



**Brighton & Hove City Council
RTPI Project
Real-time Bus Data
SMS, XML, WAP and Web 2.0 services**

DELIVERABLES AND PRICING

December 2007

V1.3

Control sheet

Version control

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Related documents

	Document	Description
SVDO454-1	SVDO_Implementation_of_VDV454_V1_1_engl_BHN01_181631V1.PDF	Siemens VDV454 Specification
SVDO454-1	SVDO_Implementation_of_VDV454_V1_1_engl_with_appendix_BHN01_21824_0V1.PDF	Siemens VDV454 Specification with appendix
SVDO454-1	VDV_Schrift_454_1_1_(english)_BHN01_151913V1.PDF	VDV454 Specification
SIRI-1	SIRI Specification 2006/11/29	SIRI Specification

Document automation & Copyright notice

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1 Introduction

This document has been prepared at the request of Gareth Tilley (Atkins) for Sue Westwood of Brighton & Hove City Council. It presents proposals for the development and hosting of real-time bus information distribution systems (RTBID) for Brighton & Hove.

The RTBID system will take as its input a real-time data feed from the Siemens VDV454 source and make it available, initially, as:

- An **SMS service**, using the Traveline national 84268 short code, and
- A **SIRI XML interface** suitable for use by a variety of other services

Separately priced additional distribution options are presented to provide mobile internet (WAP) and fixed internet (map-based) services using Kizoom's established platform.

1.1 Approach

The technical approach taken in this proposal uses established **UK and CEN technical standards** to create a flexible and "future proofed" solution. An adaptor will be built to convert the Siemens feed from its VDV454 format in German into a SIRI Stop Monitor Interface. NaPTAN will be used for external stop identifiers. The output will then be available in a convenient flexible form for use by the SMS service and for other information distribution channels.

The SIRI web service provided, though hosted by Kizoom, will be suitable for use both by Kizoom services, such as those described in this document, and by other standards-based third party services.

The real-time bus information provided though the service will become an integral part of the Brighton & Hove transport infrastructure, and so it is important that it operates reliably on a 24x7 basis. Kizoom has an excellent track record of delivering similar services non-stop for over six years and proven Kizoom technology, hosting expertise infrastructure and support capabilities will be used to deliver robust, high quality services (See Section 3).

2 Project Deliverables

2.1 Summary of deliverables

The project consists of a core back end service and a number of information distribution options, each of which uses that service (see Figure 1). If all components described in this document are commissioned, the project will deliver the following:

Back end (project core)

- An **adaptor** that will convert a VDV454 publish/subscribe data feed (using whatever stop identifiers are available) into a SIRI Stop Monitor (SM) request/response XML service (using NaPTAN stop identifiers)
- An **journey planning interface** to the Traveline timetabled data for the south east region to use as an automatic fall back in case the VDV454 real-time feed is not available
- **Separate staging** (test) and **production** environments, with the ability to connect to separate staging and production versions of the XML service and run a suite of **regression tests**.

Distribution methods (built on back end)

- **D1:** A Brighton & Hove **real-time SMS service** using the Traveline national short code 84268.
- **D2:** A **SIRI-SM XML interface** making real-time information available for use by further services, including by third party providers (included in core pricing)
- **D3:** (Option) A Brighton & Hove **real-time mobile internet** (WAP) service that can be used on GSM, GPRS and WiFi 'hotspot' connections. This can be used to **find stops** and **display departures**.
- **D4:** (Option) A **web application** to let users **find stops** on a map and **display real-time departures**, using Kizoom's 'Transport On the Map' TOTM product

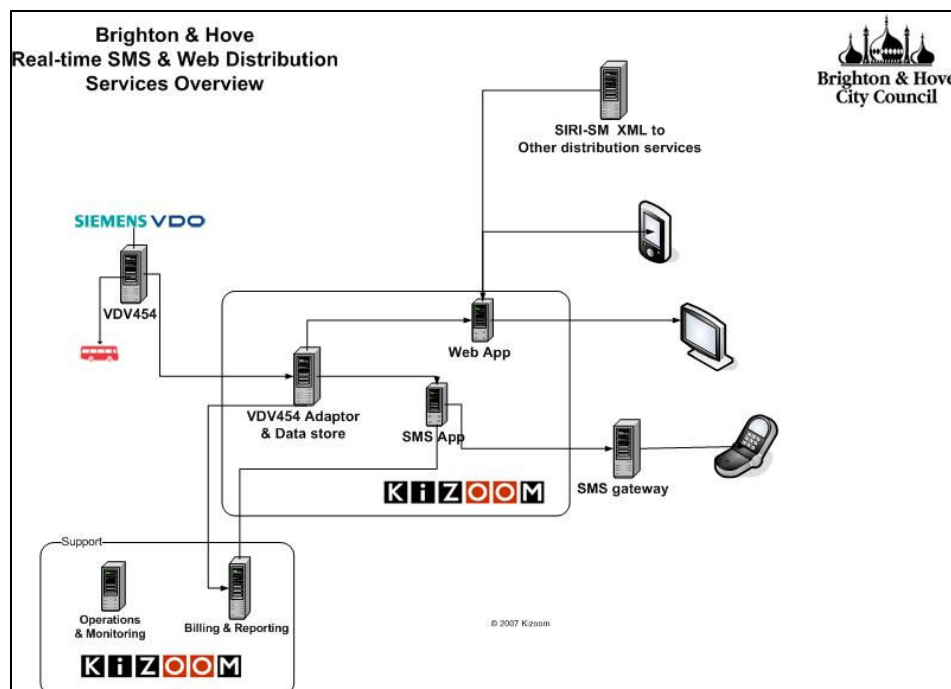


Figure 1 Overview of System Elements

2.2 #A1: VDV 454 to SIRI-SM adaptor

2.2.1 Overview

The external output of the Siemens real-time bus information system implemented in Brighton & Hove is a VDV454 service (www.vdv.de/en/). This service requires a publish/subscribe client to connect to it, and provides the base schedule, followed by any subsequent (real-time) changes to predicted departure and arrival times at stops. The service comprises separate Ref & RefSIS queries which must be used in tandem to extract the necessary real-time information, as described in the Siemens documentation & schema (see table of related documents above) and example logs supplied to Kizoom.

An adaptor will be developed by Kizoom to collect the output of this Siemens VDV454 data feed and transform it into a store of departures, queryable by stop. This will then be made available to other services as a SIRI Stop Monitor Request service, a flexible standards-based bus stop monitoring service engineered for easy interoperability and multi-channel use (www.kizoom.com/standards/siri). The SIRI-SM service will support standard NaPTAN stop identifiers, carrying out any necessary translation from the identifiers provided by the Siemens data source.

Creation of a core back end service using the SIRI and NaPTAN open standards will provide Brighton & Hove City Council with a robust basis for public information provision. Separating the real-time feed from the query load allows flexible scaling without changes to the underlying real-time system itself. Using open standards enables the effective and economical development of bus departure services via varied channels, including fixed and mobile internet, SMS, kiosks and DigiTV, and other channels as technology develops. It will also allow vendor independence in the development of such services.

2.2.2 Specification

- **Real-time and timetable feeds**

- The RTBID adaptor will interface with the Siemens VDV454 feed. In normal circumstances, blended (i.e. combined real-time and timetabled) output will be produced as appropriate from the Siemens feed alone.
- The VDV454 publish/subscribe client will support subscription to all services content, and return all required content including stop codes, line codes and headings needed to enable filtering by stop, line or destination.

- **Stop and other Reference data**

- Stop data will be obtained from the NaPTAN database on a regular basis. Any additional mapping will be supplied by Brighton – See Stop identifiers below.
- Other reference data such as post codes will be provided by the Kizoom platform.

- **Access**

- The VDV454 service will be available at a specified IP address, and other systems will be granted access on an IP controlled basis (note this is a server to server feed).
- There will be separate test and live feed versions of the VDV454 and the RTBID services available and it will be possible to have multiple subscriptions over each connection.

Note: As part of a robust Quality process, it is important to maintain separate test and production environments throughout the life of the Service so that fixes, platform upgrades and enhancements can be tested before deployment. There is thus a key assumption that it is at least possible to separately connect multiple versions of the

RTBID test and production adaptor to the VDV454 feed, and ideally that also there are separate test and production versions of the VDV454 service available.

2.2.3 Stop identifiers

The UK standard for bus stop identification is NaPTAN. Each stop has a unique short code (as used by the public for SMS queries) and a longer system code, used internally by information systems.

Since the current VDV454 feed available in Brighton & Hove uses different (non-NaPTAN) internal codes to identify stops, a mechanism is required to map these codes to NaPTAN, including a robust mechanism for handling of updates.

If necessary, a mapping table will be supplied and maintained by Brighton & Hove City Council for this purpose, to be used by the adaptor. This table will be provided in a simple format to be agreed with Kizoom, such as a dated spreadsheet or csv file containing two columns. This file will be uploaded to Kizoom according to an agreed schedule and used to update stop identifiers in the adaptor.

If at a future date Siemens are able to incorporate NaPTAN codes directly in the VDV454 service then it will be possible to drop this mapping table. Note that there is currently a technical limit on the length of stop codes in VDV454. However, since the first four characters of the NaPTAN code will be the same for all Brighton & Hove Stops, it may be possible to achieve to use NaPTAN codes with a temporary work around. This will be resolved as part for the detailed development.

2.2.4 Hosting

The adaptor and associated web service will be hosted in Kizoom's high availability server farm using capacity shared with other services, and making use of high capacity SMS gateway connectivity, SNMP monitoring and other facilities. This gives a balanced, robust yet economic capability to handle peaks and surges, while providing significant savings on support.

This approach is appropriate to the kinds of service we understand to be under consideration by Brighton & Hove at present. It would be possible to deploy to a separate installation dedicated customer infrastructure at a later date should there be a need (and sufficient budget) to do so. This would require replication of all elements of the software and hardware infrastructure, including a database for logging and billing, firewalls, load balancers, SMS gateways, etc.

Please see the Hosting and Support section below for more details of the Kizoom infrastructure and service standards.

2.2.5 Abuse protection

By making bus information available via internet services accessible by third parties, the service provider is exposed to potential risks of abuse. In particular, if the information is used on the web, there may be a risk of abuse by automated scripts which repeatedly request information. The service has been designed to support genuine end user information enquiries and is not scaled to support malicious use or a full blown denial of service attack.

Through Kizoom's automated monitoring procedures, reasonable steps will be taken to identify and prevent abuse from identifiable sources. However Kizoom also reserves the right to block access as necessary to protect services.

2.3 #D1: Real-time SMS service

2.3.1 Overview

Kizoom hosts and operates the national Traveline SMS bus departures service on the SMS short code 84268. This service is already operational in Brighton & Hove but currently provides only timetabled information from the Traveline data feed.

Once the SIRI-SM Adaptor described above is available it will be possible to upgrade the Brighton & Hove SMS service to provide real-time information. This will be integrated into the existing service, providing a seamless enhancement to the user experience, without requiring any new operating instructions to be understood by the user.

Experience has shown that, along with effective marketing of the service, the introduction of real-time information is the single most important factor in driving up usage of the SMS service.

The real-time version of the 84268 service already operates successfully in many parts of England and Wales. A straightforward, well established implementation plan exists, incorporating lessons from previous projects, and this would be applied in the case of Brighton & Hove.

2.3.2 Specification

- The existing 84268 SMS service provided by Kizoom will be integrated with the SIRI-SM Adaptor described above.
- Real-time and timetabled information will be provided in the SMS response in accordance with availability in the data sources.
- An indication will be given to the user as to whether or not any given response is based on real-time information.
- From the user's perspective their interaction with of the 84268 service will be unchanged – except that it will now contain real-time data.

2.3.3 Revenue

Commercial arrangements for the Kizoom SMS service, including its integration with real-time systems, have been agreed with Traveline at a national level, and are governed by the terms of the Traveline SMS Service Agreement. The pricing included below for this aspect of the project is in accordance with these national agreements.

The introduction of real-time data does not affect the options available to Brighton & Hove in terms of charging or free to user approaches. However, real-time integration undoubtedly creates an increased revenue opportunity through usage growth.

Detailed information on message costs and outpayments for the different mobile operators is available on request. Kizoom will also be happy to provide and discuss the results of research into successful marketing approaches.

2.3.4 Accounting & Statistics

Kizoom's SMS platform includes detailed billing and reconciliation functions to allow customers to view usage and SMS revenues and to judge demand and the effectiveness of different forms of promotion. It also performs detailed logging of SMS queries, making it possible to support or customer queries about delivery of messages.

1 Key in the bus stop code on your mobile phone – the code is shown on the bus stop plate

2 Text the code to number **84268** – only 25p*
*plus the standard charge from your service provider

3 Read the timetable information for buses using your stop
– you will receive this in a text message reply to your phone

2.4 #D2: Real-time SIRI-SM XML service

2.4.1 Overview

The XML service exposes the real time data from the VDV4 feed and adaptor using the SIRI Stop monitoring protocol as defined in the SIRI specification.

- XML service
 - The web service provided will support requests for bus departure information over http through the SIRI Stop Monitor XML request/response schema
 - In the event of Siemens feed being unavailable, a JourneyWeb interface will be used to fetch Traveline timetabled data. , and the service will automatically fall back to Traveline timetabled data.
 - Requests to the SIRI-SM web service will require bus stops to be identified with either ATCO NaPTAN codes or Traveline SMS codes.
 - The XML service is compliant with the SIRI-SM schema.
 - The service will fall
 - Technical documentation will be provided for developers.
- Access
 - The service will be available at a specified IP address, and other systems will be granted access on an IP controlled basis (note this is a server to server feed), not an end user feed. Any changes to this would be part of the support provision (see pricing table)
 - There will be separate test and live feed versions of the service available.

2.4.2 Scaling

The Kizoom platform is clustered and so can be scaled for additional load simply by adding hardware. Although a significant amount of pooled capacity is available in principle, for the purposes of this quote we have assumed only a certain load (see Section 5). If significant additional load for the XML service arises, it would come from additional third party services which B&H has decided to allow use of the service: in such cases it is likely there will be a business case able to contribute to any additional capacity costs.

2.5 #D3 (OPTION): Real-time WAP service

2.5.1 Overview

Mobile data services - viewed with a mobile browser ("WAP" or "xHTML"), provide a powerful way of finding and displaying real time departures. If properly promoted and made easy to use, such services can prove exceeding popular - Mobile browsers allow interactive stop finding and navigation of the data, and may cost the user less than SMS.

Kizoom can provide a Brighton & Hove branded WAP service to complement the SMS service. We propose a service incorporating a stop finder and departure board, providing users with a richer, more interactive experience while on the move; not restricted to the 160 characters of SMS, and without requiring users to know bus stop codes.

This service would be particularly useful within wi-fi hotspot areas using wi-fi enabled devices, but would also be available anywhere using a WAP mobile data connection, now ubiquitously available on nearly all phones as a built-in feature.

A core service (stop finder and departure boards) is outline here, followed by a series of optional features (a) mobile maps. These are priced separately below.

A live implementation of a Kizoom bus departures WAP service, developed for Network West Midlands (Centro PTE) can be seen at <http://netwm.mobi>.

2.5.2 Specification: #D3a core WAP service

- A mobile internet **home page** will be provided allowing the user to enter a stop name, street name or stop code and press 'Search'
- The system will attempt to identify the stop specified by the user and either return the departure board for the stop or, if more than one match is found, a list from which the user can select the desired stop.
- The home page and subsequent pages will include Brighton & Hove branding and brief explanatory text to guide the user.
- Appropriate error messages will be provided in the case of requests which are indecipherable or outside the region.
- The data presented in the departure board will be blended real-time and timetabled information sourced from the SIRI-SM adaptor consistent with that provided by the SMS service.
- An indication will be given to the user as to whether or not any given response is based on real-time information. (e.g. TT or RT in the illustration)
- To use the service the user must enter the URL of the home page into their phone. Having done this once it can typically be saved as a bookmark for subsequent one-click use

2.5.2.1 Screen flow

These example screenshots are taken from an existing live service, and design details will be adapted as appropriate for Brighton & Hove.

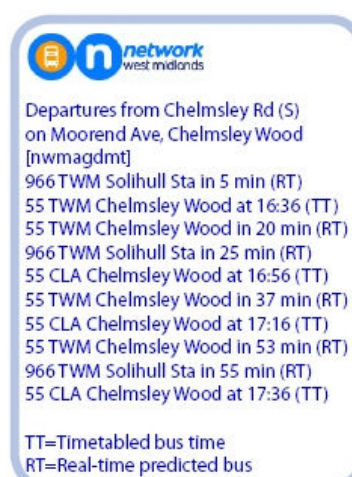
1. Search page



2. Results page



3. Departure board



2.5.2.2 Phone type support

There are a large number of different types of mobile phones and mobile devices, which vary considerably in their size and capabilities. Kizoom’s mobile platform uses adaptive technology to detect the device type and optimise the use of the screen size, colour and other device capabilities. This is supported by a large database of current devices regularly updated that covers the popular phones on all the major UK phone networks. Kizoom’s existing mobile services between them handle more than 800,000 enquiries per month and the breadth and robustness of our phone coverage is amongst the industry’s best.

To use the service the user must have a mobile phone with a WAP browser which has been configured to access their mobile operator’s WAP gateway. Almost all phones now have this (statistics can be provided on request).

2.5.3 Enhancement: #D3b Search by postcode

This feature provides additional usability when stop finding by allowing users to search for the nearest bus stops to a given postcode.

Support for postcodes will be added to the search field on the home page. If the system detects that a postcode has been entered instead of a name or stop code, results will be presented in order of increasing distance from the geographical centre of the postcode, calculated using lat/long information.

To keep the number of results manageable a circle of suitable radius, for example 500m, will be applied, with only stops within that radius being returned. Where more results are returned than can be presented on one page, they may be seen on subsequent pages using a ‘more’ link.

Postcode data will be sourced from a commercial postcode database held on the platform by Kizoom, which will be updated with suitable frequency. Usage-based costs are incurred by Kizoom for querying the postcode database. The recurring costs for this enhancement have therefore been set with a usage cap intended to cover expected demand, with additional charges for higher usage. Please see the pricing section below for details.

2.5.4 Enhancement: #D3c Show stops on a mobile map

This feature enhances usability of the WAP service by allowing the user to view a local map on their phone. This can help the user in two different ways; i) to help them select their stop, and ii) once a stop has been selected, to help them find its physical location.

i) *Selecting a stop*

If the stops listed as the result of a query can be contained within a bounding box of a defined size (configurable), the user will be offered the opportunity of viewing the stops on a map. The user will then be presented with a map showing the location of all the stops in the list, with icons uniquely identifying each, using appropriate graphics such as colour or letter codes. Having identified the desired stop by its icon on the map, the user will scroll down to pick that stop from the list below and follow a link to its departure board.

If the results list consists of stops too widely separated or too numerous to present on a map in a useful way on a mobile phone, the option will not be made available. The system will perform the necessary calculations to ensure that the user can view a map if and only if it will be usable. The precise rules to make this most effective will be subject to continuous review and tuning.

Stop results displayed on a mobile-optimised map pane:



- [A Dixon's Green Rd \(NE\), Tesco](#)
- [B Dixon's Green Rd \(SW\), Tesco](#)
- [C Dixon's Green Rd \(NE\), Owen St](#)
- [D Dixon's Green Rd \(SW\), Owen St](#)

ii) *Locating a stop*

A link will be added to the end of each stop's departure board allowing the user to view a map centred on the stop. The map will simply mark the single relevant stop, allowing the user to locate it in relation to the surrounding streets.

The scale of the map will be the same for all stops, but configurable in accordance with the geography of the region. The map size will reflect the capabilities of the user's phone.

Maps will be sourced from a third party service provider. At present Kizoom's view is that Multimaps offers the most suitable technology for the mobile platform. This will be kept under review as mapping providers' develop their services. Usage-based costs are incurred by Kizoom for delivery of Multimaps images. The recurring costs for this enhancement have therefore been set with a usage cap intended to cover expected demand, with additional charges for higher usage. Please see the pricing section below for details.

2.5.5 Enhancement: #D3c OTA bookmarks

An OTA (over-the-air) bookmarking feature will be added to the Brighton & Hove City Council website, enabling users to send themselves an SMS message containing the URL of the WAP service. This will assist the user in easily returning to the WAP service whenever they need it, and should therefore drive up usage.

The bookmark feature will be styled and designed for easy insertion into the appropriate pages of the Brighton & Hove web site. The user will enter their mobile phone number and any other necessary details, and then press a button to trigger the sending of the SMS.

This feature will be secured by a Captcha to reduce the risk of abuse (<http://en.wikipedia.org/wiki/Captcha>). This is intended to prevent automated scripts using the page to send unauthorised bookmarks. For an example of a Captcha in a similar context see <http://mobile.tfl.gov.uk/sendbookmark>.

Messages will be sent without charge to the user. Usage-based costs are incurred by Kizoom for sending bookmarks (i.e. SMS costs). The recurring costs for this enhancement have therefore been set with a usage cap intended to cover expected demand, with additional charges for higher usage. Please see the pricing section below for details.

2.6 #D4 (OPTION) TOTM map system

2.6.1 TOTM Overview

Kizoom's Transport On The Map (TOTM) product is a customisable web based application for showing travel related data within an easy to use map based interface. It makes it easy and cost effective to publish different types of static and real-time transport information on a map, which can then be integrated into a customer's website. In particular it lets users

- Find where stops are.
- View real-time departures.
- Find out the identifiers of stops to use with the SMS service.
- View real-time incidents.

A TOTM installation provides a web based complement to the SMS, WAP and on-street real-time displays. As an additional option we propose a map based tool integrated with the Brighton & Hove website.

TOTM may be deployed in different variations, including different types of data. The simplest use is as a bus stop finder providing SMS codes to the public. This can be enhanced, either for launch or at a later date, by adding more transport layers and other local data to the map, depending on data sources available.

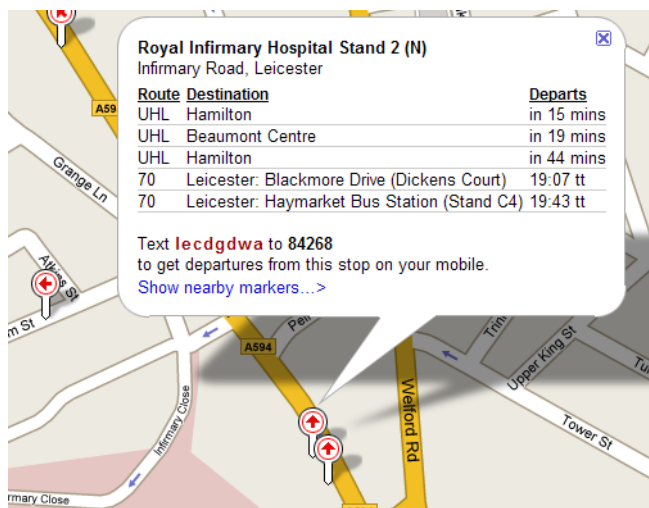
2.6.1.1 Core elements of TOTM:

- Basic bus stop finder.
- Bus departure boards (including real-time data from a SIRI based feed).
- Postcode search.

2.6.1.2 Possible extensions:

- Rail stations and real-time departures.
- Road works and incidents (from a DATEX2 or other feed).
- Car parks.
- Jam cams and traffic congestion data.
- Link bus stops to journey planner.
- Tourist information.

An example of an existing implementation of TOTM showing a simple stop finder can be seen at www.pticymru.com (click 'Traveline txt' for the TOTM pages). An example of a TOTM service including a range of additional features can be seen at www.leicestertravel.info. This latter example clearly shows the basic elements of the TOTM interface: Google Maps mashup, search box, left hand results column with tabs, checkboxes to select layers, and client branding elements.



Detail of a screenshot from the Leicester TOTM, showing popup bubble with real-time and timetabled bus departures.

2.6.2 TOTM #4a: Web2.0 map interface & stop finder

The TOTM stop finder allows members of the public to find and view bus stops on a map and to find out the Traveline SMS codes for their stops, encouraging use of the 84268 service. It includes the core components of the TOTM technology platform and is the basis upon which additional data sets can be added.

The basic stop finder includes the following key features, which are described in more detail below:

- Client styled TOTM user interface.
- Stop search (by stop code, address or name).
- Display stops on a Google Map using NaPTAN bus stop data.
- Display stop details including SMS code in a bubble.
- Intelligent stop aggregation depending on zoom.
- Usage reporting.
- Resilient hosted hardware & infrastructure.

2.6.2.1 Client styled TOTM user interface

TOTM has been designed to enable simple tailoring to fit the house style of customers' websites. The site banner graphic and the background colour can be altered at no additional charge. Additional style changes are possible but additional costs may be incurred.

2.6.2.2 Stop search

The stop finder helps users to pick the stop that they are interested in - accepting queries for stop name, street address, regions and SMS stop code. The stop finder intelligently distinguishes between different query types so that multiple data entry fields are not needed. Requests that do not resolve to a single stop or region will produce a disambiguation list in the side bar. Once an unambiguous stop or region name has been resolved, the map will scale to show the chosen location.

2.6.2.3 Direct Interaction using Web2.x0 Mashup

The service uses Web2.0 mashup technologies (see http://en.wikipedia.org/wiki/Mashup_%28web_application_hybrid%29) to combine map data from Google Maps with transport data from various sources.

This allows direct interaction by the user with the user who can zoom, pan or scroll tiles to find their area of interest simply by dragging and clicking. A pre-emptive background loading of map tiles give a fast, smooth rendering.

Google Maps was chosen as the basis for the service because of its excellent usability and design.

2.6.2.4 Display stop details in bubble

Once a single stop or area has been selected using the stop finder or on the map, the stop icon can be clicked to open a 'bubble' which shows the stop name, locality and SMS code. The stop icon will show the direction of travel from each stop.

The stop data published by the service is updated every night from the online NaPTAN database.

2.6.2.5 Intelligent stop aggregation

To avoid screen clutter and make stop selection easier when there is a high density of stops at a given zoom level, TOTM includes a unique feature to aggregate overlapping stops into a single stop flag. The aggregated stop icon is designed to be easily distinguishable from single stops. The user can click on an aggregated stop icon and zoom in closer to reveal the individual stops.

2.6.3 TOTM #4b – Search by postcode

A postcode search function can be integrated as an optional extra (see pricing section below). Results are presented in the left hand side bar in order of increasing distance from the geographical centre of the postcode. The user can then click on an entry in the results list and the map will zoom directly to that location. Postcode data will be sourced from a commercial postcode database covering the whole of the UK held locally by Kizoom (usage cap applies).

2.6.4 TOTM #4c Bus departure boards

If timetabled or real-time data is available – as it is for Brighton and Hove - an important optional feature is the addition of blended timetabled and real-time stop departure information on the map. The TOTM bus stop bubble will display the same timetabled and/or real-time information that is available from the Kizoom Traveline SMS system.

With this functionality implemented, the bus stop bubble will include the basic information described above, and also a table of the next few departures from the stop, showing route numbers, time expected, and whether or not the time given is timetabled or real-time.

A protection system will be introduced in an attempt to prevent automated scripts from auto-refreshing stop information. High levels of auto-refresh activity could place excessive loads on Kizoom's systems and those of underlying real-time feed suppliers.

3 Hosting and Support

3.1 Summary of services

All services commissioned will be hosted on Kizoom's resilient shared infrastructure in accordance with the service commitments described below. A summary of the costs and activities covered by Kizoom's annual recurring charges is as follows:

3.1.1 Hosting and operation

- Data centre rack space and internet bandwidth.
- Infrastructure and software platform support contracts.
- Resolution of all hardware and networking issues.
- Monitoring, logging and collection of statistics.
- Backups.
- Abuse detection and counter measures.
- Infrastructure patches and other maintenance.

3.1.2 Support and maintenance.

- Investigation and resolution of all issues according to SLA terms.
- Log file inspection and follow up.
- Application code maintenance.
- Bug fixes.
- Code refactoring.
- Test suite maintenance.
- Application documentation updates.
- NaPTAN and other source data updates as required.
- System configuration changes.
- Tuning and performance improvement.

3.1.3 Service management

- 24x7 service desk.
- Preparation of usage reports.
- Service procedure documentation.
- Support escalation channels.
- Management of service and maintenance teams.
- Monitoring of SLA compliance.
- Major incident handling and reports.

3.2 Hosting technology platform

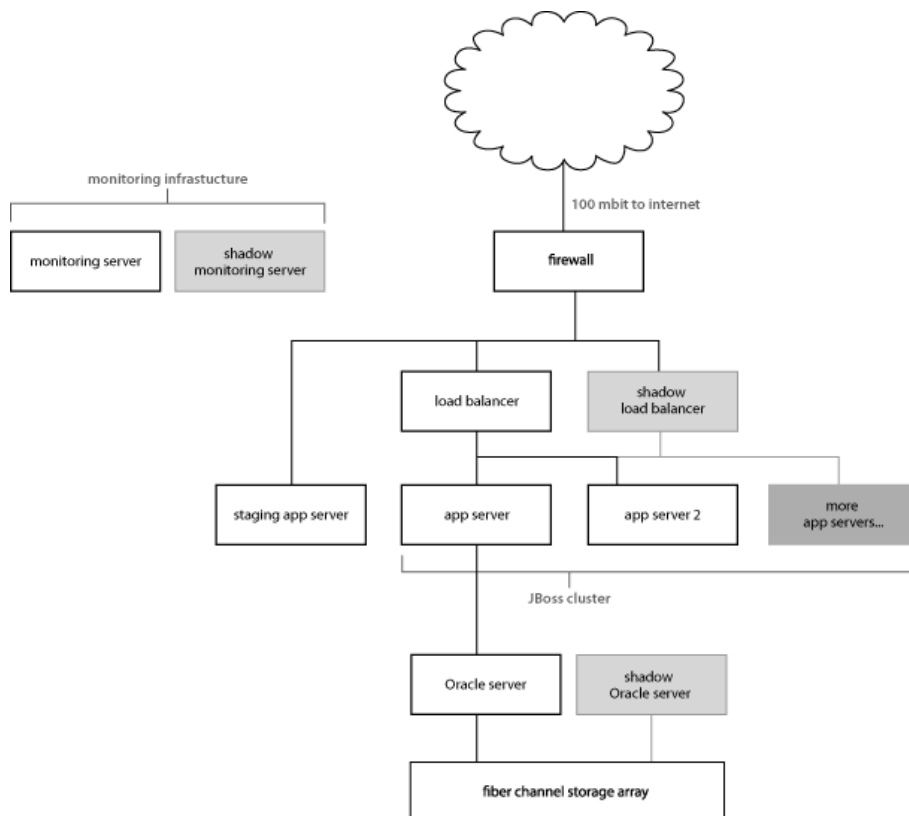
Kizoom operates live services from our servers located in a Cable & Wireless (C&W) secure hosting facility in Leeds. C&W provide rack space, security and access control, highly resilient bandwidth and power supplies, environmental controls and backup facilities. C&W also provide 'hands and eyes' services to ensure speedy replacements of failing hardware such as RAIDed disks or redundant power supplies.

The Adaptor, SMS, WAP and TOTM services will be operated in our proven Wildebeest environment. This is a best practice hosting infrastructure, offering high performance and availability and consisting of the following key components:

- Firewall
- Failover pair of Apache Web servers
- Failover pair of Load Balancers
- Fully clustered JBoss application server farm

- Web and application servers on resilient hardware (dual PSUs, RAID disks), running RedHat Enterprise Server
- Failover pair of Sun Solaris 10 database servers running Oracle 10g
- Database storage on FiberChannel RAID array
- Proven redundant monitoring and alerting framework based on OpenNMS with priority configured SMS and email communication channels

3.2.1.1 Kizoom Wildebeest platform



Brighton & Hove services will share this infrastructure with other Kizoom managed applications. This approach allows our customers to benefit from resilience and scaling capacity more economically than if each service was hosted on a stand alone basis. The Wildebeest environment also includes existing personalisation and location based components that would greatly simplify the upgrade path if these enhancements were required in future.

3.2.2 Monitoring

Kizoom’s monitoring systems comprise three components:

- *Automated Health checks:* The Wildebeest system includes a comprehensive suite of automated health checks which monitor the availability and performance of key feeds and pages and which fire automated SMS & email alerts as appropriate if any check fails.
- *OpenNMS Dashboard:* Kizoom uses OpenNMS to present SNMP information from our production servers. This allows our operations team to quickly and easily pinpoint actual and potential issues with our services. This system also handles escalation of production outages to ensure prompt and accountable incident handling

- *Log Files:* Kizoom's support team inspect our Java application log files daily to check for system errors and warnings which may not show up via the automated healthchecks.

3.2.3 Usage reporting

Service usage reports for TOTM are made available to the customer via a password protected web site. The following reports will be available as standard:

- Daily web sessions count
- Daily report of bus stops visited, showing volume per visited stop
- Weekly report of bus stops visited, showing volume per visited stop
- Monthly report of bus stops visited, showing volume per visited stop

These same reports may also be regularly forwarded to customer email addresses if required. Additional bespoke reports from our data warehouse may be developed if desired.

3.2.4 Platform maintenance

The Wildebeest platform is maintained by Kizoom's infrastructure team. They ensure that we track the most recent stable versions of the platform software, that patches are applied as necessary, and that the platform is updated to make best use of evolving technologies.

3.3 Support

Kizoom systems are supported by a team of specialists who are always available during normal office hours, and who also operate a 24x7 on call support rota. The support team maintains the status and performance of our production systems by monitoring email, phone, SMS, OpenNMS and JIRA accounts. They also respond to customer or third party requests and alerts.

Response to one-off customer support requests (e.g. for interim stats) will normally be handled without additional charge. Where Kizoom considers that levels of support are being requested that exceed what is reasonable, we will alert the customer to this situation and reserve the right to charge for additional support levels at the Daily Developer rate.

Technical support as required for the SMS, WAP and TOTM services is included in the established pricing scales. Since the Adaptor is bespoke, and the level of support required therefore difficult to judge, a cap is proposed of 4 days per year, which we anticipate being sufficient, allowing recurring costs to be set at an economical level. Further support will be charged on a time & materials basis - please see pricing notes below.

The support team also oversees the timely fixing of bugs. Bugs reported by customers or identified by Kizoom using the JIRA system will be resolved according to assigned severity level. Severity levels are defined on a scale ranging from Cosmetic to Critical.

Kizoom will not provide end user support to the general public.

3.4 Scaling

The Kizoom Wildebeest platform described above is highly scalable and provides a robust basis to flexibly accommodate our clients' ambitions in terms of usage growth and introduction of new services.

However, to enable hosting charges to be set at an economical level we propose certain limits on usage, which we see as appropriate to the circumstances of this project:

- The real-time SMS service is available for unlimited use within the council area

- TOTM is priced in bands based on numbers of stops. The implementation proposed is limited to 15,000 stops
- Likewise the WAP service is limited to 15,000 stops
- Use of the SIRI-SM Adaptor XML interface by third parties is limited to 600 queries over a 6 hour period (see assumptions). For reasons of economy the implementation is designed for limited use appropriate to systems such as kiosks, which is understood to be current intention. However, the platform is fully scalable and a future investment could be made to boost capacity for other types of service.

3.5 Service level commitments

TOTM

Summary details of Kizoom's service level commitments are provided here. Provision of the TOTM service will be covered by a contractual Service Level Agreement which is available on request.

3.5.1 Service availability

The service will be available a minimum of 99% of the time, measured over a calendar month. Availability will be measured by automated querying of the home page of the service every 10 minutes to ensure that it responds correctly.

Specific exclusions:

- Periods of previously agreed planned maintenance
- Failure of 3rd party services not provided or contracted by Kizoom

3.5.2 Service response times

In this project Kizoom's application response time will be dependent upon the response performance of Google Maps and the real time and timetable services, which are outside of Kizoom's control. We will measure and report on the response time performance of those operations within Kizoom's control. Performance will be measured by querying the home page of the service every 10 minutes and monitoring the response time.

- 99% of enquiries will be handled within 1.5 seconds, averaged over a clock hour

3.5.3 Service capacity

Kizoom will commit to the availability and response time measures stated above for traffic volumes less than or equal to:

- Page Requests: 1,000 per hour, measured over a clock hour
- Bandwidth: 1 megabyte per hour, measured over a clock hour

Should the traffic volumes exceed these levels, Kizoom will endeavour to maintain the response time and availability measures.

3.5.4 SLA reporting

Kizoom will provide a set of SLA reports to include:

- Calendar monthly availability performance
- Response time performance against SLA
- List of new/outstanding support issues relevant to your service

We have included costs for these reports in our prices. Any additional reporting requirements will be handled on a case by case basis

SMS service

The Kizoom Traveline SMS service is provided in accordance with service commitments agreed with Traveline. Details can be provided on request.

WAP service

The Kizoom WAP service will be provided in accordance with SLA commitments for availability comparable to the SMS service. Details can be provided on request.

Adaptor

Service commitments for the SIRI-SM Adaptor will be agreed at an early stage of the project when i) the Siemens data source has been made available to Kizoom and its capabilities and limitations are understood, and ii) a clearer idea of expected usage is understood.

3.6 Kizoom hosting & development credentials

Hosting and operating high availability internet services are a major part of Kizoom's business. Services are hosted in a MOD quality facility at Cable and Wireless, with full resilience and dual backbone connectivity to the internet. We now operate more than 100 live services for our clients and have accumulated a vast experience of the procedures and infrastructure needed to meet their SLA targets.

We have provided some examples below of services currently operated by Kizoom.

3.6.1 National Rail Enquiries

Kizoom built and operates many of the pages on the National Rail Enquiries web site; we also manage the nationalrail.co.uk domain. Kizoom's responsibilities include serving more than 750,000 page requests and 25 GB of data each day, and ensuring that the site is resilient and scaled to support burst demand of many times normal daily demand.

3.6.2 Transport Direct

Kizoom built and operates the mobile and iDTV channels for the DfT's Transport Direct Portal, www.transportdirect.info. These are the only externally hosted channels in the TDP family and are operated by passing users' Journey queries via an XML API to TD's Journey Planning servers. The mobile service tailors responses for a wide variety of different mobile devices whilst the iDTV service is built as a plug-in for the DigiTV platform, which publishes the information on Digital Televisions.

3.6.3 Mobile operator portals

Kizoom built and operates the Public Transport information services for all 5 of the major UK mobile operators (Vodafone, Orange, O2, T-Mobile & 3). Information services provided include rail and urban journey planning, real time arrival and departure information and travel news services. In most cases the services connect to the mobile operators' personalisation, location and billing systems using XML APIs. The services are fully operated by Kizoom, and are branded for each mobile operator.

Kizoom's mobile operator services handle more than 750,000 journey enquiries each month.

3.6.4 Directory enquiries

Kizoom built and operates a web based rail journey information service for the UK's leading 118 directory enquiries provider. Their expert call centre operators use an optimised interface to quickly access train time information. Response time and usability are especially important in this application, which queries Kizoom's own farm of Journey Planning engines.

4 Project Outline

4.1 Roles and responsibilities

4.1.1 Kizoom

Core services

- Develop, test, configure and implement new Adaptor and SIRI-SM web service for the Siemens VDV454 data feed
- Implement real-time SMS service for Brighton & Hove
- Host, operate, maintain and support all services
- Provide documentation, including technical information for use of the SIRI-SM web service API

Optional services

- Implement real-time WAP service for Brighton & Hove
- Implement TOTM map system for Brighton & Hove

4.1.2 Siemens

- Provide test and live versions of VDV454 service
- Provide support details including escalation points for the real-time system

4.1.3 Brighton & Hove City Council

Core Services

- Maintain timetable and stop data including any stop identifiers
- Provide and maintain stop identifier mapping table
- Ensure availability of Siemens VDV454 data feed to Kizoom
- Agree configuration options for real-time SMS service
- Register SMS stop codes if necessary
- UAT for all systems

Options

- Agree configuration options for TOTM map system
- Integrate TOTM map system into Brighton & Hove website as required
- Provide council branding materials as required

4.2 Project timeline

A phased project timeline is proposed, with the Adaptor and SMS service treated as phase 1, and the WAP and TOTM systems, if commissioned, treated as phase 2. The outline project plan will be as follows:

PHASE 1	
Commence work	04/02/08
Siemens data source made available to Kizoom*	11/02/08
Interim progress report	03/03/08
Work on adaptor complete and deployed to staging for UAT	17/03/08
Real-time SMS system deployed to staging for UAT	24/03/08
Changes implemented and Adaptor / SMS ready for final review	07/04/08
Deployment to production and launch	23/06/08

* Note that the early, reliable, and continuous availability to Kizoom of the Siemens data source is essential to this timeline.

PHASE 2	
Commence work	21/04/08
Clarification of all configuration and UI details	28/04/08
TOTM complete and deployed to staging for UAT	19/05/08
Real-time WAP system deployed to staging for UAT	02/06/08
Changes implemented and TOTM / WAP ready for final review	16/06/08

Deployment to production and launch

23/06/08

This timeline assumes i) that the work can be commissioned by **Friday 18th January**, and ii) that the scope of the commission is as proposed above.

The project plan will be finalised at an early stage of implementation once requirements have been confirmed in detail and all data sources and other dependencies have been clarified.

4.3 Assumptions

Component	Ref	Assumption
VDV454 Feed and /SIRI-SM Adaptor	AdF1	A stable test feed will be made available by Siemens, realistic in the nature and scale of its content. This must be available throughout development.
	AdF2	A full XML specification of the Siemens feed will be available prior to the beginning of the project. The feed will be fully documented with a schema, and will be structured exactly in accordance with its documentation.
	AdF3	Any necessary licences for the feed and its use for the intended channels are obtained by the client.
	AdF4	The VDV454 feed will provide a robust, timely distribution of real-time data. Subscribing to data for all stops with a single subscription is performant.
	AdF5	The VDV454 feed will support multiple subscriptions at the same time.
	AdF6	There will be separate VDV454 feeds available for test and production use.
	AdF7	The VDV454 will provide updates for a useful data horizon, i.e. time period ahead.
	AdF8	There is a separate stop identifier in the VDV454 source for each individual pole, i.e. each stop in each direction.
	AdF9	The data provided by the Siemens feed will either be NaPTAN referenced, or if not, Kizoom will be provided with a suitable identifier mapping table.
	AdF10	Brighton & Hove County Council will be responsible for updating bus stop data in NaPTAN in accordance with agreed procedures.
	AdF11	The mapping table will be made available to Kizoom in a consistent, reliable form and location as a simple web request.
	AdF12	The VDV454 feed includes both real-time and timetabled data and that the necessary blending of this data is carried out by the source.
	AdF13	The total query load on the SIRI-SM web service will not exceed 600 requests per 6 hour period. For load above this, alternative hosting arrangements at additional cost may be discussed.
Real-time SMS service	SMS1	The SIRI-SM Adaptor will be available as a prerequisite.
	SMS2	The real-time service will be provided as an extension of the Traveline 84268 service.
	SMS3	Any necessary licence for use of the feed for the SMS channel is obtained by the client.
Real-time WAP service	WAP1	The SIRI-SM Adaptor will be available as a prerequisite.
	WAP2	The number of bus stops covered by the TOTM implementation is below 15,000.
	WAP3	Any necessary licence for use of the feed for the WAP channel is obtained by the client.
TOTM map	TTM1	The SIRI-SM Adaptor will be available as a prerequisite.

system	TTM2	The number of bus stops covered by the TOTM implementation is below 15,000.
	TTM3	Brighton & Hove City Council will provide Kizoom with a banner graphic file and specify a preferred background colour.
	TTM4	Brighton & Hove City Council will be responsible for adding the necessary navigation links to TOTM from wherever is required.
	TTM5	Any necessary licence for use of the feed for the web channel is obtained by the client.
General	G1	Usage loads are scaled for queries by end-users, not by bots or other automated processes..
	G2	The providers of the VDV454 feed Siemens will respond to queries and support issues in a timely manner
	G3	Brighton & Hove City Council will act in a timely manner to provide web design requirements, to supply stop mappings, and to perform UAT

4.4 Risks

Component	Ref	Risk	Impact
VDV454/SIRI-SM Adaptor	R1	Delay in availability of test feed	Delay to project
	R2	Inadequacy or instability of test feed	Delay to project; additional costs may be incurred

4.5 IPR

IPR will be held as follows:

- Council branding, logos and trademarks and domains for the SMS, WAP and web skins: Brighton & Hove City Council
- 84268 Access code: Traveline
- Stop data: Brighton & Hove City Council, under NaPTAN licence
- Real-time data: Brighton & Hove City Council &/or Bus operators
- The SIRI and VDV protocols: the relevant standards bodies
- Any updates, changes and extensions to the Kizoom platform and product suite, including the VDV454 adaptor: Kizoom

The real-time data and services will be subject to terms and conditions of use which will be published on the site.

5 Pricing

We present separate prices for each distribution channel. All require the adaptor. Within each distribution channel, optional features are shown as line items.

5.1 #A1: VDV454 adaptor and #D2: SIRI XML

Project: Brighton & Hove SIRI adaptor development and implementation, including SIRI XML interface		
	One-off	Recurring
PRICE	£38,000	£4,000

5.2 #D1: Real-time SMS service

Project: Brighton & Hove real-time Traveline SMS service		
	One-off	Recurring
PRICE	£12,000	£6,000

5.3 #D3: Real-time WAP service

Project: Brighton & Hove real-time WAP service		
	One-off	Recurring
a) Stop finder and bus departure boards	£19,000	£4,000
b) Search by postcode	£2,000	£1,000
c) Show maps of area around stops	£7,000	£2,000
d) Send bookmark from website	£4,000	£1,000
TOTAL PRICE	£32,000	£8,000

5.4 #D4: TOTM map system

Project: Brighton & Hove TOTM map system		
	One-off	Recurring
a) Basic bus stop finder	£15,000	£4,800
b) Search by postcode	£2,500	£1,500
c) Bus departure boards	£12,000	£3,600
TOTAL PRICE	£29,500	£9,900

5.5 Pricing summary with discount

A reduction of 10% on the one-off and recurring costs is offered if all of these projects are commissioned together.

Project: Brighton & Hove RTPI combined triple project		
	One-off	Recurring
a) SIRI adaptor	£38,000	£4,000
b) Real-time SMS service	£12,000	£6,000
c) Real-time WAP service (all functions)	£32,000	£8,000
d) TOTM map system (all functions)	£29,500	£9,900
Total	£111,500	£27,900
PRICE, with reduction	£100,000	£25,000

5.6 Pricing notes

- Usage-based costs are incurred by Kizoom for querying the national postcode database. The recurring costs for the TOTM and WAP postcode features have therefore been set with a usage cap of **10,000 postcodes per year**. This is intended to cover expected demand, and small additional charges are payable for higher usage. Details are available on request.
- Usage-based costs are incurred by Kizoom for supplying map images to mobile phones for the WAP service. The recurring cost for the WAP map feature has therefore been set with a usage cap of **10,000 map images per year**. This is intended to cover expected demand, and small additional charges are payable for higher usage. Details are available on request.
- Usage-based costs are incurred by Kizoom for sending OTA bookmarks to mobile phones for the WAP service. The recurring cost for the WAP bookmark feature has therefore been set with a usage cap of **2,000 bookmarks per year**. This is intended to cover expected demand, and small additional charges are payable for higher usage. Details are available on request.
- The recurring cost for the SIRI adaptor and XML interface includes technical support time limited to a total of **4 days per year**, to be used at any time in the year. In the unlikely event that this is exceeded we will charge for additional support at a daily rate of £750. The client will be informed in advance if this limit is being approached. Support for all other services is not time limited.
- Detailed commercial arrangements for the real-time SMS service, including messaging costs and outpayments, are governed by the terms of the national Traveline SMS Service agreement, available on request.
- Work on agreed changes in scope will be charged at rate of £750 per day.

5.7 Commercial terms

5.7.1 Contract term

- Five years from satisfactory completion of UAT

5.7.2 Payment terms: one-off costs

- With order 30%
- Work delivered to staging for UAT 30%
- Work signed off as complete 40%

5.7.3 Payment terms: recurring costs

- Annual, in advance

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5.7.4 Acceptance

The applications will be deemed acceptable if they performs the agreed functions on the target devices according to UAT demo scripts supplied by Kizoom and validated by the Customer.

Timely feedback will be provided by the Customer during development to decide review points, and timely feedback during UAT to enable Kizoom to take any corrective action. If more than 30 working days from start of UAT have passed for any given stage (Currently shown as 24/03/08 for the SMS service) without adequate feedback the application will be deemed to have passed UAT.

We assume timely availability of feeds and of the VDV feed. In the event of the work being completed but access to the production feed environment being unavailable,. The service may be deemed accepted if the Supplier can demonstrate correct function in a similar environment in the form of a test feed or a similar feed at provided by the Supplier.