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Gismo: a Gremlin or . . . ? How Medway Intranet serves officers, members, citizens and pupils

Gesche Schmid, Manager ICT and Information, Medway Council
Andrew Hodge, Application Support, Medway Council

Abstract

GIS Medway Online (GISMO) was developed to provide council wide, user-friendly access to wide ranging geographic Information at minimal costs. GISMO is underpinned by a geographic information management policy which supports joined up information across the council. Any geographic information developed anywhere in the council is stored centrally, and distributed via GISMO to all 2000 PCs across the authority, including front desk services.

GISMO uses the Cadcorp Active Server component, a dynamic, fully functional, web-based, thin client GIS, which does not require any plugins. Therefore, GISMO can be accessed simply using an intranet browser from any of the 2000 PCs across the council. It allows map distribution, querying and printing of information. Address searching utilizes the recently developed land and property gazetteer.

GISMO proves to be an excellent service for facilitating frontdesk customer inquiries and supporting decision making for development control and strategic planning. GISMO has recently been extended to give primary schools access to map and aerial photo information via an extranet as part of the local grid for learning. School children have access to local aerial photos and high-resolution map based information underpinned by exercises specifically tailored to the local geography.

In addition, plans are underway to make the service also available to libraries giving citizens access to council information at one-stop shops.

The implementation of GIS on the intranet brings the information needs and services of the council into the 21st century and provides a first step in meeting the government's targets for e-government in 2005. Gremlins have been kept at bay whilst users have multiplied overnight.

1 Introduction

GIS Medway Online (GISMO), the council's intranet GIS, was developed to give user-friendly access to wide ranging geographic information council-wide via an intranet browser at minimal costs. The dissemination of geographic information via the GIS intranet is regarded as one of the greatest beneficiaries of developing a GIS (Keith, 2000).

Two years ago, Medway Council embarked on a GIS strategy to bring geographic information to the front desk of service delivery within the council. Geographic information underpins 80% of all information held within the authority. Providing accurate, consistent and up-to-date geographic information is paramount for providing a best value service to its citizens. Accurate, up-to-date information is one of the greatest assets of local authorities and managing the information one of the greatest challenges.

In the past, it has taken officers days to collate relevant information by visiting individual sites and copying information such as properties, footpath, trees and schools, from paper maps. Often, it was not even guaranteed that the information recorded on the maps was up-to-date. The practice of searching and holding information in different departments in various systems or on paper was inefficient, time consuming and costly. It has not meet the increasing demand by GIS users, government agencies and

consultants to provide surveys at short notice based on electronic information as required by e-government in 2005.

The inefficient practices of geographic information access are being transformed at Medway through the implementation of the GIS intranet (GISMO). GISMO has been made possible through the implementation of a GIS strategy approved by Medway in December 1998. The main objectives of the GIS strategy were:

- To introduce Cadcorp as the corporate desktop GIS for Medway.
- To provide a centrally accessible Geographic Information Library.
- To promote a culture of joined up information, allowing information to be shared across the council.
- To develop a policy for geographic information management which endorses the capture, maintenance and electronic sharing of accurate, consistent and up-to-date geographic information by all directorates across the Council
- To provide user-friendly access to geographic Information at front desks and at minimal cost through the development of a GIS intranet.
- To raise the awareness of the benefits of GIS council-wide.
- To appoint GIS champions in directorates, and to provide GIS training in the handling of geographic information.

This paper presents a best practice example for managing geographic information and developing and implementing a GIS intranet to facilitate access to locational information as part of electronic service delivery.

2 Geographic Information Management

The basis for geographic information management at Medway Council is outlined in a policy paper, which gives clear guidelines for capturing, maintaining and managing geographic information. To foster joined-up information, all geographic information available within the authority has been collated in a geographic information library accessible from a central map server (Appendix, Table 1). All information is captured according to a specific standard and quality guidelines (AGI, 1996). Information captured internally is to be updated and maintained by individual stakeholders. In addition, various essential data sources not available under the Ordnance Survey service level agreement have been purchased or acquired (Appendix, Table 2). Instead of holding external information on the server, remote access of information directly from various service providers is being investigated. This would have the advantage of accessing the most up-to-date information and reducing the cost of data administration at the Council.

A meta database was created which holds a record of all geographic information according to national guidelines (NGDF, 2000). The meta database provides a search facility for all geographic information within the council and is accessible via the intranet and from within Cadcorp licences.

In 2001, the development and implementation of a land and property gazetteer was incorporated into the GIS to facilitate location searches by addresses. A master copy of the Land and Property Gazetteer is batched out overnight from the HUB to an SQL server to be accessible council-wide via the intranet and GISMO.

3 GISMO implementation

3.1 History of GIS & GISMO implementation within Medway Council

At present over 40 licenses of the desktop GIS, Cadcorp, have been installed in council wide since 1999. These standalone licenses form the backbone for developing geographic applications and capturing, updating, analyzing and manipulating geographic information according to specific user needs within individual directorates.

The development of GISMO was undertaken as part of the GIS Strategy implementation. Funding for the project was provided via a supplementary credit approval for the local government reorganization. The initial development began in autumn 1999 with the key focus being on providing a user friendly, easy to use interface with a quick search and download time of relevant information. The first pilot went live in April 2000 with the system being fully implemented in summer 2000. Since its initial launch, development has continued to provide more functionality and ease of use to the growing volume of users. Since July 2000, over 2000 PCs in the council, which are networked, can access geographic information fast and efficiently via GISMO. The implementation of GISMO is supported by staff awareness and training sessions. The system has counted 10000 hits during the last 6 months alone.

3.2 GIS & GISMO Structure Plan

Figure 1 shows the structure and joined up nature of GIS and geographic information within Medway Council. The map server forms the hub of the GIS implementation as it holds all geographical information. Cadcorp standalone license users have read access to the server. Individual users develop GIS applications and capture and update geographic information relevant to their service area. The GIS co-coordinator is responsible for the administration of the map server and for the update of geographic information on the server.

The GISMO server hosts the GIS intranet and pulls geographic information from the map server. GISMO is controlled and developed by the GIS co-coordinator and IT application support. All Intranet users at the main council sites and extranet users, such as libraries, have access to GISMO. Schools will be given selected access to GISMO via a school server. The land and property gazetteer and the meta database is stored on a separate SQL server to give wide access to the gazetteer not only via GISMO but also via the intranet and other custom designed applications.

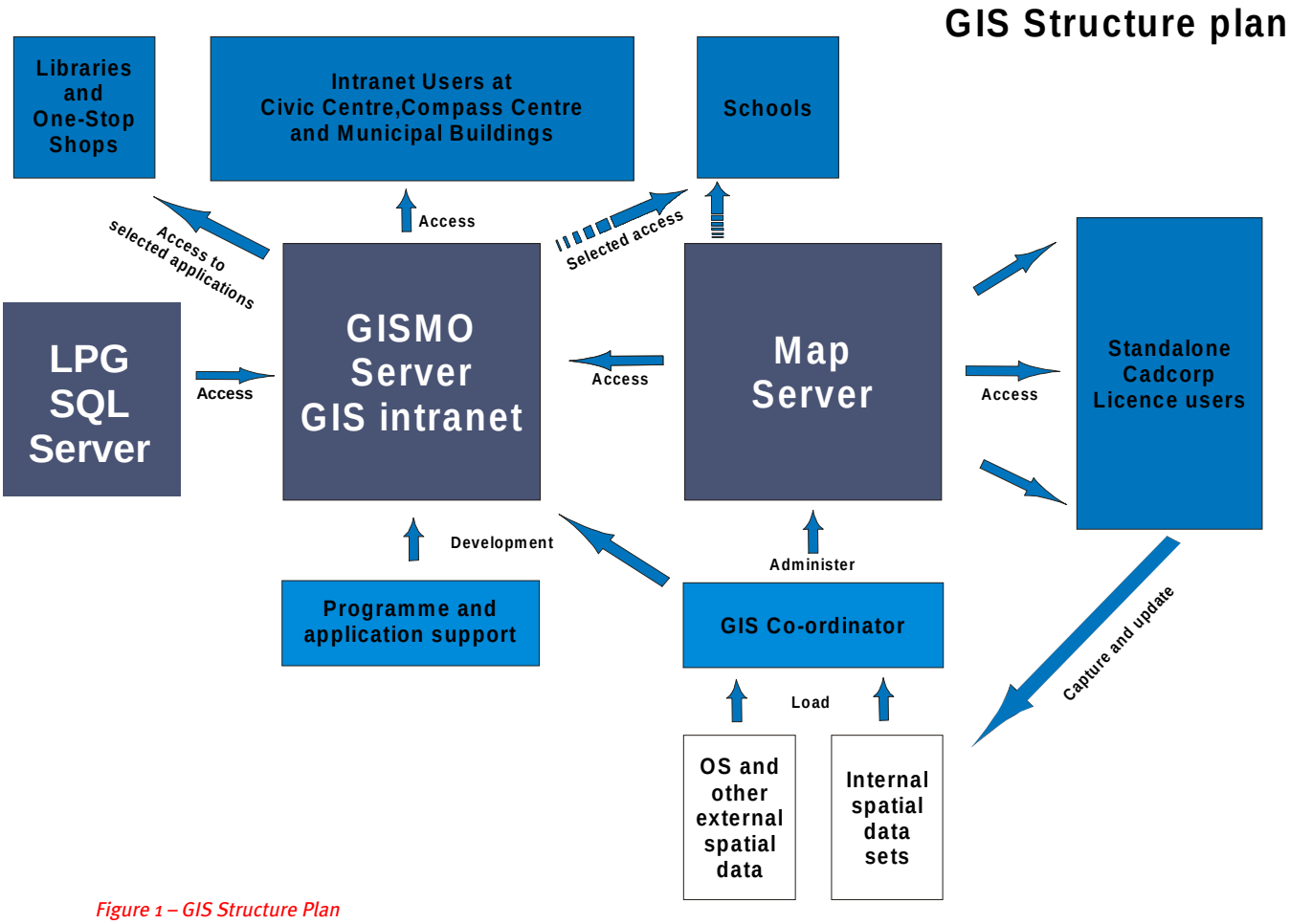


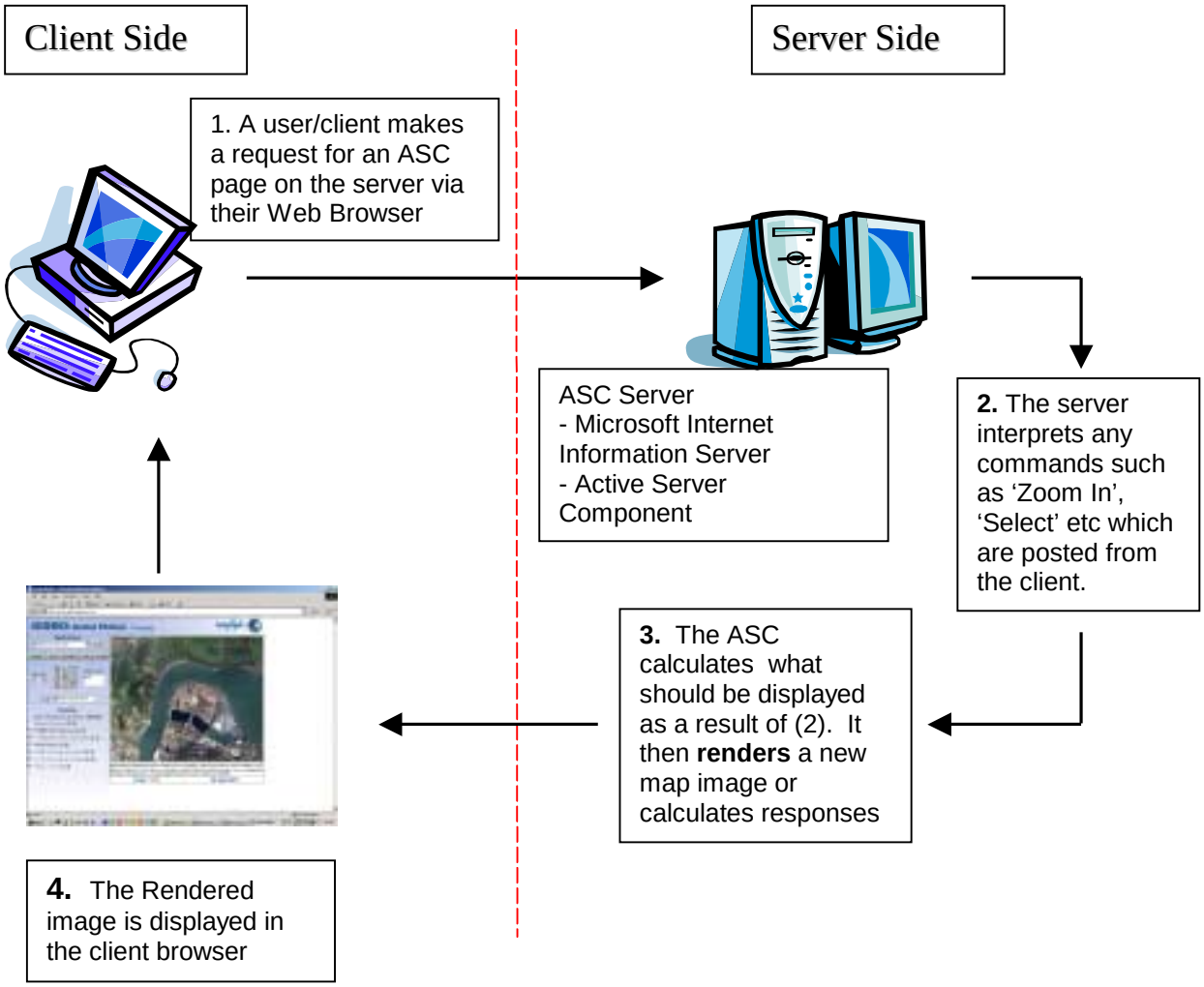
Figure 1 – GIS Structure Plan

3.3 The technology behind GISMO

GISMO uses a wide variety of internet based technologies but it is the Cadcorp Active Server Component (ASC) that forms the backbone to the whole GIS intranet system. The ASC provides an Application Programming Interface (API) to the Cadcorp Spatial Information System. The ASC API allows near full GIS functionality to be developed. The GISMO system uses client/server architecture to receive requests and provide responses to and from users (Figure 2). This client/server architecture is supported through Active Server Pages (ASP) viewable via any standard internet browser. The ASC is based on a thin client/server model requiring minimal processing, data storage and bandwidth on the client machine. The lack of plug-ins or installation of other applets and the thin client structure has allowed the rapid user uptake and sustained performance of the GIS intranet system.

ActiveX Data Objects (ADO) has been used to combine internet mapping technology with database retrieval, via ASP. ADO provides a fast, efficient (DSN free) way to retrieve information from databases which allows powerful joined up applications to be developed and deployed through the GIS intranet system, for example, the land and property gazetteer and Meta Map database (section 4).

Figure 2 – Client/Server Architecture (Modified from Cadcorp (1999)

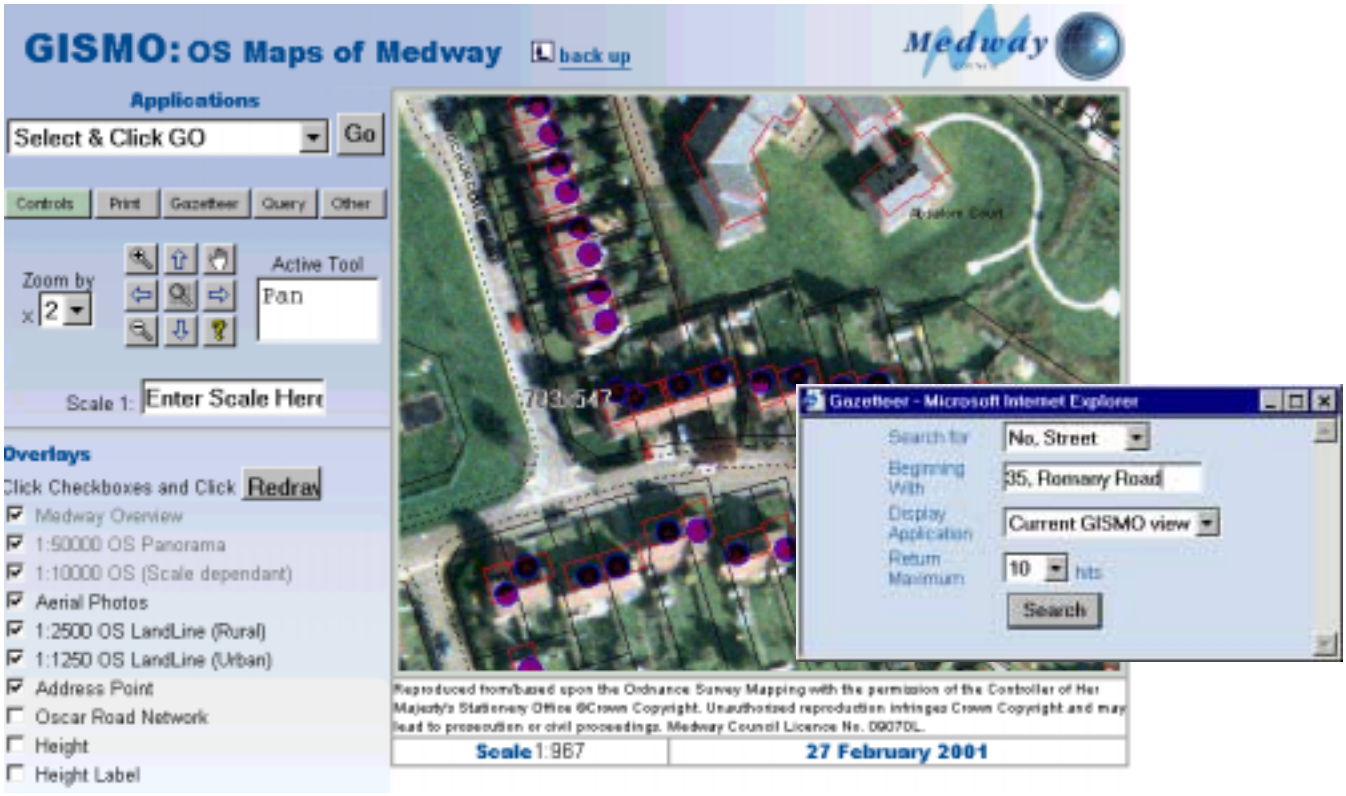

Client Side
Server Side
1. A user/client makes a request for an ASC page on the server via their Web Browser
ASC Server
- Microsoft Internet Information Server
- Active Server Component
2. The server interprets any commands such as 'Zoom In', 'Select' etc which are posted from the client.
3. The ASC calculates what should be displayed as a result of (2). It then renders a new map image or calculates responses
4. The Rendered image is displayed in the client browser

4 Applications

4.1 GISMO Functionality

GISMO can be easily accessed from any internet browser within the council. Once accessed, the user is able to choose from a selection of GIS applications ranging from OS maps to local plans, leisure facilities, highways etc (Appendix, Table 3). OS maps or aerial photos are included all applications. Within the application, the user is able to navigate around the map using pan or zoom functions. The land and property gazetteer provides a search facility to select and locate a specific address on the map. GISMO also allows the user to zoom to a specific location via grid coordinates. Further functionality such as measuring distances or defining buffers are also included.

Figure 3 – Address search via the address gazetteer in GISMO.



Within an application, individual data layers can be turned on or off according to the user's specifications. This permits map creation according to specific user needs. The attribute information which relate to individual features on the maps can be queried, such as size, name, type, length. A link from the individual layers to the meta database gives the user the opportunity to determine the data currency and other information about the dataset. Finally, the screen map can be printed using a standardized Medway print template which includes an OS copyright statement, scale, title and watermark to comply with the recent OS copyright regulations. Online help pages are provided to guide the user through GISMO.

4.2 Applications

Specific applications are developed according to user requirements and needs (Appendix, Table 3). During the recent foot and mouth crisis, the location of outbreaks, exclusion zones and closed public rights of ways were displayed immediately on GISMO once mapped. If new cases of foot and mouth were suspected the emergency officer could immediately check the address of the farm and the grid co-ordinates via GISMO and issue maps for the environmental protection officers.

As part of the recent ward review in Medway, the ward proposals by the different political parties were published via the intranet for comments. This permitted members and officers to conduct how various schemes would effect different neighbourhoods and streets in Medway. Unfortunately, the Land Property

Gazetteer was not completed on time to provide accurate estimates of the electorate for the proposed ward schemes.

The Land and Property Gazetteer has replaced the OS Addresspoint dataset in forming a major route into the available geographic information. Non-geographically skilled members of the council therefore have the ability to search for geographic locations, based on known addresses and not geographic co-ordinates. This encourages the use of GISMO to find information relevant to a property.

Medway's customer and wardens service is using GISMO to quickly assess the location of various citizen inquiries such as refuse collection, waste disposal sites, hotspots of fly tipping, or street type (adopted or private). Soon the entire street scene inventory including streetlights and tree inventory will be made available on the intranet and linked to a contact centre.

Primary Schools will get access to the rich map database via the schools internet server. Specifically designed map pages will guide the student through a set of questions aimed at keystage 1 and 2. Pupils will use the gazetteer to find their house and the school and to measure the distance between the two. They will identify individual features on the aerial photograph in two dimensions and see how they appear on a map. This application will help students to gain spatial awareness of their neighborhood and Medway from GISMO once it has been made available through the local learning grid.

With the recent unlocking of the OS copyright licence, plans are under way to make a reduced version of GISMO available to the citizens via the internet as part of web mapping. Citizens will be able to locate any address or street, council facilities including schools, libraries, leisure facilities, public transport routes, refuse collection routes etc using GISMO as a mapping tool.

5 Benefits and Constraints

5.1 Benefits

The implementation of GISMO and the creation of a comprehensive geographic information library have provided Medway Council with outstanding benefits which include:

- Access to geographic information for members and officers. Geographic information can be mapped instantly from any site within the council.
- Time absorbing searches and site visits have become redundant.
- Members can access any information relevant to their wards, including schools, leisure facilities, census information, polling districts, location of polling stations etc.
- The central administration of the geographic library is more cost-efficient as only one version of the databases needs to be up-dated. This guarantees better access to up-to-date information.
- Individual licence costs and update of licences is greatly reduced as GIS is accessible via the internet browser without requiring any extra software licence or plugins.

5.2 Constraints

With the availability of a powerful map display tool such as GISMO the user assumes that the information displayed is up-to-date and accurate. However, the internal data providers and data stakeholders do not always appreciate the need for supplying up-to-date data layers, often due to a lack of understanding of joined up information and the lack of resources. It is vital that a clear policy for information maintenance is implemented and funding is made available not only for data capture but for data update. But more fundamentally, a cultural change is required to look beyond budget silos and delivery of individual services, to free and join up information and to make it available across the council.

GISMO provides a very powerful and useful tool for map dissemination and display. However, external suppliers are often reluctant to utilize and link GISMO to other application systems. Therefore, it is not only important to initiate a cultural change towards information sharing but also a cultural change amongst software suppliers to provide open interfaces which allow the linking and joining up of systems.

6 Conclusions

GISMO forms an integral part of the electronic service provision by Medway Council. The distribution of geographic information via the intranet gives a much wider audience access to geographic information without the need to purchase and to install individual licenses. Once GISMO is further expanded to one-stop shops, libraries and ultimately to the internet, the ability to map council services and facilities will improve electronic service delivery to the citizens of Medway as requested by e-government. However, a sound geographic information management policy and a cultural change to provide up-to-date accurate information are fundamental for any reliable service delivery.

GISMO provides a best value service and meets the council's core value by giving value for money. In addition, GISMO will provide a valuable decision support tool by improving spatial awareness and therefore influencing the core values of:

- Promoting economic, physical and social regeneration
- Improving the environment
- Working for equal opportunity and access

The implementation of GIS on the intranet brings the information need and services of the council into the 21st century and provides a first step in meeting the government's targets for e-government in 2005.

7 Acknowledgement

Thanks to:

- the present and former GIS team at Medway Council for capturing and maintaining the range of accurate geographic information
- the IT team for always finding a network, infrastructure, or application solution
- Cadcorp for their ongoing support.

References

AGI, 1996: Guidelines for geographic information content and quality. http:/www.agi.org.uk./pages/freepubs/guidelines.html

Keith, Gavin 2000: Using Intranet GIS to support corporate GIS service delivery in local government: an information-led approach. AGI Conference at GIS 2000 Proceedings, W3.1.

NGDF, 2000: Discovery Metadata Guidelines. Version 1.2. www.ngdf.org.uk

Appendix

Table 1: internally captured geographic information

Database
Administrative Boundaries including Ward Boundaries Electoral District Boundaries, Parish Boundaries and postcode boundaries
Air quality management areas
Council Owned Land
Employment
Land and Property Gazetteer
Landscape and urban character areas
Leisure and Arts Facilities
National Landuse database
National Street gazetteer
Planning Applications
Planning Constraints which includes all local plan layers
Public Right of Ways and adopted footpath
Public Transport Routes including bus routes, stops and cycle path
Refuse collection rounds
Regeneration Areas
Retail
Schools
Social Services Facilities including rest centres for emergency planning
Trees and parks
Utilities data including sewarage and gas pipelines
Waiting Restrictions including car parks
Wardens Round
Waste disposal sites
And many more .....

Table 2: Externally purchased or acquired information

Source	Supplier
Digital Street Map	Arka
Geology	British Geological Survey
Habitat 2000-2003	Kent County Council
Historical Land Use	Landmark
Historical Topographic Map Data	Landmark
Landcover Change 1999	Kent County Council
Landform Profile	Ordnance Survey
Orthophotos	Geo Information Group
Post Code Sector	Geoplan
Public Rights of Ways	Kent County Council
Sewerage	Southern Water
Topographic Base Data	Ordnance Survey

Table 3: GISMO Applications

Applications Project	Description
Administrative Boundaries	Constituency, ward, parish and polling distict boundaries
Aerial photos	Orthophotos overlaid by maps
Communities and neighbourhoods	Neighbourhood boundaries and centres, services and statistics
Council Facilities	Leisure and Art, schools, social services, council offices and council owned land
Emergency Planning	Risk areas and rest centres (restricted access)
Foot and Mouth	Exclusion zones of F&M outbreaks and closed footpath
GIS for Schools	Various map layers and associated learning sheets (via separate access)
Highways	Street Network, footpath, public right of ways, and other street scence if it comes live
Landscape and urban character areas	Landscape and urban character areas linked to assessment sheets
OS maps	Various OS maps viewable by scale
Planning applications	
Planning constraints	All planning constraints as shown in the local plan
Public Transport	Bus Routes, stops, train stops, cycle routes

Refuse and Waste	Refuse collection rounds, street cleaning, waste disposal sites
Utilities	Sewerage
Ward Review	Proposed ward boundaries by political party