ITEM 13

Report to: Executive Board: 10th January 2005

Procurement of Real Time Information Display Software for Bus Shelters in Oxford City and the Current Position of City and County Councils.

		WARDS AFFECTED
Report of:	**City Works Business Manager**	**ALL**
Report Author:	**Kate Stratford ext 252 957 email kstratford@oxford.gov.uk**	
Lead Member Responsible:	**Cllr. Mary Clarkson**	
Overview and Scrutiny Committee Responsibility:	**Environment**	

1.0 SUMMARY AND RECOMMENDATIONS

1.1 This report lists a number of possible options with regard to the procurement and maintenance of bus shelters in Oxford City.

1.2 This links in with the Vision because it aims to improve the Council's performance and will help to improve the environment where we live and work. It links with improved transport and mobility and may, depending on the recommendation of the Executive Board, involve working with others to develop and deliver shared goals and whilst doing so improve dialogue and consultation

1.3 Executive Board is recommended to agree the first recommendation (4.1).

1.4 Executive Board is recommended to note the remaining options (4.7 onwards) and discuss the best route(s) forward for the Authority. If the Board is prepared to advise on their preferred option, more detailed work , including more detail on costings, can be done and Executive Board advised at a future meeting.

2.0. Introduction

2.1 Background: Oxford City currently has 163 bus shelters. Of these, 35 are the responsibility of Adshel, Clear Channel and the rest are installed on an 'as required' basis by Bus Shelters UK and maintained by the City Works department. In addition, there are 168 bus stop ports where the poles are owned and maintained by the City Works department and the flags and timetables are owned and maintained by the bus companies. These provide no shelter, but there is potentially some advertising space.

2.2 Bus shelters vary in type, state of repair and cleanliness.

3.0. **Current Position**

3.1 Oxfordshire County Council (the County) has identified public transport as one of its key priorities. The County aims to raise the quality overall and provide more and better shelters with the capacity to be fitted with 'real time information' displays. They are taking a two-pronged approach, (a) implementing a trial of a 'real time information system' on one bus route that runs partly through Oxford City and (b) inviting companies to tender for the provision of bus shelters on a County-wide basis. The resulting contract would include a commitment to regularly upgrade these bus shelters. County seeks to implement this arrangement in 'partnership' with the 11 authorities (including District and Parish councils) who have responsibility for bus stops within their areas.

3.2 Oxford City Council (City) has had meetings with the County to discuss this in principal. For the 'real time information system' trial (see Appendix 1), the County is installing 4 bus shelters with the technology required. County is meeting the cost of the 4 bus shelters for the duration of the trial, which is anticipated as starting 'around Christmas'. There is no end date specified for this trial. This trial is in conjunction with both Oxford Bus Company (OBC) and Stagecoach, who are meeting some of the financial cost with County. OBC in particular is reportedly enthusiastic about this have stated their intention to equip their entire fleet with the necessary hardware and software.
The cost of installing the 'real time information system' is approx £3.5k for a 3 line display and £4k for a freestanding unit.
It should be noted that planning consent is required for advertising on bus shelters.

3.3 The Transport and Parking Business Unit is in negotiation with an alternative company who are offering a 'real time information system' for use in some of the City's car parks. This technology is from a different firm than the one being used by County. Compatibility of software/data is not known and County have stated that they would like anything the City has planned is put on hold pending the outcome of their trial or failing that, for the City to write a letter of assurance stating that the use of this system will be severely limited. Notwithstanding this, T&P BU is moving ahead with it's trial, as detailed at Executive Board on 26/04/2004.

3.4 County has invited companies to submit a pre-qualification questionnaire as part of a Negotiated Procedure. Several companies have responded and a script is being prepared to open the negotiation process with the top (minimum) three companies. City officers have requested input into the script, which has been agreed.

3.5 It is understood from comments made by County officers, that the companies are more interested in sites in Oxford City itself than anywhere else in the County, such sites being perceived as having a greater potential value.

3.6 County are hoping that a County-wide contract could be cash neutral for the participants. The intention is that advertising revenue generated by the contractor at prime locations would build up 'credits' or 'points' which would be used to provide bus shelters in locations where advertising is deemed by the companies to be unprofitable. This is untested, so there is a risk that there may be an unwillingness to provide bus shelters in unprofitable areas. There may be an as-yet unbudgeted financial implication in this.

4.0. **Options and Possible Implications**

4.1 Officers recommend that in the interim, the Executive Board recommends the City negotiates the satisfactory closure of the current Adshel contract.

4.2 The current contract with Adshel is generally agreed to be unsatisfactory, and to have been written in such a way that the obligations of both parties are often unclear.
With this understood, it is possible to argue that this contract expired on 23rd July 2001. Equally it may be argued that it is still current and potentially, that it runs for a period of 14 years from the date upon which the last bus shelter was installed by Adshel approx. 3 years ago. If the termination of this contract is unsatisfactory to either party and is disputed, it is potentially a litigious and expensive route for the City to take, with the only real solution being a negotiated settlement.

4.3 The contract may be terminated with 12 months notice, but at the end of this notice period, Adshel, according to the terms of the contract, are required to remove their shelters. It is, according to the terms of the contract, the City's responsibility to make the ground good afterwards – another financial implication.
It is anticipated that another potential source of litigation could arise if the Council undertakes to maintain the bus shelters because these are the property of Adshel. Once the notice period is completed Adshel may consider it cheaper to leave the shelters where they are, but if we touch them we are effectively trespassing on their property (or Adshel may potentially claim this).

4.4 If the City takes over the ownership and maintenance of the bus shelters with Adshel's consent, this would have a major cost implication on City Works. This is currently estimated £2k pa per shelter.

4.5 We have been advised that in discussions with the County, Adshel have implied that problems with the current contract would be easily resolved if they were awarded the new contract. The City has not (as yet) been party to the discussions between Adshel and the County.

4.6 If this is agreed it will be necessary for the Council to provide the service in a different way, and below are some suggestions that the Board is invited to discuss and then to provide a steer on their preferred option. The options are therefore set out below:

4.7 Retain the current situation, with increased effort/resources directed into cleaning existing shelters.

* Bus shelters will continue to vary in type and maintenance.
* The issue of the contract will remain and at some point in the future, negotiations will have to take place in order to terminate it.
* Possible implication of directing resource into this area during current budget demands.

4.8 Negotiate the satisfactory closure of the current Adshel contract and devise a new contract with Adshel or an alterntive supplier more weighted to the City's advantage.

* An opportunity to review the entire cleaning and maintenance regime to involve Adshel in the entire stock.
* An opportunity to negotiate with Adshel that a percentage of the advertising revenue may be paid to the Council from an estimated total of £7k per week.

* There may be some cost implications in this if it is necessary to acquire title in the existing Adshel shelters.

4.9 Negotiate the satisfactory closure of the current Adshel contract and work proactively with the County to ensure a consistent Oxfordshire-wide standard of design, construction and maintenance. County have approved in principal working closely with the City; giving the City a say in the decision-making process in return for the City taking the lead role in this approach.

* Risk that the City's priorities will be given inferior status by County's approach.
* Financial implications are not yet known.
* If no new contractor is appointed by the end of the notice period, the implications discussed above apply.
* An opportunity to investigate incorporating innovative design, such as solar-lighting in bus shelters.
* There may be a risk that the City effectively subsidises other districts to the detriment of our own less 'popular' areas ('popular' in this sense means favoured by the manufacturers/advertisers/County) because this project is being driven by the County who will be keen to ensure bus shelters are widely distributed throughout their region.
* Potential loss of income to the City of the advertising revenue that could potentially be negotiated to come to City Works.

This report has been seen and approved by: Mary Clarkson – Portfolio Holder Mike Baish – Financial and Asset Management Julie Thomlinson – Legal and Democratic Services

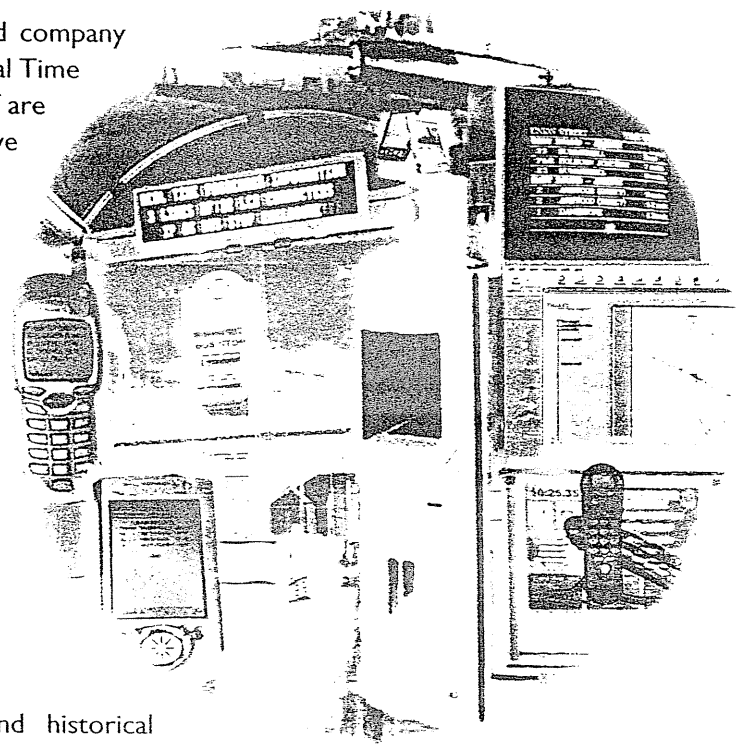
There are no unpublished background papers

IMPROVING PUBLIC TRANSPORT THROUGH TECHNOLOGY

REAL TIME INFORMATION
MEMORANDUM

Since 1995 ACIS has been the UK leader in providing Real Time Information to Local Authorities, Operators and Passengers. Across Britain, from Aberdeen to Winchester, Norfolk to Swansea, and in The Hague, The Netherlands, ACIS' transport management solutions have been installed as a key component in the drive to revolutionise how people use travel facilities in their region.

ACIS is a young, dynamic and innovative UK-based company employing over 60 people dedicated to providing Real Time Information Systems to our customers. All our staff are specialists in their field, the majority of whom have many years of experience in high-tech industries. As a company, ACIS is able to offer a complete package of IT solutions, systems design and configuration, high-end engineering assembly and installation, project management and delivery, as well as a dedicated customer services team and the vital ongoing maintenance and software support staff.



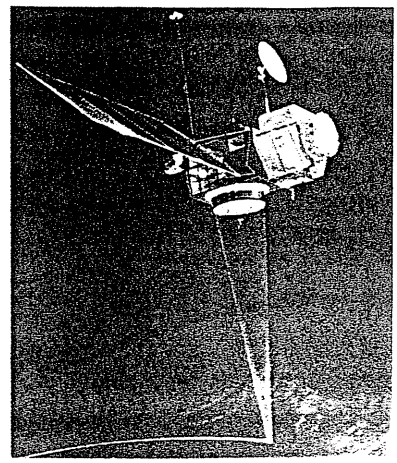
Through our product, **BusNet**, ACIS are dedicated to the improvement of public transport through technology through the provision of:

- Real time information to the public
- Real time fleet management information and historical performance data to bus operators
- A cost effective data and voice communications system
- Intelligent variable traffic signal priority either locally or integrated with wide area SCOOT UTC systems
- Links to UTMC systems to monitor pollution and provide data on traffic flows.

ACIS BusNet makes travel information available both at a bus stop and at the point of decision-taking where it can make a real difference to passengers: at home, at work, in lifestyle environments such as cinemas, shopping complexes, and leisure centres, and in public service locations like hospitals, schools, and railways. Real Time technology also provides passengers with the information they require whilst on the move, by alternative methods such as Internet, WAP, SMS and encouraging greater social inclusion through landline phone technologies.

If this document does not address any issues which you may have, please contact Ian Buckley or Jamie Hewetson at: ACIS House, Knaves Beech Business Centre, Loudwater, Bucks HP10 9QR or Telephone: (+44) 01628 524900

ACIS AVL SYSTEM



ACIS BusNet uses the differential Global Positioning System (dGPS) to locate vehicles by measuring the range of the equipped bus from a number of satellites. GPS provides a fix roughly once a second to better than 10 metres of actual position and, with differential GPS correction (dGPS) accuracy is improved to +/- 2 metres. This is essential for the level of accuracy needed for Bus Priority. The system is unaffected by extreme weather.

No roadside infrastructure is required making the system particularly easy to extend to rural areas and causing no disruption to traffic or the environment in a city centre during installation or maintenance. The system allows bus-operators to measure service quality by reporting adherence to schedule. Improvements to service quality can be achieved through better supervision of the daily operation of the routes under their control.

SCALABILITY

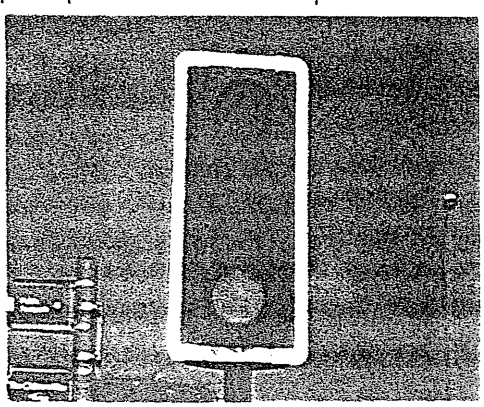
The system is designed on a modular basis, with minimal infrastructure enabling incremental expansion from a single route to a countywide system. Once either a public or private radio infrastructure is in place, adding both routes and buses is extremely simple.

With Private Mobile Radio, if more than 200 buses are needed extra channels can be applied for from the radio authority. The system architecture permits an unlimited number of signs. Routes can be added by using existing software tools within the Central Control Station software (CCS). New routes can be input quickly by merely drawing them onto the GIS mapping database. No programming skills are required.

More varied methods of information dissemination Web, Wap, SMS, cable technologies and the phone server can be added to the system later if required. Enhanced Operator functionality such as BusNet Live, which can be tailored to the needs of individual operators,, provides a further bolt on to the core system. Intelligent Variable Signal Priority and other packages made possible by knowing the position of the tracked bus such as pollution monitoring and congestion measurement can be included if and when required.

BUS PRIORITY

ACIS BusNet integrates with wide area SCOOT UTC systems. By using dGPS, our award winning intelligent variable bus priority can be implemented at signal-controlled junctions through virtual loops, pre installed at the Control Station. No costly roadside infrastructure or maintenance is required and traffic flow remains undisrupted. Variable bus priority in areas where ACIS BusNet has been installed (such as Cardiff) has been found to complement SCOOT system, significantly ameliorating the speed and punctuality of buses whilst having minimal impact on other traffic. Greater efficiency and performance in public transport enables bus operators to offer quality of service thereby meeting both the expectations of the Traffic Commissioner and improving passenger perception of Public Transport.



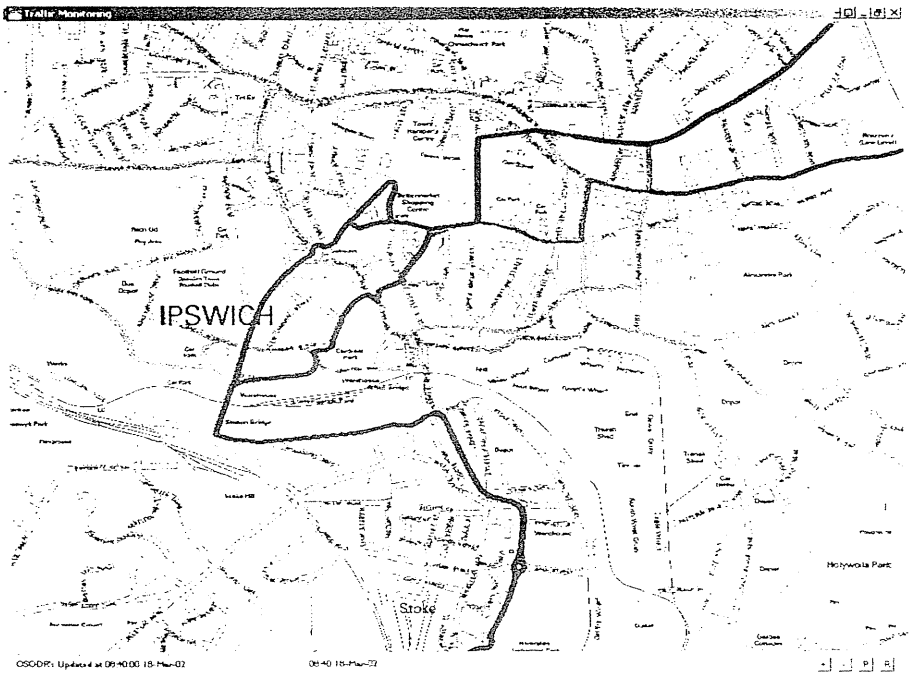
The TRL paper delivered in October at ITS 2001 in Sydney reported on the extensive study carried out by TRL into the Variable Intelligent Bus Priority System in Cardiff. The results showed that when the ACIS bus priority was used in morning peak times, an average time saving of 15% was found and 16% for priority on the outbound in afternoon peak times. The system had a minimal effect on traffic flows as only late buses were given priority.

ACIS is the only company in the UK to offer a Traffic signal priority interface approved by the Highways Agency under the Road Traffic Regulation Act 1984 with Statutory type approval.

UTMC

ACIS believes that a real time system should not be limited to displays at certain positions on street. The BusNet system offers a wealth of functionality which could be deployed beneficially to integrate with traffic control systems in a wide variety of applications.

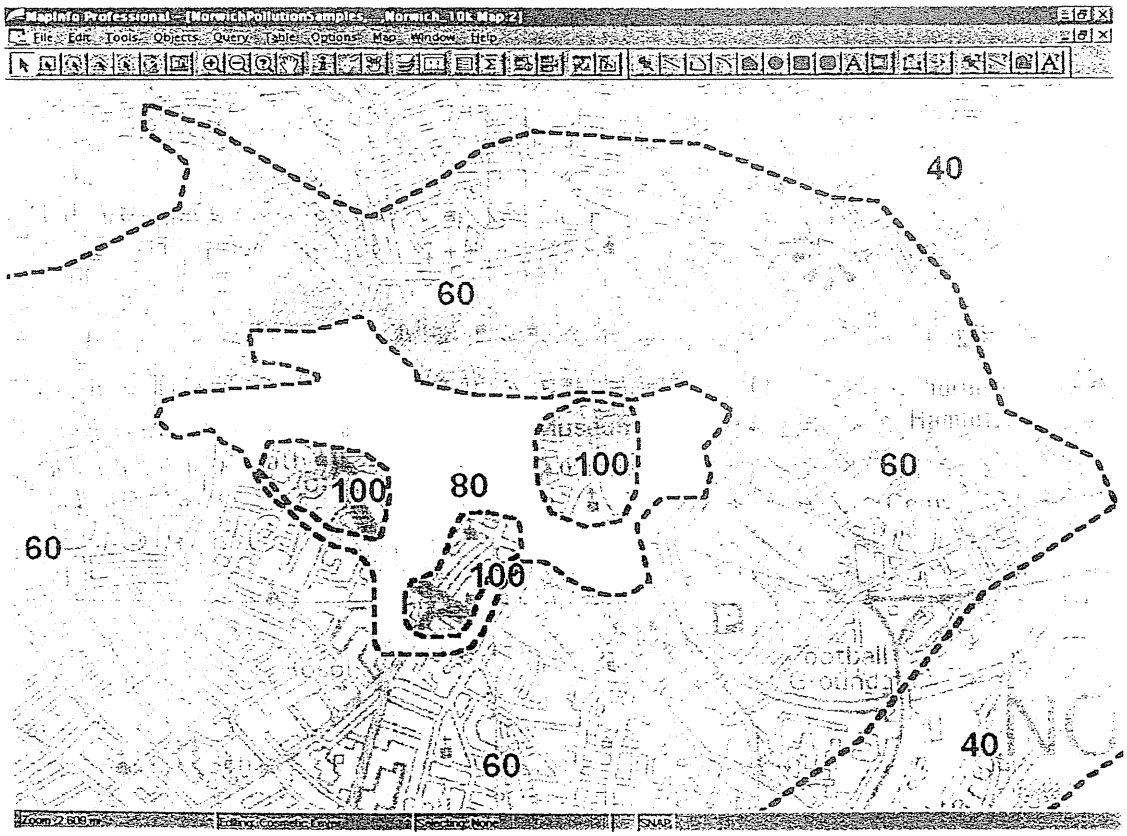
Working closely with a number of the UTMC authorities to link RTI systems with the Authority transport management systems, ACIS is providing information on traffic flows in real time by using buses to perform the task of traffic congestion 'probe' in urban areas.



A colour coded screenshot showing Traffic Congestion

The ACIS system predicts real journey times based upon actual experience and can then feed the information into the TCMS linked to VMS signs. The system may also assist in developing a model for providing 'virtual' predictions allowing Highways Departments to develop strategies. Through the provision of real time bus and journey information, the BusNet system is a valuable tool in managing transport and influencing travel decisions.

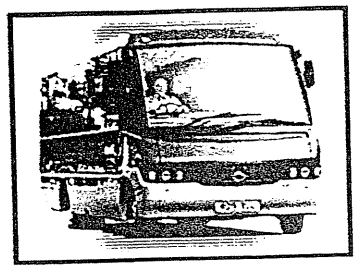
POLUTION MONITORING



ACIS is involved in a collaboration project with a University involving research in the field of particulates through monitoring environmental air quality. Buses are equipped with air scoops and act as mobile monitoring units producing the data both in Real Time and as historical records.

DEMAND RESPONSIVE TRANSPORT

ACIS is aware of the need to facilitate social inclusion through the emphasis on and development of modal shift in transport choices. ACIS BusNet interfaces with Demand Responsive Transport providers such as Mobisoft to enable bus services to be booked in advance to assist both the mobility impaired and also those who risk social exclusion in rural areas or in urban areas with an infrequent bus service. For areas where a mains electricity supply is not readily available, ACIS have also developed a solar powered sign.



A typical DRT bus

COMPATIBILITY WITH OTHER LOCAL AUTHORITIES

ACIS is involved in technical discussions with both competitors as well as suppliers of synergistic systems such as Demand Responsive Transport and schedulers to develop interfaces between systems. These will enable PTI compliant operators to download scheduling data automatically from the PTI database to the ACIS BusNet system and permit buses to be tracked across authority borders without duplication of equipment. Wherever possible, open and readily available software and standard protocols such as XML are used in order to feed information between our system and others.

In terms of the utilisation of communications platforms, the BusNet system currently employs either PMR or GPRS, as in our partnership development with Vodafone in Newbury.

The add-on of our enhanced on-board communications selector, UltiCom, enables a fitted bus to transmit its position utilising the low-cost PMR where available and then switch to GPRS when necessary, for example, in the case where a vehicle crosses the boundary into a neighbouring authority.

PARTNERSHIP

ACIS is proud of the relationship it develops with its customers and is continuously working to support all parties involved in what is a significant change to local transport infrastructure. The company believes that the commissioning and installation of a Real Time Information System is the start of a long-term partnership between the local authority, the bus operator or operators, and ACIS as the supplier. The System functionality is developed not just by ACIS and its production partners but also in partnership with our users. ACIS has a user group, which during a general meeting held twice a year, is encouraged to request added features and constructively criticise the system.

MIGRATION

ACIS have previously migrated systems from the early beacon tracking and pager communication based systems to the new GPS tracking and MPT1327 communications based technologies. Technology will continue to evolve and ACIS will remain at the forefront of technological development. Whilst supporting existing technologies ACIS will always provide customers with a clear migration path.

FUTUREPROOFING

Real Time Systems will be measured by their success over time. ACIS systems are built to last and designed to adapt to changing technology. In 10 to 15 years ACIS will ensure the BusNet system will still be as relevant, functional and market leading then as it is today.

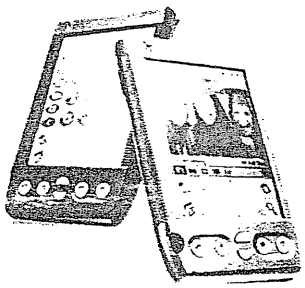
GETTING YOUR INFORMATION OUT

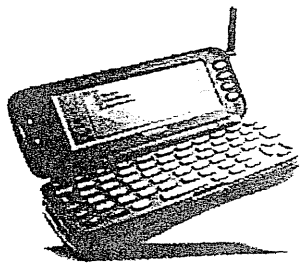
The Government is keen for real time information to be made available through information channels other than the now traditional bus stop displays. ACIS is at the forefront of new technologies providing immediate data to suppliers and their end users.

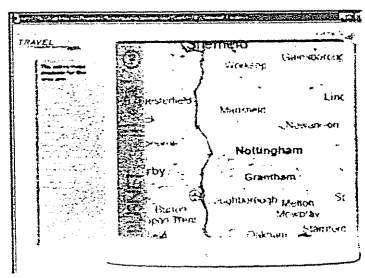
Users will be able to view bus arrival time information by accessing an authority's website or that of a Traveline call centre. The live information and web frames are provided through a VPN (virtual private network). This allows the two remote servers to exchange data using Internet protocol (IP) without the use and costs associated with private line connections.

Live information is routed from local authority sites directly back to a web server from where information is disseminated using a variety of media including the web, a WAP server, SMS messaging and voice telephone servers.

Real time information can also be distributed over cable television, for example the data being viewed in a scroll bar running along the lower portions of the television screen.

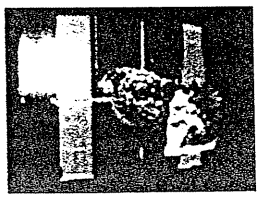


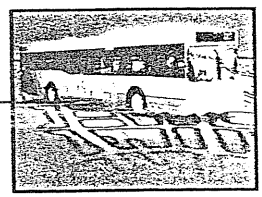


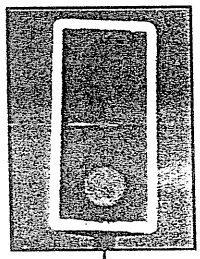


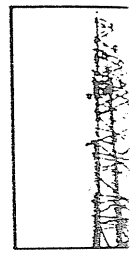
The ACIS System schematic

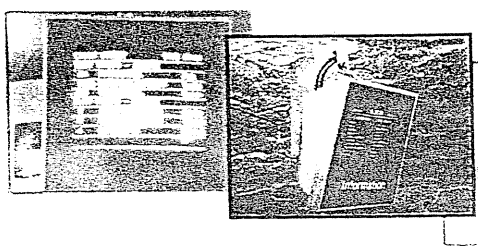
Global
Positioning
System (GPS)

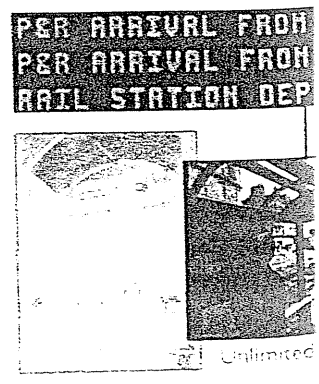


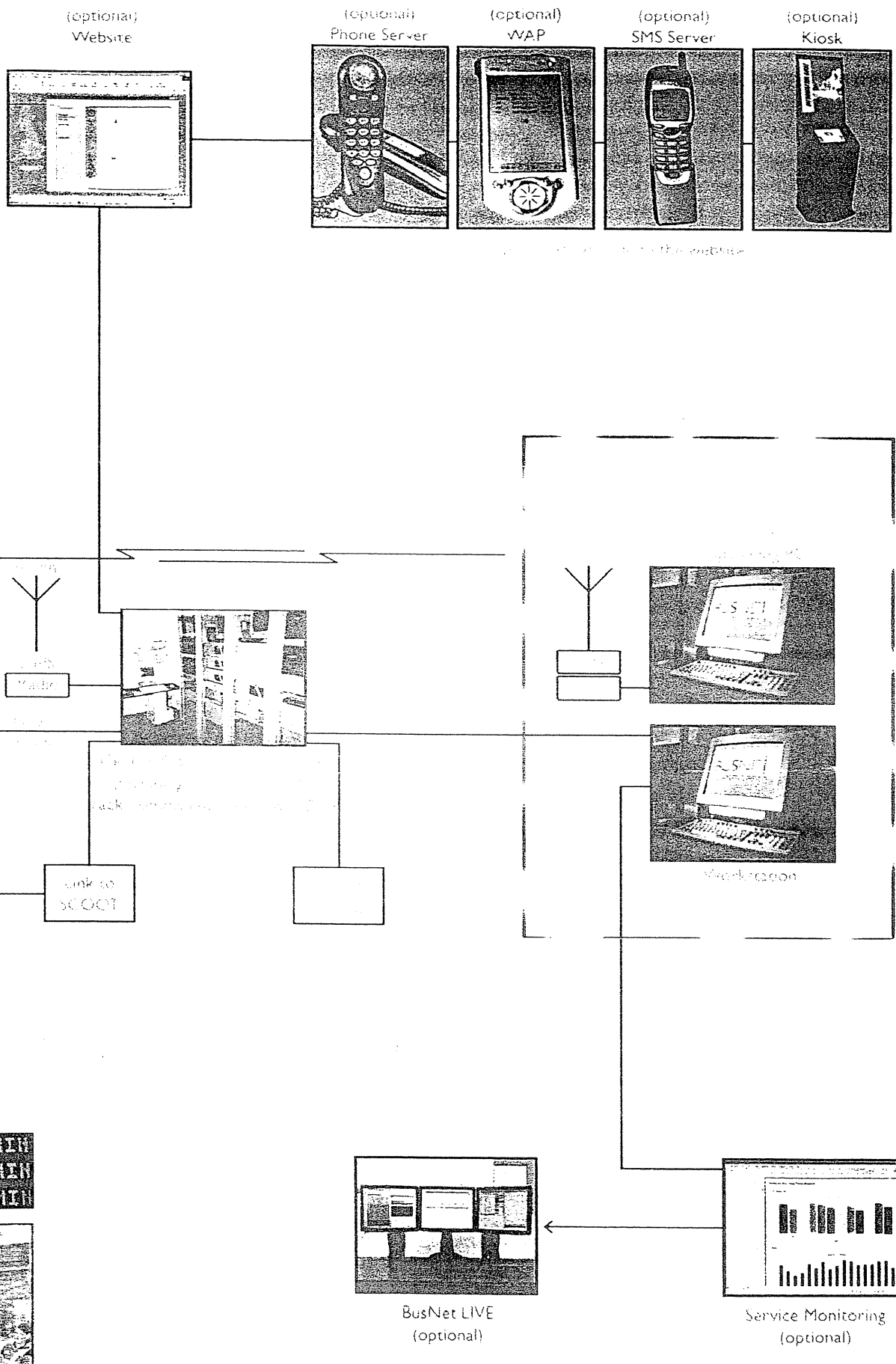











(optional)
Website
(optional)
Phone Server
(optional)
WAP
(optional)
SMS Server
(optional)
Kiosk
9 MIN
18 MIN
ERY 15 MIN
BusNet LIVE
(optional)
Service Monitoring
(optional)

13-11

PARTNERSHIP WITH BUS OPERATORS

A partnership between the local authority, the bus operators and the suppliers is paramount for achieving the best results from real time systems. Operators and authorities have different needs and requirements. The full potential of these systems is realised with commitment on the part of all parties concerned.

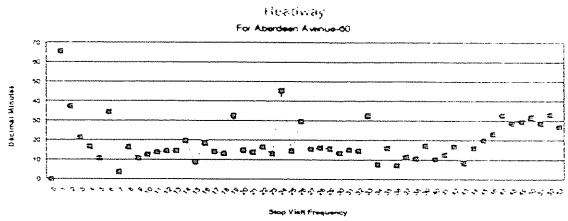
For Operators, two key areas can be addressed by a real time system. Firstly, Service Monitoring **(live and historic reports)**, generated through the data produced by the system, enables schedulers to redraw timetables which accurately reflect real journey times thereby improving adherence to schedules.

Secondly, **BusNet Live (live reports)** enables depot managers to proactively manage their fleets in real time. BusNet Live allows deport manager to see where a problem has arisen and take a decision as to how to remedy it before the situation becomes an issue.

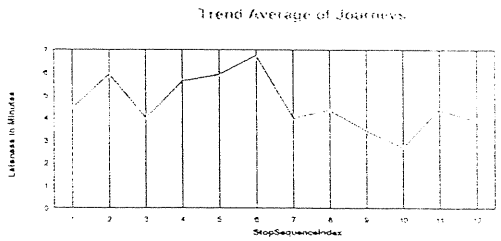
All information is filtered to allow operators access only to the information relating to their own fleets.

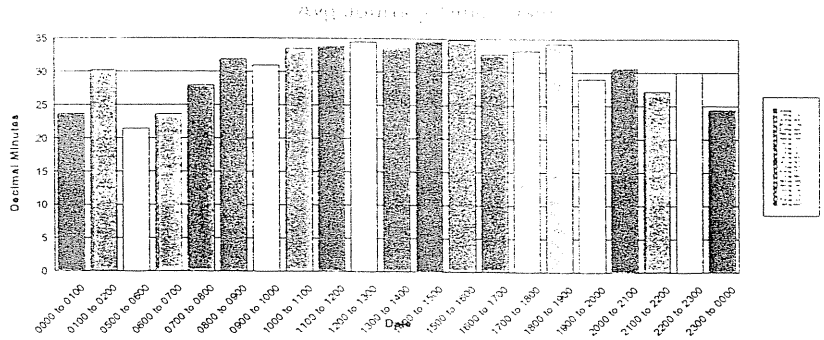
Service Monitoring

ACIS has produced a suite of reports that provide management information on service performance, service by service, vehicle by vehicle and stop by stop. The reports provide access to historical data on which both service performance can be judged and commercial decisions made. Bus Operators are assisted in investigating and answering public correspondence. They pinpoint the location of a bus at



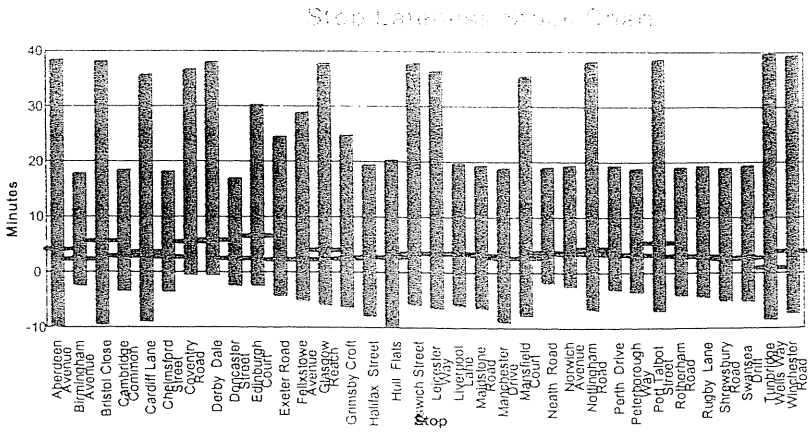
any time, analyse service performance and provide data over the entire network of stops to allow weaknesses in service





delivery to be addressed. Problems at junctions can be viewed, enabling operators and authorities, in partner-ship, to look at possible ways of alleviating any problems, perhaps through the implementation of intelligent variable bus priority.

The reports allow operators to monitor bus services saving the costs of employing people on the street with clipboards. Since files can be re-run using the archived data, traffic flow problems at any given time can be highlighted to respond vigorously to any concerns of the Traffic Commissioner.

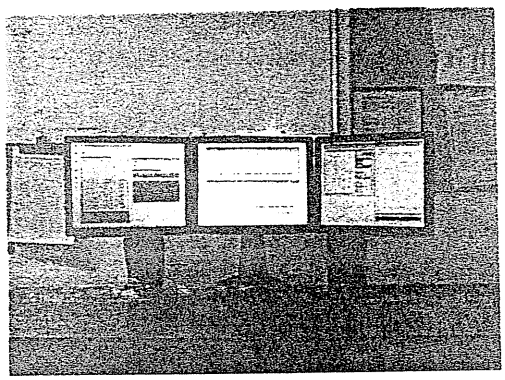


BusNet Live

BusNet Live is ACIS' Real Time Information Provider System supplied for the purpose of increasing service delivery efficiency to a bus operating company. There are a number of interlinking screens or sets of data that may be analysed individually or, alternatively, at the same time with links enabling the user to navigate through the system. BusNet Live is delivered over the web and is designed so that it may be deployed locally.

There are 6 screens or sets of data which should be able to be analysed individually or at the same time and links will enable the user to move from screen to screen by linking data.

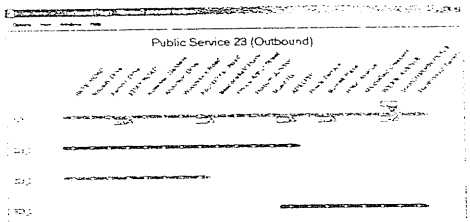
BusNet, which receives its Positioning System (GPS), location of all buses whilst they valuable information to operators well as the performance of may then interrogate, configure vehicles and their adherence to position of a particular bus and its managers to make 'real time' likely to be a problem, to take



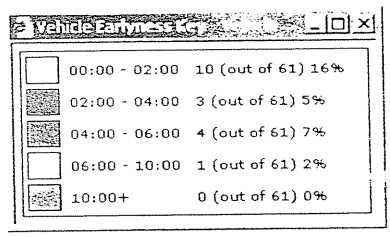
An example of a BusNet Live Suite

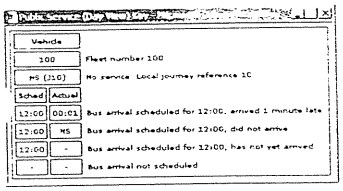
information via the Global provides accurate data on the are operating. This provides on how services are running as individual vehicles. Operators and monitor the position of the schedules. Knowing the schedule status allows fleet decisions and, where there is evasive action in good time.

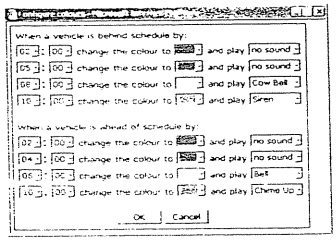
The monitoring of bus performance in real time also allows bus operators to answer telephone queries and provide accurate information to the public regarding the arrival times of their buses.

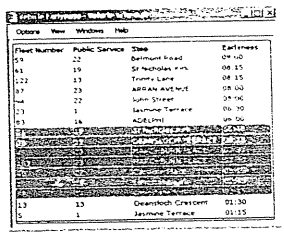


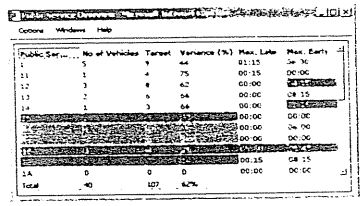
BusNet screens can be shown 1-4 displays (as shown above) highlighting problem or critical areas. The system will alert the operator when a bus, or a service is operating outside of acceptable performance







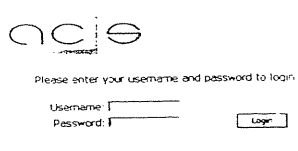




Security

BusNet Live provides the operator with the security privileges required for safeguarding the data.

Management services are only available to authorised users. There will need to be a database of users of the services and the operator information they can access. There are three types of user: local operators, operator groups, and local authorities. Local operators are able to access their own vehicles only. Operator groups are able to access all vehicles from local operators in their Group. Local authorities are able to access all operators in their area. This constraint will apply to all windows.



A CORE SYSTEM

For the implementation of a core system, the necessary components are as follows:

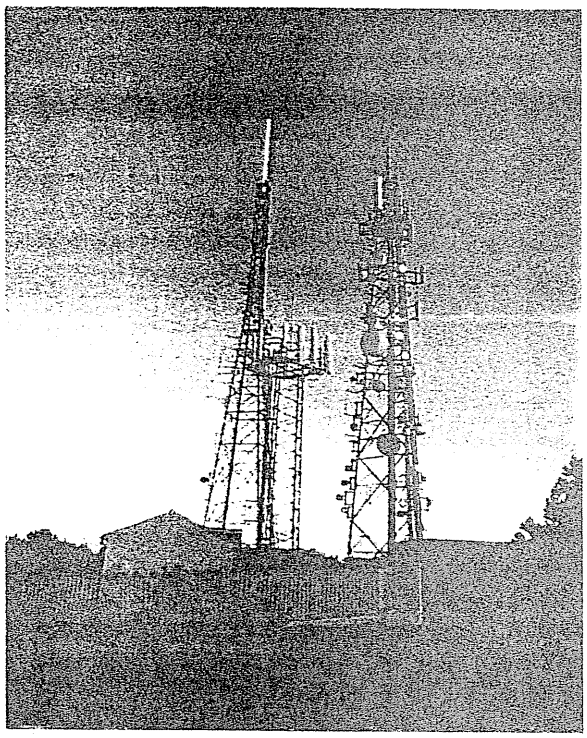
- One Central Control Station
- One base station (if using PMR)
- On vehicle equipment

To be borne in mind:

- Configuration and project management
- Ongoing maintenance cost

Extra

- One or more workstations may be required by the operators.
- If service monitoring or bus priority are wanted then a differential base station is required.
- If WAP or SMS or a phone server are wanted, then a website is required.



A key decision that will need to be made by you as a local authority will be on the size and scope of the RTI infrastructure you may wish to put in place. This section is designed to assist you in deciding on the architectural design of your system.

Questions which need to be considered by a local authority are:

Over the next 5 years:

- What is the scope of the system?
- How many buses?
- How many displays?
- How many routes and variants?
- How many operators?
- How do we want to build it up?

Also

- What kind of communications do we want?
- Public? or private?
- Voice? and data?

GPRS COMMUNICATIONS (PUBLIC)

A General Packet Radio Service (GPRS) system makes use of a public communications network and thus substitutes the need for any up-front capital outlay with call charges. The revenue costs for communication using GPRS are for each bus and each display. ACIS is at the leading edge of development of this communications technology and, as the approved partners of Vodafone, is installing a GPRS system into Newbury. ACIS can trunk GPRS systems in with PMR to enable buses to report their positions where a PMR structure is unavailable, for example where a number of uncovered infrequent rural routes feed into a central spine with regular services.

PMR COMMUNICATIONS (PRIVATE)

Since revenue expenditure is such a major issue for Local Authorities, the majority tend to opt for a Private Mobile Radio (PMR) system which is owned by the authority and has **no ongoing call charges.** Therefore, for a system with a larger number of buses and displays, this kind of communications system matches the local authority requirement for minimal operating costs.

If the authority is considering the installation of a PMR system then it needs to ask:

- What type of base station do I require?

Deciding on the type of base station

Before deciding on a base station two questions need to be asked:

- Do we need voice capabilities?
- Do we intend to expand the system to allow buses to roam countywide?

There are 3 types of base station:

Option 1: A single stand-alone base station using an existing radio mast gives good coverage of an area with, on average, 30km radius depending on the region's topography. This figure may be doubled in a flat area. A single stand-alone base station has **data** capability only and cannot be trunked.

Option 2: A trunked base station for **data** only. If the bus operator **does not need voice** and the intention of the authority is to gradually build the system to cover its county so that buses roam seamlessly, this could be considered the best option. As the system expands, further base stations may be added and trunked.

Option 3: A trunked base station for both **voice** and **data**. This base station may be expanded in the same way as Option 2.

If you, on behalf of your local authority, would like our radio specialist to give some guidance as to the number of base stations that are likely to be required or whether the proposed routes would receive coverage, then please do not hesitate to contact us.

MAKING TECHNICAL STANDARDS A PRIORITY

ACIS prides itself on its technical standards believing them to be some of the best currently available in the UK. As an organisation we consistently aim to work in line with the proposed nationally agreed structure always aware of all users' needs to have systems in place that may in time be integrated and unified.

Therefore, ACIS, as an RTPI supplier, welcomes the Real Time Information Group National Real Time Passenger Information Strategy as a framework around which suppliers can work. ACIS believes that if suppliers work together in linking their systems it will accelerate widespread distribution of RTPI systems. As a company, ACIS looks forward to assisting the Working Party to ensure that the standard delivers its aims.

The ACIS BusNet system is very largely compliant with the issued draft. ACIS welcomes the opportunity to link our System to those of other suppliers, and have operating sites that have integrated legacy systems. However, Local Authorities should be aware that how this link is to be established has not yet been identified within the standard and therefore ACIS cannot claim to be fully compliant.

ACIS are also aware of and will be compliant to the Highways Agency Travel Information Highway. We would like to draw your attention to the fact that the company have already established Highways Agency approval for its award winning traffic light priority system.

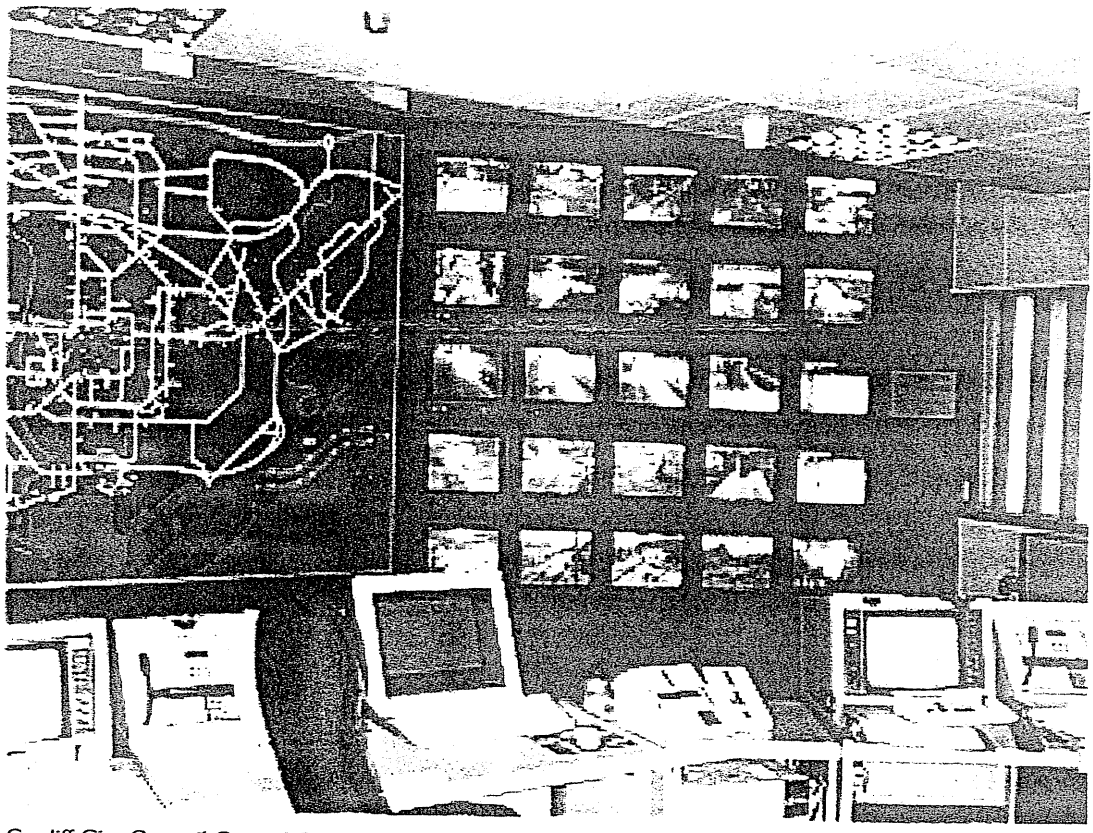
Once established, ACIS will work with the National Stops Database. ACIS currently import data from several external databases including those developed for PTI2000.

ACIS Systems have been developed with TransXchange in mind and the company has been active in the setting of the standard. ACIS are working with Transmodel in its database structures both directly and indirectly through TransXchange. Please note that ACIS already operates XML, the basis of TransXchange, for the import and export of its data.

FINANCE

Budgetary pricing can be provided on application as costs are dependant on a variety of factors and specifications. Some fixed cost items are:

- **Ongoing Revenue Costs**
  - **For a PMR system**
    - There are no airtime charges using PMR.
    - The annual licence for the bandwidth paid direct to the Radio Authority is roughly £300.
    - Site sharing rental paid to NTL or Crown Castle is between £2,000 and £7,000 p.a.
    - The link from the base station to the Central Control Station and to workstations is via a BT high speed kilostream link, prices for which are available from BT.
  - **For a GPRS system**
    - For GPRS there are ongoing revenue costs per month per bus and per sign.
    - A leased line to the server.
  - **For all systems**
    - The costs for vandalism and wear and tear on the system.
    - All exterior signs are IP65 rated.
    - The first 12 months of maintenance are included in the cost of the system. After that, maintenance costs based upon the cost of the hardware and level of support for software.



Cardiff City Council Central Control Station