Road Pricing Framework Division

Demonstrations Project

Context and Statement of Requirements

Contents

1. Introduction

Congestion is a growing problem that affects the economy and is frustrating for road-users. Despite over £140 billion of planned central government transport investment over the 10 years up to 2015, The Eddington Transport Study published in December 2006 predicted that congestion could get 25% worse if nothing more is done. This is why the Government called for a national debate on road pricing in 2005, and the role it could play in helping to tackle congestion.

No decision has been taken on national road pricing. In the first instance the Government is working with interested local authorities to bring forward local pricing schemes to tackle local congestion problems. Any local scheme would be part of a package of measures including significant investment in public transport to provide viable alternatives.

It is only on the evidence we get from established schemes that any decision on national road pricing would be made.

At the same time, the Government has said it wants to explore the systems and technology that could enable a road pricing scheme charging by time, distance and place to operate in practice. The Demonstrations Project is therefore intended to explore in a simulated environment how such schemes could be designed so that they safeguard people's privacy whilst operating reliably and accurately.

The demonstrations are not 'real' schemes but will seek to recreate as closely as possible the conditions in which time, distance and place road pricing schemes would operate in order to build the Government's understanding of the systems and technology issues that need to be considered as our thinking on road pricing develops.

Where the terms "schemes" or "scheme owner" are used in this document they refer to the hypothetical schemes and owners in the simulated demonstrations and not to any real schemes, unless specifically stated. Similarly the terms "charges", "statements" and "payments" refer to hypothetical charges within the simulated demonstrations.

Please note: the language used within this document is technical and a Glossary of terms has been provided at Annex A.

1.1 The Demonstrations Project Requirements Documents

This document provides an introduction to the Demonstrations Project as part of the information for organisations expressing interest in being awarded contracts for a range of demonstrations services of road pricing within the UK. This document is the first volume of a set consisting of:

- Volume 1: a description of the Demonstrations Project and high level requirements for all the services required
- Volume 2: the detailed requirements for the demonstration of Road User Services
- Volume 3: the detailed requirements for the Compliance Contractor
- Volume 4: the detailed requirements for the Certification Contractor
- Volume 5: the detailed requirements for Data Management services

- Volume 6: the detailed requirements for Security Infrastructure services
- Volume 7: the detailed requirements for Scheme Owner support services
- Volume 8: the detailed requirements for the Evaluation Contractor.

Annex A to Volume 1 provides a Glossary of Terms used within the Demonstrations Project.

1.2 Purpose of this document

The purpose of this document is:

- To provide the background to the Demonstrations Project and future context to be explored;
- To describe the aims and objectives of the project and the proposed ways of working; and
- To give a high level description of the capabilities required of interested suppliers.

The document consists of the following sections:

- Section 2: the background for road pricing within the Department for Transport.
- Section 3: the overall road pricing context for the Project.
- Section 4: the scope of the demonstrations services which are required.
- Section 5: information on the Road User Services required during the Project including the high level requirements.
- Section 6: information on the Compliance Services required during the Project including the high level requirements.
- Section 7: information on the Certification Services required during the Project including the high level requirements.
- Section 8: the additional services required for a complete demonstrations capability, including the evaluation of service performance on behalf of the Department.

2. Background to Road Pricing

2.1 Context

As the economy continues to grow, we are travelling more. Traffic on our roads is increasing and this is contributing to growing congestion.

The Government is already tackling the problem of congestion by providing more road space where it is warranted, managing roads better, and encouraging people to make smarter choices where possible. But this is not enough in the long term.

The Road Pricing Feasibility Study published in 2004 explored the role that road pricing could play in helping to tackle congestion. The Study concluded that a system of road pricing could have a beneficial effect on congestion.

Since then, the Government has started working with, and provided funding for, 10 interested local areas as they develop innovative packages of local measures, including road pricing, to tackle local congestion problems. The Government has also invited bids for packages of measures, including road pricing, to be funded through the Transport Innovation Fund, which will make available up to £200 million per annum from 2008. [1]

Any local road pricing schemes developed by local authorities will help us to learn more about how road pricing could operate in practice. To help local authorities as they develop their thinking, the Department has provided Guidance on scheme design, *Business case guidance for the road pricing element of the TIF package* published on the DfT website on 8th February 2007: www.dft.gov.uk/pgr/regional/tif/tifguidanceprogrammeentry.

It is important that local authorities developing local road pricing schemes do so in a consistent way. That is why the Road Pricing Framework Division (RPFD) at the Department for Transport is developing a 'Consistency Framework' - more detail in section 3.1.

It is likely that local schemes will be mostly centred on event-based charging, using established technologies, such as number-plate readers or charging tags. However, the Road Pricing Feasibility Study did suggest that significant benefits could be accrued to the economy if road use was charged according to the distance driven, and the time and place of driving. This has been characterised as Time-Distance-Place (TDP) charging.

Although systems and technology for event-based charging are well established in both the UK and abroad, the same is not true of systems and technology to support TDP charging. So in May 2006, the Secretary of State announced a programme of demonstrations projects to explore how TDP charging might operate in practice, ensuring that people's privacy is safeguarded and a scheme could function reliably and accurately.

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[1] For further information on the Transport Innovation Fund, refer to *Business case guidance for the road pricing element of the TIF package* published on the DfT website

2.2 Existing Road Pricing Research: DIRECTS

The Department conducted technical research into tolling in the late 1990s and an on-road research programme during 2005/06 called DIRECTS. This research has provided a range of operational and performance data and helped inform the future shape of research activities.

As part of the DIRECTS Project, the contractor was required to develop a suite of specifications for road pricing, known as OPMISS (Open Preliminary Minimum Interoperability Specifications). This material is comprehensive in nature, particularly for tag and beacon approaches to road pricing, but does not address the wider range of solution options currently being considered by local authorities as presented in the Guidance, including time distance place (TDP) charging concepts. The OPMISS material is nevertheless contributing to the ongoing demonstrator work and the development of the Department's Consistency Framework for road pricing.

2.3 The Road Pricing Demonstrations PIN Notice

In July 2006, the Department issued a Prior Information Notice (PIN) inviting industry to describe concepts and suggest demonstrations for end-to-end TDP road pricing. This market sounding catalogued the market's capabilities and supported the development of specific requirements for the demonstrations phase. Thirty four responses were received from different organisations. Submissions for demonstrations fell into two main groups:

- Service providers interested in demonstrating their ability to provide road pricing services as an addition to existing or planned telematics service offerings based on deployed equipment and current road-users (referred to elsewhere in this document as the "market-delivered service" approach).

- Other suppliers and consortia interested in building, implementing and operating a system according to defined specifications and standards defined by the DfT.

There was a wide variation in the scope and quality of submissions suggesting how road pricing systems could be defined and developed. Many submissions offered end-to-end demonstrations of distance based charging concepts building on systems and services already in the market with an existing customer base. All submissions were analysed and contributed to the definition of the scope and content of the road pricing demonstrations which might be conducted within a 12-24 month period.

The submissions demonstrated a strong commitment of the industry to participate in any demonstrations activity which might be proposed by the DfT. With this knowledge the DfT established a project in September 2006 to deliver a series of road pricing demonstrations as part of its wider research programme. The Demonstrations Project is described in detail in section 4.

3. Context for the Demonstrations Project

Two road pricing schemes already exist in the UK, in London and Durham, plus tolled crossings including Dartford and Severn. The Road Pricing Demonstrations Project aim is to test the feasibility of charging by TDP as an end-to-end service operating in the context of a hypothetical future when there might be several schemes operating across the country. What is set out in this document and is included in the Demonstrations Project represents one of the many hypothetical futures that could potentially be realised. This is done to help inform the development of thinking on how and if TDP might be delivered in the future.

Where the terms "schemes" or "scheme owner" are used in this document they refer to the hypothetical schemes and owners in the simulated demonstrations and not to any real schemes, unless specifically stated.   Similarly the terms "charges", "statements" and "payments" refer to hypothetical charges within the simulated demonstrations.

The demonstrations will test the feasibility of TDP in the hypothetical scenario where there might be some local schemes in operation, some regional schemes and schemes covering travel on other roads. Each scheme would be 'owned' by a different authority, and operate under different charging rules, but within an overall framework to ensure there is an acceptable degree of interoperability and consistency across schemes.

The demonstrations would therefore simulate a road pricing context where people's privacy is safeguarded, and systems and technology are tested for accuracy and reliability. This might involve:

- Charging on the basis of distance travelled.

- Applying charges to all distance travelled within designated areas.

- Varying charges by location, time, class of vehicle and road-user.

- Applying charges to all vehicles at some time or other.

This section sets out the main characteristics of this context and how a TDP capability would work within it.

3.1 Consistency Framework

The Government has said it would like to learn from the schemes being developed by local authorities, and would not want to procure the technology required to make a TDP road pricing scheme function. The aim and purpose of the Consistency Framework is to help ensure interoperability between schemes and sufficient consistency that road-users would have a broadly consistent experience no matter where they travel in the country.

RPFD has developed the Consistency Framework and produced the *Business case guidance for the road pricing element of the TIF package.* It reflects current thinking and provides local authorities preparing TIF proposals with guidance on a number of elements (e.g. common components, design constraints, a Glossary of defined terms – an extract of which is included in Annex A) that are expected to shape potential local road pricing schemes in the future. Such elements may apply to any of the parties involved in the delivery of road pricing.

There is obviously a balance to be struck between the constraints imposed on **existing** schemes by their current governance arrangements, the freedom of **new** scheme owners to introduce innovative approaches to influence road-user behaviour, and the constraints that the Consistency Framework needs to impose to ensure a consistent approach across **all** schemes.

The TIF Guidance represents the DfT's current position on this balance. Some of the Consistency Framework thinking will be the source of some of the requirements for the Demonstrations Project. The Demonstrations Project may be used to investigate alternative approaches or simply to learn more about the possibilities offered by industry, which in turn can feed into future development of the Consistency Framework.

The TIF Guidance describes five generic solution options which are important in understanding how the Demonstrations Project as a simulation of a TDP Charging capability relates to other existing and possible future scheme types. The solutions can be offered and accepted in various combinations by schemes. Based on their relative maturity and initial estimates of the affordability of the technologies involved, three solutions are viewed as most likely to be viable in the short term:

a. Personal declaration, event-based charging;

b. Scheme detection (ANPR), event-based charging; and

c. Scheme detection (tag & beacon), event-based charging;

However, the guidance also states that local authorities may also consider solution options in the following groups, both of which rely on a considerable degree of further development before implementation:

d. Assisted declaration, event-based charging (with a service provider assisting the road-user to declare in some way); and

e. TDP charging, rate based charging by service providers.

There are currently no examples of assisted declarations or TDP charging in the UK but the other solutions are exemplified by existing schemes noted above. In the future, schemes may accept a variety of solutions, rather than a single solution.

To be representative of a future context where a TDP solution option would be accepted by some schemes, the Demonstrations Project is intended to support different schemes where other solution options may also be available to road-users. For this reason, the Demonstrations will need to take account of the fact that other solutions could be available and used by some road-users.

3.2 Scheme Ownership

Scheme ownership is vested in the scheme owner, being the authority (or authorities) with the legal powers to introduce a road pricing scheme. The scheme owner defines the scheme in terms of the basis of the charge, which areas or roads are subject to a charge, on which days and times, and how the charge might vary by type of vehicle and road-user.

In effect the scheme owner defines the requirements which the market needs to meet. There are no existing schemes offering/accepting TDP solutions and so in the Demonstrations Project the role of the scheme owner would need to be fulfilled by "actors"

playing the role of a scheme owner prepared to offer/accept a TDP solution. Such actors might be:

- Existing (non-TDP) scheme owners investigating the implications of accepting a future TDP solution or the consistency requirements;

- Local authorities developing road pricing schemes testing their current thinking on TDP charging by simulating their possible Scheme rules within the Demonstrations Project; and

- The Department's policy divisions (i.e. RPFD, Roads Strategy Division) testing current thinking on how TDP charging would support the Department's exploration of road pricing.

3.3 Future Provision of Road Pricing Services

Using the Demonstrations Project, the Department intends to investigate the feasibility of road pricing services based on TDP solutions and the current capability of industry to supply a service. To ensure the appropriate degree of consistency across all schemes, the Consistency Framework will ultimately need to define a common minimum set of requirements on all the organisations involved in the delivery of services. Current thinking to this end is reflected in the roles defined in Figure 1.

RPFD already has responsibility for the development of the Consistency Framework and so will play the role of the framework owner for the Demonstrations Project. In addition to the scheme owner(s), the figure shows two other roles: the road user service provider, and the compliance contractor.

Analysis of the possible range of road pricing services, which might be provided across all the five solutions defined in the TIF Guidance, suggests that there are several service elements involved. There could potentially be many different ways in which organisations could participate in a mature competitive market for road pricing services. The DfT will continue to develop its ideas on the structure of the market as part of its work to explore how road pricing could tackle congestion. Each unbundling of services (below the level shown in Figure 1) means that appropriate technical, operational and commercial interfaces would have to be defined. The Demonstrations Project is looking at the feasibility of TDP, implying 'first generation' deployment of such solutions to meet the needs of suitable schemes. Given this context and the practicalities of the Demonstrations Project, the market context chosen by the Department for application in the Demonstrations Project is one in which services to road-users are provided as a packaged end-to-end service by road user service providers (RUSPs).
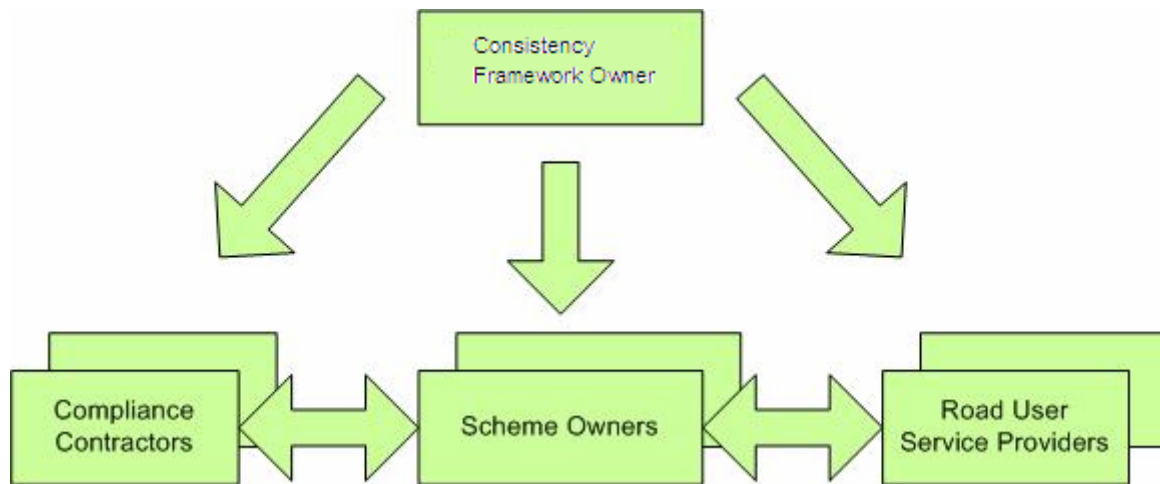
Figure 1: Key roles in the delivery of TDP road pricing

3.3.1 Road User Service Providers

The Consistency Framework defines a service provider as a provider of a service under their own brand or identity associated with road pricing. Within the context of the Demonstrations, a RUSP is therefore a service provider that offers an integrated end-to-end TDP service to road-users consistent with the requirements of the schemes accepting the TDP solution. The requirements to be met by the RUSP would therefore comprise common requirements arising from the Consistency Framework, and scheme-specific requirements determined by each of the scheme owners.

A RUSP would be expected to offer its road-users a TDP service which can support all of the schemes defined for the demonstrations, all of which will be assumed to accept/offer TDP-based charging. The RUSP would give each road-user a single statement of hypothetical charges covering the use of all the schemes during the billing period. To the extent it is possible to do so, they may also simulate the process of collecting payment from the road-user. The RUSP would then provide each of the scheme owners with the hypothetical total collected charges on their behalf.

Figure 1 does not show the road-user as one of the actors in the system. The RUSP would manage the road-user relationship and be the first point of contact for all road-users. The RUSP therefore encapsulates road-users' dealings with road pricing schemes in the demonstrations. Clear terms will be set-out for the management of relationships with road-users.

Under the Consistency Framework, RUSPs would be subject to some form of certification to provide scheme owners with assurance that the offered services meet the defined service and associated quality requirements. As a way of exploring this issue further, there would be a simulation of the certification process within the Demonstrations Project. As already noted, the context of the Demonstrations assumes that schemes generally would accept a variety of Solutions in the future. Potentially a RUSP could therefore offer a service which provides the road-user with more than one solution. Rules would need to be developed to determine which solution should be used when more than one is accepted by

a scheme and offered by a road-user. Such rules may be simulated in the Demonstrations Project.

3.3.2 Compliance Contractors

In this simulation, as in the real world, all scheme owners would expect to have confidence that all road-users of their Scheme pay the charges according to the charging rules, by whichever solution may be appropriate. The compliance process helps provide this confidence.

Currently each operational road pricing scheme in the UK includes a compliance process as an integral part of the scheme. In the context defined for the Demonstrations Project, scheme owners for new schemes would obtain compliance services from compliance contractors and might jointly commission a compliance service from one or more compliance contractors; compliance contractors would also be able to offer services to more than one scheme.

In order to encourage the growth of a market for compliance services, there would be a common approach to the design of compliance services to ensure that the services operate within the Consistency Framework. As more schemes are introduced, it is likely to become more important to ensure that the compliance process works in a consistent way across the UK. In particular, information flows concerning compliance would need to be standardised, as would arrangements to safeguard privacy. This degree of inter-working would mean that compliance resources could be deployed flexibly according to the requirements of scheme owners and this will be investigated within the Demonstrations Project.

The main focus of the compliance contractor is to identify the road-users that are non-compliant. However, scheme owners may wish to use the information collected by the compliance equipment in an assurance process. This could provide a mechanism for verifying that RUSPs are passing the correct payments to the scheme owner.

3.4 The European Context

European Union Directive 2004/52/EC on the interoperability of road toll systems was adopted in April 2004.

Clause 1 of Article 3 describes the European Electronic Toll Service (EETS) as follows. "EETS shall be set up which encompasses all the road networks in the Community on which tolls or road usage fees are collected electronically. This electronic toll service will be defined by a contractual set of rules allowing all operators and/or issuers to provide the service, a set of technical standards and requirements and a single subscription contract between the clients and the operators and/or issuers offering the service. This contract shall give access to the service on the whole of the network and subscriptions shall be available from the operator of any part of the network and/or from the issuer."

Member States and road operators in Europe have been working with the European Commission on the development of the necessary legal and commercial framework for EETS. The CESARE project has proposed an organisational approach to the delivery of the EETS. It is intended that the Demonstrations Project should be consistent with the approach set out in CESARE.

One of the issues to be faced in reaching agreement on EETS is to reconcile the rights of each Member State to define charging policies at a later date with the need of service providers to know the requirements for "all electronic toll systems in service" both now and in the future.

The context for the Demonstrations assumes that the requirements of any road pricing scheme requiring a TDP Solution would be constrained by the Consistency Framework to ensure that the market could support and interoperate with all UK schemes and any EETS scheme.

3.5 Achieving Trust within TDP

3.5.1 Trust between the Scheme Owner and RUSPs

Any scheme or service has to be trusted if people are to feel confident about its use. For people to feel confident about its use they need to be able to see that it can function reliably and accurately whilst safeguarding privacy. Establishing trust is therefore a key feature within the Demonstrations Project.

In an open market context, scheme owners would require RUSPs to provide them with assurance information to develop trust in the services they offer. This is particularly important in relation to a TDP Scheme since the scheme owner would not be directly involved in the process of detecting vehicles using the Scheme. Various types of assurance information can be considered:

- Assurance information supplied by each RUSP relating to the processes they operate;

- Assurance information on RUSPs supplied by the compliance contractor derived from vehicle identification data during operations; and

- Independent information provided by specialist certification services prior to operation.

In the demonstrations, both the 3rd party assurance and independent assurance mechanisms will be used to evaluate the assurance information offered by the RUSPs. The knowledge gained will inform decisions on the future requirements for assurance of road pricing services and certification of road pricing systems within the Consistency Framework.

In order to investigate trust between scheme owners and RUSPs, scheme owners will be required to specify not only the services related to charging, but also the target quality requirements, such as accuracy of distance measurement. RUSPs will thus know the current expectations for a TDP Solution. The Demonstrations Project will provide the basis for considering the balance between future performance targets and the cost of the meeting those targets.

3.5.2 Trust between the Scheme Owner and Compliance Contractors

In principle the issue of trust in compliance contractors could be simpler than that of trust in RUSPs since the impact on the scheme is indirect because compliance contractors provide a compliance check only on a sample of road-users. However, scheme owners must still have trust that the compliance activities are robust and meet the levels of service

required. The assurance issues for compliance will be investigated within the Demonstrations Project.

3.5.3 Trust between the road-users and Road User Service Providers

In real schemes, road-users would be under a legal obligation to pay the charges defined by each scheme owner. In the *context* of the Demonstrations Project, this is not the case because the demonstrations will operate in a simulated environment where no money will change hands, but it is assumed the level of compliance will be similar to comparable obligations.

In an open market, road-users would expect to be able to meet their obligation to pay charges more conveniently and reliably by registering with a RUSP. They would also expect their privacy to be safeguarded. This is an important requirement which will be given close consideration in the Demonstrations Project. The following are guiding principles for the RUSP and road-user relationship:

(a) The RUSP would act responsibly towards the road-user, in particular ensuring that confidentiality safeguards relating to privacy and the use of data are treated as paramount.

(b) The RUSP would provide the road-user with everything necessary to be fully compliant (in relation to the particular service(s) provided) with all Schemes.

(c) The RUSP would notify the road-user of any known problems with the equipment or service in time to enable the road-user to take any action which may be necessary.

(d) The RUSP would represent both his own interests and the interests of the road-user in dealings with the scheme owner.

And, for charging in particular …

(e) Charges which appear on a statement are properly incurred by that road-user for use of the scheme(s) according to the rules of the scheme(s).

(f) Charges are calculated accurately.

(g) The RUSP will act reasonably in collecting payment from the road-user.

In the demonstrations, items (a), (b), (c) and (d) will be monitored through road-user feedback which they all will be expected to provide.

Items (e) and (f) will be independently verified (see section 4.2.8), and may also be subject to checking by the road-user who will be encouraged to verify overall mileage on statements.

Item (g) is only feasible to check where real payment is involved. The Demonstrations Project is likely to be limited in this respect because no real payments will be made

3.5.4 Certification as a means of creating trust

The objective of certification is to create trust amongst all parties involved in the solution. This is achieved by establishing a regime for certification of service providers which subjects them (both RUSP and compliance contractors) to a series of inspections and tests to ensure that the service they offer meet the full requirements of the service set by

the Consistency Framework Owner. Certification aims to confirm the capability and provide evidence that each service meets its performance requirements. The certification process required in the future will be accredited to both national and international standards.

Within the road pricing context certification involves two services:

Verification

Verification involves independently testing and confirming that all the business processes and systems (including the assurance processes) provide outputs that meet the service performance requirements. This provides an independent assessment to confirm that the specifications (and any certifications implied by service requirements) are being achieved. Within the demonstrations this service may be used for some acceptance testing of services.

Quality Management

Quality Management reviews are carried out on the services to confirm that the quality standards required for the business processes are observed and hence certify the quality of services. This assumes that the services have a quality management system in place to provide the assured delivery of services.

Outputs and analysis of these services will help define an effective and efficient certification regime within the future context as an output from the Demonstrations Project.

3.6 Commercial arrangements

The Demonstrations Project will simulate a commercial context in which scheme owners wishing to accept a TDP Solution would pay RUSPs for the charging and payment services they provide. While this assumes that RUSPs operate freely in an open market, it is less clear that an open market could be developed for either compliance or certification services.

For the Demonstrations Project therefore it is assumed that the compliance function will be a service contracted from compliance contractor(s) by individual scheme owners or a central body/agency acting on behalf of Schemes which would operate under the scheme's 'brand name'.

Certification and verification contracts are correspondingly assumed to be contracted centrally.

4. The Demonstrations Project

This section provides an outline description of the Demonstrations Project including the various stages of demonstrations and their timescales. It is intended to inform the bidders on the structure and the expected outcomes of the Demonstrations Project.

4.1 Establishing the Demonstrations Project

Since September 2006, DfT has developed its requirements for the Demonstrations Project and established a formal project team. A Project Board has been set up and a Gateway Review initiated. Objectives for the Project have been approved and are as follows:

- To establish the feasibility of time/distance/place (TDP) road pricing as a robust end-to-end service[2] that can safeguard people's privacy and function reliably and accurately;

- To inform the development of local TIF schemes and the Department's exploration of road pricing; and

- To inform decisions on the timescales for the practical implementation of TDP road pricing, so that a realistic option exists for implementation in a small geographical area by 2010, and a larger area by 2012, should it prove to be the right solution for that area.

4.1.1 Critical Success Factors

Derived from the three objectives above, the critical success factors to be achieved by the Demonstrations Project within the two year frame have been agreed as follows:

A. **Privacy** - To understand how we might design any time, distance and place road pricing scheme so that it safeguarded people's privacy.
B. **Service Capability and Performance** – To demonstrate that at least two different Service Providers working in more than one road charging Scheme can issue a single invoice with sufficient accuracy of charging to meet prescribed service performance criteria.
C. **Road-user Compliance** – To investigate and demonstrate how compliance of all road-users against different sets of charging rules could be determined in a fair, consistent and auditable manner whilst meeting prescribed service performance criteria.
D. **Road-user Experience and Attitudes** – To investigate the experiences, and level of confidence of road-users involved in the demonstrations, in respect of the operation of all the service components across the road charging Schemes they encounter.
E. **Commercial Viability** – To investigate whether a viable competitive and commercially attractive market for TDP road charging services with separate compliance services could be developed, and to identify the major cost drivers.

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[2] i.e. as market delivered services

F. **Service Interoperability** – To demonstrate that all data relating to road-users, charging, payments and compliance processes can be securely exchanged between the appropriate entities within confidentiality and data protection considerations, so that they meet existing legislation as well as applying best practice.

4.1.2 Expected outcomes from the Project

The Demonstrations Project will create a research environment in which a range of services (using different technical solutions) will be operated by a number of service providers to more fully understand feasibility, operational performance and business issues for market delivered services. The evaluation of data from the Demonstrations Project will inform the debate on road pricing, assist local authorities in developing local road pricing schemes and inform the Department's thinking on road pricing. In particular it should build our understanding on how to:

- Safeguard road-users' privacy and ensure data confidentiality within a road pricing scheme;

- Create an effective compliance regime; and

- Design an accredited certification regime that is reliable and robust for the certification of providers of road pricing services.

To assess whether these expected outcomes are achieved, all aspects of the demonstrations will be subject to an evaluation process, both during the operation of the services and at the end of the project. The evaluation will identify refinements and specific aspects to be considered in later stages. All participants will be required to cooperate and contribute to the evaluation task as part of the services provided.

4.2 Structure of the Demonstrations Services

4.2.1 The Service Packages

The Demonstrations Project will explore the feasibility of road pricing being provided as a market delivered service. This means that the service packages identified in section 3.3 above will form the basis of the services required.   During the two year period of the Demonstrations Project various demonstrations of services will be requested, in a series of stages.   Each stage may be required to show enhanced functionality or improved performance levels to reflect particular aspects of operation to be investigated by the Demonstrations Project Team.
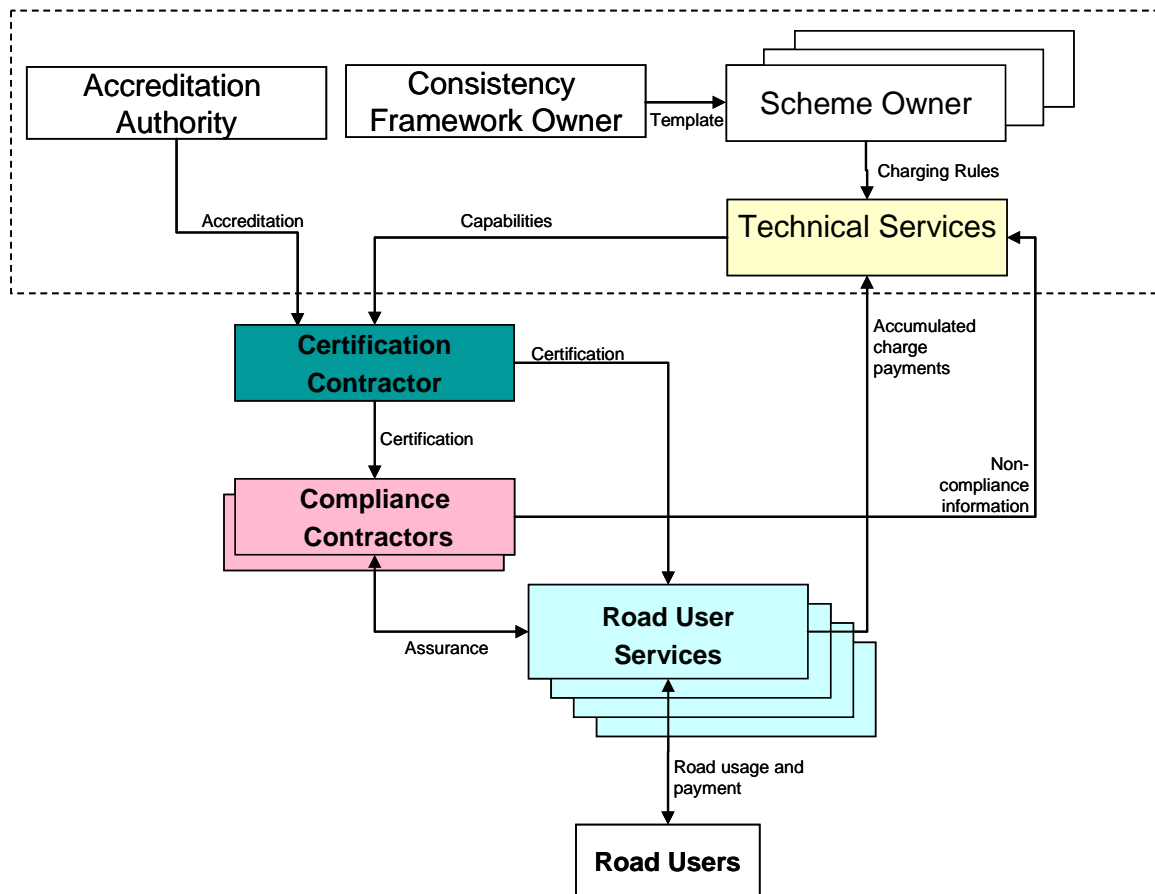
Figure 2: The Structure of the Demonstrations

4.2.2 Consistency Framework Owner

The role of the Consistency Framework Owner is to make sure that there is consistency in all the requirements set by the Scheme Owners within the Consistency Framework. This requirement is established initially by the Scheme Template described below in terms of schemes and via a certification process for consistency of performance of all Demonstrations services. RPFD will play the role of Framework Owner and thus be responsible for the consistency requirements.

4.2.3 Accreditation Authority

The certification process required in the future will be accredited to both national and international standards by the Accreditation Authority. In the case of the Demonstrations Project this is the UK Accreditation Service (UKAS). A trial process will be developed and used in the Demonstrations.

4.2.4 Scheme Owners

Demonstrations will involve the operation of road-pricing services against a range of Schemes that are designed to test various TDP options. It is anticipated that this will include a number of scheme owners who will be responsible for approving the simulated charging rules and process for each scheme.   Within the Demonstrations Project,

references to schemes must be understood to be the hypothetical schemes that have been created and are operating within the Demonstrations Project. The schemes included in the Demonstrations Project may be:

- Demonstration schemes, under the ownership of Roads Strategy Division (DfT).

- Simulated schemes, under the ownership of an Authority that has been granted or is seeking TIF funding for its project.

- Support for a TDP solution option for use with existing Schemes.

Actors playing the role of Scheme Owner for the demonstrations will be responsible for the Scheme Owner requirements in the Statement of Requirements. Initially, these will be provided to bidders as generic requirements for capabilities which would be required to support any UK Scheme. Each request for demonstration will provide specific Scheme Owner requirements in the form of Scheme Templates for each Scheme.

4.2.5 The Scheme Owners' Template

Service providers must support the "scheme template", a generic capability which defines the hypothetical charge rules for any scheme, including the performance characteristics.

Potential scheme owners will each use the scheme template to define the specific charging rules for their scheme. The template will be used initially to inform service providers of the capability required, then test the readiness of service providers to provide the required services and finally to provide the actual charging rules to be used for the Demonstrations. The scheme template includes the following hypothetical information:
- Scheme details
- Place details
- Basis of the charge
- Places where the charge applies
- Vehicles subject to the charge
- Road-users subject to the charge
- Days and times when the charge applies
- Additional charging rules.

The details of the particular schemes can then be implemented by means of definition tables and parameters. The format of these will be standardised.

4.2.6 Technical Services

Some aspects of the scheme owner responsibilities for specific technical services will be used to ensure that the simulation of operation is as complete as possible. For example, a service to distribute the charging rules in a consistent format to all service providers will be provided. These services will be selected from existing or new framework agreements.

4.2.7 Road User Services Provider (RUSP)

For Demonstrations purposes the terms 'payments', 'charges', and 'settlements' will be used to characterise actions in a simulated environment involving no real money. The

opportunity may be there for payments to be made in currently charged areas at later stages of the project.

A number of RUSPs will be required to establish services at the same time. Each will be required to implement the necessary charge rules for each scheme, recruit road-users (either from within existing services or new road-users), provide both equipment and service to each road-user and start operating the service for the Demonstrations Project.

RUSPs will be responsible for the operation and maintenance of their own charging processes. They will be receiving road usage data from their road-users and based on this data will calculate the hypothetical charges according to the charging rules set by the scheme owners. A single statement will be issued to each road-user for each billing period including all incurred charges.

Accumulated charge information will be forwarded to each scheme owner and appropriate simulated settlements made.

The RUSP will be responsible for internal assurance processes confirming that the services described in section 5 are able to meet the Key Performance Indicators (KPIs) as outlined in section 5.2.

4.2.8 Compliance Contractors

The Demonstrations Project will explore the feasibility of developing a common approach to compliance across different schemes and will primarily verify the capability of the market to provide TDP solution options. However, apart from system failures, road-users of the TDP solution options offered by the RUSPs are not likely to be found to be non-compliant. Compliance contractors will therefore focus on ensuring the compliance of all road-users within schemes which accept a TDP solution option. This aspect may be simulated as it is not anticipated to recruit road-users other than those equipped with TDP solutions by RUSPs.

The DfT's intention is to invite the industry to offer innovative methods for providing compliance services using a range of techniques and technologies. This may include, for example, investigating the feasibility of having a targeting process based on various methods of identifying vehicles travelling on charged roads but would not provide evidence of non-compliance and therefore are likely to be less expensive to provide and operate. The data produced would consist of the vehicle identification and the place, date and time when the vehicle travelled and would not be suitable as evidence and contain no personal data.

Where any scheme covers a large geographical area this gives indicative intelligence that particular vehicles are evading the charge and enables a compliance management plan to deploy mobile and portable equipment in appropriate locations to capture evidential records of non-compliance.

Scheme owners involved in the demonstrations will identify the approach to compliance that is appropriate for their scheme. Some schemes may already have compliance services (mainly fixed compliance infrastructure) and such services would be accommodated as far as possible into the demonstrations. For others innovative new approaches may be explored. For example, future schemes covering large geographic

areas might use portable and/or mobile compliance equipment deployed to a number of compliance points to achieve greater flexibility. Any TDP Scheme may need to use a mixture of fixed, portable and mobile compliance equipment.

The Demonstrations will test services provided by different compliance contractors to verify any common interfaces and explore how they can inter-work within the Consistency Framework. Current and future scheme owners will be involved in this process. This will involve the development of specifications for data exchange, in particular to safeguard road-users' privacy and confidentiality between the various actors.

The Demonstrations Project is expected to be of sufficient scale to operate compliance targeting, but will not include the full range of road-users and solutions. However, it is expected that the demonstrations would allow the feasibility of such approaches to be assessed.

The services required from compliance contractors will involve both on-road and back-office compliance management services.

4.2.9 Certification Contractors

Certification Contractors will provide independent evidence of the levels of performance delivered by both the RUSPs and compliance contractors for three specific purposes:

- Providing quality management certification for services to meet the quality standards. This activity provides 3rd party confirmation that the service providers' quality management system is robust for assurance purposes. This will be introduced in later parts of the demonstrations.

- Verifying that services meet the standards required at each stage of the demonstrations before commencing operation, for example, by using specially equipped vehicles to prove distance calculations. This will also provide an entry process for organisations able to meet the operational standards, whether or not they are currently contracted to the Department.

- Verifying in-service performance as part of the independent 3rd party assurance of the KPIs and other performance indicators.

Within the Demonstrations Project, the specification and development of the certification processes for all the Demonstrations services will be on a trial or prototype basis.

4.2.10 Road-Users within the Demonstrations Project

The Demonstrations Project will involve members of the public who willingly volunteer to participate either through the RUSPs, who may recruit existing customers or new ones for this work, and/or through external sources who are willing to participate with service providers.

All road-users will be required to be actively engaged, providing feedback on their experiences at key stages during the demonstrations, in particular on their observations about privacy safeguards and confirmation that statements reflect their road usage accurately. Actual changes in road-user behaviour in responding to simulated charges will

not be assessed by the Demonstrations Project, though others (such as scheme owners) may choose to do so in parallel.

The overall number of road-users will vary through the various stages of the Demonstrations Project. In the early stages it is planned that around 1,000 road-users will be involved with 200-250 per Service Provider. In later stages the overall number of road-users will be increased. Each should reasonably be expected to drive 1,000 miles or more per month.

4.3 Demonstrations Operation and Stages

4.3.1 Overview of Stages for the Demonstrations

Within the Demonstrations Project, activities will be split into four stages to enable a progressive build up and demonstration of performance. When referring to "a demonstration" we mean a contracted period of services within one of the stages. So that if a service provider is able to provide services to the specification agreed for stages 1, 2 and 3, we would refer to three demonstrations. Clearly two different service providers running services in stage 1 is referred to as two demonstrations.

The four stages are shown in Figure 3 below. The figure shows the three main service packages with lines representing demonstrations which may or may not continue from one stage to the next depending on a number of factors, such as performance, research need and budget. All the lines in the diagram are indicative only and do not represent the numbers of contracts involved at each stage. It is expected that service providers will be demonstrating their own service solutions which may or may not use the same technology or systems architecture.
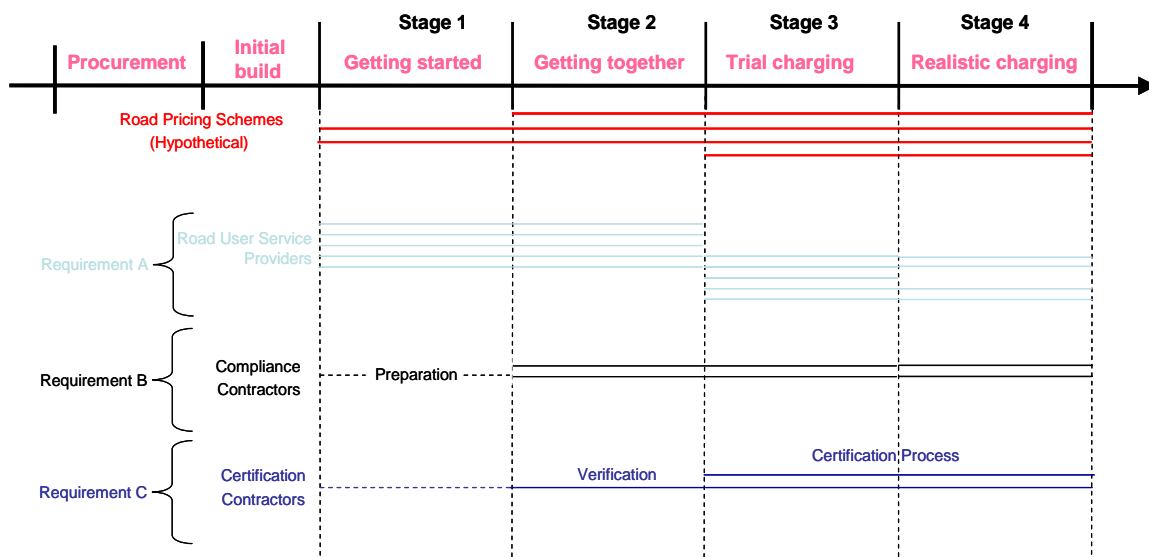

Figure 3: The Four Demonstrations Stages

Initially it is anticipated that there will be two schemes at the start of the Demonstration, and that at each stage at least one further scheme, or amendment to a scheme, will be introduced. The nature and locations of these will be issued to bidders in due course.

Each stage has been allocated six months, although later stages will "open" early to enable capable RUSPs to upgrade their demonstrations at the earliest reasonable point as shown in section 4.4. The levels of performance for each of the services may be different as the capabilities of services to be demonstrated are upgraded. RUSPs can upgrade to the next stage when they satisfy the entry requirements.

It is currently envisaged that the service levels defined by the Key Performance Indicators (KPIs) for each stage will be established during the procurement process.

4.3.2 Stage 1 – Getting started

During the first stage the appointed RUSPs will implement the necessary charging rules for at least two schemes via the "scheme template". They may provide their own road-users or recruit from a "pool" of volunteer road-users and register them with the schemes. The RUSPs will be expected to provide up to 200-250 road-users for up to three months, reporting all simulated charges via regular statements to the road-users and via returns to scheme owners.

To enter Stage 2, the RUSP should be able to support charging for all scheme owners, be capable of producing statements for road-users and calculate the payments due to each scheme owner. Assurance and other reports will be produced and evaluated to understand any service quality differences during Stage 1. Road-user feedback will be collected and analysed during this stage to establish the initial baseline for road-user attitude analysis.

RUSPs will be expected to cooperate in preparatory work being performed by other contractors.

4.3.3 Stage 2 – Getting together

The RUSPs will continue with the same level of target performance as in Stage 1 and in Stage 2 will establish and commission the necessary interfaces for data exchange with other contractors.   The operation of RUSPs during stage 2 therefore provides a source of data, operational services and compliance "targets" for the new services and the ability to both demonstrate compliance and assure service performance.

Information on travel through compliance points will be used as independent assurance for both the RUSP and compliance contractors' operational performance.   Road-user feedback will be collected and analysed during this stage.

4.3.4 Stage 3 – Trial charging to confirm performance

During Stage 3, the Demonstrations Project should have an end-to-end operation of all services, representing a trial of a simulated charging environment. RUSPs will be required to increase the number of road-users (the actual numbers for each will be agreed as part of the service selection process for Stage 3), and register them with the schemes, collect charge data, invoice road-users, collect 'payments', calculate charges due and 'pay' the scheme owners, although as the Demonstrations will take place in a simulated environment no money will be involved.

The Schemes introduced in Stage 1 will continue and further schemes may become operational during this stage in preparation for the realistic charging planned for stage 4. The compliance services will operate the detection, identification, and analysis of compliance and non-compliance for all observed road-users, and will be provided to the scheme owners in a format to be agreed.

During this stage, RUSPs and any compliance contractors should start to operate to the performance levels required equivalent to the charging requirements of Stage 4. Service providers will be given the opportunity to address performance problems and overcome them in order to enter Stage 4.

The certification contractor will be accredited by the Accreditation Authority to certify the service providers appointed to this demonstration stage and will certify each of the services prior to operation. The certification will cover both quality management processes and verification of performance. They will also confirm the technical competence of the demonstrations services, probably using equipped vehicles and analysing the results for conformance to the entry criteria for Stage 4.

4.3.5 Stage 4 – Realistic charging demonstrations

Entry to Stage 4 will be through the achievement of the entry criteria by completion of the Performance Approval process operated by the certification service. The target criteria are described in Section 5.2 below. It is planned that more road-users would be involved during this stage, although, the build up and distribution of road-users is yet to be agreed between scheme owners, service providers and the Demonstrations Project.

Stage 4 will operate as if in a live environment, within the limitations of the demonstrations with the road-user service continuing with the most realistic charging (i.e. a simulation of a real environment) scenario possible for the road-users.

Road-user attitudes will be explored before, during and after this stage to provide understanding of the differences between different services as provided by RUSPs.

4.4 Demonstrations Project Schedule

The current project milestones are shown in the table below for the Demonstrations stages shown in Figure 3. All dates are provisional and will be confirmed as the project evolves.

Milestone	Planned Date
Procurement and initial build	
Start of initial build of services	February 08
Demonstrations Phase	
Start of Stage 1 Demonstrations	March 08
Close of Stage 1	September 08
Start Stage 2	June 08

Milestone	Planned Date
Close of Stage 2	March 09
Open Stage 3	November 08
Close of Stage 3	September 09
Open Stage 4	March 09
Close of Stage 4	March 10

The Department wishes to retain the flexibility to open and close the demonstrations stages dependent on experience gained and performance of the services provided during the Demonstrations. Thus we have planned that Stages 1 and 2, although nominally 6 months each will in practice overlap and may be completed in less than 12 months.

4.5 The Research Challenges that need to be addressed

The Demonstrations Project will inform the work that local authorities are doing to develop local road pricing schemes, and build the Department's understanding of how a road pricing scheme could function whilst safeguarding people's privacy, and operating reliably and accurately. As such the Demonstrations Project, within the context of achieving the critical success factors described in section 4.1.1, provides a basis for investigating the challenges.   Essentially there are three challenges that are implicit in the objectives for the project:

- How to ensure that the privacy is safeguarded so that the road-user is confident that any information gathered is only used for purposes that have been specifically agreed to in advance;

- How to generate sufficient trust throughout the system so that high levels of compliance are achieved with the minimum of expenditure on compliance and enforcement infrastructures. This will involve the level of robustness, integrity and security within services. For example, not just the physical protection against tamper, but also process security to give the assurance of performance required by scheme owners and the consistency owner; and

- How to provide the necessary equipment and services for charging and the compliance and certification regimes in a cost effective manner, such that the overall costs are a small proportion of charges applied for using the roads within the defined schemes.

The extent to which these challenges will be demonstrated within the Demonstrations Project will be the subject of discussion as the Project develops. However, it is the Department's wish to explore the success or otherwise of existing, or newly offered services, in meeting these challenges and achieving the objectives set for the Demonstrations.

4.6 Demonstrations Project Colloquia

As part of the Demonstrations Project there will be a series of quarterly meetings in which those involved in the Demonstrations Project meet to discuss topics as part of the development of understanding of future needs. This is expected to include scheme owners, service providers, the Department and potential suppliers wishing to keep abreast of technical developments.

5. Demonstrations of Road User Services

This section describes the nature of the services required for road-users:

- The High Level Requirements for the services provided for road-users;

- The Key Performance Indicators (KPIs) for road user services; and

- How service provider transition from one stage to the next is achieved.

5.1 Road User Services High Level Requirements

RUSPs should understand that the descriptions given in section 3 (Context) and references to the Guidance have been given so that Demonstrations proposals may take the context fully into account. However, while being broadly in line with the Guidance, the definitive requirements are as given in this and the related documents and these take precedence over the Guidance for the purposes of the TDP Demonstrations.

This section summarises the service requirements that will be contained in the full Statement of requirements for road user services (Volume 2).

5.1.1 Customer-facing Functions

The Road User Service Provider (RUSP) shall provide road-users with effective set-up services and support them during the Demonstrations.

The RUSP shall provide the capability to acquire and bring the road-users taking part in the Demonstrations into full service. The RUSP shall be responsible for establishing a simulated road charges account for the road-user and installation of any in-vehicle equipment that may be required. Information regarding the road-user and associated vehicle shall be registered with the scheme owners.

The RUSP shall provide the capability to answer all road-user queries by phone, email and letter within an agreed response time. The RUSP shall maintain such information as required for each road-user and shall be the sole interface to road-users for providing service support, fault rectification and resolution of any road-user disputes. The RUSP shall be responsible for all equipped vehicles.

DfT will provide guidelines for building and maintaining a relationship with the road-user during the Demonstrations. These guidelines must be adhered to.

5.1.2 Charging

The RUSP shall provide the capability to correctly identify the distance travelled within charge objects and associated charge liabilities, to process charge data and calculate charges and issue statements to, and collect simulated payments from road-users.

The RUSP shall be able to automatically record any use of the defined schemes for the Demonstrations by use of the in-vehicle equipment, according to the charging rules of each scheme. The resulting charge shall be added to the simulated account of the road-user which is maintained by the service provider.

The RUSP shall provide the road-user with regular (possibly weekly) simulated statements of charges incurred through use of the nominated vehicle. This statement should show all chargeable travel to the level of detail required by scheme owners and road-users. The RUSP shall maintain an audit trail of charge data to support the investigation of any discrepancies which might arise through independent assurance, and to help us understand how we might best be able to safeguard privacy.

5.1.3 Assurance Functions

In order for both the Scheme Owners and all road-users to trust the services during the Demonstrations, the RUSP shall assure all services. Formal assurance processes should demonstrate that the Key Performance Indicators (KPIs) defining the quality of service are being achieved in the delivery of services to road-users and others.

RUSPs shall be able to provide assurance services as follows:

- That the RUSP meets the service quality levels which are defined as the KPIs described in section 5.2.

- That the RUSP has the capability to provide information to support the assurance of other services within the Demonstrations. This capability may include, but is not be limited to:

  1) Providing information of events or other interactions between the RUSP, its customers, road-users and compliance contractors to support the assurance assessment of compliance services; and

  2) Providing such information as is requested by the certification contractor in its role of independent quality assurance provider for all demonstrations services.

5.1.4 Support Functions

RUSPs shall have the capability to support the day to day running of their services within the context of the Demonstrations environment.

RUSPs shall provide the capabilities to manage all aspects of the Demonstrations service whilst in operation to ensure service integrity, including:

- Performance management.

- Management of the assets to provide accurate accounting.

- Configuration management and change controls.

- Contract management.

- External communication, working in partnership with the DfT.

For the demonstrations, RUSPs shall provide the capability to support and operate the Demonstrations activities required as generally described in section 4. In particular they should have the capability to:

  1) Detail their implementation approach including the proposed methodology that will be used. RUSPs must also be able to articulate their proposed solution, including how they plan to integrate all component parts.

  2) Provide a cohesive approach to explaining the type(s) of testing planned and how they plan to achieve acceptance, including contingency plans.

3) Operate an effective project management methodology and describe how it will be tailored to deliver the services required on plan.

4) Provide such information as is requested by the certification contractor to support the testing, verification or evaluation of Demonstrations services.

RUSPs may be required to undertake tasks pertinent to their own services to support the understanding and evaluation of the demonstrations activities as part of the research programme as described in section 6.1.

5.2 Indicative Key Performance Indicators for Road User Services

These performance requirements are not intended to be statements of requirements deemed necessary by the Department or Scheme Owners for the acceptability of solutions. They are indicative measures to be used in an experimental context to improve the DfT's understanding of the performance required and the variability of service providers' abilities to deliver under different conditions. As a result of further understanding, the Department may or may not use them as a basis for future specifications.

One of the critical success factors of the project is to "demonstrate that service providers are working with sufficient accuracy to meet prescribed performance criteria". This will be measured by using Key Performance Indicators (KPIs). These have been put forward at two levels: an initial level to establish a common initial operational basis that forms a benchmark for all service providers and a target level that may be appropriate for final operations.

KPI Name	KPI Description	Initial KPI	Target KPI
Correct Charge Object Recognition	The probability that a charge record is generated when an eligible vehicle incurs a charge liability according to the charging rules by encountering a charge object	85%	98%
False Charge Object Recognition	The number of occasions that a charge record is incorrectly generated when an equipped vehicle is not eligible for a charge according to the charging rules.	1 per 10 road-users per Month	1 per 100 road-users per Month
Distance Measurement	The mean error and standard deviation of the distance reported in a charge record, compared with the actual driven distance.	Mean Error = 0 ± 9% St Dev = 8%	Mean Error = 0 ± 2% St Dev = 3%
Charge Calculation	The probability that the charge reported in a charge record is calculated using the correct charge parameters.	95%	99%
Total Charge	The mean error and standard	Error = 0 ± 8%	Error = 0 ± 1%

KPI Name	KPI Description	Initial KPI	Target KPI
Accuracy	deviation of total charges as reported in charge records compared to the true charges.	St Dev = 8%	St Dev = 2%
Charge Allocation	Proportion of charges reported in charge records that appear in the correct road-user statements.	95%	99%
Revenue Allocation	Proportion of charges reported in charge records in returns to the correct Scheme Owner.	95%	99%
Cost of charge collection	Cost per mile travelled, assuming: - charges normalised to 1000 miles per month - calculation still needed when not being charged	Service Provider to propose	To be confirmed

5.2.1 Graduated performance levels

During the Demonstrations Project the Department wants to establish a consistent standard of operation across all service providers in order to meet the scheme owner objective. This is expected to involve achieving higher levels of performance as services are refined during the Demonstrations.   Three levels of performance are planned to provide this graduation:

Initial performance: Service providers are expected to meet these performance levels during Stage 1 and Stage 2.

Intermediate performance: Service providers are expected to meet these performance levels to enter Stage 3 and for them to be consistently maintained.

Target performance: Service providers are expected to meet these performance levels to enter Stage 4 and operate to them during that stage.

The KPIs at the intermediate level will be agreed as a result of the experience gained as the services are provided. All performance levels are currently indicative and will be reviewed during the project by the scheme owners to ensure that they reflect realistic and practical levels of service capabilities across different technical solutions. This will form part of the on-going dialogue between the Department, RUSPs and scheme owners.

5.3 Implementation of Demonstrations Stages

Each Stage of the demonstrations will be the subject of the selection processes under the terms of the enabling Framework Agreement. Definition of the initial set of Schemes (i.e. a

Scheme Template for each scheme) will be issued to Service Providers during the procurement process.

5.3.1 Entry to Stages 1 and 2

The start date for Demonstrations (after the opening of Stage 1) will be agreed with Scheme Owners and potential RUSPs as part of the detailed implementation planning process. This will involve the recruitment and set-up of road-users and services. The selected RUSPs for Stages 1 and 2 will initiate road-user services within the schemes and will run services for a maximum period of six months during which the RUSP will be expected to reach the intermediate performance level by the end of Stage 2. However, entry to Stage 2 will be automatic, provided the Service Provider has committed to establish suitable interfaces for data exchange and any other terms agreed for that transition.

During operations, the service performance will be confirmed by the service providers' own assurance processes and reports of the performance levels will be provided to scheme owners and included as part of contract management. Reporting requirements will be included in the appropriate statements of requirement.

The process will be developed during this period to provide a regime for certifying service providers during Stages 3 and 4.

5.3.2 Entry to Stage 3

Entry to Stage 3 will be subject to criteria which will include operating to the Intermediate performance level. The evaluation and selection process is expected to include the following steps:

- The applicant for Stage 3 submits test information on the performance achieved during self-qualifying preparatory work to the Certification Contractor (who has been accredited for this purpose). The format and nature of this information will be defined during Stage 1 but will not assume that the applicant is providing services within Stage 2.

- The certification contractor assesses the information, makes any inspections (for example of site facilities) needed and issues a "ready to enter" note to the service provider

- The certification contractor requests and witnesses any prescribed preparatory tests, for example benchmarking distance measurements, to qualify equipment used within the service. Subject to these results, the service tests would be initiated.

- The service provider initiates the services tests with the prescribed number of road-users. Performance is monitored by the certification contractor. It is anticipated that a one week period would be sufficient for this purpose (dependent on the number of road-users deployed).

- Upon successful completion, the certification contractor issues a "Pass Notice" to the scheme owners who are then able to formally approve entry to the Demonstrations

- The service provider is then able to operate road pricing services for the scheme owners for a maximum period of six months and establish the required number of road-users for this stage.

The performance of services within Stage 3 is assured by the service provider's own processes and independently qualified by the certification contractor.

5.3.3 Entry to Stage 4

The service provider may apply to enter Stage 4 when consistent performance at the target level is achieved for a period of four consecutive weeks. To enter Stage 4 a similar selection process to that used for Stage 3 will be operated, although since the service is in operation, the quality of service will already be known. Service providers may remain in Stage 4 for up to six months.

6. Demonstrations of Compliance Operations

This section describes the services required to investigate and confirm the simulated compliance of road-users within the Demonstrations Project:

- The High Level Requirements for the Compliance Contractor
- The Key Performance Indicators (KPIs) for Compliance Contractor
- Activities at different stages of the Demonstrations Project.

Each of these will be discussed in the sub-sections below.

6.1 High Level Requirements for Compliance Contractors

It is important to test whether a road pricing scheme could operate accurately and reliably. Key to this is ensuring that people comply with the rules of the scheme, so the demonstration will include a focus on compliance. Compliance Contractors should understand that the descriptions given in section 3 have been given so that compliance approaches may take the context fully into account. It is particularly important to have compliance measures that ensure the compliant road-users' privacy is protected, and which operates in a fair, reliable and accurate way for all road users in all schemes.

6.1.1 Roles required for Compliance

The Demonstrations Project will test the feasibility of creating a market for contracting Compliance Services which could be deployed to any, and therefore all, schemes. Within the Demonstration, the market will be considered as three related roles any or all of which may be offered by Compliance Contractors. These roles are shown in Figure 4.
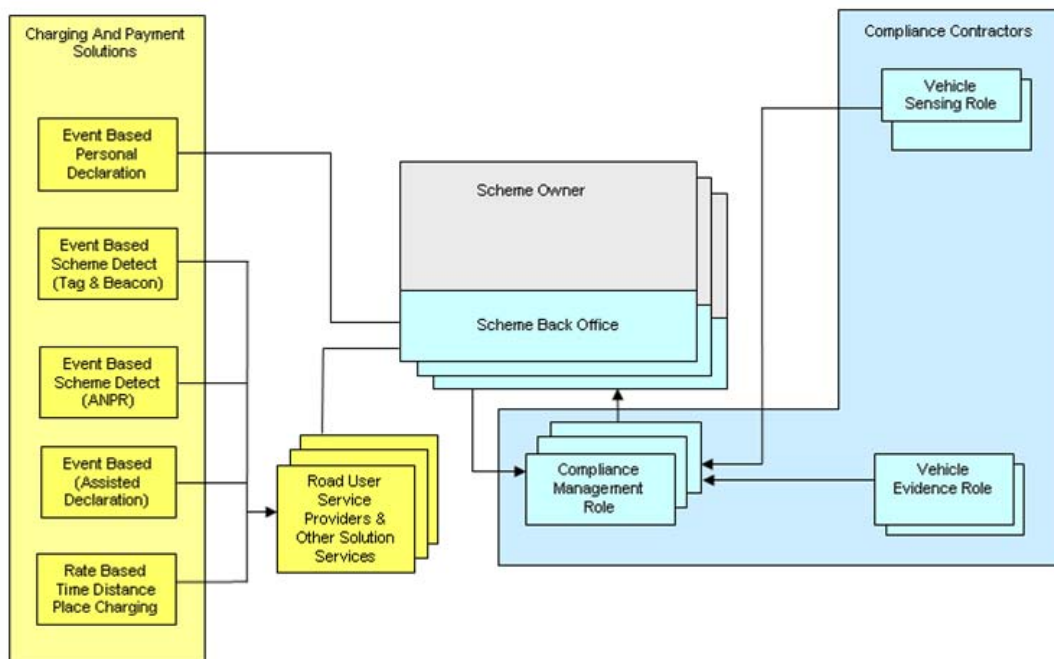

Figure 4: Overview of compliance roles

Compliance Contractors are required to provide scheme owners with information and evidence of road-users who are not compliant within the rules of any scheme in the Demonstration. They will therefore need to implement and apply the rules of each scheme in order to capture vehicle data to support the determination of the compliance of each road user passing a simulated compliance point. Comparison against those rules may include consideration of compliance against other charging solutions, such as personal declaration (either real or simulated). Where schemes include compliance infrastructure for other payment solutions (for example, ANPR for personal declarations) this should be allowed for by the Compliance Contractor.

Scheme owners would, in the future context being demonstrated, be responsible for deciding whether to proceed with the enforcement process on the basis of information and evidence submitted. The Demonstration will not seek to simulate the enforcement process and will therefore stop prior to the decision on whether to proceed with enforcement of a non-compliant road-user. In particular Compliance Contractors will not be required to confirm the registered vehicle keeper details with DVLA and DVLA will not supply this information.

The Demonstration will investigate alternative means of delivering this compliance process. This process may consist of the roles outlined below.

6.1.2 Compliance Management

A Compliance Contractor performing the Compliance Management role will be required to support one or more scheme owners in managing the stream of incoming evidence and vehicle identification data for use in a matching process to identify vehicles which have not paid the charge and planning the deployment of mobile and portable compliance equipment in order to obtain evidential quality identification of the non-compliant vehicles. The Demonstrations will not include real payments so all non-compliance would be hypothetical only.

Where the scheme owner does not receive payment, the vehicle enters a special category on the vehicle list and will be subject to evidence capture on the next occasion when it passes through a compliance point. For the Demonstrations Project, the content and operation of the special categories on the vehicle list will be simulated.

In the Demonstration, the Compliance Management role will provide and receive information from other compliance contractors and will hence need to establish suitable interfaces to ensure efficient transmission of information.

6.1.3 Vehicle Sensing

Compliance Contractors performing vehicle sensing will be expected to offer a means of capturing non-evidential information on vehicle locations in a cost-effective manner. Sensing identifies the vehicle in a given time and place for use as a source of intelligence on non-compliance. This process may include filtering of the data to identify and remove data for vehicles that are exempted or fall outside the scheme. Other functions may be included according to the overall compliance design.

This role will be expected to provide assured vehicle lists to compliance management.

6.1.4 Evidence Capture

Compliance Contractors performing this role will be required to receive and process vehicle lists distributed by compliance management on behalf of Scheme Owners indicating the status of vehicles and any actions required.

Compliance Contractors will be required to deploy facilities at agreed or random compliance points within the boundaries of defined schemes. For vehicles in the appropriate vehicle list categories they will capture evidence of non-compliance which would be suitable for subsequent enforcement, although no enforcement will occur within the Demonstrations.

They may filter captured data based on the vehicles list and remove data for vehicles that are exempted or fall outside the scheme. The remaining vehicle data may constitute the basis for compliance / non-compliance records which may be passed to compliance management for the definitive determination of non-compliance. As soon as the definitive position is established the irrelevant data would be deleted.

6.1.5 Determination of compliance with one or more payment solutions

Determining compliance with scheme rules implies that the compliance infrastructure would need to identify vehicles that are compliant through different payment solutions by suitable means. In practice this is likely to be simulated during the Demonstrations. In addition, there is a longer term aspiration to be able to demonstrate compliance with TDP solutions only and this will need to be factored into the work of the Demonstrations.

6.1.6 General Compliance Contractor requirements

Assurance of the performance and quality of any services which they offer is required from all Compliance Contractors. They will also be required to support the mutual assurance with Road User Services by identifying and matching any serviced vehicles passing through compliance points.

Compliance Contractors will furthermore support the requirements for 3rd party independent assurance of their services.

There is a general requirement for all Compliance Contractors to operate and manage the assets they use in providing the compliance roles, including any on-road equipment and supporting back office infrastructure.

Compliance Contractors will also be required to support the activities of the evaluation and advisory functions as described in section 8.

6.2 Key Performance Indicators for Compliance Contractors

For the Compliance Contractors the target set of KPIs are designed to provide assurance that the processes are working properly and to reflect the operational targets that would be expected in future operations. The following KPIs are defined initially with indicative values to provide a basis for discussion.

KPI Name	KPI Description	Initial KPI	Target KPI
Vehicle identification effectiveness	The probability that a vehicle passing a compliance point is correctly identified within a charge place and period.	To be agreed, dependent on operational situation	To be agreed, dependent on operational situation
Correct Vehicle Allocation	The probability that an identified vehicle is allocated to the right vehicle class list according to the rules agreed for the operational situation.	To be agreed, dependent on operational situation	To be agreed, dependent on operational situation
False Vehicle Allocation	The probability that a correctly identified vehicle is allocated to a wrong vehicle class list according to the rules agreed for the operational situation.	To be agreed, dependent on operational situation	To be agreed, dependent on operational situation
Correct identification of non-compliance	The probability that an identified vehicle is correctly identified as non-compliant according to the scheme rules.	Contractor to propose	To be confirmed
Correct proof of non-compliance	The probability that an identified vehicle is correctly proven as non-compliant according to the scheme rules.	Contractor to propose	To be confirmed
Correct identification of compliance	The probability that an identified vehicle is correctly identified as fully compliant according to the scheme rules.	Contractor to propose	To be confirmed

The actual values for these KPIs for the contractor performance will be developed in association with scheme owners and the Compliance Contractors during the course of the Demonstrations Project to reflect the operational situations where the compliance approach is to be investigated.

6.3 Implementing Compliance Management within the Demonstration

6.3.1 Developing Compliance Approaches

The Department is intending to appoint suppliers to perform design studies to investigate innovative approaches to compliance to achieve the KPIs identified above during stage 1 of the demonstrations. Suppliers are encouraged to propose alternative approaches that would provide a cost effective means of identifying non-compliance. Such approaches may or may not include:

- Use of intelligence-led evidence gathering of non-compliance as discussed above
- Direct interrogation of on-board equipment by wireless communications (and the implied installation of any additional equipment needed to support this method)
- Additional data flows between parties, for example between the RUSPs and Compliance Contractors.

Thus designs for compliance solutions should seek to reflect both the context of optional charging solutions and that where a TDP solution is mandated and the availability of suppliers within the contracted Framework Agreement for discussion of implementation issues.

An important factor to be considered will be the temporal rules governing payment, and hence non-compliance, where different technical solutions and payment means are involved. Such approaches should seek to ensure that the road-user is dealt with fairly and consistently in establishing any transgression of the hypothetical charging rules.

Implementation of the most promising compliance approaches are planned for stages 2 through 4 in parallel to the operation of Road User Services.

Definition of the initial set of schemes (i.e. the scheme templates for each scheme) will be issued to Compliance Contractors as part of the procurement process. Additional schemes and performance requirements may be issued during the demonstration to enable alternative compliance methods to be investigated.

6.3.2 Processing Compliance Data

Given the requirement for compliance to work consistently across the UK, the Demonstration will involve establishing and using common interfaces for the exchange of information relating to Compliance between the Compliance Contractors, scheme owners and RUSPs.

Exchange of information between the Compliance Contractor and any other entity is expected to be handled as data exchanges between back offices. It is not expected that any mobile units and portable compliance equipment from different Compliance Contractors will be interoperable with each other. Compliance Contractors will operate communications between their own back office and any mobile and/or portable equipment which they operate.

6.3.3 Primary data flows involving Compliance

A summary of the primary data flows involving Compliance will be included in the Volume 3 Statement of Requirements, but will be issued as an indicative guide only – proposals for Compliance Services may develop and propose alternatives solutions where these are believed to meet the overall objectives of the Demonstrations Project.

7. Demonstrations of Certification

This section describes the approach for the development of a certification regime to apply within the demonstration, in particular:

- The High Level Requirements for the certification roles including:
    - Quality Management assessment
    - Verification test and inspection
- The Key Performance Indicators (KPIs) for the delivery of the roles.
- The implementation stages required for the roles and how these align with the Demonstration services provider by the RUSPs and Compliance Contractors..

7.1 The Certification Process in the Demonstration Project

All contractors should understand that the descriptions given in section 3 have been given so that proposals may take the future context fully into account. The primary purpose of certification is to ensure that a consistent, and high, level of trust can be placed by road-users on how the various service providers deals with their privacy needs within a robust and reliable road pricing environment.

The Consistency Framework Owner is responsible for approving (and establishing the regulatory requirements for) the certification regime that will be used in the future context to certify trusted service providers. This means that part of the Demonstrations Project's objective is to understand the certification required for demonstration services associated with TDP solutions (i.e. those provides by RUSPs and Compliance Contractors).
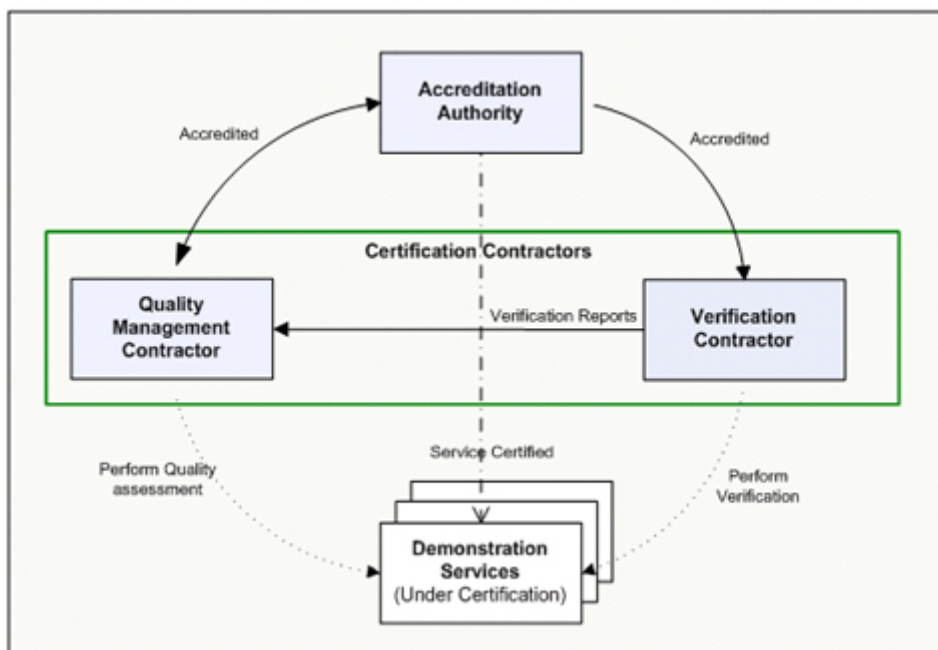

Figure 5: The roles in Certification

A key part of the project will be to develop the certification process for the future context through the use of a trial process for the later stages of the Demonstration. This will

provide a better understanding of the key features of efficient processes and information for the Consistency Framework Owner (and future scheme owners if required) to use these processes for appointing services providers.

7.1.1 The scope of Certification within the Demonstration

Figure 5 provides an overview of the certification roles within the Demonstrations Project. Certification Contractors are required to appraise the performance of both RUSPs and Compliance Contractors, who are collectively referred to as the demonstration services.

The Demonstrations Project, acting on behalf of the Consistency Framework Owner, will appoint one Quality Management Contractor (QMC) who should have experience in quality and process methodologies and should be able to assess a Quality System to a certifiable standard (such as ISO 9001). Additionally, a Verification Contractor (VC) will be appointed on the basis of specialised industry knowledge and/or technical competence to perform detailed technical validation of performance of the demonstration services.

Suppliers bidding for these roles will be prohibited from providing any demonstration services since they must provide an independent view of the performance of the RUSPs and Compliance Contractors within the Demonstration.

7.1.2 Demonstration of competence for Certification Contractors

Suppliers bidding to provide certification within the Demonstration will be required to demonstrate their competence by providing evidence of accreditation by the United Kingdom Accreditation Service to a relevant scope.

7.2 Quality Management High Level Requirements

The description below is intended to provide an indication of the requirements for this role, but the definitive requirements will be defined in the Volume 4 Statement of Requirement.

The Quality Management Contractor shall provide certification for road pricing services provided within the Demonstrations Project. As part of normal operations, all services are expected to provide assurance information to scheme owners and road-users and be subject to 3rd party assurance checks. These checks will be implemented by the Quality Management Contractor.

Quality Management assessments will be performed on a demonstration service's normal business and assurance processes to determine whether the service operation is robust enough for service providers to be trusted. The certification assessments are likely to cover the following areas of RUSPs and Compliance Contractors:

- Confidentiality and Data Protection – to investigate and confirm that measures are in place for data protection and operate effectively.

- Safety & Security – to ensure that all equipment safety, privacy and data confidentiality and system security requirements are met.

- Process integrity – to ensure that business processes, for example, how charge tables are maintained, are performed according to the documented procedures.

- Operational performance – to ensure that each candidate service meets the defined Key Performance Indicators (KPIs) and Service Level Agreements (SLAs), based on all sources of assurance information

- Consistent operation – to ensure that all services are operated in a fair, consistent and auditable way for all users (or recipients of service)

- Component Interoperability – to ensure all required data interfaces in the solution are able to interact with each other.

During the demonstration, the emphasis will be on identifying any perceived weaknesses in the demonstration service operations and internal assurance processes and seeking to develop (in partnership with those involved and the Demonstration Owner) how these may be improved.

7.3 Verification High Level Requirements

The Verification contractor shall provide independent 3rd party verification of road pricing services within the Demonstrations Project. The description below is intended to provide an indication of the requirements for this role, but the definitive requirements will be defined in the Volume 4 Statement of Requirement.

7.3.1 Demonstration Entry and Progression

For the demonstration owner and scheme owners to have confidence in the services entering the demonstration, they need to prove they can perform to the demonstration standards required. The demonstration entry and progression function will be implemented by the verification contractor covering the following three areas:

- Service Commissioning – Acceptance verification for a demonstration service before it participates in the Demonstrations Project. The Certification Contractor is responsible for defining what these steps should be.

- Demonstration Stage Progression – provide the capability to assess performance to justify moving to the next stage of the Demonstration by analysing the demonstration service operations.

- New Scheme Entry – provide the capability to ensure schemes' data is correctly defined and implemented prior to start-up by both the scheme owner and the demonstration services

The verification contractor will perform verification on any service making a funded request to the Department, and meeting performance qualification standard.

7.3.2 Service Performance Appraisal

The Verification Contractor will perform independent verification activities on any, and hence all, the demonstration services. The key aspects to be included in the verification include:

- To confirm that distance measurement is within the required accuracy bounds

- To confirm the actual performance levels that demonstration services are delivering compared to the KPIs defined for each one.

- Analyse positional and/or charging data provided by service providers.

- Identify the test process, facilities and equipment that will be needed to validate service performance, such as those identified above.

The VC will provide performance reports to the QMC to enable an independent assessment of the operational service performance.

7.4 Key Performance Indicators for Certification roles

For the Certification Contractors, the target set of KPIs are designed to encourage the development of cost effective certification processes for use within the demonstration context, consistent with gaining an understanding of the level of confidence provided by the processes. To that extent the KPIs represent a "resource box" within which certification activities would be completed.

The following KPIs are defined initially with indicative values to provide a basis for bidders to scope.

KPI Name	KPI Description	Initial KPI	Target KPI
Quality Certification time period	The average time period between receiving an application for quality management certification to completing all appropriate certification tasks.	Contractor to propose	To be agreed
Quality Certification resource	The effort required to perform all quality management certification tasks as a proportion of the initially proposed effort.	Contractor to propose	To be agreed
Verification time period	The average time period between receiving a request for verification to completing all appropriate verification tasks.	Contractor to propose	To be agreed
Verification resource	The effort required to perform verification tasks as a proportion of the initially proposed effort.	Contractor to propose	To be agreed
Cost prediction of Verification tasks	The proportion of actual costs to initially proposed costs required to complete verification tasks to 95% confidence level, for example: - accuracy of distance measurement - service KPI determination.	Contractor to propose	To be agreed

The actual values for these KPIs for certification will be reviewed in association with the contractors and Accreditation Authority during the Demonstrations Project.

7.5 Implementing the Certification and Verification Contractors

7.5.1 Stages of Implementation

The certification activities will follow the demonstration stages defined in section 4.3:

Stage 1: During this stage the Verification Contractor will be appointed in preparation for providing external assurance from the start of Stage 2. It should be noted that although the period of Stage 1 services is six months from the start of the Demonstration, the opening of Stage 2 is expected to be three months after opening of Stage 1, to allow acceleration of activity for those demonstration services that are performing above initial KPIs. Bidders

for the role of Verification Contractor may propose timetables for those activities which they believe would give the Department the greatest flexibility and value for money.

Stage 2: From the start of Stage 2 the Verification Contractor is expected to initiate 3rd party assurance processes on the operating RUSPs and Compliance Contractors. Preparations for this, such as installation and proving of any truthing systems, are expected be performed during Stage 1. The gathering of independent assurance information and comparison with the self-assurance provided by the RUSPs should enable any discrepancies to be investigated.

Stages 3 & 4: Stage 3 is opened with the Certification Contractor using the prototype certification process that has been approved by the Accreditation Authority. This means that all demonstration services (both RUSPs and Compliance Contractors) wishing to deliver services in Stage 3 need to satisfy this certification process, which may be the service acceptance tests for these services. It is expected that the functionality required as well as performance levels, in particular by the RUSP, may be enhanced in Stage 4 and this may require an additional approval process for entry.

7.5.2 Processing Demonstration Data

The responsibility of the Verification Contractor includes gathering data from the various parties in order to establish performance. This responsibility may be extended to include processing and/or onward transmission of data to other parties within the Demonstration.

7.5.3 Primary data flows within the Demonstration

A summary of the primary data flows to be handled by the Certification Contractor within the Demonstration will be included in the Statement of Requirements, but will be issued as an indicative guide only – the requirements may develop as discussions for the delivery of Road User Services and Compliance Contractors take place.

7.5.4 Supporting the evaluation of the Demonstration

All contractors are required to support the evaluation of the project. This involves supporting the Demonstration Team or any appointed Evaluation Contractor during the demonstration, including the provision of documentation or the participation in various discussions or service-focussed meetings.

7.5.5 Test and Truthing Equipment

The Verification Contractor shall provide all the equipment and processes needed to deliver the tasks required. This includes maintaining any test or truthing equipment and systems and any other assets needed to verify or assess the demonstration services.

8. Evaluation and Technical Services supporting the Demonstrations

Supporting the demonstrations services there are four additional services that will be undertaken by the Department or its agents, and with whom the demonstrations services will need to interact to support their work. These are:

- Evaluation tasks that will be placing both specific and general requirements on Service Providers and other contractors.

- Data management contractors who may provide data distribution or other services for the demonstrations project.

- Security services to provide the security infrastructure needed.

- Scheme owner support services to provide scheme owner demonstrations back-office services for those scheme owners who do already operate such facilities.

8.1 Evaluation of Service Performance

As a research project it is planned that a formal evaluation will consider all aspects of performance throughout the project. To facilitate the feedback and enhance greater overall understanding of those issues there will be periodic meetings involving all framework contractors, scheme owners etc.

8.1.1 Evaluation and Required Outcomes

Throughout the operation of the demonstrations there will be evaluation and feedback of the service operation into the definition of subsequent stages and into local authority's and the Department's exploration of road pricing. The Demonstrations Project is expected to provide:

- Information for evaluation and refinement of the service levels and regulatory structures needed to deliver consistent and robust road pricing processes;

- Information to define accreditation and certification requirements for the road-user and compliance services should these be needed in the future; and

- Information papers and reports to inform the DfT.

It should in particular be noted that the entry requirements for the certification process and levels of performance required will be openly published so that potential suppliers who are not part of the framework agreements for road user services or compliance contractors may understand the requirements emerging throughout the Demonstrations Project.

8.1.2 Supporting the Evaluation processes

Through the Demonstrations Project, the Department seeks a better understanding of emerging issues and will request full participation in a quarterly Road Pricing Colloquia of suppliers, scheme owners and the Project team to review progress, issues and plans for the evolution of the demonstrations.

In addition to the contribution of papers etc, for these sessions, it is envisaged that the Department may commission design studies to enable service providers to provide in-depth information on topics such as:

- How their service could be scaled up in size to provide fully operational services rather than demonstrations-scale services;

- How alternative specific business models (e.g. dis-aggregation of service components) might be achieved for their service; and

- The interface specifications are required and other performance or design issues.

A key requirement of being selected to provide demonstration services would be agreement to engage in such sessions and that such sessions are open to the extent needed to ensure full understanding of specifications by the wider industry.

8.2 Technical Services

The definition of other technical services needed to support the full range of activity planned for the Demonstrations is still under internal discussion. This section will be completed prior to the release of tender documents for any services required by the Demonstrations.

Annex A: Glossary of Terms

The following table definitions of the key road pricing terms used within RPFD.

Term	Definition
	(based on RPFD Glossary v6 dated 30/04/07)
Account	A service offered in which funds are held on behalf of a client or in which services are supplied on credit. Registration of number plates, mobile numbers and credit card details does not constitute an account.
Accreditation Authority	The authority responsible for ensuring that the certification process for services meets appropriate national and international standards and provides a basis for trust within the system.
Anonymity	The ability of the user to not identify themselves when performing an action (such as paying a charge) by withholding personal information. In the context of road pricing, the personal information may cover identity information (address, telephone number, e-mail address, etc), financial information (credit card number, bank details, etc) and journey information (e.g. linking number plate to location at certain times).
Assisted Declaration	A Declaration made by a User to a Scheme is done through a Service Provider (e.g. via the provision of a single phone number or web address).
Assurance	The act of determining the level of trust in a system or service which implements pricing policies as intended.
Automatic Number Plate Recognition (ANPR)	The process of determining the characters comprising a vehicle's number plate (vehicle registration mark – VRM) by generating a photographic or digital image and interpreting that image (e.g. using optical character recognition) to extract the VRM. This is typically achieved from a roadside (or overhead) camera.
CESARE	Series of European projects dealing with the design, promotion and implementation of a common interoperable Electronic Fee Collection System (EFC) on European toll roads. See website at http://www.asecap.com/english/projets-cesare3-en.html
Certification Contractors	Contractors appointed to provide services to test, verify and inspect the services provided by Road User Services Providers and Compliance Contractors.
Charge Object	A computer-based representation of the limits of extent of a zone, road corridor, or virtual Charge Point expressed in the form of a 2-D polygon whose boundary is a single continuous line that does not cross or intersect itself or the boundary of any other Charge Object. Travel into or across such a Charge object shall give rise to the creation of a Charge Record where a valid tariff is in force at the time of the vehicle's transit or travel within that Charge Object.

Term	Definition
	(based on RPFD Glossary v6 dated 30/04/07)
Charge Record	The Charge Record identifies a distinct charge derived from the computed distance incurred within a specific Charge Object when a particular tariff is applicable for each separate measure of distance travelled in that Charge Object within that tariff period on that day. For the avoidance of doubt, should a tariff change during the period when a vehicle is within a Charge Object, a separate Charge Record should be generated for the distance covered during the period when the distinct tariffs were applicable. It forms the basis for a line item on a User invoice or statement.
Charging	The raising of a claim which, in normal circumstances, needs to be settled through payment.
Charging Rules	The set of rules by which the Scheme Owner's charging policies are implemented.
Charging Tag	A vehicle-borne tag which carries out certain charging functions (e.g. displaying stored value or confirmation of receipt of a User's declaration) and communicates with roadside infrastructure.
Compliance	A User's existence wholly within the rules defined for road charging.
Compliance Management	The combination of proactive and reactive steps taken to determine whether a User is compliant and to react when a User is found not to be. Compliance Management includes the steps taken to communicate compliance issues to the User.
Compliance Contractor	This role covers the Detect function in the Compliance and Enforcement stream and the processing of detection data to determine compliance. This is likely to involve operating mobile and portable enforcement units to identify vehicles and calculate what a compliant declaration from that vehicle should contain
Compliance Point	A physical location at which compliance checks are performed on passing vehicles in a manner that meets Health and Safety requirements for the staff involved.
Confidentiality	The obligation for all Road Pricing entities to ensure that User information is not disclosed to others (intentionally or otherwise) and in such instances is only <u>further processed</u> in an manner compatible with the <u>specified and lawful purposes</u> for which it was obtained. This is in accordance with Schedule 1 of the Data Protection Act. *Such information to be treated confidentially may include: identity information (address, telephone number, e-mail address, etc), financial information (credit card number, bank details, etc) and journey information (e.g. linking number plate to location at certain times).*
Consistency	The alignment across Schemes of certain aspects that help to ensure the User experience (and potentially that of Service Providers) is the same or similar amongst Schemes. This covers aspects such as Scheme rules and operating procedures.

Term	Definition
Consistency Framework	The combination of Consistency rules, User rules and Common Components that together ensure that Schemes are consistent with policy objectives and adhere to any legislative and policy constraints.
Consistency Framework Owner	Responsible for the consistency and interoperability requirements across all Schemes, Service Providers and other Entities and for facilitating the delivery of any Common Components, including any oversight functions, such as security management.
Contractor	A provider of a service associated with road pricing that is wholly or largely defined by a contract signed with, and specified by, a Scheme Owner and if offered to Users is typically done so under the Scheme Owner's brand (not the Contractor's own brand).
Distance Based Charging	See definition for 'TDP Charging'.
EU Directive 2004/52/EC	Directive on the interoperability of electronic road toll systems in the (European) Community. This Directive requires that a European Electronic Toll Service (EETS) be created. This service, which is complementary to the electronic toll services of the Member States, shall ensure the interoperability throughout the Community, for users, of the electronic toll systems that have already been introduced in the Member States and of those to be introduced in the future in the framework of this Directive.
EETS (European Electronic Tolling Service)	A European Union-wide service which seeks to create an interoperable road pricing/tolling network, where any User of a service, after registering with any EETS provider, is able to be charged by any electronic charging scheme without having to stop and pay.
Event Based Charging	The charge payable for any journey within a scheme can be completely determined from one or more separate 'snapshot' observations of the vehicle state, its location and the time. There are four event-based charging models that are potentially useful as a basis for road charging: • Area: Driving within a given area • Cordon: Crossing a closed cordon • Point: Driving past a point • Route: Driving a route with several charging points having a common theme
Guidance	Document prepared and available to interested local authorities via the Dft website entitled: "Business case guidance for the road pricing element of the TIF pack"
Interoperability	The ability of systems and system components from different Schemes (and certain other organisations) to communicate and interact successfully with each other to support the requirements of Schemes.
Non-Compliance	A User's existence outside one, or more, of the rules defined for road charging

Term	Definition
	(based on RPFD Glossary v6 dated 30/04/07)
Privacy	The offering of a service (or number of services) by a Scheme or Service Provider which provides the User with options about the amount of personal information that they have to disclose to use a Scheme.

Such options for disclosure may include the levels of identity information (address, telephone number, e-mail address, etc)and financial information (credit card number, bank details, etc) that are provided to the Scheme. |
| **Rate Based Charging** | The charge payable for any journey within the scheme is based on a parameter that a Solution accumulates over a journey or set time period (e.g. a day). The charge is determined by multiplying increments in this parameter by a charge rate. That charge rate may be different in different areas and different time slots. There are three rate-based charging models that are potentially useful as a basis of road charging:

- Driven distance (TDP)
- Elapsed time
- Driven time |
Realistic Charging	Charging within the demonstration that is based on real users on real roads but with hypothetical charge rules
Registration	The explicit provision and recording of information in order that a User may make use of a service or a particular Solution. This may be, for example, name/address type information for billing or payment details for direct debit payments.
Road Pricing Colloquia	The series of quarterly meetings in which those involved in the Road Pricing Demonstrations Project meet to discuss topics as part of the development of understanding of future needs. At each session it is expected that Scheme Owners, including the Consistency Framework Owner, Service Providers for Road User Services and Compliance, organisations wishing to keep abreast of the technical developments will be involved.
Road User Services Provider	A provider of all services associated with the road charging as an end-to-end process. There may be sub-services or components within the services that are not directly apparent externally.
RPFD	Road Pricing Framework Division within the Department of Transport's Road Pricing Directorate.
Scheme	A legal implementation of a road pricing policy established under statutory powers that charges defined Users for road use within defined geographic areas within defined periods of time.
Scheme Detection	In the charging function of a Scheme Detection Solution, the Scheme detects when an eligible vehicle has been driven compliantly in chargeable circumstances and determines the Charge Payer's liability for a specific charge.
Scheme Owner	The organisation legally entitled to implement a road pricing Scheme – in this case, usually a local authority.
Scheme Rules	The rules defined by the Scheme Owner that describe how the Scheme powers will be exercised.

Term	Definition
	(based on RPFD Glossary v6 dated 30/04/07)
Security	The act of ensuring a suitable level of confidentiality, availability and integrity is maintained across all layers within a scheme or across the national framework. Security includes maintaining the integrity of all devices (tamper proofing etc).
Service Providers	A provider of a service associated with road pricing that is defined largely or wholly by that provider and, typically, is offered under its own brand. Examples include taking on a User's declaration or payment functions to a Scheme.
Solution	The complete provision for a way in which a User can interact with a Scheme. Definition of a Solution includes identifying the basis of the charge (e.g. event or rate), who has responsibility for detecting the charge liability, the method of determining that liability and (if appropriate) declaring it.
Supplier	Provider of equipment or materials to a Scheme, a Contractor, a Service Provider or User.
TDP charging	The specific instance of rate-based charging that charges by distance travelled by an eligible vehicle within a Scheme under its own power, possibly varied by place, time of day and attributes of the User.
Transport Innovation Fund	An initiative of the Department for Transport offering local authorities additional funds to develop and deploy new traffic management measures including road pricing schemes where these meet local needs.
Road-user or User	An individual or organisation that interacts with a Scheme in one or more ways that could include: • Being the registered keeper of a vehicle; • Registering as an account holder for paying road charges; • Registering with a Service Provider in order to use a particular Solution; and • Driving a vehicle under chargeable circumstances.
Vehicle List	A list of vehicles known to the road pricing scheme containing information and status about the vehicle and how it should be handled by schemes. No personal data is included. Vehicle lists may be local to a scheme or common across schemes. Examples of categories within the vehicle list are: Clearlist: A classification for which 'no action' is to be taken. An example could be a list of the registration marks of special vehicles for which there is no registration data held by the DVLA, but which are legitimate vehicles and are to be treated as such by Schemes. Hotlist: A classification against which specified action is to be taken when the vehicle is identified. An example is a class of known cloned vehicle registration marks (VRMs).