However, the Home Office is not necessarily set up to fund and facilitate software development, market the software components that are produced, manage their delivery into CDRPs in England and provide technical support to those that implement solutions developed by Project Dragon. And although Project Dragon's staff are answerable to the Home Office and not the Welsh Assembly, their priorities do still remain to the Welsh region.

System	Project Dragon	Website	Launched
		No website	January 2002
System access	IT solution (Analytical toolkits and software modules) • Access to toolkits to users on their agency's intranet and who have registered access to the software module System resources • Analysis and technical support • Development of purpose built toolkits		
Number of users	• Police Briefings Module: 300 (South Wales Police); Unknown (Gwent Police); Unknown (BTP) • ASB Module, Internet version: 50 trial users • South Wales FRS: unknown • Mid-and-West Wales FRS: 50 • Strategic Analysis Toolkit: 25 (Cardiff CDRP)		
Development since initial launch	• September 2002: Pilot - launch of Police Module in Gwent (standalone version) • May 2003: Launch of Police Module in Gwent (Intranet version): Installation at South Wales FRS • November 2003: Installation of Police Module in South Wales (Intranet version) • January 2004: Installation at Mid-and-West Wales FRS • March 2004: Launch of ASB Module (standalone version) • February 2005 – Installation at BTP London HQ • Development in progress: Internet All-Wales Server Solution; ASB Module Internet version		
Details of system data	• Updates: Daily for operational requirements, to monthly for strategic user requirements • Detail of data: Personal data are provided to the Project Dragon Team. Personal data are exchanged to partners to support their operational front line requirements and in certain toolkits to support analytical requirements. • Data cleaning: No data cleaning is performed on data received but all data go through an in-house bespoke automated process to standardise the formatting of data fields before publishing to the information hub. • Metadata facility: Metadata is not provided in the analytical toolkits. However, data are explained in training materials		
System IT functionality	• Toolkits: Police Briefings Module; Multi-agency tactical analysis via toolkits; Operational incident management via toolkits; A trial anti-social behaviour reporting module; Continual auditing for CDRPs via toolkits		
Management support	• No formal Management Group but supported by the Welsh Home Office Director		
Analytical capacity	IT System • Staffed resources • Dedicated analytical support in the Dragon team to support CDRPs and partner agencies, based on requests • The ability to query multiple layers of data and view against each other and produce symbol and thematic maps		
Costs	IT System • IT solution implementation costs (to launch): Since most of the software components are built by the Dragon team, the costs are catered within staff costs. Server set-ups at installation sites do though require review prior to any installation. • IT solution implementation annual maintenance costs: £25K • Dedicated system staffing costs: £160K per annum • 2005/06 development system staffing costs: £25K - £40K per annum depending on requirements • Funding Contributors: The Home Office provide 100% of Project Dragon's funding (via the Welsh Assembly). This includes the former PBM fund and funding drawn from the ONS NeSS for the supply of small area recorded crime data.		

SCaDIS – Surrey Crime and Disorder Information System

What is SCaDIS and how is it used?

SCaDIS is an intranet GIS-based system that is designed to act as a central storage and retrieval point for the collection, analysis and dissemination of community safety data for Surrey's 11 CDRPs, Surrey County Community Safety Unit (CSU) and partner agencies in Surrey. The need for SCaDIS originated from the problems experienced while undertaking the audits in 1998 and 2001 and the desire to move forward with an information-led approach that supported the monitoring of strategies and targets, and improved the capability of Surrey's CDRPs to identify local crime and disorder trends, analyse the causes of crime, inform decision-making and implement long-term problem-solving solutions to reduce crime.

SCaDIS is managed by the Policy, Research and Information Officer based at the Surrey CSU. This person apportions 25-50 per cent of their time towards SCaDIS. Data cleaning tasks are performed by this officer and/or temporary staff.

SCaDIS is used by Surrey's CDRPs, Surrey County Council (Surrey CC), local community partners, Surrey Police and Surrey Ambulance Service. Access is controlled by Surrey CSU and is only possible if the user can connect to the Surrey Council intranet.

The SCaDIS system offers a mapping interface through which users can access and visualise a variety of community safety datasets either at depersonalised postcode precision format or as ward-based thematic maps. Data can be queried and downloaded as aggregate counts by wards or as depersonalised versions of the raw data if permissions for the user allow. SCaDIS also provides a 'management information' tool that generates tabular-based counts of data at either county, district or ward level.

How was SCaDIS specified, implemented and developed?

The need for some form of community safety information repository had been recognised for some time by Surrey County Council, initially after the Audit production process in 1998 and continually up to and including the same Audit process in 2001. A proposal for SCaDIS was drafted by the Surrey CSU which led to the appointment of an IT service provider to develop the system. Resourcing of SCaDIS, mainly to support the project management and information sharing processes of the system were also identified in the original proposal. SCaDIS became operational in 2003.

Perceived impact of SCaDIS

SCaDIS is being used as a starting point to generate ward level community safety profiles. These profiles offer a basis for helping identify certain community safety issues in a standard format across Surrey. In some cases, this information is then built on by sourcing more detailed data from other sources. SCaDIS assisted the production of the 2004 Audits, particularly in terms of saving time in accessing police and other CDRP partner data. However, many users find the system to be restrictive due to data not being current enough and functionality that is not necessarily tailored to the requirements of those who are keen to use the system.

These findings were similar to a survey of SCaDIS users that Surrey CSU carried out after the 2004 Audit production process. The survey found the following:
- SCaDIS was well-thought of but was under-achieving;
- the number of inactive users and relatively low return from active ones suggested that SCaDIS was not regarded as a valuable tool;
- of those that did respond, 45 per cent said that SCaDIS was of 'some use', however, nearly a quarter said it was of 'little use';
- the most useful feature was the mapping interface; and
- many users expressed dissatisfaction over the lack of currency in the data held on the system, their lack of relevance compared to user requirements and the availability of better information existing elsewhere.

There is a core of regular SCaDIS users who do find the system useful but little evidence is available that demonstrates how SCaDIS is having a practical impact in the generation of analysis products and partnership activity. While individual partner agencies such as the police and the fire service have analysts, there are no dedicated analysis positions in any of Surrey's CDRPs. Surrey Police occasionally provide support to certain CDRPs but the clear lack of multi-agency analytical products suggested that SCaDIS was proving to be of little value in supporting partnership problem solving.

Commentary on SCaDIS

SCaDIS is under-achieving. Technically, SCaDIS has the infrastructure to become a valuable system but its lack of resourcing (e.g. it has no full-time project manager) means that it offers little more than an expensive mapping and tabular generation tool for displaying community safety data, many of which are presented in too coarse a fashion to be of any practical use.

The insufficient system management resource to support Surrey's information sharing processes means that the effort that is then put into processing data is often too late to meet the requirements of the majority of its users, and often has no opportunity to seek improvements in existing data or explore the potential of meeting new data requirements. This is then compounded by the functionality of the system not being designed to suit the main needs of its users and delivering data in a style that is restrictive for reviewing, identifying and exploring community safety problems. Added to this is the dearth of CDRP analysis resources across Surrey – SCaDIS contains a comprehensive hub of data but there is very little resource across Surrey's Community Safety Teams that are appropriately skilled to make use of these data for partnership problem-solving analysis. Resourcing the SCaDIS system with a CDRP analyst to support the work of Surrey County Council's community safety requirements and its CDRPs would be a useful and practical step forward.

Stakeholders in SCaDIS need to rethink its purpose and potential to prevent their investments failing to deliver to the requirements of partnership information sharing needs. If supported with adequate resources it has the opportunity to make a beneficial difference to how Surrey's CDRPs share information and analyse community safety issues, review trends, performance manage and reassure the public.

See Table 3.1 for details of the system's project management documentation and Table 3.2 for details on the system's datasets

System	SCaDIS	Website	No dedicated website although general information is at www.surreycsu.org.uk	Launched	April 2003

System access	IT solution (Intranet-based) • Available to officers of agencies that are connected to the Surrey extranet or who are granted dial-in access System resources • Not applicable
Number of users	• 300 registered users
Development since initial launch	• Small enhancements to functionality and addition of new datasets • Proposed developments subject to funding: Addition of police offender data; System functional improvements
Details of system data	• Updates: Data are either updated monthly or quarterly • Detail of data: Unsanitised data are provided to Surrey CSU. It is then made available as aggregate ward counts. If an agency supplied data to SCaDIS, they can access and download these data at the point level, but it is not supplied with geographic coordinates. 'Trusted partners' can access and download other agencies data at the point level (but again without any geographic coordinates) if the supplier has permitted access • Data cleaning: Data cleaning is performed by Surrey CSU on all personalised data supplied by CDRP partners. • Metadata facility: Metadata is generated dynamically based on data that are selected and includes: Title, type and description of data; Time period and geographic coverage; Terms and conditions of use
System IT functionality	IT solution • Interactive mapping tool that allows the user to select and view community safety data. Multiple layers can be selected for visualising comparisons. • Contacts directory of Surrey CDRPs and Surrey CSU. The contacts directory also lists designated officers in each partner agency that is nominated to share personal information where appropriate • Generation of tabular aggregated information for specific user selected wards, districts or the county • Data can be exported by copy and pasting tables that result from a map-based enquiry or tabular selection
Management support	• Initially had a development group when first specified and implemented but this group no longer meets
Analytical capacity	IT system • SCaDIS offers basic scanning functionality that allows data to be visualised as points or thematically as ward patterns Resources connected to the System • None
Costs	• IT solution implementation costs (to launch): £133K • IT solution implementation annual maintenance costs: £13K • Dedicated system staffing costs: £20K (equivalent to 50% of Surrey CSP staff member) • 2005/06 development costs: Proposal for £30K • Funding Contributors: Surrey's 11 CDRPs, GOSE and Surrey CSU (funded by Surrey CC and Surrey Police).

4. Lessons learned from the implementation and use of GIS-based information sharing systems

The review of the nominated GIS-based information sharing systems has provided a valuable opportunity to record many lessons learned that can be used to help the development of new systems and enhance existing systems. Indeed, the system descriptions in Chapter 3 have already identified several strengths and weaknesses in the individual systems and opportunities for their enhancement. This chapter builds on these by recording many of the lessons that have been learned and considers how to approach the development of key factors that influence the success of systems. Many of the lessons that are recorded in this chapter are statements that have been captured from system managers, users and other practitioners from their experiences of their system's implementation and use, and from other studies of information sharing systems (for example, Stockdale *et al.*, 2002).

The lessons learned and key success factors are presented and discussed by grouping into the following categories.
- System technology.
- Data and data sharing.
- The role of analysis.
- Staffing the system and skills development.
- System financing.
- Governance and CDRP business process.

System technology

The systems considered in this review use a range of different technologies. These are summarised as:
- satellite sites with local analytical workstations: JUPITER;
- local area network with local analytical workstations: GMAC;
- internet/extranet approach: Project Dragon (for certain toolkits);
- intranet approach: SCaDIS, Project Dragon (for certain toolkits); and
- internet/extranet approach with local analytical workstations: LASS, Amethyst, CADDIE, COSMOS, NERISS, NWRCMS.

There is not one particular technology approach that works better than others in all situations although strengths in certain approaches can be seen across the systems.
- Intranet-based systems and local area networked (LAN) systems can restrict the number of users that can access the system. In certain situations this may be the desired requirement for restricting access to sensitive data, but in an environment where partnership users are geographically dispersed this approach can constrain its use and development.
- An internet approach offers a useful mechanism for information to be shared and disseminated, with sensitive data being secured via firewalls (in an extranet) to allow access only to authorised users. GIS-based information sharing systems that follow this approach are though limited in the

technical analytical functions they can perform. This is usually due to the large amounts of processing that certain analytical functions require.

- Local analytical workstations can provide a richer and more sophisticated range of analytical tools (compared to web-based solutions) for understanding patterns in community safety data. The workstation approach can operate effectively through either a standalone arrangement (JUPITER), or a local area network arrangement (GMAC).

What appears to work well is where systems combine local analytical workstations with a networked system such as a LAN or a web-based solution. The networked solution can host an information hub where users can access data and where information can be disseminated, with the workstation being the platform on which problem-solving analysis is performed. A web-based networked solution has the advantage over a LAN or extranet approach for acting as a mechanism from which analytical results can be widely disseminated.

System managers should also consider new technology, rather than simply following the technology solutions adopted by existing systems. For example, new options for web-based geospatial technology have become available in recent years. This means that there are new and powerful technologies that are now available that were not present when some of the first GIS-based information sharing systems were built. Enterprise web-based GIS may have been the previous technical solution of choice for systems, but the geospatial functionality offered through Flash and Scalable Vector Graphics technology can be just as viable, more user-friendly and significantly cheaper.

Data and data sharing

Key lessons learned
- *Make data the major asset*: Data should be the major asset of any information-based system
- *Maintain the essential datasets*: If the core and essential datasets are not available from the start, partners will rely on other ad hoc sources. Identify the essential datasets and maintain these. Other data should be collected with a specific analysis or initiative in mind
- *Poor data*: Poor quality data (including poorly geocoded data) and data that are out of date are of little value for analysis, decision-making and performance review. Regular updates of data are required to ensure their value is maintained
- *Dataset consistency*: Datasets need to be consistent with each other and appropriate for the purpose they are used. For example, it would be difficult to perform a problem-solving analysis study on vehicle crime and vehicle arsons if the vehicle crime data is updated weekly and is available at postcode unit precision when the fire and rescue service data is only supplied quarterly and is aggregated as counts to ward level.
- *Avoid areal restrictions*: Areal units change, can be poorly understood and mislead the interpretation of patterns. Avoid constraining the mapping of patterns to artificial boundaries and use techniques instead that are more intuitive such as grid thematic mapping or density surface methods
- *Demonstrate how partner agency data is being used:* The lack of evidence that shows how data can be used to solve problems has led many data providers to feel that their data are either not necessary or are simply an extra demand on their time. Ensure that data that are collected are relevant and document how they are used and their impact
- *Employ a simple and appropriately resourced approach to information sharing*: The information sharing and data processing function needs to be simple, efficient, automated where possible and appropriately staffed. Importantly, the system's process for sharing and accessing data must be easier than existing methods
- *Ensure you have the protocols and data sharing agreements in place before you start designing the IT components of the system*: Before any technology design is specified or begins, the system should have an easy-to-understand information sharing protocol in place. This should be supported with agreements from data providers that describe what will be supplied, restrictions on its use, and frequency of updates.

While each system considered in this review has been customised to support its own specified requirements and hence the data it holds may differ, the review has identified several key factors that

should go towards the selection and maintenance of data and the processes that are used to share data. These involve following a problem-solving approach to data sharing, ensuring that data that are shared are fit for use, and applying appropriate resourcing to the processing and management of information sharing.

A problem-solving approach to data sharing helps to decide which data to store on the system. That is, data should be stored, processed and maintained with respect to identifying community safety problems and supporting decision-making that helps better understand and solve problems. This results in ensuring that data collection is not excessive and that the essential datasets are maintained over peripheral datasets. This problem-solving approach to data exchange also helps to identify data that are most useful and have the potential for increasing buy-in from partner agencies because they see the utility of their data to a particular problem.

Data shared and stored on the system must then be fit for the tasks that they are put to. That is, data must hold the content that is most commonly required to aid problem identification and understanding (e.g. crime data should not just be aggregate counts of records but should contain content such as details on the persons involved, the time and date of the offence, and details on property that was stolen or damaged), it is up to date for the purposes it is applied to (e.g. most data should be updated at least once per month for strategic CDRP problem-solving analysis requirements), and are available at a high geographic resolution (e.g. at least to postcode). Legislative requirements such as Data Protection must be complied against and understood to ensure that data that are shared meets the CDRPs requirements.

The review was also useful for reviewing resourcing requirements for sharing information. Different systems will have different resourcing requirements based on the volume of data that are shared and require processing. A useful principle to follow in terms of measuring this resourcing requirement is to consider the resourcing impact that sourcing, cleaning, geocoding, validating and the management of data will require. This is a dedicated role (or part of a role) and must be resourced in order to ensure that data held on the system are relevant, timely, of good quality and easy to interpret.

The role of analysis

> *Key lessons learned*
> - *Understand the role of analysis:* The implementation of any system needs to realise the importance of an analysis capability that will make use of the system. Crime problems are solved by those that can interpret and explain patterns, and work with others to suggest the direction in how the problem can be tackled
> - *Give analysts time to do their job*: If a system has an analytical resource, the analysts need to have the opportunity to review research, study the theory that underpins understanding crime patterns and offender behaviour, and review what works. Analysts also need to be given appropriate time to develop problem-solving analysis products. This may include them leaving the office to visit hotspots and other community safety problem areas
> - *Partnership analysis should complement NIM:* Systems should support the generation of community safety multi-agency analytical products that are complementary (in content and timing) to NIM Intelligence Products, particularly Strategic Assessments

The GIS-based information sharing systems reviewed in this research show they can offer a multi-agency analysis role that complements the more tactical and operational analytical role performed by their police partners. Multi-agency analysis tends to be more considered in its outlook, considers not only crime problems but other community safety problems, relies on data that may not need to be as current as that for police operational analysis, and focuses on delivering outputs for strategic partnership interventions for improving community safety. The two analytical roles can complement each other very well, particularly where the partnership approach adopts a Police National Intelligence Model (NIM) approach in the generation of its multi-agency analytical products. This NIM approach to partnership analysis helps to coordinate and complement the production of analysis products and helps direct analytical dialogue towards a single common language.

Staffing the system and skills development

> *Key lessons learned*
> - *Minimise the suppliers' resource burden on information sharing*: Information sharing can be resource-intensive and may be the reason that prevents data suppliers sharing their data. A system's staff team can be useful in overcoming the reliance on each agency to process their data and help ensure that common standards and processes are applied to all data that is shared
> - *Staff employers*: Police-employed staff in the system's team can help to overcome issues with accessing police data. Similarly, fire and DAT analysts employed by these partners but based in the team can overcome access issues to other data
> - *Recruiting the right staff can be difficult*: It can be difficult to find staff with the skills that are required to help develop and maintain the system. The ideal package of skills is very rare and salaries may not be high enough to attract the experts required
> - *Using temporary contract staff*: Recruiting temporary contract staff to perform data cleaning tasks or systems development may be financially economical but fails to retain and build expertise in the system's team, plus it can be difficult to fast-track them to the level of expertise that is required
> - *Train decision-makers and users of analytical outputs*: Training and skills development should be provided to those that request analysis products to ensure they understand problem-solving and how the system can be used. This type of training will also help them in their questioning and requests for analytical products
> - *Build sustainability into your system resourcing:* The reliance on relatively few individuals for information sharing, data processing and analysis can leave the system vulnerable to staff succession.

A key factor that contributes to the underperforming of the nominated systems in this review is the inadequacy of staffing the system's key functions. The system needs to be adequately staffed to support the following functions.
- The project management and promotion of the system.
- Facilitating the information sharing, data processing and data management requirements.
- Supporting the technical infrastructure of the system.
- Performing an analysis role.
- Training users and providing technical support.

Many systems find benefit in appointing a dedicated system manager. This person typically has the role of managing the information sharing process, overseeing the system's technical development and coordinating the analysis production process.

Those systems that are applying an appropriate level of analytical resource are those that are succeeding in the generation of quality problem-solving analysis products. Most systems recognise that the IT solution part of a GIS-based information sharing system can only the support the analysis function so far. If the analysis facility is not properly resourced, the IT solution can easily become redundant and offer little value (e.g. pressing a button in a GIS is not going to tell you why crime is happening at a particular place). For a system to be effective it must be used for the generation of good quality multi-agency analytical products, and therefore appropriately staffed by analysts or used by local analysts. GMAC, CADDIE (Sussex) and COSMOS provide useful examples of the analytical resource that is required to support the generation of good analytical products for CDRPs.

It is also important that staff receive appropriate skills development opportunities. Indeed, for any new system it is vital that in its specification and implementation plan it considers the training and skills development requirements of the system's personnel. Training requirements need to be appropriate and at the level required, and may include information sharing, data management, statistical analysis, GIS and crime mapping, problem solving, report writing, presentation skills, and web development. Training priorities should be towards problem solving in the first instance, rather than technical analysis. Skills development must also include allowing staff to attend seminars and conferences so they can learn from the experiences of others.

System financing

Key lessons learned
- *Avoid false economies*: While there is a need to be economical with funds to support the system's development, there is a danger that financial prudence will be preferred to innovation. This may result in the system's aim not being fulfilled and prove to be a false economy.
- *Mainstream the system's funding*: If the system was developed using central or regional funds, it should have a clear and agreed programme of transition that will see it become mainstreamed into its CDRP user community. Many systems have been adversely affected by the lack of any planned transition or clear dialogue towards the withdrawal of central/regional support and funding
- *Agree a future funding plan:* The lack of any agreed future funding plan for the system makes it difficult to set out development plans. This means that the system can easily stagnate, development is only reactive to system problems rather than meeting a well-thought through plan of system enhancement, and in some cases has resulted in staff leaving the system due to the lack of certainty in future development funding and job insecurity.

This review, while not aiming to provide a best value assessment of the systems, has provided a general review of the estimated costs associated with each system. Costs between systems will naturally be different due to the area of their coverage. Much of this does though relate to the staffing requirements for each system.

The costs listed in each system's tabular summary were itemised to allow certain comparisons between the systems. This has revealed several differences in costs of the IT solutions in terms of the functionality they offer, their practical use and how they compare to different technology approaches for systems that have similar coverage areas. For example, COSMOS has demonstrated that for relatively little cost it is possible to develop a practical and very usable system. GMAC is the system that has the biggest budget (£2.7M), but in terms of technology implementation its cost (£75K, which includes £20K for server upgrades) has been less than the majority of the other systems – most of GMAC's funding going towards the recruitment of its 14 strategic analysts and other staff.

Almost all of the systems have benefited from Home Office funding. Several are still reliant on Home Office funding while others have begun to or have now managed to mainstream their funding provision from their CDRPs and other sources. COSMOS and CADDIE are commendably the first systems to achieve this, with GMAC and JUPITER planning to have fully adopted their funding from mainstream sources in their next financial planning cycle.

For existing and new systems, central government funding can be useful in helping to initiate the system but should not be seen as a source for maintaining the system into the future. Instead, each system should work towards a model of mainstreaming their funding by sourcing contributions from local partners. Moving to a local mainstream funding model is a real test of the system's qualities. If the system is a key contributor to CDRP business processes then mainstreaming funding provision should be straightforward. If local CDRP partners see little value in financially contributing to the system then it is usually apparent that the system is not meeting the expectations or requirements of its most important audience.

Governance and CDRP business process

The first four factors identified in this chapter can be considered as important *ingredients* that go towards the content of a system, with the fifth factor, 'system financing', describing important considerations for initial and continual system funding. However, while a system can be comprehensive in content, appropriately staffed and sustainably funded, if it is not being used by the CDRP then the system will clearly be redundant.

Information sharing systems often come to be specified because of the information demands of CDRPs. That is, the introduction of a system is seen as being a facility that will help the partnership become better at being information-led and evidence-based in its decision-making. Indeed, all of the systems included in this review were very much originally specified to help meet these requirements. However, the impact they have had in developing partnership working in the areas they cover has been varied and is seen to be dependent on the effectiveness of the partnership processes that were also originally in place or that have developed as a result of the introduction of the system. For example, successes experienced by GMAC have been because the partnership's business processes stressed an initial requirement for a 'system', and as a result of its introduction has helped to improve how the CDRPs operate across Greater Manchester. Other CDRPs may have stressed the same demands on the concept of their system. Reasons for it underperforming are most usually linked to the system not delivering against the core requirements of the CDRP, or the CDRP business environment lacking in information, problem-solving and evidence-driven focus, and where multi-agency intelligence is not being effectively coordinated into the tasking of partnership resources. A system can look good on the surface but if it does not operate within an effective partnership business model, then its potential will be difficult to realise.

CDRPs also naturally have a performance review requirement. However, if this requirement is not going to overwhelm the resourcing that is required for analysis (i.e. it is often the partnership analyst who is tasked with producing performance figures) then other ways to generate this information are required. This review has revealed examples on how this performance review requirement can be automated and easy to use – informing key officers with statistics, trends, and charts that monitor crime and disorder levels against their strategic targets. COSMOS offers a good example of such a

function, and it is notable that many of the other systems are considering similar functionality to automate this performance-reporting task.

A number of systems are also providing the public with information about community safety in their area, including statistics and maps of crime and other data. At present most systems provide data at the ward level by showing aggregate counts of crime in a table alongside a map of the area. Some systems that have a public internet interface are using this as a mechanism to help gather public input. For example, some systems use their internet sites to help the public report crimes or incidents of anti-social behaviour, and others run public polls which have returned valuable information that helps contribute to the direction of the CDRP activities.

5. How can GIS-based information sharing systems best support the business service functions of community safety partnerships?

Each of the nominated GIS-based information sharing systems considered in this review applies an approach that is in some way different to the other systems. However, all these systems have the same common goal – to help reduce crime, disorder and the misuse of drugs, and improve community safety. To reach this goal, all the systems commonly aim to improve partnership working by directly supporting CDRPs in sharing information between their partners.

Information sharing is essential for supporting the following objectives.
- To enable the initial and periodic review of crime, disorder and other community safety issues.
- To help partnerships become evidence based, driven by factual information and multi-agency analysis products that can be used to help influence and direct their decision-making.
- To ensure that targets remain valid and that activity is sustained.

By linking to these common objectives, and as a result of this review, four key community safety partnership business service functions have been identified that GIS-based information sharing systems can most effectively support. These are as follows.
- Delivering a performance review function.
- Operating a scanning role.
- Providing an analysis mechanism.
- Interfacing with the public.
(These four key business service functions are described in more detail below.)

This is not to say that each system has to be designed to perform every one of these roles, but does encourage system managers to recognise these key functions and develop their systems against them to help maximise their success. For example, if the main initial purpose of a system was to provide an analysis mechanism, the next natural function for the system to develop would be in one (or more) of the three other areas. Which function is developed first depends on the demands and priorities of the system's users. Similarly, if a CDRP is exploring the concept of developing a system they should be guided in their thinking towards the business service functions that these systems can best support. Again, the priority function to develop being determined by the CDRP's prioritised requirements.

These business process functions are also presented with scenarios that are based on how these functions can typically be applied by a CDRP. These scenarios are not based on any one particular system, but have been written by drawing together practice that operates across a number of systems and from other researched examples. These scenarios are provided to help place the function into a practical perspective.

Delivering a performance review function

All partnerships have requirements for monitoring their performance and reviewing information that offers an overview of crime patterns and trends. Performance review is required to support the following.
- A continual auditing process, providing an up-to-date measurement and description of trends and patterns.
- Monitoring of performance against the targets set in the CDRP's Strategy.
- Strategic review of the impact of targeted reduction initiatives and interventions.
- Operational briefing of key CDRP practitioners and partner agencies that regularly require reviews of performance.
- Facilitating information-driven agendas at partnership meetings, where the review of crime patterns and trends is accessible to relevant personnel in between meetings and specifically

before them to help ensure they are informed and can contribute to an action focused meeting dialog.

This style of performance review reporting is different to that offered by systems such as iQuanta. iQuanta offers a useful strategic view of crime patterns and trends at the local authority level, but for many local CDRP purposes the style of performance review that is a typical requirement is one that is:

- concise enough to offer the level of local detail that is required (i.e. neighbourhood level), containing information that is relevant and easy to interpret (e.g. a map showing crime hotspots, supported with a graph showing crime trends, and a table listing wards and the crime changes within them);
- timely enough to provide an update on the previous month's trends and patterns;
- interactive to allow reporting to be customised to the user's requirements;
- simple to use, easily accessible, and delivered quickly;
- designed in a manner that provides facts at a level of precision and in a format that supports all performance review requirements; and
- covers not only crime but other community safety data.

GIS-based information sharing systems should be designed to support this performance review requirement. They should be able to draw from an up-to-date information hub to deliver management information in a style which has minimal interaction, contains relevant data, is concise, and is easy to interpret for supporting performance review.

Scenario 1

A Community Safety Officer is due to attend the CDRP's monthly Robbery Working Group later that day. The Officer has been sent the standard agenda, the first item of which is 'Performance review'. The Officer logs onto the CDRP's extranet GIS-based information sharing system and with ease of minimal interaction generates a report that contains a table of key statistics that list how robbery has changed in recent months, a map that reveals where hotspots have recently emerged (shown against areas where initiatives have been targeted) and a graph that shows robbery trends against the CDRP's reduction target. The report shows that robbery has continued to rise in the last three months. By clicking on a 'ward profile' button another table is generated that shows how crime levels have changed for each ward over the last six months. This table also lists crime levels in the areas that have been subject to robbery reduction initiatives. It has taken no more than five minutes to generate all this performance review information. Armed with this information, the Officer attends the Robbery Working Group feeling confident that they can contribute to discussions that lead to partnership actions.

Operating a scanning role

Scanning is the first stage of a problem-solving process. It involves identifying problems, defining and classifying them, exploring the nature of the problem and hypothesising over its cause. It also considers the selection of relevant data that can then be used in an analysis. The scanning role can be performed by either an analyst or other CDRP practitioners such as a community safety manager or officer. Scanning for a problem begins the process that brings together facts about a problem and confirms if a problem does exist. In the first instance it does not require sophisticated analytical techniques.

GIS-based information sharing systems should be designed to support this scanning requirement. Mapping interfaces offer a useful means for visualising data in a manner that identifies if a crime or community safety problem exists (e.g. by hotspot mapping) and through interaction allows the problem to be explored in more detail. This can include layering additional datasets that help define the nature and classification of the problem. This then allows the problem to be hypothesised and questions formed for analysis.

A Community Safety Manager has received anecdotal comments that violent crime is going up in two of the district's towns. The Manager logs on to the CDRP's extranet GIS-based information sharing system and reviews the online library for the recent Violent Crime Working Group's monthly performance review report. The report shows that violent crime in the district has not changed over the last few months. The Manager then interacts with the map and locates one of the town centres, and clicks to display the last six months of violent crime data. The Manager quickly draws an area around the centre of the town and views month-by-month violent crime figures for this area. The statistics show that violent crime is going up, and in recent months quite markedly. The Manager, out of curiosity, displays the location of licensed premises against a hotspot map of the last six months of violent crime. The display shows that the hotspots are located in areas where the licensed premises are concentrated. It has taken no more than ten minutes to generate this information.

Armed with this knowledge the Community Safety Manager hypothesises that the there is a rising violent crime problem, at least in this town centre, and suspects it is linked to night-time drinking in bars, pubs and nightclubs. The Manager contacts the CDRP's analyst and presents them with a number of questions to explore in an analysis, including stating what they hypothesise the problem to be, how the analysis products will be used, and when they will be required.

This scanning role also includes identifying relevant data sources and allowing easy access to data that are fit for purpose to begin a detailed problem analysis.

GIS-based information sharing systems should be designed to support this scanning/data access requirement. The system should allow the analyst to identify and select the data they require and download it in a format for them to begin to precisely and specifically explore and analyse the problem. The download mechanism should also be supported with a dynamically produced, comprehensively completed, metadata form.

An analyst has received a request from their Community Safety Manager to generate a problem profile of violent crime in the district, focusing in particular on two town centres. The analyst and the manager have discussed the proposed content of the problem profile including the questions it should explore. The Community Safety Manager has also suggested that the problem may be linked to late night alcohol-fuelled crime problems.

The analyst considers the data they need to perform this analysis. They list what they regard as being their essential data requirements and those that are not essential. The analyst logs on to the CDRP's extranet GIS-based information sharing system, selects and downloads the data they require. The data are also delivered with a metadata form that includes contact details of the data supplier.

Providing an analysis mechanism

Analysis is the second stage of the problem-solving process. The technology associated with a GIS-based information sharing system can only support the analysis function so far. The analysis needs to be effectively resourced by an analyst who is skilled in applying a range of analytical techniques, knows what works in policing and crime reduction, understands the theory that underpins crime patterns, is able to interpret analysis outputs that have been generated using a variety of tools, understands problem-solving and what it involves, plus is able to communicate effectively and be in a position to ensure their products and opinions are heard and used.

GIS-based information sharing systems should be resourced to fulfil this role. If the information hub that has been developed in the system is not being used by analysts then a significant amount of its purpose is lost. The analytical resource should be supported with adequate and robust desktop analytical tools. The analyst should be given clear direction in the task that they have been asked to

complete. The analysis product should also be designed in a complementary style to its equivalent NIM Intelligence Product, drawing on the NIM analytical techniques to help structure its content.

Scenario 4

A problem profile of violent crime has been requested by the Community Safety Manager. The analyst consults with their local police intelligence analyst over any problem profiles on violent crime that have recently been produced and considers any other intelligence they have that may support this analysis.

The analyst's workstation holds a GIS, statistical analysis software, a database, as well as standard Office tools. Using their workstation they complete the problem profile, and include in the report photos from the streets outside the bars that are proving to be a particular problem, a contacts list of individuals they consulted during the course of the analysis and several recommendations that suggest how the problem could be tackled, sourced from a useful guide on 'tackling violent crime outside bars' that they sourced from the United States Problem Oriented Policing Center's website. The analyst sends the Community Safety Manager the report and posts it to the online library page on the extranet GIS-based information sharing system.

Interfacing with the public

GIS-based information sharing systems can effectively provide a public access interface that offers a mechanism for supporting the reassurance agenda by providing the public with facts about community safety. These systems should also offer an interface that better enables the public to contribute to issues of community safety, including responding to polls and reporting incidents of crime and anti-social behaviour.

Scenario 5

A member of the public keeps hearing on the news that violent crime is significantly going up. Worried about this problem, he logs onto a website of the local crime mapping system that he heard about via his local newspaper. He arrives at the site and is prompted to type in his postcode and select from a list the crime category he is interested in. He types in his postcode and selects violent crime and is instantly returned a map showing where incidents of violent crime have occurred in the last month. He notices that these are in the local town centres and away from where he lives, and that there were only six incidents last month. He also sees the option to display a graph showing trends over a time and is reassured that violent crime is actually reducing in his area.

6. The next steps: enhancing an existing system or developing a new system

This review has considered a representative sample of existing GIS-based information sharing systems, all of which have particular strengths but also with identified areas for improvement. As these systems now look towards their future development, their inclusion in this review has helped them to identify and be advised on potential enhancements. In particular, this has helped existing systems to compare and contrast their experiences against other systems so each can benefit from lessons learned to aid their future development.

New systems are also being specified and developed in other parts of the country and until now most have not been able to benefit from Home Office guidance on how they should be developed. While one system design is not suitable for all requirements, learning from existing systems and following the recommendations of the key CDRP business service functions that these systems can best support will help new systems to be successful.

The template in Figure 6.1 is designed to help existing and new systems with their next steps. The template encourages the specification of a new system or enhancements to an existing system to recognise the CDRP business service functions that these systems can best support. A specification for a GIS-based information sharing system should also review the experiences of existing systems and draw from lessons learned from those that have been implemented. This report provides substantial material to aid this, but all system managers should be encouraged to visit existing systems and see how they work in practice. In supplement to this the template also lists key considerations for the specification of a GIS-based information sharing system.

Following this template will help provide useful direction to new systems, enhance existing systems, and introduce consistency between systems for them to better interact.

Figure 6.1: Template for the specification of a GIS-based information sharing system
Using this template in the specification of a system will help enhance existing systems, provide direction to new systems, help introduce consistency which will better enable systems to interact, and provide for a more effective application of these systems nationally for improving community safety.

Review other systems
Review lessons learned from other systems

Specifying a GIS-based information sharing system

Community business service functions offered by the system:
- Delivers a performance review function
- Operates a scanning role
- Provides an analysis mechanism
- Interfaces with the public

Key considerations

System vision and purpose
- Establish a clear, unambiguous vision that is periodically renewed, with set objectives that are evaluated to monitor development and success

System management
- Create system management documentation. This should include a business case, requirements plan, technical specification, resourcing specification, implementation plan, user guide, promotional material, system evaluation, development plan
- Establish a forum of main users and stakeholders where system development can be discussed and good practice can be shared
- Ensure that analysis and intelligence is at the heart of the system and is driving partnership agendas
- Ensure that analysis products are not merely descriptive, but are explanatory and help direct how problems can be tackled

Data
- Ensure that data stored on the system are relevant, not collected excessively, are of good quality, precise, and are current for the purpose it serves
- A problem-solving approach to data collection should be implemented to ensure that data held on the system are most relevant to requirements

Technology and functionality
- Ensure that the technical design of the system reflects and encourages a problem-solving analytical approach
- Develop technical solutions that are simple and easy to use. Avoid implementing sophisticated functionality until the basics have been justified

Resourcing, staffing and skills
- Invest in a system's team that is proportional to requirements. Roles should include Systems Management, Information Sharing Processing and Management, and Analysis
- Ensure that analysts, users of analysis and those responsible for implementing community safety responses fully understand problem solving. If necessary invest in suitable training

Funding
- Establish a two-year rolling system fund

Impact
- Capture evidence of the system's impact, particularly in terms of showing its cost-effectiveness and how it has helped reduce crime and disorder, improved community safety, and reduced the fear of crime

7. Recommendations

Recommendations for existing project managers of GIS-based information sharing systems

Recommendation 1A

Existing project managers of GIS-based information sharing systems review their system's capability against the four core business service functions. These being:
- *delivering a performance review function;*
- *operating a scanning role;*
- *providing an analysis mechanism; and*
- *interfacing with the public.*

Recommendation 1B

Existing project managers of GIS-based information sharing systems should plan their future developments against the gaps identified from their review of their system's capability against the four core business service functions.

Recommendation 1C

Existing project managers should move towards mainstreaming their system funding from local CDRP and other sources, rather than from Home Office or Regional Government Office funds.

Recommendations for prospective project managers of GIS-based information sharing systems

Recommendation 2

Prospective project managers of GIS-based information sharing systems should specify and design their systems against the template provided in Chapter 6

Recommendations for Home Office consideration

Recommendation 3A

The Home Office establish a system managers' forum that meets annually to share good practice between the systems, and allows new systems to learn lessons from existing systems. In particular, system managers should be encouraged and recognised where their system offers value for money and seek to establish a demonstrable impact on reducing crime and disorder and improving community safety.

At this stage it is difficult to assess whether GIS-based information sharing systems are offering value for money. There is clear evidence that they are supporting partnership activity, and helping partnerships to become more informed and evidence-based in their activities, although the adoption of problem-solving approaches still requires development. GIS-based information sharing systems can support them with this development due to the active problem-solving processes that their core business functions can best support.

System managers are being encouraged to capture evidence of the impact their systems are having in reducing crime and disorder and improving community safety. A forum where they could promote their system's impact would be at an annual Home Office-organised seminar that brings together system managers and other key stakeholders. This will also help improve networking between systems and benefit from the sharing of good practice.

Recommendation 3B

The Home Office promote these systems across other government departments to help explore opportunities for these systems to support agendas wider than community safety, including Neighbourhood Renewal and Local Area Agreements.

GIS-based information sharing systems that are used for community safety are beginning to have a wider impact and help inform other government agendas (e.g. Neighbourhood Renewal, Local Area Agreements). This presents the opportunity for the Home Office to promote these systems to other government departments and raise awareness of their application. Rather than other, similar systems being designed it may be more practical for these existing community safety systems to be modified to help meet these other demands. Indeed, several systems are already being asked to consider this move. The Home Office has the opportunity to demonstrate the innovations of these systems and initiate awareness-raising across other government departments to ensure that future duplication can be avoided.

Recommendation 3C

The Home Office create a Head of Profession for Community Safety Information Sharing and Analysis.

The function of an analytical role should be at the heart of a CDRP GIS-based information sharing system but without any leadership or central direction in community safety analysis, the application and development of problem solving multi-agency analysis is being stifled. Each police force has a Principal Analyst who in turn is supported at the national level by a Head of Profession for Police Analysts. A similar role is missing for the CDRP analysis community. This often results in a lack of direction, a lack of steer, and a lack of development in CDRP analysis. Similarly, there currently persists a lack of a technical lead, direction and steer on information sharing.

A Head of Profession for Community Safety Information Sharing and Analysis could offer significant value in helping to ensure the effective application of information sharing and use of analysis at the local and regional levels.

Recommendation 3D

The Home Office decide on their future plans for utilising software produced by Project Dragon.

The Home Office own the IPR on the analytical toolkits and software modules developed by Project Dragon. This presents the opportunity for other CDRPs in England and Wales to build GIS-based information-sharing systems around this free software. The Home Office needs to decide whether they wish to exploit and more widely adopt the Project Dragon software components for the benefit of other CDRPs in England and Wales.

Recommendations for Regional Government Office consideration

Recommendation 4

Regional Government Offices should encourage existing GIS-based information sharing systems and any future systems to be specified and designed against the template provided in Chapter 6.

While the managers of new and existing systems can be encouraged to follow the template provided in Chapter 6, the Regional Government Offices should be active in also encouraging the use of this template when existing systems are being further developed and future systems are being specified and designed.

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