

UK Real Time Information Group

The Value of RTIG Standards and Guidelines

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1 Introduction

1.1 About this document

- 1.1.1 This document has been produced for the Real Time Information Group (RTIG) by Centaur Consulting. It is one of the deliverables to be completed under RTIG Government Task 1.2: Evaluation of implementations.
- 1.1.2 Amongst the services that RTIG provides is a range of monitoring studies, reviews and surveys that utilise its ability to connect with a broad base of UK implementers. Within this remit, DfT has commissioned RTIG to undertake a review of how members value RTIG Standards and Guidelines.
- 1.1.3 Under support from the Department for Transport, the Welsh Assembly Government and the Scottish Executive, RTIG is conducting a number of studies into areas of importance to Members and Affiliates. One of these is a review of the use and value of RTIG standards.

2 RTIG Standards and Guidelines

2.1 Introduction

2.1.1 The purpose of the development of RTIG Standards and Guidelines was to ensure that there is a suitable suite of robust, open specifications to support the necessary aspects of RTI system implementation. These documents assist implementers to:

- identify, select and validate equipment;
- to achieve cross-border interoperability;
- to enable flexible fleet management;
- to allow UK suppliers to effectively market to overseas customers.

2.1.2 Through this work, all stakeholders benefit through the improved facility to buy interworking systems with standard interfaces. Design and implementation of integrated systems will be quicker, easier and cheaper, and less risky. Links to other systems and initiatives, such as UTMC systems or the Transport Direct Portal, are greatly facilitated. Emergency service responses will be facilitated. Passengers will benefit from more accessible information, faster and more reliable journeys, and a safer travel experience.

2.1.3 Potential new areas for standards and guidelines development are normally raised by members and then referred to the RTIG Executive and Department for Transport (DfT). If the Executive and DfT decide that this work would be of benefit to RTIG members and the RTI community as a whole, a working group is then set up to develop the document.

2.1.4 Documents vary from particularly technical specifications to more accessible guidelines. These documents are more often than not designed with a particular audience in mind, be it technical or non-technical.

2.1.5 Since 2003, eight standards and guidelines documents have been produced by RTIG and three more are currently being developed for publication in the near future.

2.2 About this document

2.2.1 This report will focus on case studies where members have adopted an RTIG standard or standards and their experiences since their adoption. It also takes into account the views of members on RTIG standards and guidelines that are currently in development, and their potential for future use. Ultimately, it will indicate the work that RTIG has done and whether or not it has proved to be useful.

2.2.2 It examines:

- standards adopted by local authorities, bus operators and suppliers;
- the benefits of becoming RTIG 'compliant';
- the expectations of users;
- issues that have arisen;
- member's anticipation of future standards work.

2.3 Currently available RTIG Standards and Guidelines

2.3.1 The following RTIG Standards and Guidelines are currently available from the RTIG library (current version date in brackets):

- **RTIGT003:** Quality of Service and evaluation (2003);
- **RTIGT005:** Outline Requirements Specification (2003);
- **RTIGT006:** RTIG-XML (server-to-server) (2004);
- **RTIGT008:** Traffic Light Priority and Cleardown Specification (2005);
- **RTIGT011:** RTIG National Architecture (2004);
- **RTIGT013:** Key Fobs Guidelines (2004);
- **RTIGT014:** Project Management Guidelines (2004);
- **RTIG-PR003-D001:** DDA Review (2005).

2.4 RTIG Standards and Guidelines in development

2.4.1 RTIG standards and guidelines currently under development are:

- Shelters – at stop infrastructure (recently circulated to members for comment);
- ETM-OBU bi-directional link;
- DDA Guidelines.

2.4.2 Respondents were asked to comment on future plans to consult these documents. This gives RTIG a good idea of the take up of documents that are currently being finalised, and the attitudes of members to the on going work of RTIG and its applicability and relevance.

3 The benefits of current RTIG Standards and Guidelines

3.1 Introduction

3.1.1 In order to capture views and comments from a broad a range of members as possible, ten RTIG members were contacted during October 2005 and asked for their cooperation. These members were made up of representatives from:

- Bus operators;
- RTI systems suppliers;
- Local Authorities.

3.1.2 A survey was sent electronically and respondents were asked to complete and return in their own time. If any follow-up questions were needed a telephone interview was arranged. All telephone interviews were minuted and were cleared for publication by each respondent.

3.2 Current usage

3.2.1 Current usage is detailed in table 1 below (those marked with an asterisk denote that standards/guidelines have been provisionally consulted, but a decision has yet to made on whether or not they will be adopted):

Case Study	Type	Standards Used or Consulted
Brighton and Hove Council	Local Authority	RTIGT013: Key Fobs Guidelines RTIG-PR003-D001: DDA Review
South Yorkshire Passenger Transport Executive	PTE	RTIGT003: Quality of Service and evaluation RTIGT005: Outline Requirements Specification RTIGT006: RTIG-XML (server-to-server) RTIGT008: Traffic Light Priority and Cleardown Specification RTIGT011: RTIG National Architecture RTIGT013: Key Fobs Guidelines RTIG-PR003-D001: DDA Review
Essex CC	Local Authority	RTIGT013: Key Fobs Guidelines* RTIG-PR003-D001: DDA Review*
Hampshire CC	Local Authority	RTIGT006: RTIG-XML (server-to-server) RTIGT008: Traffic Light Priority and Cleardown Specification RTIGT011: RTIG National Architecture RTIGT013: Key Fobs Guidelines RTIG-PR003-D001: DDA Review
Surrey CC	Local Authority	RTIGT006: RTIG-XML (server-to-server) RTIGT008: Traffic Light Priority and Cleardown Specification RTIG-PR003-D001: DDA Review
Siemens	System supplier	RTIGT006: RTIG-XML (server-to-server)

		RTIGT008: Traffic Light Priority and Cleardown Specification RTIGT013: Key Fobs Guidelines*
Init ¹	System supplier	RTIGT003: Quality of Service and evaluation RTIGT005: Outline Requirements Specification RTIGT006: RTIG-XML (server-to-server) RTIGT008: Traffic Light Priority and Cleardown Specification* RTIGT011: RTIG National Architecture RTIGT013: Key Fobs Guidelines* RTIGT014: Project Management Guidelines RTIG-PR003-D001: DDA Review
First Group	Bus operator	RTIGT005: Outline Requirements Specification RTIGT008: Traffic Light Priority and Cleardown Specification RTIGT014: Project Management Guidelines
Brighton Buses	Bus operator	See Brighton and Hove Council

Table 1: Case studies overview

3.3 Usage by respondents

3.3.1 As outlined in table 1, respondents were taken from three representative groups – systems suppliers, bus operators and local authorities. We will now consider each stakeholder group separately and discuss their usage of RTIG Standards and Guidelines.

Systems suppliers

3.3.2 Systems suppliers are more likely to be interested in using more technical documents and this has been highlighted in questionnaire responses and follow-up interviews. Both of the systems suppliers contacted have used, or are considering using, RTIGT006, RTIGT008 and RTIG013. Both respondents, on the whole, have had positive experiences with all of these technical documents – in one case Siemens has used RTIGT008 during the tender process for London’s next-generation RTI system.

¹ In the case of Init, a relatively new RTIG member, it is currently reviewing the majority of applicable standards and guidelines documents for future system development and enhancement. However, Init’s system development and specification has already been in accordance with similar standards and guidelines, and future specifications should experience little problems when going down the RTIG ‘route’.

- 3.3.3 Both suppliers have advocated going down the 'RTIG route'. In the case of Siemens this means adopting a bus priority standard that will benefit buses coming in to London from neighbouring boroughs. This is seen as key to the efficiency and functionality of the new London system. Initt too are keen to keep their systems as RTIG compliant and have used standardisation in the past as the main driver for project requirements. Initt claim that their UK based projects are mainly RTIG compliant, however they need to work further on traffic light priority compliance and are currently working with RTIGT008.

Bus operators

- 3.3.4 Bus operators are in the position where, if they wish to be RTIG compliant and reap the benefits, they will need to encourage their local authorities (and their suppliers) to go down the same route.
- 3.3.5 In light of this, First Group has encouraged the local authorities in the areas in which it operates to become RTIG compliant. This benefits First Group as it will allow their large fleet (which frequently will cross authority borders) to operate seamlessly and provide its passengers with reliable and accurate real time information. In addition, the use of guidelines documents such as the DDA and key fobs will allow bus operators to provide their disabled passengers with a more accessible service.
- 3.3.6 The bus operators interviewed for this report have consulted: RTIGT005, RTIGT008, RTIGT013, RTIGT014 and RTIG-PR003-D001.

Local authorities

- 3.3.7 Local authorities have consulted and used a broad range of RTIG Standards and Guidelines, by nature of their role as a system implementer. This includes both technical and more 'guideline' based documents.
- 3.3.8 The most consulted documents by local authorities include RTIGT006, RTIGT008, RTIGT011, RTIGT013 and RTIG-PR003-D001.
- 3.3.9 Local authorities have expressed an interest in the development of more 'guidelines' based documents in the future as they find these particularly useful. Brighton and Hove Council, in particular, have found both the Key Fobs Guidelines and the DDA Review to be very beneficial to their system and have saved both time and money.

3.4 Reasons for usage

- 3.4.1 In order to gather information on why standards have been used, respondents were asked for specific reasons for each standard or guideline. The two most popular reasons for usage were strategy and system development.
- 3.4.2 The majority of respondents interviewed have been using RTIG Standards and Guidelines since their inception. In many cases this was after their systems went online, and thus documents have been used to enhance and develop their systems. In addition, respondents indicated that RTIG Standards and Guidelines enabled them to think about future developments and how best to prepare for the addition of functionality. Initt, as newcomers to RTIG, have had some experience with using **RTIGT006** and are currently taking other standards and guidelines into account for future use and for recommendation to clients.

Document	Primary reasons of usage	Users
RTIGT003: Quality of Service and evaluation	<i>Strategy Development</i> <i>System Development</i>	Hampshire, First Group Buses, Init
RTIGT005: Outline Requirements Specification	<i>System Development</i>	SYPTE, Init
RTIGT006: RTIG-XML (server-to-server)	<i>Strategy Development</i> <i>Compliance</i> <i>System Development</i>	SYPTE, Hampshire, Surrey, Init, Siemens
RTIGT008: Traffic Light Priority and Cleardown Specification	<i>Procurement</i> <i>Strategy Development</i>	SYPTE, Hampshire, Surrey, First Group Buses, Siemens
RTIGT011: RTIG National Architecture	<i>System Development</i>	SYPTE and Hampshire, Init
RTIGT013: Key Fobs Guidelines	<i>Strategy Development</i>	Brighton and Hove, Brighton Buses, SYPTE, Hampshire, Essex, Siemens
RTIGT014: Project Management Guidelines	<i>Strategy Development</i> <i>System Development</i>	First Group Buses, Init
RTIG-PR003-D001: DDA Review	<i>Strategy Development</i> <i>Compliance</i> <i>System Development</i>	Brighton and Hove, Brighton Buses, SYPTE, Hampshire, Essex, Surrey, Init

Table 3.2: RTIG Standards and usage

3.5 Benefits of usage

- 3.5.1 Respondents were asked to outline the benefits that the use of RTIG standards and guidelines has brought to their systems. No respondents suggested that RTIG Standards and Guidelines had brought negative benefits to their system.
- 3.5.2 Generally, respondents were particularly positive with regard to the RTIG Standards and Guidelines that they have used and see them as a 'good thing' and a worthwhile membership feature. Some documents have required a great deal of work to get them to a useable state, however respondents comment that this has been a worthwhile investment of time and money as the benefits to their system outweigh any effort.
- 3.5.3 Both of the systems suppliers interviewed agreed that merely the availability of RTIG Standards and Guidelines was a benefit in itself. If a client decides that they wish to be RTIG compliant, the system provider can simply refer to existing documentation.

- 3.5.4 Respondents, local authorities in particular, are pleased with the development of the RTIG DDA Guidelines and the forthcoming RTIG Shelters Specification. These types of documents have an element of non-technicality which LAs appreciate, and give RTI teams clear guidelines and process descriptions in 'layman's terms'. Praise was made of their clear and concise approach to two pertinent and potentially difficult issues – that of DDA compatibility and installing shelters in a timely and trouble free fashion.
- 3.5.5 The questionnaire asked respondents to comment on the benefits of standards and guidelines, in particular towards the following:
- procurement process;
 - system installation;
 - system integration;
 - post implementation;
 - system enhancement;
 - system cost.
- 3.5.6 Of these, the three most popular options that benefited from using RTIG Standards and Guidelines are (in order):
- system enhancement;
 - system installation;
 - procurement.

Procurement process

- 3.5.7 Four respondents suggested that the procurement process of their RTI system or enhancements to their system have benefited from the use of RTIG Standards and Guidelines.
- 3.5.8 Brighton strongly benefited from the guidelines they used whilst developing their system in their procurement process. Specifically they felt that the guidelines and standards that they used sped up the procurement process, thus allowing it to develop their system in a more efficient and informed way.

System installation

- 3.5.9 Five respondents claimed that system installation has benefited from the use of RTIG Standards and Guidelines.
- 3.5.10 Hampshire in particular has found that the standards it has adopted since the early planning stages of system implementation have been of great benefit.

System integration

- 3.5.11 Two respondents have found that by adopting RTIG Standards and Guidelines, their system integration developments have benefited. One area of future enhancement is cross-boundary links with neighbouring systems, and this is potentially an area where guidelines could be useful.

Post implementation

- 3.5.12 Three respondents have benefited from using RTIG Standards and Guidelines after the implementation of their RTI systems. This will mean enhancements, upgrades or general maintenance of their system.

System enhancement

- 3.5.13 The most popular use of RTIG Standards and Guidelines is system enhancement. This is not particularly surprising as many of the local authorities interviewed had systems which were operational before the introduction of RTIG specifications. In addition, as systems have now reached a point of maturity, implementers and systems suppliers are now looking to improve upon what they have already achieved and introduce new functionality and integration with other elements of ITS.

- 3.5.14 The following local authorities are looking to enhance or add new functionality to their system and will be using RTIG Standards and/or Guidelines:

- SYPTE;
- Brighton and Hove Council;
- Surrey County Council;
- Hampshire County Council;
- Essex County Council.

System cost

- 3.5.15 Two respondents commented that becoming compliant is expensive, but it is worth the investment. Two other respondents, however, commented that by using RTIG guidelines, they have actually saved money.

- 3.5.16 The Brighton team achieved strong system cost benefits from the use of the DDA Review and the Key Fobs specification during system enhancement and development stages. These cost benefits were derived directly from the time saved during development and procurement stages. RTIG Guidelines documents allowed system developers, in this case a local authority, to be aware of any issues surrounding a particular implementation and, in turn, develop a process that allowed them to avoid them as much as possible.

- 3.5.17 This case is interesting and is a possible area of promotion for future RTIG guidelines – the fact that they can save members money in the long run.

3.6 Main issues raised by respondents

- 3.6.1 Respondents were asked to comment on any issues that were experienced during the use of any RTIG Standards and Guidelines. Only three particularly pertinent issues were recorded and will be discussed below.

Costs of compliance

- 3.6.2 The main issue expressed by respondents (all stakeholders) was the cost of compliance. At least four respondents commented that going down the 'RTIG path' is expensive. However, many see this cost as acceptable because of the benefits that will be reaped in the long-run.

The problems associated with early adoption

- 3.6.3 SYPTE were early adopters of RTIG-XML and invested time and money into developing the standard into its final, useable state. A great deal of effort was put into fine-tuning this standard, but this was necessary to develop a fully RTIG compliant RTI system. This issue was predominately expressed by local authorities and bus operators.

Standards not working correctly

- 3.6.4 At least two respondents commented that the standards that they had used had not worked correctly from the outset. In many cases these issues are being ironed out successfully and, so far, no standards or guidelines had been abandoned completely.
- 3.6.5 The majority of respondents commented that, so far, it was too early in their system's lifecycle to comment on any significant or 'show stopper' issues, but monitoring would be carried out to make sure that any are picked up at an early stage of adoption.
- 3.6.6 Again this issue was mainly recorded by local authorities working closely with technical standards (such as SYPTE) and those who keep a close eye on the further enhancement of their system (such as Surrey).

3.7 Conclusions

- 3.7.1 It is clear that different stakeholders use different documents. Systems suppliers will primarily concentrate on technical standards and compliance, while bus operators will focus on encouraging relevant local authorities that the 'RTIG route' is of great value and will therefore use (or encourage the use of) documents which are of mutual benefit.
- 3.7.2 Local authorities have consulted and employed a broad range of RTIG documents, both technical and more 'guideline' based. Some local authorities, such as SYPTE, have used the majority of the available RTIG guidelines and have been influential in their development and work closely with their suppliers. Others do not have such a great deal of technical knowledge and rely on their system suppliers to concentrate on the complexities of compliance.
- 3.7.3 It is important to note, however, that all of the RTIG documents produced so far have been consulted or used by at least one of the stakeholders interviewed. In some cases RTIG documents have been used in major tender processes, and in others they have saved stakeholders time and money which would otherwise have been spent on investigating the complexities of DDA.
- 3.7.4 It is encouraging that, according to the responses made, the take-up and usage of RTIG Standards and Guidelines has brought benefits to RTI systems, in particular procurement, installation and enhancement. Respondents made particularly positive comments towards the worthwhile nature of RTIG Standards and Guidelines and going down the 'RTIG road' of compliance. Some respondents commented that although it has been a struggle to become compliant, both financially and technically, this will prove to be valuable in the long run.
- 3.7.5 The general feeling expressed by respondents was the RTIG Standards and Guidelines were a 'good thing' and have helped greatly in system enhancement and system installation scenarios. With more LAs enhancing the functionality of their systems, guidelines and standards will be key to smooth and trouble free procurement and installation, and they look forward to further developments.

- 3.7.6 Guidelines in particular, because of their usability in the 'real world' are seen as a very useful and potentially cost saving exercise and one that should be pursued in the future.

4 Future standards

4.1 Introduction

4.1.1 It is important that RTIG look to the future and develop standards and guidelines that reflect the way that LAs are planning to develop and enhance their systems. We asked respondents if they would be using a number of standards and guidelines which are currently in development and if they had any ideas on new areas of interest.

4.2 Upcoming RTIG Standards and Guidelines

4.2.1 There are currently three documents being developed by RTIG Work Groups. They are:

- Shelters – at-stop infrastructure;
- ETM-OBU bi-directional link;
- DDA Guidance.

4.2.2 Respondents were asked if they had plans to use these documents. Four suggested that they would be consulting the Shelters document; six would be considering the ETM-OBU specification; and five the DDA Guidance document.

4.2.3 A number of respondents were pleased that these three issues were being addressed as they all address particularly important issues, and look forward to using them in the near future.

4.3 Future RTIG work

4.3.1 Possible work areas identified by respondents include:

- The use of a 'reference' RTI system that implementers can use as a benchmark;
- RTI Marketing guidance;
- 'Key' RTI systems case studies;
- Signage case studies;
- Procurement guidelines;
- RTI website functionality guidelines.

4.4 General comments

4.4.1 Respondents were keen for the development of further documents similar to the DDA review, in other words documents that provided implementers with clear guidelines and process details. In particular, local authorities were keen for 'non-technical' documents to be produced that can be used as useable guidance for difficult system enhancements and developments.

4.4.2 The shelters document, which was recently distributed to RTIG members for comment, is seen as very important as it will save LAs a great deal of time and money.

4.4.3 Respondents (both LAs and bus operators) were also looking forward to the publication of the ETM-OBU specification as they see this as a key area of system development.

5 Conclusions

5.1 Introduction

- 5.1.1 This report has provided a review of how RTIG's members have used standards and guidelines and their experiences. It has focused on the experiences of local authorities, bus operators and systems suppliers. All of these members have used, or are planning on using RTIG Standards and Guidelines in the future. All of them have had positive things to say about the standards and guidelines that they have used, and the majority are looking forward to using future documents.
- 5.1.2 This section provides a summary of the findings and drawing on this information, provides the following conclusions.

5.2 The value of RTIG Standards and Guidelines

- 5.2.1 It is evident from the attitudes expressed by respondents that RTIG Standards and Guidelines are 'a good thing' and that they hold much value. However, this does not mean that it has been an easy route to achieving compliance and standardisation. Early adopters have faced a number of barriers which have prevented the standards from being implemented quickly and easily. Much hard work has been put into developing these standards by a number of early adopters in order for others to benefit in the long run.
- 5.2.2 The fact that none of the respondents have abandoned any 'difficult' standards shows how important they are.
- 5.2.3 The main reason for this effort is that early adopters are clearly aware of the advantages of being 'RTIG compliant'. Investment of time and money has been key to the fine-tuning of RTIG-XML, and its European equivalent SIRI, and it is hoped that the significance of the standard will be recognised by implementers and will ultimately be adopted on a wide scale. In time the use of such a standard will enable implementers not only to add functionality but to communicate with neighbouring authorities and portals such as Transport Direct.
- 5.2.4 It has been suggested by a number of respondents that non-technical guidelines, rather than standards, are a good way forward. Although this report recognises the importance of technical standards, there are a number of areas that could benefit from non-technical guidelines such as procurement, correct use of a website for RTI and case study work. The DDA review is a good example of a 'useable' document. Local authorities seem to favour such documents and, in some cases, they save them money.

5.3 The benefits of adoption

- 5.3.1 A wide range of benefits have been experienced by the respondents, system installation and system enhancement in particular. This is encouraging and should be seen as a milestone in terms of RTIG's growth and influence in the RTI world.
- 5.3.2 In order for these benefits to continue and for members to value the work that RTIG does, the group will need to recognise the needs of its members as they seek to enhance and develop their systems. This report has highlighted a number of areas where respondents would like to see standards and guidelines developed, including marketing, reference systems, procurement guidelines and website functionality guidelines.

5.4 Acknowledging the issues

- 5.4.1 We have established that respondents are, on the whole, quite positive about RTIG Standards and Guidelines, however it must be acknowledged that in many cases is still 'early days' as a number of respondents have only recently started to use them. As their systems mature, issues may arise with their particular configuration that may require slight adjustments to the standards used. These respondents have agreed that they would provide feedback to RTIG in the light of any issues occurring.
- 5.4.2 Many respondents, in particular the local authorities, could not comment on any issues that have arisen because it is simply too early to say. In the case of Hampshire and SYPTE, their systems have yet to go live to the public. Once this happens, niggles and problems may occur. It is important that RTIG recognise this and adapt or amend standards and guidelines as appropriate.
- 5.4.3 With many of the issues raised associated with early adoption, it is hoped that future use will not be as hampered by technical issues and fine-tuning. As systems and standards mature, the initial 'groundwork' will have been carried out and any future adopters will benefit.

A Brighton and Hove Council and Brighton Buses

A.1 Introduction

- A.1.1 The interview for this case study was conducted with Sue Westwood, Brighton & Hove City Council with additional comments from Mike Best, Brighton and Hove Buses. Mike was initially approached to gather comments from a bus operator, however due to Brighton and Hove Buses' close working relationship (through a Quality Bus Partnership) with the local authority it was seen to be more worthwhile for Sue Westwood to complete the survey. Sue manages Brighton and Hove's real time information system and has more experience with the use of RTIG Standards and Guidelines, including direct involvement with the RTIG DDA Working Group.
- A.1.2 Brighton and Hove's Siemens RTI system has been live since 2001. All 250 of Brighton and Hove's buses are equipped with tracking equipment.
- A.1.3 The council are currently looking at the DDA requirements for RTI and, in particular, the development of an audio RTI broadcasting system, using a key fob mechanism to trigger announcements. It is primarily for this reason why RTIG standards and guidelines have been sought.
- A.1.4 Brighton and Hove are working jointly with Essex County Council in their approach to system enhancement to accommodate DDA requirements. Both councils have Siemens systems and thus will experience similar system enhancement issues.
- A.1.5 To help enhance their system to be DDA compliant, Brighton and Hove, in conjunction with RTIG have recently part funded a DDA Standards Review report, developed by the RTIG DDA Working Group. This is currently being developed into a DDA Guidelines document for members.

A.2 RTIG Standards and Guidelines used

- A.2.1 Brighton & Hove have consulted the following RTIG guidelines during the next stages of system development:
- **RTIGT013:** Key Fobs Guidelines;
 - **RTIG-PR003-D001:** DDA Review.
- A.2.2 This will be the first time that Brighton & Hove have incorporated RTIG standards into their system development plans, which predates their introduction.
- A.2.3 In relation to the DDA Review and Key Fob Guidelines, the standards were adopted at the point of developing the system to include audible announcements. RTIG standards and Guidelines have previously not been used due to the system in Brighton & Hove preceding the development of RTIG Standards.
- A.2.4 Brighton and Hove are working alongside their Brighton Bus partners to ensure that the stops and buses are fully DDA compliant. One of the advantages of a working Quality Bus partnership is that work of this nature can be carried out in an organised and focused manner.

A.3 Benefits of using RTIG standards

- A.3.1 Brighton & Hove comment that the procurement process and system costs have benefited from the use of both the Key Fobs and DDA Document Review. Brighton comment that both of the standards documents that they have used have enabled initial time-frames to be kept to a minimum and, as a result, development costs. They would welcome further documents that focus on keeping development costs to a minimum.
- A.3.2 The RTIG standards used have also enabled Brighton to run their procurement process much more smoothly and efficiently. It allows the local authority to focus on the important issues and develop their procurement plans accordingly. Again, Brighton would welcome further documents which focus on streamlining the procurement process.
- A.3.3 Overall, Brighton are happy with the standards and guidelines that they have used and comment that useable guidelines documents are a positive step for RTIG and will aid greatly in the future development of their system.

A.4 Issues arising with RTIG standards

- A.4.1 As Brighton & Hove are only beginning to use RTIG Standards and Guidelines, they cannot comment on any issues arising. However, no significant issues have been experienced so far with the standards they have consulted and maintain their positive attitude.

A.5 Future RTIG standards work

- A.5.1 Brighton will be using the DDA Guidance document that is currently being developed by RTIG and see this is a particularly important and worthwhile piece of work. It is seen as a document that will benefit both their system and their users in the long term.
- A.5.2 As previously commented, Brighton view easily useable guidelines as a worthwhile venture for RTIG. Not all Local Authorities have a broad knowledge of technical matters, and clear and concise guidelines would be a plus.

B South Yorkshire PTE

B.1 Introduction

- B.1.1 The interview for this case study was conducted with Tim Rivett of South Yorkshire Passenger Transport Executive (SYLTE).
- B.1.2 SYLTE were early adopters of RTIG Standards and Guidelines and have invested a great deal of time and money into becoming RTIG compliant. They feel that this is best direction for the future enhancement of their RTI system as it will allow them to be flexible with future suppliers of new functionality.
- B.1.3 Due to the geographical nature of their system, SYLTE uses RTIG-XML to facilitate internal links between different components of their Acis RTI system. SYLTE are now developing the standard to allow cross-border links with neighbouring systems as well as links to third party functionality.
- B.1.4 SYLTE's system has yet to go live as they are waiting until 90% of their buses are equipped (they are currently at 70%). They do, however, share part of their system with WYPTE whose system went live in September 2005.

B.2 RTI standards use

- B.2.1 SYLTE has used the following RTIG guidelines during their system development and enhancement:
- **RTIGT003:** Quality of Service and evaluation;
 - **RTIGT005:** Outline Requirements Specification;
 - **RTIGT006:** RTIG-XML (server-to-server);
 - **RTIGT008:** Traffic Light Priority and Cleardown Specification;
 - **RTIGT011:** RTIG National Architecture;
 - **RTIGT013:** Key Fobs Guidelines;
 - **RTIG-PR003-D001:** DDA Review.
- B.2.2 SYLTE's system predates the introduction of the majority of RTIG Standards and Guidelines, however a number of have been used for ad hoc system procurement, compliance, strategy development and system enhancement purposes. They are:
- **RTIGT006:** RTIG-XML (server-to-server);
 - **RTIGT008:** Traffic Light Priority and Cleardown Specification;
 - **RTIGT013:** Key Fobs Guidelines;
 - **RTIG-PR003-D001:** DDA Review.
- B.2.3 '**RTIGT003:** Quality of service and evaluation' has been used for strategy development and '**RTIGT011:** RTIG National Architecture' has been used for strategy and system development purposes. These standards and guidelines did not exist at the initial system procurement stage so have been used later on in the system's lifecycle.
- B.2.4 SYLTE has been using RTIG Standards and Guidelines since their publication and, in some cases, when they were in draft form.

B.3 Benefits of using RTIG standards

B.3.1 SYPTE has benefited from the following RTIG standards and guidelines during the procurement process for system enhancement functionality and improvements:

- **RTIGT006:** RTIG-XML (server-to-server);
- **RTIGT008:** Traffic Light Priority and Cleardown Specification;
- **RTIGT013:** Key Fobs Guidelines;
- **RTIG-PR003-D001:** DDA Review.

B.3.2 With regard to the RTIG-XML standard, it has been key in the development of SYPTE's RTI system and developing links between disparate systems, and to integrate future functionality such as SMS. It has allowed that system to be fully RTIG compatible and, as a result, for functionality to be sought not from the original system supplier, but from other suppliers as well. For example, SYPTE is about to test a server-to-server (using RTIG-XML) link between its system and display provider.

B.3.3 Adoption has proven to be expensive, but the financial benefits will be felt in the long run as it allows SYPTE to be flexible with suppliers. SYPTE believe that they will be one of the first to integrate third party functionality with their system.

B.3.4 In addition, the RTIG-XML schema will allow SYPTE to include roaming buses from neighbouring authorities who may soon be included in the PTE. A functioning server-to-server linkage is key here.

B.3.5 In general, SYPTE is pleased with the RTIG Standards that they have adopted and think that they are a 'good thing'. There have been a number of issues with implementing the standards, but the overall attitude is that these will be overcome and the system will benefit in the long run.

B.3.6 SYPTE is happy with the guidelines work that RTIG has carried out so far, especially with regard to the DDA work. This document has allowed SYPTE to develop a strategy to make sure its system is DDA compliant and avoid any issues in the future. They welcome the development of the current review document into a RTIG Guidance document, and any other guidelines that may be developed in the future.

B.4 Issues arising with RTIG standards

B.4.1 Being an early adopter of the RTIG standards outlined above have cost SYPTE financially. However they see this as an acceptable part of the process of developing an RTIG compliant system which will be able to accept equipment from a broader range of suppliers (other than the supplier who installed their original RTI system).

B.4.2 Specifically, standards have not worked from the outset (during the specification stage) and work has been needed to develop them further, in some cases going back to the original author and asking them to update or develop certain parts of the standard. Whilst this has been time consuming, SYPTE see the benefits of persevering with this fine tuning.

B.4.3 Generally, however, South Yorkshire readily admit that, in the long run, this further development and fine-tuning will benefit their system greatly as they will be able to be more flexible in supplier selection for future functionality and enhancement.

B.5 Future RTIG standards work

- B.5.1 SYTPE are keen for RTIG to continue the work already carried out and will welcome any future developments in standards and guidelines. Specifically, SYTPE will be considering the Shelters standard, the ETM-OBU standard and the DDA Guidance document.
- B.5.2 SYTPE would also welcome a 'reference' installation that they can compare and contrast with when enhancing their system in the future.

C Hampshire County Council

C.1 Introduction

- C.1.1 The interview for this case study was conducted with Tania McCarthy of Hampshire County Council.
- C.1.2 Hampshire is currently developing their system to be DDA compatible and to develop cross-border links with three neighbouring systems.

C.2 RTI standards use

- C.2.1 Hampshire County Council have used, or will be using, the following RTIG guidelines during their System Development:
- **RTIGT006:** RTIG-XML (server-to-server);
 - **RTIGT008:** Traffic Light Priority and Cleardown Specification;
 - **RTIGT011:** RTIG National Architecture;
 - **RTIGT013:** Key Fobs Guidelines;
 - **RTIG-PR003-D001:** DDA Review.
- C.2.2 The following have been used, or will be used, for procurement, strategy development, compliance and system development purposes:
- **RTIGT006:** RTIG-XML (server-to-server);
 - **RTIGT008:** Traffic Light Priority and Cleardown Specification;
 - **RTIG-PR003-D001:** DDA Review.
- C.2.3 '**RTIGT011:** RTIG National Architecture' has been used by Hampshire for strategy development purposes.
- C.2.4 The RTIG Standards and Guidelines outlined above have been used from the very beginning of the planning of Hampshire's RTI system. RTIG-XML is not currently being used, but will be in the near future when Hampshire links its system with Portsmouth, Southampton and Surrey.

C.3 Benefits of using RTIG standards

- C.3.1 Hampshire claim that system procurement, installation and integration have all strongly benefited from the adoption of RTIG Standards and Guidelines. System enhancement and cost have somewhat benefited. Hampshire agree that the use of the DDA Review has saved development time and costs.
- C.3.2 Hampshire regards RTIG Guidelines as useful when approaching or resolving a particular problem or issue. In this case, DDA requirements, RTI links with neighbouring authorities and the installation of power supplies into shelters. Without these guidelines and standards, Hampshire would have struggled to develop a number of system enhancements in a timely fashion. Hampshire is pleased with the guidelines produced so far and welcomes the development of similar documents in the future.

C.4 Issues arising with RTIG standards

C.4.1 As enhancements to Hampshire's system are still in development, any significant issues have yet to come to light. Hampshire will be keeping a close eye for any issues and would be happy to provide feedback to RTIG.

C.5 Future RTIG standards work

C.5.1 Hampshire will be considering the Shelters standard, the ETM-OBU standard and the DDA Guidance.

D Essex County Council

D.1 Introduction

- D.1.1 The interview for this case study was conducted with Phillipe Pernstich of Essex County Council.
- D.1.2 Essex, alongside Brighton and Hove County Council, are currently developing plans to enhance their system to be DDA compliant. They are also considering server-to-server links with neighbouring authorities and ETM-OBU link-up.

D.2 RTI standards use

- D.2.1 Essex County Council have consulted the following RTIG guidelines and review documents:
- **RTIGT013:** Key Fobs Guidelines;
 - **RTIG-PR003-D001:** DDA Review.
- D.2.2 These documents have been referred to in preparation to enhance and expand Essex's RTI system to adhere to DDA requirements. Other standards may or may not be adopted according to need in the future. Essex has been working closely with Brighton and Hove to develop a joint approach to DDA requirements and system enhancements.
- D.2.3 At the moment, Essex County Council has its system where they want it to be and do not see any need for standards in the near future, but would consider them if there was a specific need. One area that standards may be required is for establishing links to neighbouring authorities.

D.3 Benefits of using RTIG standards

- D.3.1 As Essex has not officially adopted any RTIG Standards and Guidelines, they cannot reasonably comment on benefits to their system. This is predominately due to the fact that Essex's system was developed before the advent of RTIG Standards and Guidelines.
- D.3.2 They do however generally agree that the DDA Guidelines document that is currently in development will somewhat enhance their system and will go along way to developing a 'harmonised approach' to DDA functionality across the UK. The DDA Guidelines document will be used to develop and enhance their system to accommodate DDA requirements.
- D.3.3 In addition, future standards and guidelines developments are viewed generally as a 'good thing' and consideration will be given to them in the future, depending on system enhancement or extension plans.

D.4 Issues arising with RTIG standards

- D.4.1 Again, as the Essex system was developed before the introduction of RTIG Standards and Guidelines, little can be said about any issues. However, they do comment that compliance costs may figure in their decision to adopt any future standards (where there is a specific need to do so).

D.5 Future RTIG standards work

- D.5.1 Essex believes that an ETM-OBU interface would be very beneficial, as it is currently experiencing issues with drivers not logging on to the real time system when they begin their shift. An integrated ticket machine-on bus unit link could possibly solve this problem. Essex work closely with the majority of their bus operators, so implementing such a standard is a distinct possibility.
- D.5.2 Essex is looking forward to the publication of the DDA Guidelines document and will continue to work with Brighton and Hove Council to develop and enhance their system to accommodate the requirements.
- D.5.3 One area that RTIG Standards may be adopted is for cross-boundary links to London. This link is currently still being discussed and compatibility issues being investigated. It is not known if Essex will go down the 'RTIG route', but consideration will be given to adopting any standards that are available at that time.

E Surrey County Council

E.1 Introduction

- E.1.1 The interview for this case study was conducted with John Gaff of Surrey County Council.
- E.1.2 Surrey's Acis RTI system has been live since 2002 and is soon to be developed in order to accommodate server-to-server links with surrounding counties and equip planned bus quality corridors with traffic light priority. Both of these developments will be using RTIG standards and guidelines.

E.2 RTI standards use

- E.2.1 Surrey County Council have consulted the following RTIG specifications and review documents:
- **RTIGT006:** RTIG-XML (server-to-server);
 - **RTIGT008:** Traffic Light Priority and Cleardown Specification;
 - **RTIG-PR003-D001:** DDA Review.
- E.2.2 Surrey has been using RTIG Standards and Guidelines since 2002 and has been adopted as its system has been enhanced. RTIG-XML has been used for strategy development, compliance and system development purposes. The Traffic Light Priority specification has been used for procurement. The DDA Review document has been consulted for future strategy development purposes.
- E.2.3 Like many other local authorities approached to participate in this case study report, Surrey is currently using the above RTIG documents to develop and enhance their system. In addition, Surrey are also looking to use their RTI system to improve traffic management in the county. This includes the trial of an RTI-based, cross-border, traffic light priority equipped bus corridor from Aldershot in Hampshire to Camberley in Surrey. This initial trial involves one bus operator (Stagecoach) and one system supplier (SLE). Surrey are also keen to integrate West Sussex's TLP schemes with their own.
- E.2.4 If this trial is successful, other existing RTI equipped routes may be equipped in the future. Because of a lack of UTC in certain towns in Hampshire and Surrey, the 'local' version of RTIG TLP will be used, rather than the 'strategic' version.
- E.2.5 RTIG-XML is been used to develop server-to-server cross-border links between neighbouring authorities with the same system suppliers (West Sussex in particular). The schema may also be used in the near future to add SMS functionality to the Surrey system. However, a number of issues are currently being experienced, costs being the most pertinent.
- E.2.6 DDA issues are also being considered by Surrey, however the costs of upgrading over 200 signs may mean that this is adopted in the near future, rather than immediately.

E.3 Benefits of using RTIG standards

- E.3.1 Surrey report that its procurement process and system enhancement plans have strongly benefited from using RTIG Standards and Guidelines. System installation, system integration and post implementation stages have also somewhat benefited from standards and guidelines adoption.

- E.3.2 Specifically, traffic light priority has been one of the most successful standards adopted and one which is about to be trialled in the county. A junction in Camberley has recently been selected for a preliminary small-scale trial to test the equipment in order for a larger scale corridor trial is to be carried out in March 2006.
- E.3.3 Once adopted, RTIG-XML will enable Surrey to add functionality to their existing system and link with neighbouring systems.

E.4 Issues arising with RTIG standards

- E.4.1 Surrey has felt frustrated with the progress made with server-to-server in the UK and look forward to the development of a fully functioning bi-directional link. This link is key to the integration of Surrey's RTI system with neighbouring authorities. One of the major issues has been the cost of setting up a server-to-server link with their system supplier and Surrey have looked into sharing the costs with other local authorities who wish to use the schema, by setting up a linked database that third parties can feed off.
- E.4.2 With regard to the move to an RTI-based traffic light priority scheme, Surrey has had to wait for frequency allocations from Ofcom and this has delayed the trial discussed above. Now this has been resolved, the trial will be going ahead.
- E.4.3 However, neither standard has been abandoned (progress has been made with regard to TLP) and Surrey are happy to wait for server-to-server functionality.

E.5 Future RTIG standards work

- E.5.1 Surrey is pleased with the work that RTIG does and looks forward to future developments. The ETM-OBUS specification will be consulted by Surrey upon their publication as it has recently purchased a number of new electronic ticket machines and will require bi-directional links between them and the on-bus units. Surrey will also be considering the shelters specification and has been involved in its development.
- E.5.2 With regards to possible future work, Surrey would like to see further guideline, informative case studies and 'non-technical' documents. Examples include:
- guidelines on the marketing of real time information to the passenger;
 - 'key' UK RTI systems case studies (for reference);
 - types of sign case studies;
 - guidelines on the use of web sites for RTI dissemination;

F Siemens

F.1 Introduction

F.1.1 The interview for this case study was conducted with Brian Higbee of Siemens VDO Trading Ltd, an RTI Systems Supplier. Siemens have recently won the contract to equip over 8,000 buses in London with next-generation RTI equipment.

F.2 RTI standards use

F.2.1 Siemens have used the following RTIG Standards and Guidelines:

- **RTIGT006:** RTIG-XML (server-to-server)
- **RTIGT008:** Traffic Light Priority and Cleardown Specification
- **RTIGT013:** Key Fobs Guidelines

F.2.2 Although Siemens have not used any RTIG standards on any of their active projects, they were integral to winning the contract to equip London's next-generation RTI system, known as iBus.

F.2.3 Siemens feel that using a national standard for bus priority in London is essential, since they anticipated that vehicles would be coming into the London area from outside and to not use RTIG Standards would be prohibitive.

F.2.4 RTIGT013 was consulted during Siemens tender to LBSL.

F.2.5 Siemens recognise RTIGT006 as a standard, but are actively involved in the development of the CEN standard SIRI. As a company they would prefer to support Europe wide standards, rather than have UK specific standards that need to be supported as well as the European standard.

F.3 Benefits of using RTIG standards

F.3.1 Siemens do not have a great deal of experience with using RTIG Standards and Guidelines, but see the benefits of having them readily available if a client wishes to use them.

F.3.2 They expect to gain system enhancement and development benefits from using RTIGT008 in London as it will allow Siemens to provide cross-boundary functionality. This will mean that buses entering the capital from outside London will be able to get priority. Siemens actually have a German TLP standard, but decided to not to use it.

F.3.3 Siemens are not planning on implementing RTIGT008 in any of their clients existing systems, but would be happy to do so if the client decided that the transition was a good idea.

F.4 Issues arising with RTIG standards

F.4.1 While Siemens will implement the RTIG standard if purchased, they believe there is a problem with having multiple server-to-server standards – which are essentially the same. The development of the SIRI standard within CEN is anticipated as providing a common solution to this problem.

F.4.2 In addition, Siemens believe that where a system predates a standard costs will be incurred and a mechanism is required to fund further development and integration for these older systems.

F.5 Future RTIG standards work

- F.5.1 As a systems supplier, Siemens would like to see a standard vehicle build with provision for equipment installation, driver display and potentially an antenna installation on the roof of a bus. Siemens believe, however, that this could be made difficult by the technical responsibility issues and the different types of equipment that need to be installed.
- F.5.2 Siemens will be consulting the ETM-OBU bidirectional link when it is published. The Shelters document is 'indirectly relevant' as Siemens do not supply shelters, only the equipment that goes in them. Unless shelters are procured to the specification, there is not a great deal that they can do to co-ordinate installation of this equipment.

G Init

G.1 Introduction

- G.1.1 The interview for this case study was conducted with Jens Mullak of Init.
- G.1.2 Init are relative newcomers to RTIG, having joined in April 2005. Their experience of implementing systems in Europe has led them to extending their market position to the UK where they have successfully installed RTI equipment and systems in Leicester, Derby and London.
- G.1.3 Init's systems have long been developed with RTIG Standards in mind, however as they are newcomers to the UK market it is only until recently that they have been used 'on the ground'. This case study allows a fresh perspective of RTIG Standards and Guidelines to be taken, from a systems supplier who is new to the group, but has experience of using very similar European standards.

G.2 RTI standards use

- G.2.1 Init have used the following RTIG documents:
- **RTIGT003:** Quality of Service and evaluation;
 - **RTIGT005:** Outline Requirements Specification;
 - **RTIGT006:** RTIG-XML (server-to-server);
 - **RTIGT011:** RTIG National Architecture;
 - **RTIGT013:** Key Fobs Guidelines;
 - **RTIG-PR003-D001:** DDA Review.
- G.2.2 These documents have been used during strategy development, for compliance and for system development.
- G.2.3 Init claim that the RTIG documents reflect requirements made in previous RTI projects and are therefore quite applicable to the work that Init do. A couple of documents, RTIGT008 and RTIGT014, are still being checked internally by Init technicians, but there is much promise of take up from the supplier. Init are keen to continue to go down the 'RTIG route', as they have done in London, Leicester and Derby. Importantly, with their experience in Europe and the use of similar standards, they do not want to come in to the UK and 'reinvent the wheel' with regard to standardisation and RTI implementation.

G.3 Benefits of using RTIG standards

- G.3.1 Init's system integration and enhancement have strongly benefited from the use of RTIG Standards and Guidelines. System installation, post implementation and system costs have somewhat benefited.
- G.3.2 They see RTIG as key to the development of RTI in the UK and in Europe and see standards and guidelines as a good thing. A good example of the benefits of standards would be Init's bid on the upgrade to the Munich RTI system (which included an air interface and a modern AVL system). This system was originally installed by Siemens using open standards. When the system upgrade was put out to tender, Init were able to promote their technology, compliance and functionality because of the open specification that Siemens had originally used. Init see this as key to market expansion in the UK and is a feeling echoed by SYPTE.

G.4 Issues arising with standards

- G.4.1 The issues experienced with standards are, on the whole, quite limited. Problems normally occur when systems need to deviate from the norm, for example if an alternative way of displaying information is required or if a different frequency is sought. Normally these problems can be overcome and the standard can be adapted.
- G.4.2 As a result Init see standardisation as a process which will cover a period of multiple implementations and trials. This process should be guided by RTIG and specifications should be updated accordingly.

G.5 Future RTIG standards work

- G.5.1 For the integration of AVL, Init believe that a suitable air interface standard might be helpful to integrate vehicle with lower degrees of functionality into a larger integrated ITS platform.
- G.5.2 Init are also interested in the upcoming shelters specification, the ETM-OBU specification and the DDA guidance. They feel that all of these documents are worthwhile and will help to develop their system enhancement strategies and help to aid their clients in procuring the best and most functional equipment.
- G.5.3 Init suggest that RTIG consider the use of pilot projects when putting standards into operation. This may help local authorities, operators and the industry in general to prove and verify relevant standards. In the long run this will help RTIG members and the RTI community as a whole.

H First Group Buses

H.1 Introduction

H.1.1 The interview for this case study was conducted with Brian Keith of First Group Buses UK Ltd.

H.2 RTI standards use

H.2.1 First Group have encouraged local authorities to consult and use the following RTIG specifications and guidelines:

- **RTIGT005:** Outline Requirements Specification;
- **RTIGT008:** Traffic Light Priority and Cleardown Specification;
- **RTIGT014:** Project Management Guidelines.

H.2.2 The Outline Requirements Specification has been used for strategy development purposes, Traffic Light Priority and Project Management Guidelines have been used for strategy and system development.

H.2.3 First Group work with local authorities and systems suppliers to develop their RTI systems. First take an active role in encouraging local authorities and systems suppliers to 'go down the RTIG route' of system compliance. This means adhering to RTIG Standards and following RTIG Guidelines.

H.2.4 The primary reason for First Group encouraging local authorities to adopted RTIG standards and guidelines is because of the large number of disparate systems in the UK. Having a large fleet of buses and trying to integrate them with as many RTI systems as possible is a goal for First Group.

H.2.5 First Group have adopted a number of their own standards and specifications which are very similar to the RTIG developed ones. It is hoped that this similarity will aid in the development of integrating disparate systems in the UK.

H.2.6 As an operator, First Group would like to aid in the process of compatibility by raising the possibility of adopting RTIG Standards and Guidelines. They believe that raising awareness of the RTIG 'way' is key to the development of functionality such as server-to-server links.

H.3 Benefits of using RTIG standards

H.3.1 First Group report that system enhancement has strongly benefited from the adoption of RTIG specifications and system installation and post installation have somewhat benefited. System integration and system costs have neither benefited nor not benefited.

H.3.2 RTIG Standards and Guidelines enable large fleet operators such as First Group to integrate their buses with as many RTI systems as possible. This in turn will provide a more accurate RTI service and produce 'clean' data.

H.4 Issues arising with RTIG standards

H.4.1 First Group state that a number of local authorities and systems suppliers have commented that compliance adds costs to system implementation and development. Unfortunately suppliers and local authorities have also referred to standards as 'irrelevant'.

H.5 Future RTIG standards work

- H.5.1 First Group feel that the ETM-OBU Standard is an important piece of work and look to adopting it in the future. First Group would welcome more ETM manufacturers as members of RTIG.

