rTown report

Workpackage 3 —
Parking management strategy

2020-08-25

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rTown is Project No. 971397 in the Innovate UK SBRI competition "Re-Imagining the High Street" and is contracted for delivery by:

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Document History:

Document Location: *rTown* project materials are available at: www.rTown.org.uk
Validity: *To be assigned*.
File name: *rTown_WP3_ParkingManagementStrategy_20150126_1final.docx or derived *.pdf*

Change History:

Date	Version (n.rrr)	Changes
2014-09-04	*0.001*	*First internal draft.*
2014-10-13	*0.002*	*Subsequent internal draft.*
2014-10-13	*0.100*	*Draft text for project team approval*
2014-1205	*0.101*	*Edited into rTown template*
2014-12-05	*0.101 - 0.203*	*Minor text edits, Impact text and Cost annex inserted*
2015-01-26	*0.301 - 0.303*	*Minor edits, some 'open issues' remain – cost models need completion*
2015-01-26	*1.000*	*Final text for publication post bid*

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Document Summary

This report details proposals to address the challenges facing a visitor who wishes navigate, park and then enjoy the riverside market town of Ross-on-Wye, which has a street plan dating back to mediaeval times.

A parking route system of signing has been proposed in Workpackage 2 of this project so that is assumed to exist in order to guide people directly to an appropriate parking location avoiding as far as possible the need to drive through the most sensitive shopping streets in the town centre.

These proposals aim to mitigate the potentially negative effects of creating a more pedestrian-friendly environment on availability of appropriately convenient and value-for-money parking.

The project innovations, the re-imagining aspect of the project, are:

- the first known use of a signed traffic route in the UK,
- linked to real time signage and
- to 'welcome' 'iBeacons™' linked to GPS-, triangulation- and proximity-based navigation apps and
- onward into the town's wireless information environment.

This network of e-enabled signs enables us to join hitherto unconnected pieces of information, transport and service infrastructure.

Introduction

This report deals with the current situation regarding the ownership, description, number, condition and control of the car parks in Ross on Wye. It considers the philosophy and approach that is currently evident in the management of the car parks and discusses the steps that should be taken to ensure that the parking experience of both visitors and residents of Ross on Wye is enhanced.

The project's Workpackage 2 has reported on structural means to encourage less intrusive finding of parking places. This report deals with the parking places and their management, and with the technical means to encourage car park use by integration of associated information with mobile phone based and internet accessible devices.

Market Need

Challenges

The conjunction of modern vehicular traffic volumes with the medieval street plan of Ross-on-Wye and the limited space available for both on- and off- street parking creates a common challenge for most market towns. For town users, travelling into town, parking a vehicle in a location convenient for undertaking the business of the visit, and then managing that business to avoid paying penalty charges is an increasing challenge sufficient to drive them to out of town or internet shopping.

There have been concerns expressed by traders that, for example, the penalty income to Herefordshire Council from Broad Street alone exceeds the annual parking income from Ledbury, a comparably sized market town in east Herefordshire. The user's responses to the Benchmarking study re-emphasised the scale of the problem.

For shoppers and tourists that drive to a town to visit it and its shops, convenience is the key to them staying for an extended period. Most customers for parking are the local

shoppers, occasional visitors and tourists, all of whom need to have convenient parking provision. Also important are the businesses that rely on car park users for their custom.

The solution to reducing the problems of town centres is complex; some of that complexity is addressed in other reports within this project. Parking, notably its convenience and cost, is perceived as a major concern. Shoppers go out of town for primarily two reasons, the shopping offer and convenient parking; contrary to the accepted fallacy shoppers do not go out of town because the parking is free. On-street or off-street parking exists to serve local businesses and neither is an end in itself.

However, it has been demonstrated that acceptable costs of car parking are extremely sensitive[i] with tiny pence alterations making the difference between acceptability and over-pricing. Having systems that are smart enough to monitor, and adapt to, usage changes is therefore key to ensuring that parking provision does not bite the hand that feeds it.

The rTown project seeks to address this challenge by proposing smarter options for managing car parking and for ensuring people find their chosen or most suitable parking place without damaging the fabric and environment that users are seeking to visit. Allied to that direct approach we are also proposing (Workpackage 4) to supplement it with linked incentives to travel to and park in the town centre.

Current situation

Ross-on-Wye town centre has free on street parking on every street except High Street and Copse Cross Street (which are too narrow for any parking). On most days this parking is of restricted stay duration; between 30 and 120 minutes, with the central streets offering the shortest time. This regime applies from 08:00 to 18:00. This availability means that most local residents will begin their search for a parking place by seeking out an available on street places. Only if there are no such spaces available of if the nature of their shop (e.g. a trolley full of groceries from Sainsbury's, or an anticipated number of visits that will take more than, say, 30 minutes) will they seek an off-street parking place.

There are currently ten Herefordshire Council car parks in Ross-on-Wye as listed in Annex 2: Car park site survey and located as described in Annex 3: Car Park Locations. There are three significant privately owned car parks, of which two are associated with supermarkets; the other is used mostly by businesses in the town. The only Herefordshire Council car park where charges are not levied is Wilton Road; two car parks have two Pay-&-Display machines; the remainder have one, they all take only coin - not notes or cards. Payment by mobile phone is possible but at present the take up seems to be slow.

The Pay-&-Display control system used is not one which enables a visitor to the town to choose to stay as long as they want rather than based upon the coinage in their pocket and relies primarily upon coin use. The mobile phone payment system does allow flexibility allowing visitors to extend their stay remotely the low usage is probably a reflection of the demographics and of poor promotion of this feature and the benefits that it brings.

The car parks are not easy to find, current occupancy cannot be obtained and therefore it is not possible, by using smart phone apps or navigation websites, to check occupancy "en route" and alter the destination car park.

With the current control system it is possible to know what duration of the tickets purchased was but not the actual duration of stay. The only clue to that is the number of excess charge notices issued, but this gives only an indication of defaults on days that enforcement is being undertaken – not the duration of actual stay on a statistically useful basis.

By urban standards parking charges are relatively modest, but to a population with an average income below the national average they seem high: a situation compounded by the rural location forcing people into car use because of distance, road conditions and

absence of public transport. Price changes, and hours of application, are made in response to the need by Herefordshire Council to balance budgets rather than on achieving optimum occupancy.

Many of the car parks have some form of lighting. However, it is not laid out such that it accords with the British Standard and uses light sources with higher energy consumption than the latest LED light sources.

All the car parks look unkempt, and some are in need of maintenance – most notably Wilton Road.

Asset transfers

When the rTown project was proposed there was a possibility that the Town Council would take over the ownership and management of the town's car public parks. This possibility rapidly became restricted to the three least used car parks, Crossfields, Homs Road and Wilton Road. It was therefore necessary to test the viability of this divided management and it became clear (see Annex 7: Report for Ross Town Council) that separated responsibility would incur unsustainable costs for the town Council, with no foreseeable possibility of those being covered from income.

Proposed offering

The rTown project seeks to address these challenges by proposing smarter options for managing car parking and for ensuring people find their chosen or most suitable parking place without damaging the fabric and environment that users are seeking to visit.

Allied to that direct approach we are also proposing (see Workpackage 4 report[ii]) to supplement it with linked incentives to travel to and park in the town centre.

Key advantage points

Our thesis from project inception has been that, although individual technical innovations can be important elements to re-imaging a high street, the means to achieve sustainable invigoration will lie in integration of multiple technologies into a coherent service offering that provides a pleasing experience for consumers, and economic benefit to businesses. This parking and navigation related element must therefore be seen in that wider context.

Addressing the challenge

For shoppers and tourists who drive to a town to visit it and its shops convenience is key to them staying for an extended period, the proposed parking control equipment provides that by not requiring a visitor to commit to a particular duration of stay, can pay with a multiplicity of methods (coin, credit/debit cards, mobile phone) allowing them to leave when they want to rather than when they have to. This approach also includes methods suitable for those consumers who are less comfortable with modern technology.

For local businessmen and employees who travel to work by car the system allows for those who choose to register their car registration number either paying a subscription for a season ticket or, if a less frequent visitor, to open an account chargeable to their debit or credit card monthly.

Websites and smartphone apps are commonly used to help a driver find and travel to a car park, which is helped by the ability to see occupancy data from the chosen car park while en route. A new smartphone app will include the car parks from Ross on Wye with the ability to provide safely timely turn by turn navigation to a chosen car park.

Because many drivers do not have access to the above technology, arriving and having the assistance of "Variable Message Signage" with the data provided by the parking control equipment, will ensure drivers are guided only to car parks where there are spaces,

reducing traffic congestion and improving the pedestrian environment. The physical signs will carry precise location beacons to enable the smart phone apps mentioned above.

The behaviour of visitors to a town that relies on the visitor spend needs to be recorded. Among other transport statistics, the number of car borne visitors and the time they are staying, data essential for monitoring the success of the town as a destination and its car parks as a service.

If possible new lighting needs to be installed to ensure that all car parks comply with the British Standard providing the correct Lux Level, using LED technology to reduce energy and replacement costs dramatically and using photo electric switches and proximity sensors on half of the columns to even further reduce the energy use and costs.

Similarly, CCTV is useful because it reduces crime and equally important the perception of crime, the latest designs acknowledges that a crime is not likely to be spotted at the time it takes place but should be able to provide the police with valuable images. In this context its use is primarily to minimise any reluctance to use a specific car park. . This CCTV will be designed to automatically react to specific types of movement or events within the car park, If that movement or event falls within specific criteria, the system will automatically respond by emailing a designated address or the local police, who will be able to access the live images and recordings using authorised login details. Crime levels are not high in Ross but the location of this car park being remote will, unless the lighting is improved and CCTV installed not be used as is evident from recent occupancy surveys.

Because car parks are often the first impression of a location, it is important for them to be welcoming. Car park surfaces varies across all local authority car parks but Wilton Road car park is in need of drastic rebuilding, other car parks will need resurfacing especially after the installation of the control equipment and lighting and the need for cabling and ducting. Landscaping too will need to be reviewed to ensure that the lighting and CCTV where installed are unaffected as well as modifying it to both enhance its environmental benefit and minimise maintenance costs. This is essential to ensure that both the security and perception of security of the car park users is enhanced.

Benefits to the end users

Our proposal is to add value to end users by making off-street parking extremely convenient and economically attractive. Our strategy is to thereby encourage footfall into the town centre which in turn will improve the attractiveness of property to new businesses. That in turn will improve property values and ensure returns sufficient to encourage better maintenance, thus increasing attractiveness to tourists.

Who benefits?

The immediate beneficiaries are end users, with local businesses gaining from improved stay duration and footfall. The local authority will benefit from reduced enforcement costs, with the option to do away completely with penalty charge notices and associated costs.

Suppliers, the product developers, producers, distributors and installers, will gain from increased revenue from sales as this new way of managing car parks necessitates replacement of obsolete equipment.

Market adoption

The Department for Communities and Local Government is currently sending conflicting messages about town centres. Simultaneously encouraging reinvigoration and discouraging service innovation in parking that can deliver sustainable development.

The market sector which controls just under half of charged car parks in the UK is municipal, and for the most part uses the Pay and Display method of control. It is anticipated that the proposed method of control will be introduced softly with clear signage in the car parks, initially with volunteers advising drivers what to do, leaflets on cars and, if applicable, no penalty charge notices (PCNs) issued for at least the first failure to pay during the first 6 months.

Market characteristics

There are a number of different customer, or stakeholder, groups involved in car parking but for simplicity we'll deal with them as four main groupings:

1   Consumers — i.e. those visiting the town centre to shop, to stay or for leisure;

2   Businesses — i.e. providers of goods or services from within the town centre and which may also have staff who have no option but to travel to work by car;

3   Owners and operators of parking facilities — in Ross this is at present chiefly the local authority (Herefordshire Council) which is responsible for the on-street parking and for ten of the thirteen significant car parks;

4   Suppliers — are the product developers, producers, distributors and installers which together produce equipment and software, manufacture or integrate systems, and provide services allied to provision of parking to a national or global market.

Market size

UK

This is dealt with in detail in Annex 11: Market size detail but a summary is presented here.

The turnover of Local authorities in 2012/13 for off street parking was £618,797,000.00 with over 7000 car parks operating with pay and display parking, this market increases as the 6000+ car parks currently not charged must be considered a potential market.

Current reductions in the rate Support Grant have placed pressure on local authorities to maximise revenue and minimise cost, the use of the proposed system means that although its introduction may be slowed by funding difficulties it is likely to grow because of the reduction in manpower that is possible.

If Herefordshire's capital replacement figure (£268k) used for renewing the current 40 P&D machines (i.e. £6.7k per machine) over a six-year period is taken as a guide to the lower end of end-user costs (our budget figures for ANPR in Annex 8: Full budget for proposals are 12x higher) then a conservative capital market value for parking equipment for local authority use across the UK would be £1201468 annually (assuming a that machines have the same installed life as those in Herefordshire. However, the BPA estimates that the private market is somewhat larger than the local authority market, but admits that hard data is difficult to find.

If the Department for Communities and Local Government capital value for 2013 is used then the total capital market (assuming only 30% was allocated to control equipment in line with the proportions in our Annex 8: Full budget for proposals) for control equipment spend is just under £38M. On the basis of the disparity between this figure and that extrapolated from the Herefordshire Council budget figures, a working number of £18M may be the safest working UK market size figure?

International

Neither The European Parking Association nor the International Parking Institute provide any clue as to the size of their respective markets. We are therefore only able at this stage to make some generalisations.

On the basis of the working UK parking controls market size figure of £18M then Europe, on a population ratio basis of 60:741 (thus ignoring the relative effects of GDP and investment in infrastructure), could be expected to have a market worth of £222M.

On a similar basis (60:1803009300, where the continental populations are corrected for development status) then a global market figure of £ 541B emerges.

Sources and assumptions

These are covered above and in Annex 11: Market size detail.

Market trends

In developed markets there is a continued trend toward use of ANPR and barrier-less parking because of it's convenience and flexibility – notably freedom from queuing at entry or exit, and the

Key infrastructure

Infrastructure requirements for the integrated parking and navigation aspects are, aside from the hardware considered in the Workpackage 2 report[iii] and in the Annexes to this report, electrical services to sites (all exist), fixed or mobile phone or broadband services to sites(all exist), WiFi, ZigBee and /or Bluetooth coverage of the location (partially exists).

Business sectors

Within this location, and other like it, the business sectors involved are the local authorities, local businesses and their representative organisations, third sector organisations and the informal representatives (media and social media) of consumers.

More broadly, central government and professional groups, as well as manufacturers and service providers and their trade organisations have legitimate interests.

Customers

Customer segments, expectations & benefits

Here we consider the same four main groupings as in the Markets section:
1 Consumers;
2 Businesses;
3 Owners and operators of parking facilities;
4 Suppliers — product manufacturers and service integrators.

Consumers

The results of the Workpackage 1 survey activity[iv] which benchmarked aspects of the town in 2014 revealed a high level of discontent with the current management regime for parking across the town.

On street parking was, although free, thought to be managed too inflexibly. Within the town centre on-street parking is restricted to 30 minutes, which, given the proximity of most convenience shops is adequate for a single-shop visit. Nevertheless there is a perception that while '*it is unreasonable for others to park inconsiderately, but I should be to do so because …*'.

The survey showed (see Annex 1: Use survey data) that most car-driving consumers use free parking, with 48% favouring on street locations – and with Gloucester Road (longest with most spaces) and Broad Street used by 43% of respondents. On the basis of counted

car park occupancy, Morrison's accounts for the largest proportion (also the largest capacity), followed by The Maltings.

Visitors to the town from urban areas regard the car park costs as reasonable but, perhaps due low local incomes, residents do not. Neither group regard the new longer evening hours of fee-paying application as appropriate or even sensibly income-generating.

Currently searching for a free roadside space means many consumers make more than one circuit of the central streets in a bid to find a place – thereby increasing the volume of traffic in the streets during the core shopping hours.

Workpackage 2 has reported on the options for improving the town centre environment by removing parked cars and traffic but, given the current domination of convenience shopping amongst the consumer group, it will be important to retain, or improve, a high level of parking convenience if that trade is not to be driven out of town.

Businesses

The results of the 2014 benchmarking activity [ii] revealed business owners and managers also have a high level of discontent with the current management regime for parking across the town.

Again, on street parking was thought to be managed too inflexibly, with the high level of penalty charge income in Ross being seen as a failure of the regime. The Association of Ross Traders has a policy of seeking a 60 minute restriction on central on-street parking. This would reduce the number of consumers able to park in those locations, and so increase the volume of searching traffic – at least until consumers learned to seek car park places preferentially.

The survey showed (see Annex 1: Use survey data) that 43% of car-driving business users have private parking, with the remainder either using spaces on the north side of the town. The Barrel car park is highly used because of its flat rate £1/day charge; the local authority car parks with season ticket options are the most popular of the remaining car park locations.

Business owners regard the new extended, evening, charging hours as a means to reduce evening trade in the town (many on-street spaces are occupied by residents of the apartments above shops), and as costing more to enforce than they will generate in ticket income.

Although the campaigner who initiated the bid to see 1hour on-street parking has since concluded that taking parking off the streets would be advantageous, this view is not yet shared by most business owners or managers.

Owners and operators

Herefordshire Council has a major structural deficit to redress so is in cost-cutting mode across all non-statutory service provision. Staffing levels have been reduced and there is little subtlety to the management of car parks.

Annex 10: DfT Circular provides a recently circulated interpretation of the current legislation affecting car parking provision through local authorities. Its effect is to make it difficult, or impossible, for management to be contracted out to specialist providers with modern management systems.

Local authorities are also somewhat constrained by government financial management norms so it is difficult to accurately calculate the real costs of operating assets because it is not easy to calculate the effect of any capital element alongside the revenue elements. We have attempted to explore some of this complexity in Annex 11: Market size detail.

The Herefordshire Council 2013 *"Local Transport Plan, Parking Strategy"* [v] notes in the section on Ross: '*Charges in Council controlled car parks are set to reflect the fact that there is*

significant demand for parking by both visitors and local people wishing to access jobs and local services. Charges for car parks closer to the centre are set to encourage short stay and a turnover of spaces to support the local economy, with longer term parking allocated to car parks further from the centre. Parking surveys indicate there is sufficient parking supply to meet existing demand, but with limited spare capacity.' On more general revenue policy it states: '*Revenue generated from parking charges and fines provide an important income stream to the council. There is clearly a balance to be struck in setting parking tariffs between maximising income to contribute towards a challenging budgetary position and on the other hand, keeping transport costs to a minimum in difficult economic conditions that are challenging for the 'high street' and for consumers. We will work closely with town and parish councils, who we believe are better placed to understand local economic conditions, and will provide them with flexibility to consider tariffs in their areas subject to maintaining minimum income levels.'*

The Local Government Information Unit report "*Councils in the driving seat? Local Authorities and Traffic enforcement*"[vi] provides a reasonably balanced review of some of the frustrations of trying to balance local authority parking management with political and financial imperatives.

Product manufacturers and service integrators

The incremental costs of our proposals to the manufacturers of parking control systems are, at base level, in software only. To achieve an optimal user interface to a location-wide integration with an information and incentive system may require additional hardware, but because this with the information & incentive elements adds value for the location a price increase per kiosk of up to about 20% would likely be viable, with the end-user cost tapering down with increased scale of installation.

Navigation apps are individually of low perceived value and would struggle to sell for more than £1.50. However the key to the business model lays in the value of the registered user to the contact management system for the location so free apps subsidised from business subscriptions to the incentive and information system – a subject for the report for Workpackage 4.Routes to market.

The major UK-based manufacturers of parking management systems will be able to benefit from increased system sales if a market can be created for equipment that both manages car parking and issues Location-based incentives. Additionally, there is the possibility for small commissions to be taken from payments/incentives, thus improving the revenue stream for service integrators. See the Workpackage 4 report for more on this.

Customer engagement

Within our location and related project activity we have engaged with the same four main groupings as in the Customers section:
   1   Consumers;
   2   Businesses;
   3   Owners and operators of parking facilities;
   4   Suppliers — product manufacturers and service integrators.

Contacts & support

Consumers

We have undertaken the town benchmarking study (Workpackage 1) to gauge opinions and likely support for the proposals, some dialogue has taken place on social media and in the local press but the main consultation will take place under the umbrella of the Neighbourhood plan in Q1 of 2015.

Businesses

We have engaged with local businesses through the town benchmarking study (Workpackage 1) to gauge opinions and likely support for the proposals. We have also had regular dialogue through the Association of Ross Traders and the Business Lunch Club. Again, formal consultation will take place under the umbrella of the Neighbourhood plan in Q1 of 2015.

Owners and operators of parking facilities

We have had discussions with the parking manager at Herefordshire council who is in principle supportive of our proposals so long as the legal issues about contracting can be satisfactorily addressed.

Suppliers — product manufacturers and service integrators

Of the three UK parking systems companies that we have investigated we are having active and exclusive discussions with one which is keenly interested in integrating our Workpackage 4 work to their equipment – even if the UK market for local authority uptake is delayed for a few years.

Our contractor for this workpackage has an international database which can be fed with real-time data from the proposed equipment and will develop their own label smart phone app, as well as making the data available under licence to other developers.

Design validation

Based on feedback from our survey activity, we are proposing three areas of enhancement to existing physical products, and a possible change to the way services are delivered – more of which later.

Our first proposal is predicated on the ability of car park control systems to produce real-time data. With this in place we propose not only to populate variable message signs (an existing technology) but to use those signs as communications beacons with visitors to the location. This aspect has been tested for proof of implementation by WyeNet Ltd., AMS Consulting and ProxiSmart Ltd.

With the communications beacons in place we can provide real time guidance not only on location of parking places, but of the availability of spaces in those spaces. Both of which can be optimised by primary visit type chosen by a user (convenience shopping, comparison shopping, tourist visit, resident, etc.). This aspect has been tested for proof of implementation by Ian Betts Consulting Ltd.

On arrival at a parking place we are proposing to implement parking and incentives kiosks that deal with registering for parking and as part of the same transaction as for vouchers to make purchases or visits within the location.

Routes to market

The ideal route to market for the voucher-related technical aspects is in association with parking control systems vendors. The sign-up of businesses to the incentive scheme is a subject for the report for Workpackage 4 but will lie with the developer and with the Town Team (Workpackage 6[vii]).

The route to market for the navigation and information beacons is initially, at pilot stage, through local installation and integration with Town Team services. These will always need local coverage surveys so although the eventual route to market may include integration into roadside signage that will provide separate nodes which may need to be supplemented further to provide usable coverage.

The ideal route to market for the navigation apps is through the conventional 'app stores' as well as by linkage from local and tourist information sites and media notices.

Open issues

Costs and RoI calculations are not dealt with in detail here because they relate more directly to Workpackage 4 where they have been considered briefly.

Similarly, sales & marketing/exploitation including sources of information to customers, means to initiate and increase market penetration and marketing rationale need further consideration than has so far been possible. However, DfT policy must first change if any significant UK market is to be enabled at all.

Competition

Existing

ANPR-based parking control systems are produced by three UK providers – we are not developing innovation to compete with them.

We are aware of no parking control system in the UK or internationally that integrates a voucher system with multiple traders across a location such that it is capable of crediting users accounts directly to rebate parking charges whilst cross-charging to businesses their share of the costs.

We are aware of one parking control system that can handle manual presentation of vouchers at time of payment.

Future

We would anticipate that other developers would also seek to integrate a voucher system with multiple traders across a location such that it is capable of crediting users accounts directly to rebate parking charges whilst cross-charging to businesses their share of the costs. However, we are not aware of other developers with this precise focus and believe, on the basis of our survey, that we have a good proposition that will provide first mover advantage for some years.

Concept Description

Our proposals are to introduce state of the art parking management technology and to integrate that with an occupancy-based pricing model that encourages car park use for very short stays and that rewards longer visitor stays by giving incentives that are redeemable in the town centre. These incentives are the subject of the Workpackage 4 report but are driven not only from parking kiosk integration (see Annex 9: Development Partner Invitation) but also from kiosks accessible to sustainable transport users; dealt with in the Workpackage 6 report.

We have investigated the feasibility of five areas of technology that are necessary to meet our requirements. These are detailed later but are, taken together, designed to ensure that our proposals mean that the car parks can at worst be operated without loss, but ideally at some income to enhance other transport services provided by Herefordshire Council.

Customer Requirements

We have identified a need for:
- Easier navigation around the town and better signage to car parks with spaces;
- More convenient parking within the town;
- Better perceived value for money in car parks;

- An appetite from businesses and consumers to implement a suitable incentive system;
- The need to put an end to penalty charges that are disincentives to spending time and money in the town.

Key specifications and functionality

Our key proposals are to introduce:
- The use of Pay and Display equipment linked to ANPR, and to an incentive scheme, to allow the driver to park a car without having to decide the duration of parking needed;
- Variable message signs to say how many spaces are still unfilled enabling drivers to choose which car park to use;
- Provision of timely real-time location data using the website www.carparks4u.com and smart phone apps to provide "Turn by Turn" navigation.

If resource permitted or could be invested form panning gain the following would be highly desirable:
- Use of low energy LED luminaires to reduce the energy bill and improve user safety;
- Use of CCTV is proposed for at least Wilton Road car park to automatically react to specific types of movement or events by notifying designated contacts able to access live images and recordings using authorised login details;
- Upgrade landscaping and maintenance levels.

Proposals

In addition to the navigation and convenience aspects it is important that pricing of car parking is seen to be taken out of the political realm. In order to do this it is vital that consistent and comparable data on real usage is available, which can only be achieved by sensing real vehicle movements, not by ticket sales alone.

Pricing and occupancy

The basis for pricing should be twofold.

Primarily, and on the long term, pricing should be based on occupancy levels, typically aiming for about 80% or 85% is seen as optimal. This may imply different pricing at different times of day, and year – an approach that would need to be handled with care to avoid confusion.

Secondly, there is the need to recognise different visit types so if some free on-street parking is sacrificed to achieve a better visitor ambience it may be desirable to introduce a short initial stay at no charge to encourage use of convenience shops and takeaway restaurants.

Further modelling work is needed to propose starting and end-goal regimes that would increase vitality without causing the overall management to be loss-making.

Pricing

A target occupancy rate is expected to be adopted as the trigger that determines the parking charges, the optimal rate at peak periods is essential for that purpose. Convenience shopping parking should be encouraged by initial low or zero cost periods in central car parks.

Occupancy

Actual duration of stay data is essential to determine the success of the project by monitoring the changes in the numbers of visitors to Ross and how long they are staying. It will also enable a model to be created enabling the likely effect of changes in the parking charges to be illustrated.

Navigation

Occupancy data will enable, by using smart phone apps or navigation websites, to check occupancy "en route" and alter the destination car park; it will also enable "Variable Message Signing" to be installed ensuring that traffic is aware of the location of available space.

Safety and amenity

Safety

Car parks need to be perceived as safe and hazard free, where required, surfaces should be repaired and resurfaced and drainage reviewed and updated. Car parks, where the condition requires, should be better engineered and maintained with re-kerbing, levelling, drainage installation, lining and lighting.

Amenity

All areas of landscaping will be updated; trees will be checked for condition and their relationship to the existing or proposed lighting.

Lighting

The use of proximity switches to allow only a proportion of luminaires to be kept permanently on, after dark, should be introduced to ensure economical but still effective provision.

Security

CCTV is required in the Wilton Road car park to automatically react to specific types of movement or events within the car park by emailing or texting a designated address or the local police, who will be able to access the live images and recordings using authorised login details.

Technical challenge

As stated in our project scope – our aim is not to invent any new technologies but to 're-imagine a high street' by combining technology and services with infrastructure in a novel and transferrable manner.

Areas of remaining technical challenge

Our main area of 'technical' challenge is therefore not strictly technical; but is politico-legal.

Challenge

The September 2014 letter from the Department for Transport (see Annex 10: DfT Circular) states that that local authorities are not permitted to use contract law to operate car parks they own through third parties. This has the, hopefully unintended, consequence that it is not cost effective for them to introduce and operate new technology which would enable more convenient and flexible car par use and management.

The Department for Communities and Local Government seems for reasons that are not obvious, and are certainly disjoint with its own policy of encouraging high streets, to be against the use of ANPR to manage car parking.

Options for addressing challenge

At the time of finalising this report two options present themselves – though this might evolve over the next few months:

That the project abandon implementation of any technical, and therefore information, linkage between car park and other aspects of the town's technical or information infrastructure.
This would leave the content and client management systems of the incentive and related systems as separate information islands and also mean two sets of kiosk in or near car parks – possibly reducing the uptake of the incentive system (scanning existing car park ticket barcodes into the system would be the only touch point – with no automated means of funds transfer).
Outside our pilot town, and local authority car parks in general, commercially operated car parks could implement an integrated system – but, outside large urban centres with high commercial ownership, this will tend to favour out-of-town locations.

Commercial ownership takes us to the second option.

A more complex possibility is that a Charity, or Community Interest Company, that we already envisage to take forward phase 2 of rTown could take over ownership of all the local authority car parks in the town.
This would be legally complex, involve risk to the receiving organisation, and may be perceived by Herefordshire Council as 'selling the family silver'. However, if approached carefully in the same way as other asset transfers, it could provide freedom of operation and allow any profits to be returned, at least in part to the local authorities.
If successfully negotiated, this could be a model for modern management of other car parks – and the know-how in bringing about saleable consultancy knowledge.

Technical feasibility

There are five identifiable technology elements involved, though each is itself comprised of many separate subsystems. As stated in our project scope – our aim is not to invent any new technologies but to 're-imagine a high street' by combining technology and services with infrastructure in a novel and transferrable manner.

Parking payment

The use of Pay and Display equipment linked to automatic number-plate recognition (ANPR)[viii] allows a driver to park his car without having to decide how long he/she will park and only pay when wishing to leave by typing in the car Registration Number seeing how much his time has cost paying using coin, credit/debit card or mobile phone the leaving. If a driver decides not to pay then the system will ask the DVLA for the name of Keeper of the vehicle allowing a Fine to be charged.

We have validated use of this technique using near-field communication account association on arrival, with automatic account debiting on departure, and are in discussion with a UK-based parking controls company about using it to implement the Workpackage 4 incentives technology within a single consumer kiosk.

Signage

Variable message signs (see Workpackage 2 report for more detail) not only to direct drivers to the car park named on the sign but also to say how many spaces are still unfilled. This therefore enables drivers to choose which car park to use.

The data is fed using wireless communication with real-time data from the parking control equipment, in particular the logging of the entry time and leaving time.

Navigation

In addition to provision of location data using the website www.carparks4u.com and smart phone apps, currently TktApp, Parking Pal, this project would implement a new app to provide prospective "Turn by Turn" navigation linked to sensitive local signage and communications beacons (most road traffic turn navigation is insufficiently sensitive to give timely warning), visit type (shopping, tourist or business) and real-time occupancy data.

Lighting

Low energy LED luminaires should be controlled using photo electric cells with the addition of motion sensors on "every other" luminaire so when there is no movement the energy bill can be halved and light pollution reduced. Internet connected, wireless controlled, LED light luminaires would provide means to respond to security alerts and to consumers proximity.

Security

CCTV is proposed for Wilton Road car park which is more isolated than others; this CCTV will be designed to automatically react to specific types of movement or events within the car park. If that movement or event falls within specific criteria, the system will automatically respond by emailing a designated address or the local police, who will be able to access the live images and recordings using authorised login details.

Annex 1: Use survey data

Herefordshire Council car park occupancy survey

Most recently carried out on behalf of Herefordshire Council in September 2011 and April 2012.

Car park	Date of count	09:00	11:00	13:00	Capacity
Corn Exchange	27/09/2011 24/04/2012	16 14	48 40	38 31	55
Crossfields	27/09/2011 24/04/2012	2 3	13 13	11 2	19
Edde Cross	27/09/2011 24/04/2012	3 4	10 7	14 8	49
Homs Road	27/09/2011 24/04/2012	3 4	2 5	3 4	70
Kings Acre (L)	27/09/2011 24/04/2012	42 36	43 36	43 37	45
Kings Acre (U)	27/09/2011 24/04/2012	53 5	66 8	64 11	78
Kyrle Street	27/09/2011 24/04/2012	25 25	28 27	28 31	29
Red Meadow	27/09/2011 24/04/2012	11 10	39 35	30 24	126
The Maltings	27/09/2011 24/04/2012	68 29	87 69	88 53	107
Wilton Road	27/09/2011 24/04/2012	10 14	18 27	34 30	279

rTown Benchmarking survey

The Survey dates & times were, on a non-market day, 19 August 2014, from 10:10−12:30; and, on a market day, 21 August 2014, from 10:15−12:00.

Car parks

Note that Wilton Road was not included because it does not fall within the town centre survey area. The two blue shaded locations represent the car parks (with Wilton Road) then under discussion as the possible subject of asset transfer from Herefordshire Council to Ross Town Council.

Charges

Location Name	Car Park Type	Charges - £		
		< 1h	< 4h	> 4h
Corn Exchange	Car Park	0.6	2.1	3.1
Crossfields	Car Park	0.6	2.1	3.1
Edde Cross Street	Car Park	0.6	2.1	3.1
Homs Road	Car Park	1	1	1.5
King's Acre Lower	Car Park	1	1.5	1.5
King's Acre Upper	Car Park	1	1.5	1.5
Kyrle Street	Car Park	1.5	1.5	1.5
Maltings (The)	Car Park	0.6	1.6	n/a
Red Meadow	Car Park	0.6	2.1	3.1

Location	Car Park Type	Charges - £		
Name		< 1h	< 4h	> 4h
Barrel (The)	Private Car Park	1	1	1
Aldi	Private Car Park	-	-	-
Morrisons	Private Car Park	0	0	85.00 (@<2.5h)
Watsons, Church Street	Private Car Park	Season ticket	Season ticket	Season ticket

Usage

Location	Spaces			Vacant		
Name	Total	Short Stay ≤4h	Long Stay ≥4h	Disabled	Market Day	Non Market Day:
Corn Exchange	56	0	53	3	1	22
Crossfields	19	0	18	1	10	5
Edde Cross Street	49	0	48	1	47	48
Homs Road	44	0	42	2	43	40
King's Acre Lower	44	0	42	2	2	3
King's Acre Upper	76	0	74	2	51	58
Kyrle Street	31	0	29	2	3	0
Maltings (The)	99	99	0	2	22	41
Red Meadow	92	0	90	2	71	72

The following pie graph shows the relative availability of off-street parking places for public use.
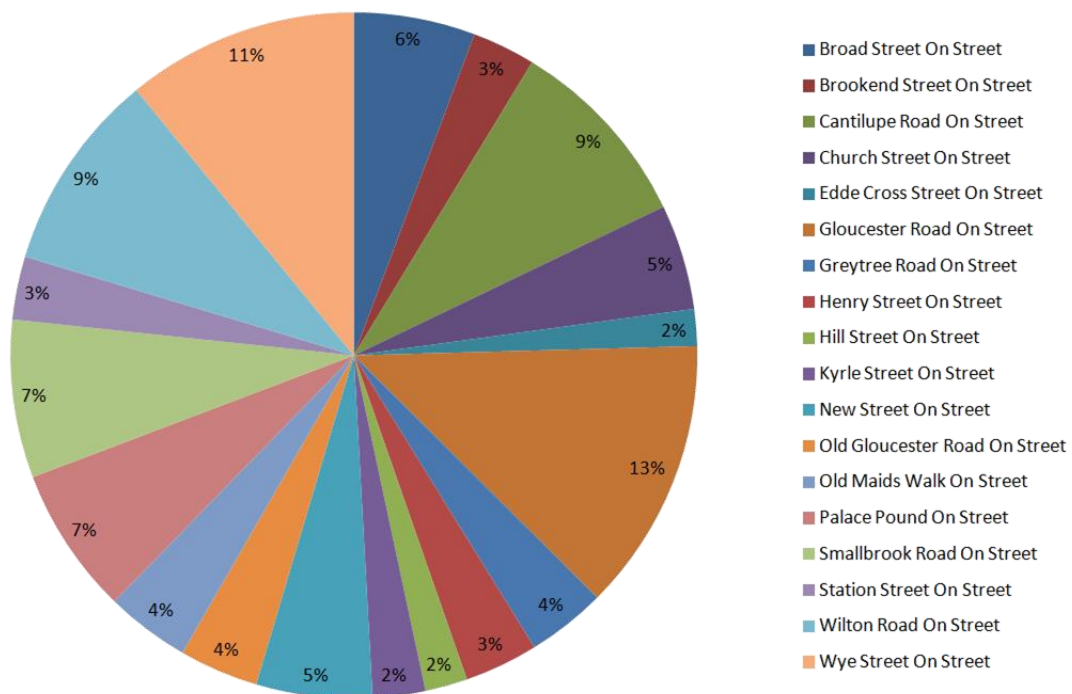

Total Off Street Parking Spaces
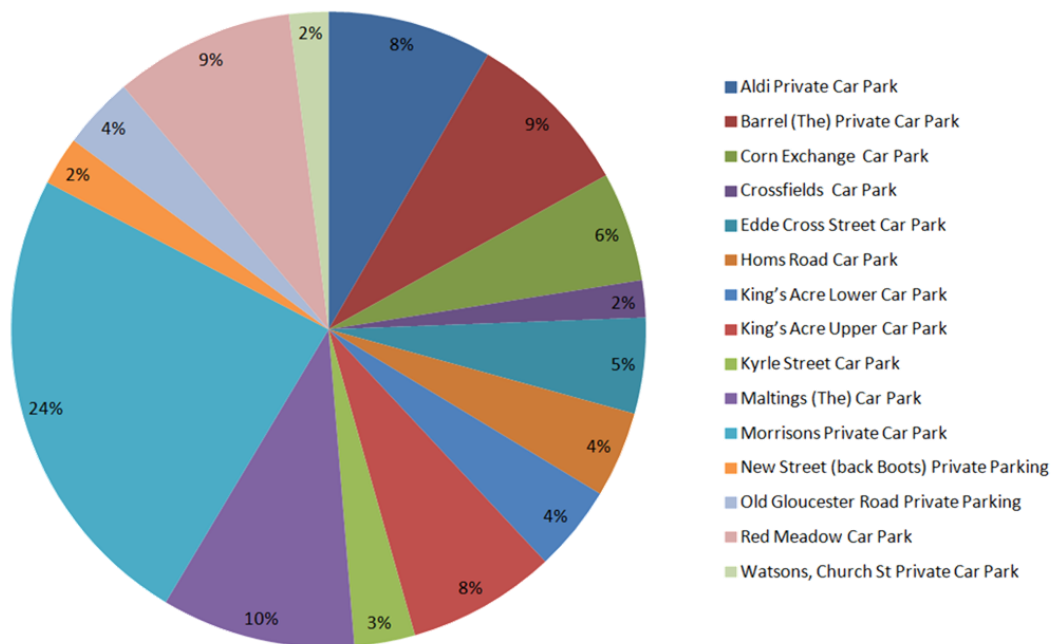
On street parking

The following streets fall with in the survey area.

Location Name	Spaces				Vacant		'Illegal' Uses	
	Total	Short Stay ≤4h	Long Stay ≥4h	Disabled	Market Day	Non Market Day	Market Day	Non Market Day
Alton Street	32		32		19	11		
Broad Street	23	16		7	3	10	1	5
Brookend Street	12	12			4	6		
Cantilupe Road	37	35		2		3		
Church Street	20	20			4	2		
Edde Cross Street	7		7		1	1	1	
Gloucester Road	52	50		2	10	14		2
Greytree Road	9		9		3	4		
Henry Street	14	14				2		
Hill Street	8	8			2	4		
Kyrle Street	10	10			4	4		2
New Street	22	22			3	6		
Old Gloucester Road	15	15		9	3	3		
Old Maids Walk	16	16			3	6		
Smallbrook Road	30	30			20	18		
Station Street	12	12			4	5		

The following pie graph shows the relative availability of on-street parking places for public use.
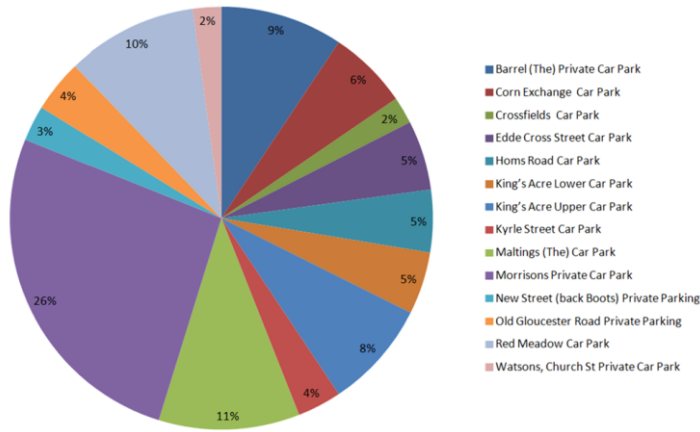
Total On Street Parking Spaces
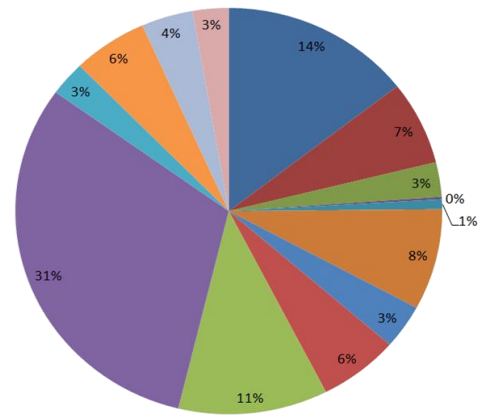

Use of parking space

The following pie graphs show the overall occupancy of on-street and off-street parking places on market and non-market days.
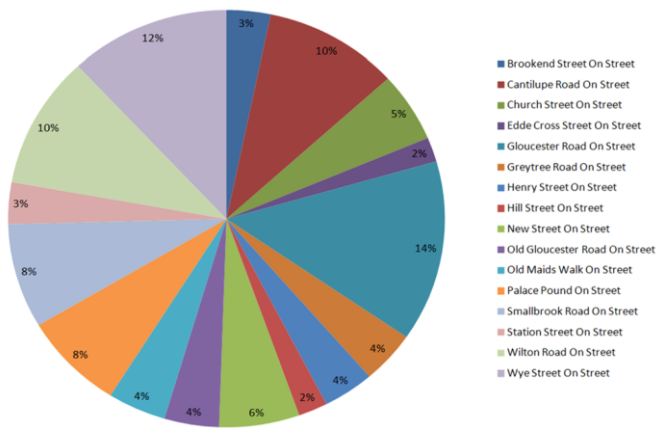
Car park use on a market day   Car park use on a non-market day

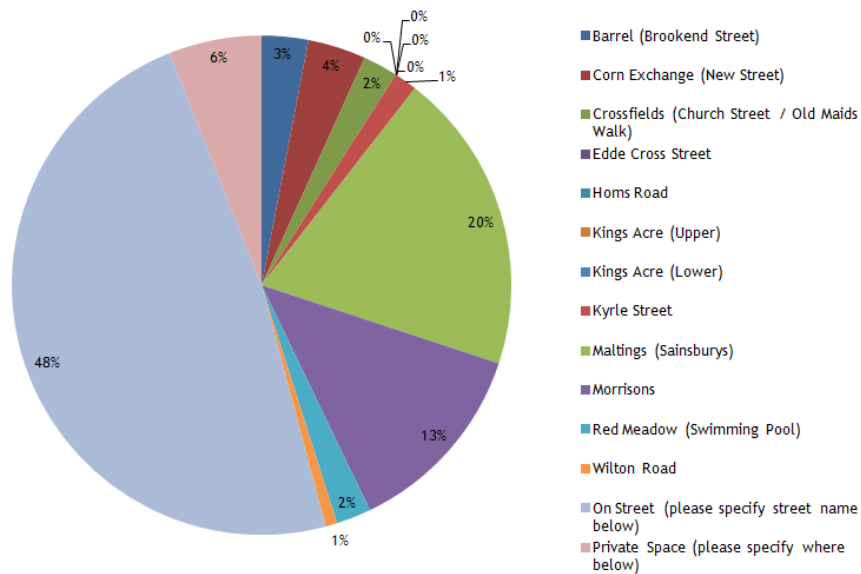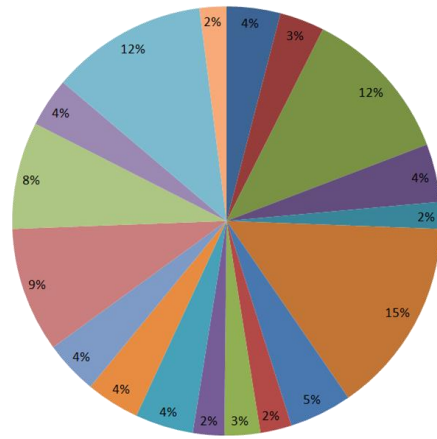On street parking use on a market day

On street parking use on a market day

Car parking usage by town centre users

Named parking places used

Legend:
- Barrel (Brookend Street)
- Corn Exchange (New Street)
- Crossfields (Church Street / Old Maids Walk)
- Edde Cross Street
- Homs Road
- Kings Acre (Upper)
- Kings Acre (Lower)
- Kyrle Street
- Maltings (Sainsburys)
- Morrisons
- Red Meadow (Swimming Pool)
- Wilton Road
- On Street (please specify street name below)
- Private Space (please specify where below)

The specified locations were categorised into areas of the town centre and are detailed below.
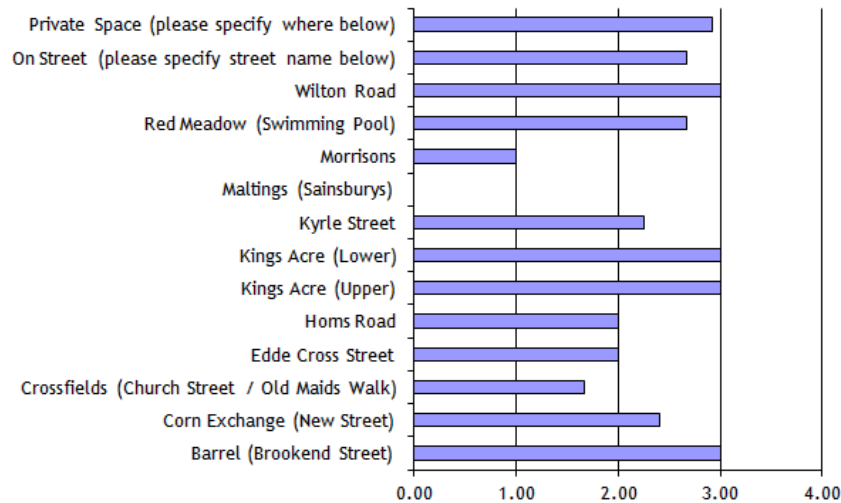
Categorised parking places used
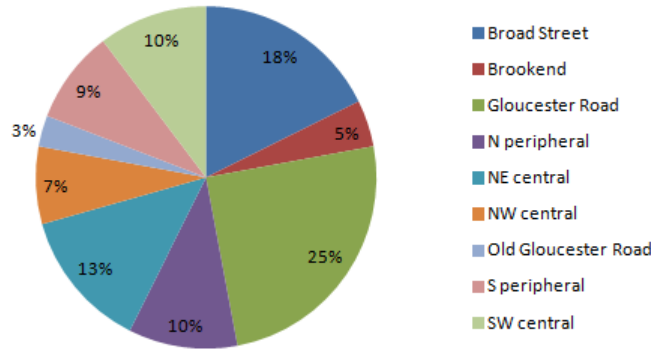
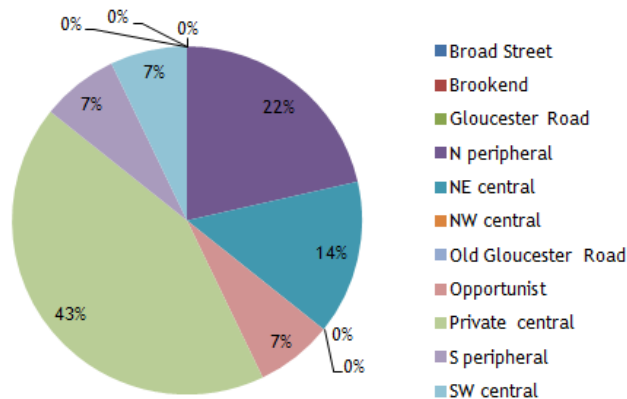## Car parking usage by town centre businesses

Preferred parking places

This question asked for a ranking of the three most preferred parking locations used by business staff. The average rankings are shown below.
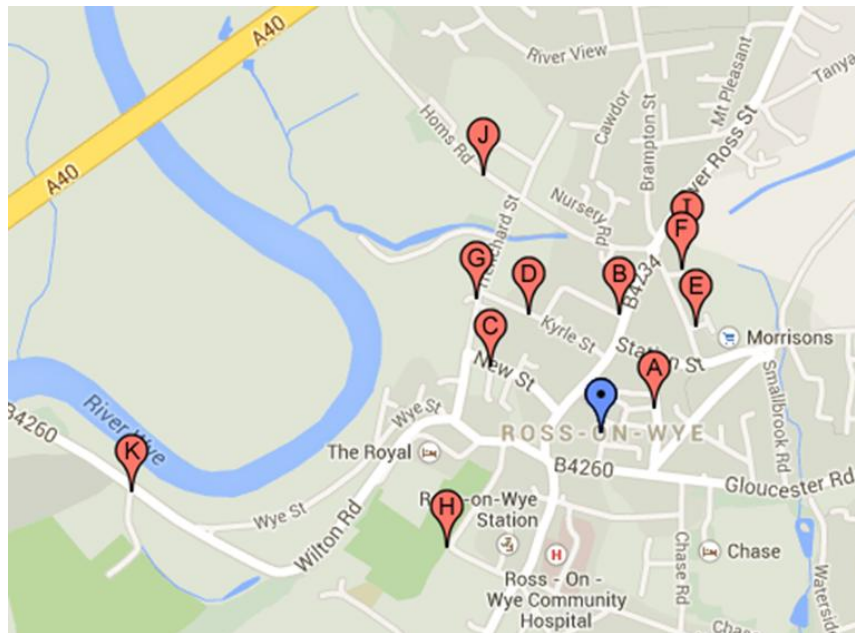

The specified locations were then categorised into areas of the town centre and are detailed below.

Categorised parking places used

Annex 2: Car park site survey

Car Park Locations

Car Park Detail

Summary

Name	Address	Control Type	Control Equipment Manufacturer	Total Spaces	Disabled Spaces	Number P&D Machines
Corn Exchange	New Street	Pay and Display	Metric Accent	55	3	1
Crossfields	Church Street	Pay and Display	Metric Accent	19	1	1
Edde Cross Street	Edde Cross Street	Pay and Display	Metric Accent	49	1	1
Homs Road	Homs Road	Pay and Display	Metric Accent	70	2	1
Kings Acre (Lower)	Millpond Street	Pay and Display	Metric Accent	45		1
Kings Acre (Upper)	Over Ross Street	Pay and Display	Metric Accent	78	2	1
Kyrle Street	Kyrle Street	Pay and Display	Metric Accent	29	1	1
The Maltings	Henry Street	Pay and Display	Metric Accent	107	4	2
Red Meadow	Brookend Street	Pay and Display	Metric Accent	126	2	2
Wilton Road	Wilton Road	Free		279		

Individual car parks

Crossfields

The car parks surface is in good condition and does not appear to be in any need of attention at present, lining is visible but relining can perhaps wait until there is a need for resurfacing.

There is one lamp column with one luminaire.

There is one Metric Pay and Display machine.

Corn Exchange

The car parks surface is in good condition and does not appear to be in any need of attention at present, lining is visible but relining can perhaps wait until there is a need for resurfacing.

There are four lighting columns three with 2 luminaires and one with 1 luminaire, they are on an antique design and more decorative than efficient.

There is one Metric P&D machine one grit bin and one litter bin.

Maltings

The car parks surface is in reasonable condition with some patches and some loss of stone. The lines are visible and will probably last till it is resurfaced.

There are seven lamp columns each with two luminaires. The take the form of glass globes designed more for appearance than efficiency.

There are two Metric P&D Machines and one litter bin.

Red Meadow

The surface of this car park is poor, crazed in places with potholes, a major part of which is being used as a contractor's compound which appears to relate to the new Aldi being built on the Brookend Street frontage.

There are two P&D machines and four lamp columns visible it is not clear what, if any work will be done to the car park when the building works are complete.

In any event the surfacing needs attention, it may be that patching and resurfacing is intended to take place when building works are complete.

Kyrle Street

The car parks surface is in good condition and does not appear to be in any need of attention at present, lining is visible but relining can perhaps wait until there is a need for resurfacing. An area of patching exists and appears to relate to the drainage gulley situated in the middle.

There is no lighting, one Metric P&D machine, one litter bin and one grit bin.

Edde Cross Street

The car parks surface is in good condition and does not appear to be in any need of attention at present, lining is visible but relining can perhaps wait until there is a need for resurfacing.

There are four lamp columns on the periphery of the car park, one P&D Machine, one litter bin and one grit bin.

Homs Road

Surfacing is reasonable however in the centre of the car is a circular area in the middle of which is a rectangle of concrete into which are set utility and other similar covers, this area is only partially marked out and its status needs to be clarified.

There are five lighting columns with floodlights with the one adjacent to the P&D Machine having two floodlights.

There is one Metric P&D Machine, one litter bin, one entrance with height barrier and two derelict brick buildings.

Kings Acre Upper

The surfacing here is showing some signs of wear and may need a resurface soon, as can be seen from the photograph the lower section of the car park has already been resurfaced. Lining is still visible.

There are two lamp columns, one Metric P&D Machine, one litter bin and one grit bin. Part of the boundary has grass trees and shrubs requiring maintenance.

Kings Acre Lower

This car park has been recently resurfaced and has two lamp columns, one Metric P&D Machine, one grit bin and one litter bin.

Wilton Road.

This car park, sited on a former municipal refuse tip, is by far in the worst condition, the surfacing is in need of attention the levels are uneven, there has been some subsidence forming depressions in which water collects and forms a pedestrian and vehicular hazard, the only drainage I saw was a couple of gulleys which appear to drain into the next field.

There are no marked out spaces, no direction arrows and no lighting, all of these defects should be corrected before any charges could be levied.

Annex 3: Car Park Locations
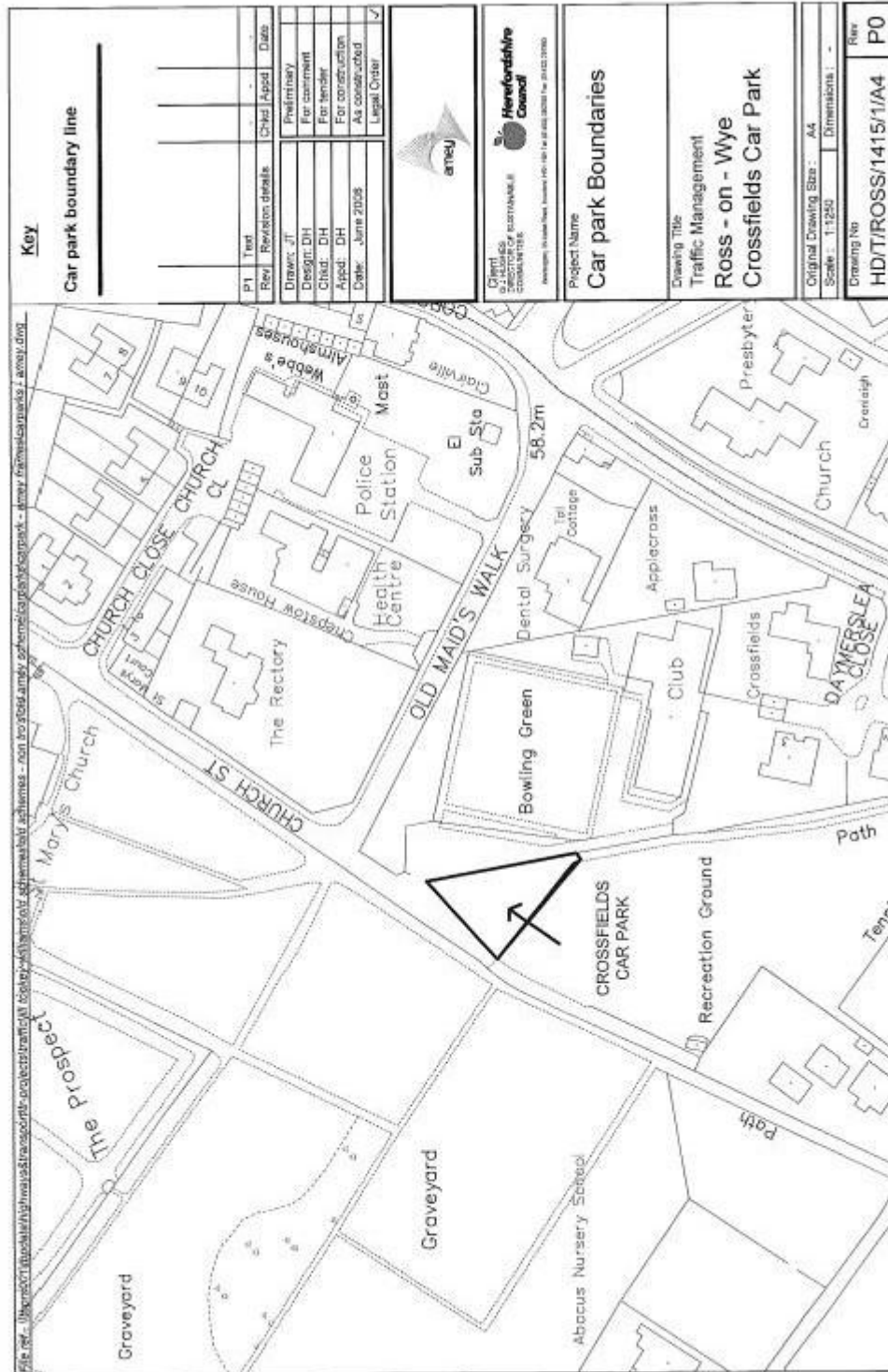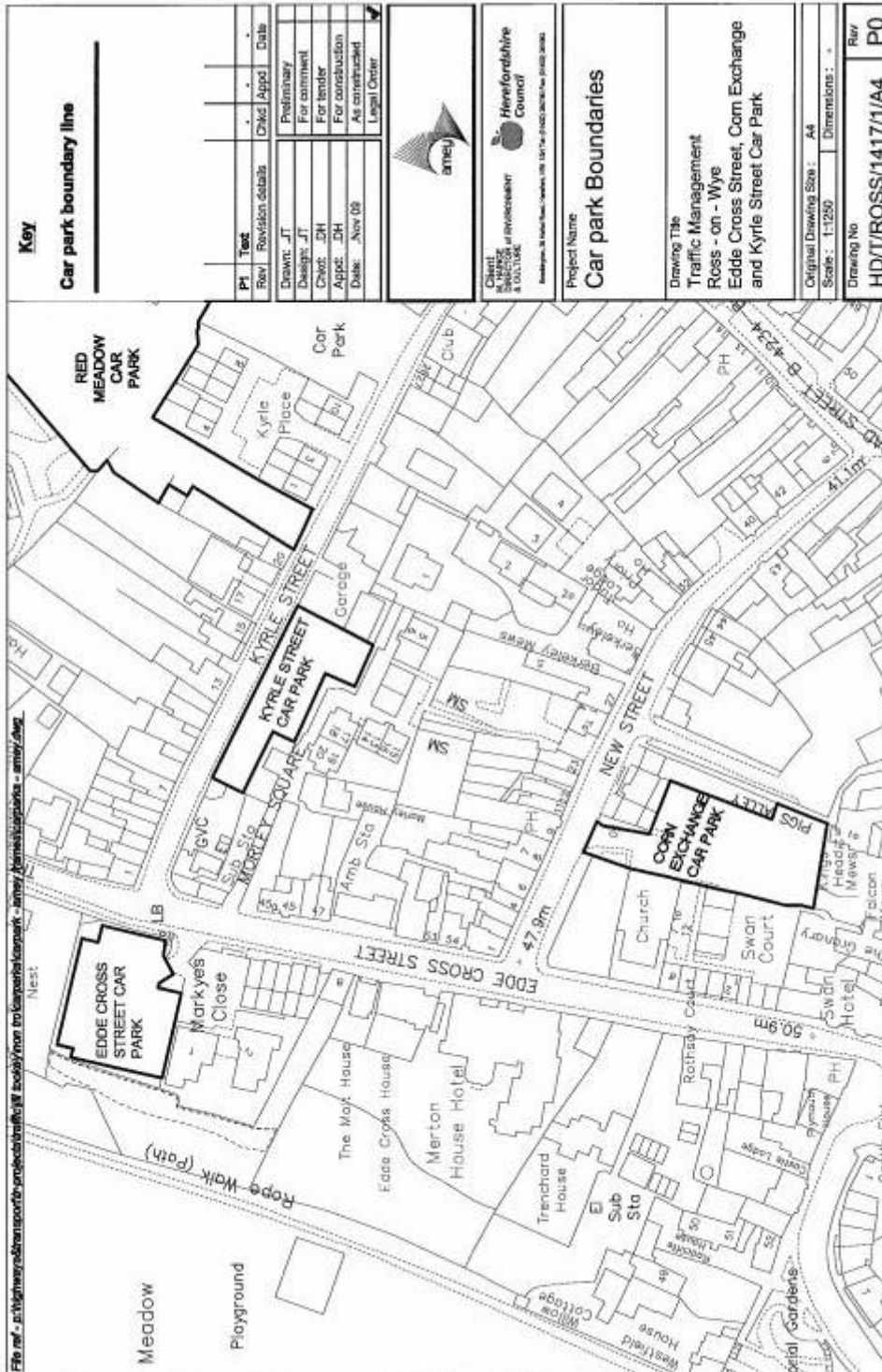
Locations within town
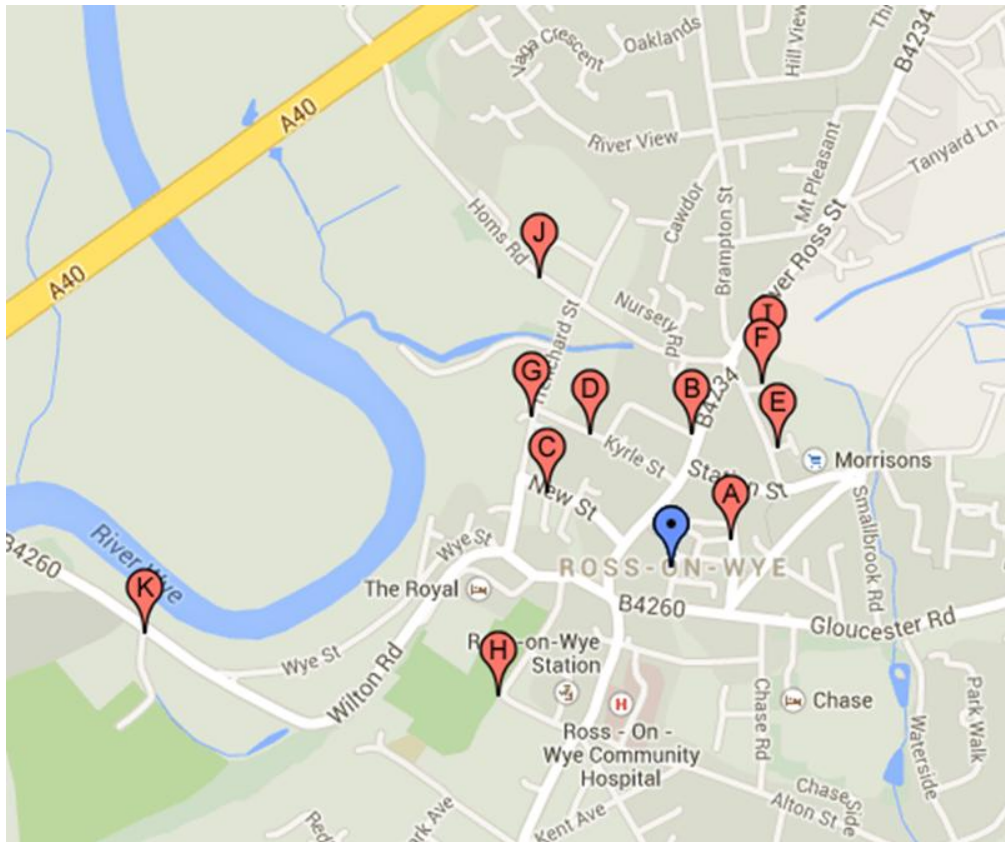
Street location details

Although scaled on each drawing, the following boundary maps are not to scale as reproduced here.

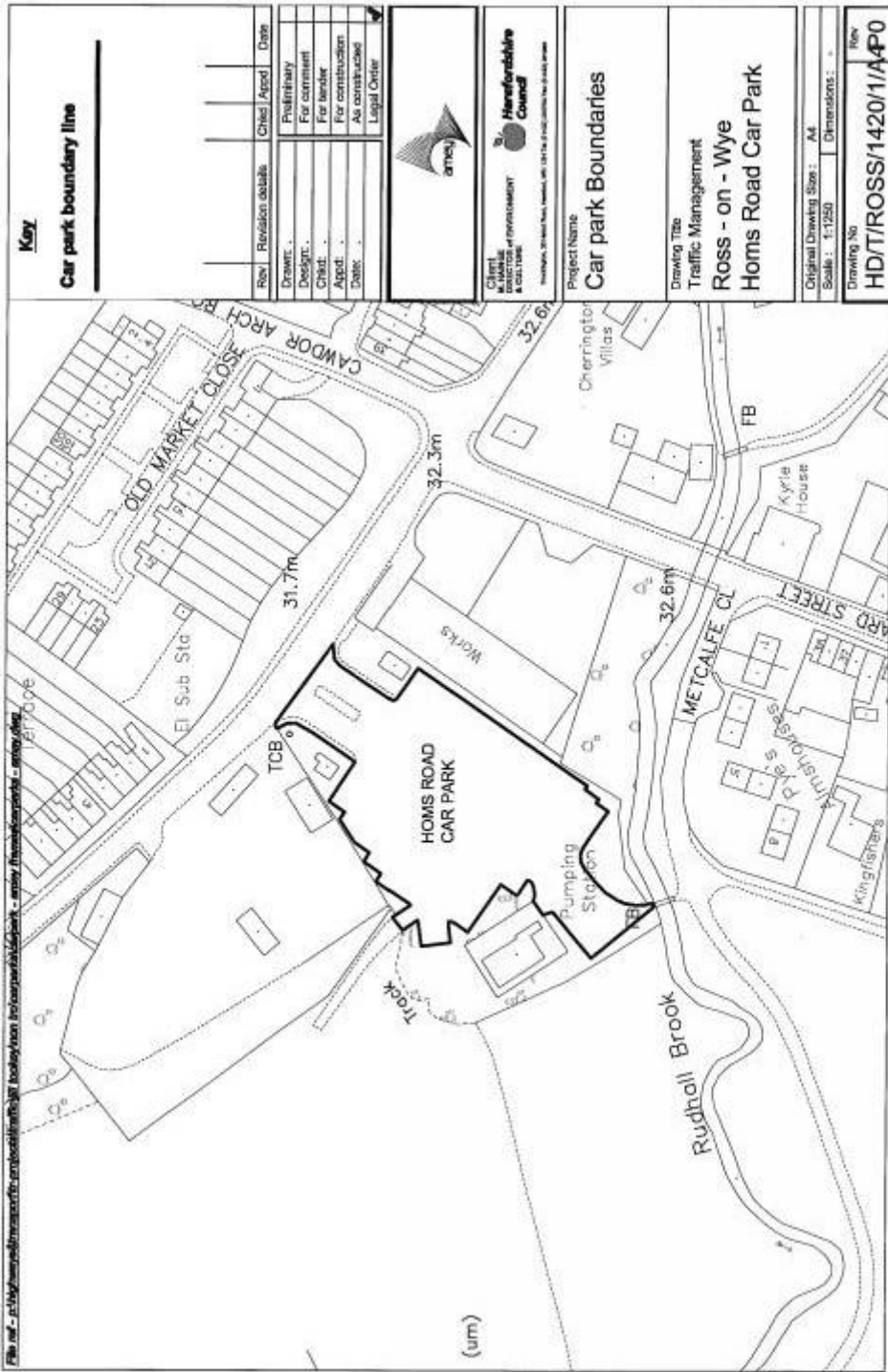## South west central

North-west

North central

West central

Central

West

The drawing shows:
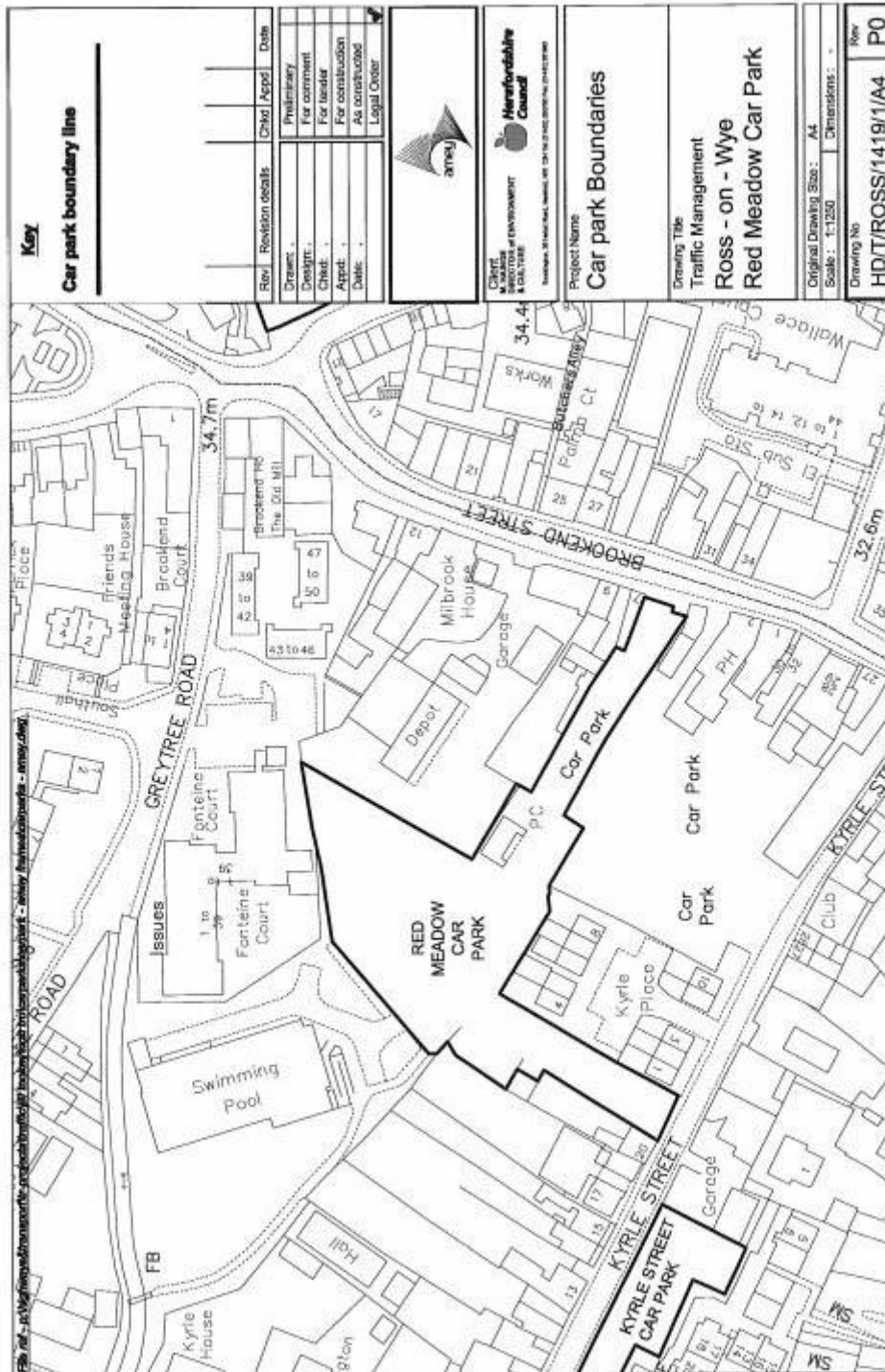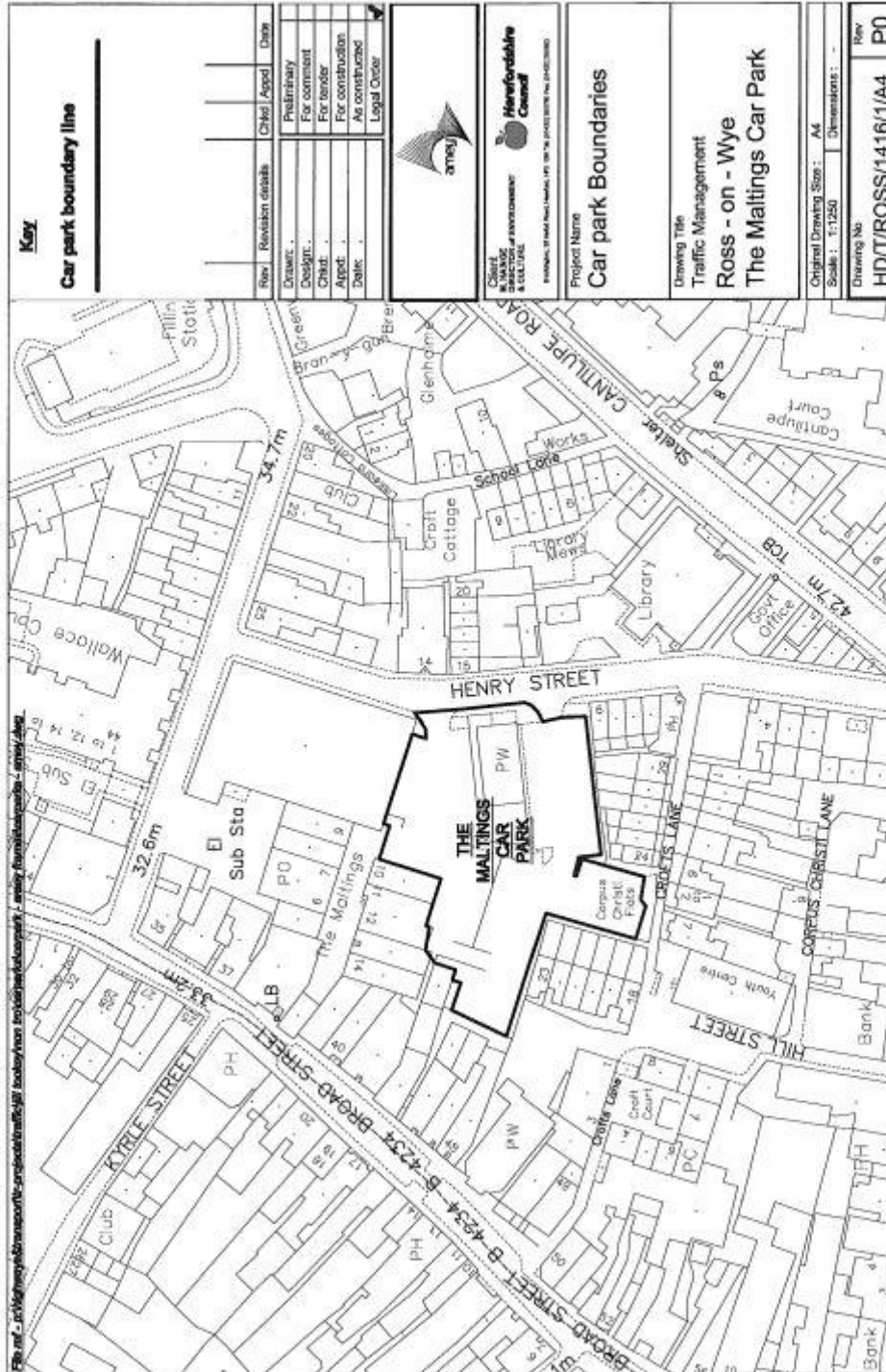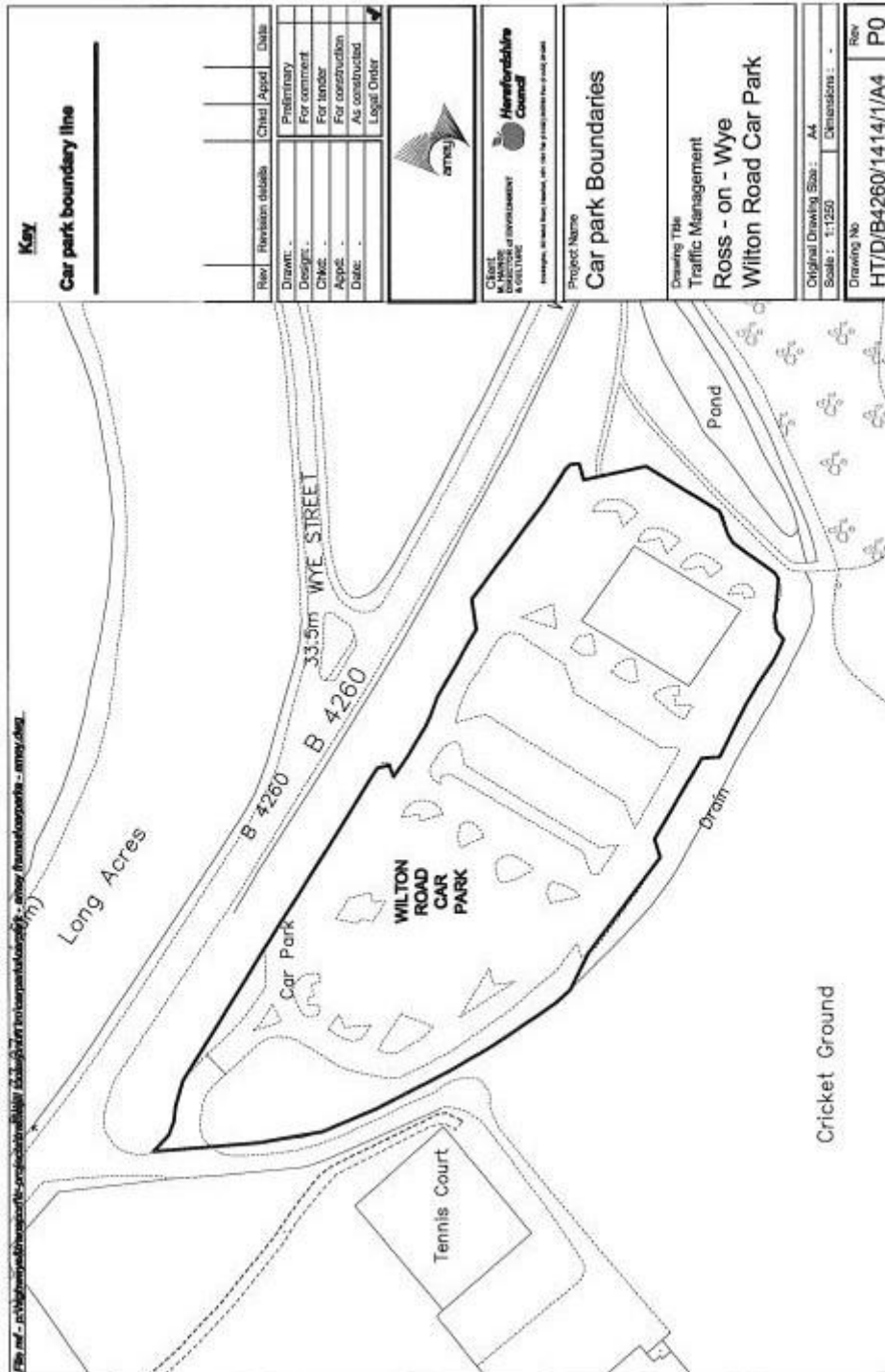
Key — Car park boundary line

Client: M. Hainge, Director of Environment & Culture, Herefordshire Council

Project Name: Car park Boundaries

Drawing Title: Traffic Management, Ross - on - Wye, Wilton Road Car Park

Original Drawing Size: A4

Scale: 1:1250 Dimensions: -

Drawing No: HT/D/B4260/1414/1/A4 Rev P0

Revision status: Preliminary / For comment / For tender / For construction / As constructed / Legal Order

Map labels: Long Acres, WYE STREET, 33.5m, B 4260, Car Park, WILTON ROAD CAR PARK, Pond, Drain, Tennis Court, Cricket Ground

Annex 4: Control Systems

We have investigated the three major UK providers: Swarco/APT, Parkeon and Metric.

The material below is from the current provider to Herefordshire Council, Metric.

VivoPark™ brings together cutting edge Automatic Number Plate Recognition (ANPR) with the most flexible, comprehensive payment terminal available today.

Metric Group Ltd have led the way in the supply of ANPR payment terminals since 2003 when they developed machines for use with the London Congestion Charge scheme. The latest evolution of this system is VivoPark™, which takes all the knowledge and experienced gained from previous projects into the latest, most versatile solution to date.

Shopping Centres
Hospitals

innovative solution for
parking management

Hotels
Leisure Facilities
Private Land

Server

Located in the parking area the server is the heart of the system. Captured vehicle images are held in the database with transactions flowing to and from the payment terminal and cameras 24/7 in real time.

- HTTP Technology – fast reliable look up
- Intelligent logic for data matching
- Operator portal for analysis and reporting
- Remotely monitored

Operator Tools

The back office provides the operator with all the tools to manage their site and system, including audit of transactions and analysis. The operator configures concessions, discounts and all transaction management.

- White-list management
- Vehicle movement data
- Financial statistics
- Enforcement statistics

Customer Portal

The car park user will have the opportunity to register their own online account, this portal will be available 24/7 and can be used on mobile devices.

- Pay for parking at home, single or multiple visits
- Season ticket purchase
- Account management
- Discount code redemption

Manage your account anytime online, at a time that suits you.

All website users will have the option of setting up an account. This account will enable speedier payment for parking as well as open up the other functionalities of the website. Customers will also be able to view their account history and make any changes required to either their personal information or their vehicle information. Other benefits of creating an account include:

- Multiple vehicle accounts
- Multiple credit/debit card registrations
- Card expiry alerts
- Redemption of previous receipts

Account holders can manage their account from a mobile device. In the busy life that we all now lead the user can now pay for parking on the move with their mobile device. This can be achieved either via the secure payment route or by SMS.

Flexible enforcement

VivoPark™ provides the site operator with a choice when it comes to enforcement. Operators can choose to utilise the back office to manage the entire process, including handing appeals through to bailiff documentation, or if an existing third party enforcement system is in place choose to generate 'evidence packs' for exporting.

The system allows you to offer varying levels of enforcement – from taking no action at all, to issuing warning letters or requests for payment by post, the choice of policy can be configured at the touch of a button.

METRIC group

Metric Group Ltd. Metric House Westmead Industrial Estate, Westlea, Swindon SN5 7AD
Tel: 01793 647800   Fax: 01793 647802   www.metricgroup.co.uk

The material below is from a potential provider to Herefordshire Council, Parkeon.

THE STRADA OFFER

Over 40,000 Strada's installed around the world – 3 offers for on and off street parking

Strada Colour screen

Strada Touch

Strada with LCD screen

11

The material below is from APT/Swarco.

Veri-park goes live with new installation at busy retail park in Bracknell

Veri-park is now in operation at The Peel Centre in Bracknell. With no barriers the 800 space car park is managed via ANPR cameras and Veri-park kiosks that enable users to validate discount vouchers and make payment.

The Veri-park payment Kiosks offer visiting customers a choice of payment options including cards, notes and coins with the opportunity to pay onsite during any part of their stay. With a 15" touch screen display incorporated within the device, the kiosk provides users with a clear and easy to use set of payment instructions and options.

With the advantage of no barriers, the Veri-park solution is the essence of customer convenience, capable of avoiding frequent long queues at entrance and exits.

Using ANPR technology, this barrier less parking service delivers quick and simple solutions for customers who want an uncomplicated parking experience.

Annex 5: Example of Lighting System

The final choice as to the lighting to be used should be made at the detailed design stage, energy efficiency, ease of maintenance and cost feature among the criteria used, these details are of a type commonly used.

CHARACTERISTICS

Luminaire tightness level:	IP 66 [*]
LED module tightness level:	IP 66 [*]
Impact resistance (polycarbonate):	IK 10 [**]
Aerodynamic resistance (CxS):	0.0484 m2
Nominal voltage:	230V – 50Hz
Electrical insulation class:	1 [*]
Weight:	8.2 kg

[*] according to IEC– EN 60598

[**] according to IEC– EN 62262

KEY ADVANTAGES

- LensoFlex®: a selection of high performance photometries that can be adapted to a range of urban applications, thereby reducing energy consumption to an absolute minimum
- LEDsafe® and ThermIX® – maintains performance over time
- Road/path widths: footpaths to 12m+
- Column height: 5 or 6m
- Simple and flexible mounting system
- FutureProof – modular upgradeability
- Minimised power consumption
- Designed to incorporate Owlet range of control solutions
- Maintenance friendly
- Low cost of ownership
- Minimised environmental impact

AXIA AFFORDABLE LED LIGHTING

A distinctive LED luminaire characterised by its efficiency and innovative design. Intended to be the ultimate multi-purpose luminaire, the Axia is fully adaptable and can take a range of photocells and control gear, providing a solution to those looking to reduce their energy costs. The Axia offers all the advantages of LED lighting, without the high cost associated with LEDs.

The IP 66 driver compartment and the IP 66 LEDSafe® LED modules ensure optimum performance over time. ThermIX® optimises heat extraction to maintain 90% of the LEDs' nominal flux at over 100,000 hours. The lantern body has uniquely designed cooling fins to keep the drivers and LEDs cool ensuring long life and high LED lumen maintenance.

The Axia features a simple and effective mounting system, allowing side-entry or post-top mounting.

Through its highly developed and distinctive design, the Axia provides an energy efficient, environmentally friendly and low cost solution.

Coating: Polyester powder

OPTIONS

- Available in Grey: RAL 7040 or Black: RAL 9005
- Photocell (NEMA or miniature)
- Standalone dimming
- CMS compatible
- 0° inclination system when post mounted (standard 5°)

AXIA LED LIGHTING

LENSOFLEX®

Axia luminaires are equipped with LensoFlex® LED modules. Each LensoFlex® module contains 8 LEDs and a maximum of 6 modules can be fitted per luminaire, to suit the exact photometric and energy requirements. Schréder has therefore specifically developed a range of lenses which together provide a wide spectrum of photometric solutions. The LensoFlex® modules are placed horizontally enabling a genuine 'overlay' system to be used. It is especially suitable for lighting the urban environment where public safety and well-being are paramount.

LEDSAFE®

To maximise the reliability of the LED modules they are sealed to IP 66 LEDSafe®. Like Sealsafe® which is recognised as a bench mark in traditional source public lighting - LEDSafe® is based on the principle of a totally sealed photometric engine.

THERMIX®

ThermiX® optimises heat extraction to maintain typically 90% of the LEDs' nominal flux at over 100,000 hours. The lantern body features vertical heat sinking fins keeping the LEDs cool, while cooling fins under the driver compartment extend the life of the driver. Very low LED junction temperatures give exceptionally long life and high LED lumen maintenance.

FUTUREPROOF

The modular LED concept of the Axia makes the luminaire future proof. The LED modules can be upgraded easily in situ, as LED efficiency improves.

AXIA ● THE GREEN LIGHT

For more details and to follow the progress of the products configurations, please visit our website.

AXIA

PHOTOMETRY

LED high-powered white light

Type	Cool (6200K) or Neutral (4250K) white
Maintained luminous flux	L90* (or greater) at 100,000 hours

*L90 at the number of hours indicated, the LEDs maintain 90% of the initial luminous flux.

AXIA LENSOFLEX								Lifetime residual flux @ t_j 25°C[1]
Number of LEDs	**Cool white**	8 LEDs	16 LEDs	24 LEDs	32 LEDs	40 LEDs	48 LEDs	@100,000h
Current 350mA	Nominal flux (lm)*	1120	2240	3360	4480	5600	6720	
	Power consumption (W)	11	22	23	38	46	54	
Current 500mA	Nominal flux (lm)*	1534	3072	4608	6144	7680	9216	90%
	Power consumption (W)	14	28	40	52	64	79	
Current 700mA	Nominal flux (lm)*	1904	3808	5712	7626	9520	11424	
	Power consumption (W)	20	40	61	79	88	104	

*The nominal flux is an indicative LED flux @ t_j 25°C based on LED manufacturer's data. The real flux output of the luminaire depends on environmental conditions (e.g. temperature and pollution) and the optical efficiency of luminaire.
Nominal flux depends on the type of LED in use and likely to change in accordance with the continuous and rapid developments in LED technology.
To follow the progress of the luminous efficiency of the LEDs used, please visit our website.
[1] In accordance with IES LM-80 - TM-21.

LIGHT DISTRIBUTIONS

AXIA

LED

Universal mounting system which suits side-entry or post-top. Covers the unused mounting entry point

Sustainable and recyclable materials: high-pressure die cast aluminium cover and body

Cover screws accessed from the underside to prevent build-up of dirt and corrosion of the fastener

IP 67 waterproof plug and socket connector system for ease of module replacement

Cover plate - no secondary protector to optimise performance

IP 66 LEDSafe® totally sealed, easily upgradeable LED module. Incorporates LensoFlex® 8 LED optical system offering a choice of photometric solutions. Lenses are from vandal resistant polycarbonate.

Mounting surface for a NEMA socket or a range of miniature photocells and CMS nodes

IP 66 control gear compartment

ThermiX®: Large surface area and vertical cooling fins for outstanding heat extraction

Removable driver plate for ease of upgrade or maintenance

AXIA

ALL ALUMINIUM

The body and canopy of the Axia are made
from die-cast aluminium, which is easily recyclable.

MAINTENANCE

All mounting and access fixings are positioned on the
underside of the lantern, to reduce dirt build-up and
corrosion.

MOUNTING

A universal mounting piece allows side entry or vertical
installation of the luminaire with the two M8 locking screws.

Side entry: Ø42mm - Ø6omm (or Ø32mm with Shim)

Post-top: Ø6omm or Ø76mm at 5° inclination
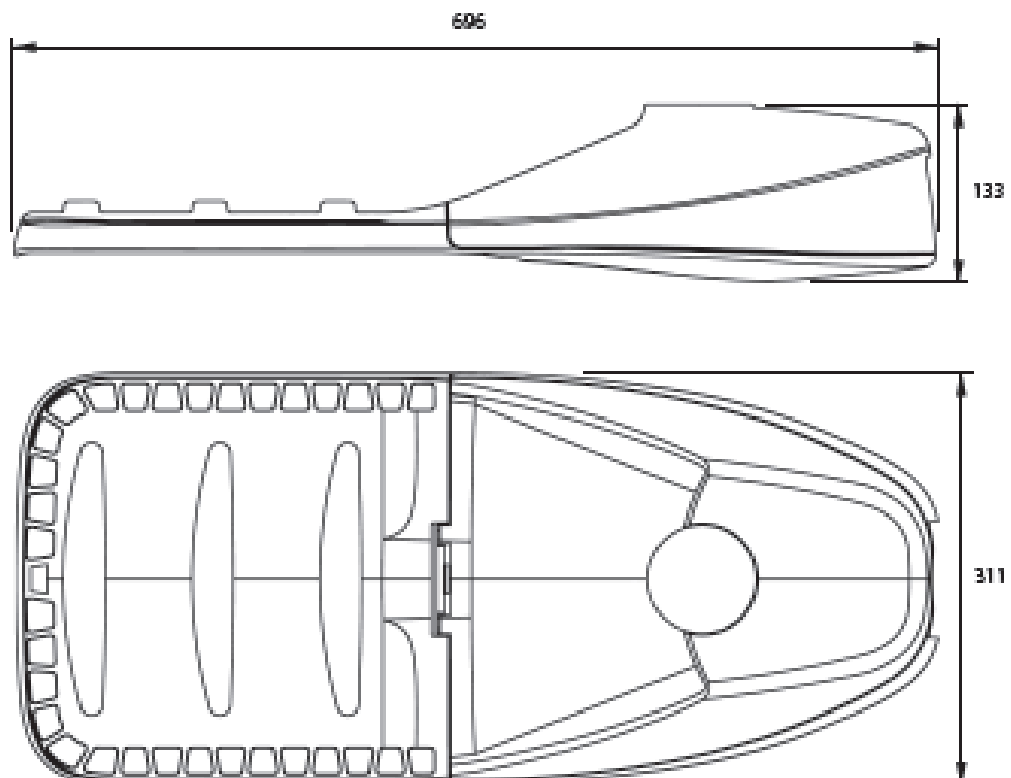(or 0° with shim)

Annex 6: Secure Car Parking

Wilton Road, because of its relatively isolated location requires a good level of security equipment to encourage use - especially at either end of the day

The CCTV system suggested for this car park is of an innovative and advanced design, creating a strong deterrent to criminal activity and a desirably safe place for customers to park.

High resolution CCTV images are produced and recorded throughout the car park by high specification cameras mounted on 10 metre columns.

All images from the cameras can be monitored by an analytical system which would provide automatic alerts when the video content resembles criminal activity such as 'car surfing' in progress. Car surfing is the term given to the process of moving from one parked vehicle to another to select a vehicle for the intention to commit a theft or other criminal offence.

As soon as the video analytics system recognises car surfing it will send an alert to the local police or a designated monitoring point so that the monitoring person can remotely view live and recorded images to allow action to be taken.

The CCTV system should record all images for a pre-set period of say 7 days which could be increased or decreased to suit requirements. The system could also be viewed continuously at a remote location by an operator who has the correct login and passcode, over a fixed IP SDSL broadband link at the car park.

The car park (including the skate park) should be adequately lit by high efficiency, low power LED lighting to give an overall lighting level of 10 lux. This would ensure that the car park is lit for safe public use and also that the CCTV system has ample light with which to perform its automated tasks.

If proposed, additional tasks could be set for the analytical system, such as to monitor and produce alerts for ; abandoned vehicles, overnight parking, anti-social driving behaviour, smoke or fire detection, out of bound areas, loitering, crowd gathering, left baggage.

All of the above analysis and alerts could be carried out automatically over a 24 hour 365 day period.

The effect of such an advanced car park monitoring system allows the car park to be perceived as a safe car park therefore becoming full before other car parks without such a system. For an out of town car park such as this it becomes a long stay car park which frees up shoppers parking in the town centre. This is good for generating extra revenue for the car parking authority to quickly pay for the cost of installation and produce useful additional revenue going forward. It is important to recognise that such a well-designed car park scheme generates visitors to the area with happy consequences for local shops and businesses.

Additional enhancement

An attractive, useful extra enhancement of the scheme is to allow car park users to monitor remotely the area in which their particular vehicle is parked via their smart phone.

This is enabled by the car park user calling a designated phone number and inputting their vehicle registration number to the service once they have parked up. After this is done the user can recall the number and the CCTV system will transmit the camera image containing their car to their smart phone for personal monitoring and peace of mind. The system will also call the car park user if car surfing is detected and will transmit the image to the smart phone.

Once the system detects that the vehicle has left the car park the user will no longer have access to the CCTV images. The system can also send an image to the smart phone once the vehicle has left if required, in this way it would warn the car parker of unauthorised driving away of their vehicle to get quicker alert to the authorities.

This scheme requires additional equipment and integration and therefore would be at additional cost.

Example of equipment

For the CCTV system as described:

- 11 off 5 Megapixel IP cameras

- 2 off   Number Plate Recognition cameras

- 6 off   10 metre CCTV columns with concrete bases

- 1 off   6 metre CCTV column and concrete base for access road
  2 x NPR and 1 x 5 Mp cameras

- 2 off   Roadside protective equipment cabinets

- 1 off   10 channel video analytics system

- 1 off   13 channel CCTV recording system

- 1 off   2000va Uninterruptable Power Supply

- 1 off   Fibre optic connection system for CCTV system with
  500metres of 4 core optical fibre

- Network switches, routers and encoders

- 500metres of 2.5mm SWA mains cable.

Not included are; supply and installation of cable ducting, provision of mains power supply, provision of fixed IP address ADSL link.

Source of specification:
SECURE ENGINEERING LTD, East Sutton, Maidstone, Kent, ME17 3DD

Annex 7: Report for Ross Town Council

Brief:

Ross Town Council requested a concise report giving a professional opinion as to the costs and benefits of it taking over the three car parks that have been offered under the asset transfer package from Herefordshire Council. In particular it was interested to learn the extent to which these could be profitable in the medium term.

A recommendation was also sought on the issue of whether it should proceed with this part of the asset transfer.

Note that the count of spaces was taken before the additional 82 spaces at Aldi became available, nor does it account for the capacity at in private car park at The Barrel.

Car parks offered

Based upon the information provided by Herefordshire Council the income accruing to all the car parks in Ross is shown in the table below. The most interesting lines are the lower four; the Town Council has been offered three car parks (shaded blue) with 368 spaces, which is 42% of the spaces in Ross. However, of those car parks the majority of those spaces (279) are in Wilton Road, a car park where no charges are currently levied.

Detail			Income				
Name	Control	no of spaces	Jan to Oct 2010	April 2010 to March 2011	April 2011 to March 2012	April 2012 to March 2013	April 2013 to March 2014
Corn Exchange	P&D	55	£31,788.00	£30,099.00	£29,015.00	£36,173.00	£38,122.00
Crossfields	P&D	19	£5,198.00	£5,930.00	£6,071.00	£7,748.00	£8,804.00
Edde Cross Street	P&D	49	£10,877.00	£10,458.00	£9,128.00	£9,345.00	£9,737.00
Homs Road	P&D	70	£2,184.00	£1,436.00	£1,396.00	£1,432.00	£2,740.00
Kings Acre (Lower)	P&D	45	£26,186.00	£12,290.00	£15,351.00	£18,988.00	£19,412.00
Kings Acre (Upper)	P&D	78	£13,161.00	£12,441.00	£9,946.00	£11,102.00	£9,464.00
Kyrle Street	P&D	29	£6,724.00	£7,456.00	£7,728.00	£8,233.00	£11,118.00
The Maltings	P&D	107	£94,162.00	£73,071.00	£64,723.00	£87,308.00	£93,488.00
Red Meadow	P&D	126	£48,275.00	£34,323.00	£34,845.00	£42,946.00	£43,079.00
Wilton Road	Free	279	£0.00	£0.00	£0.00	£0.00	£0.00
Morrison's	Free	265	£0.00	£0.00	£0.00	£0.00	£0.00
Total Turnover		857	£238,555.00	£187,504.00	£178,203.00	£223,275.00	£235,964.00
Offered Turnover		368	£7,382.00	£7,366.00	£7,467.00	£9,180.00	£11,544.00
Residual Turnover		489	£231,173.00	£180,138.00	£170,736.00	£214,095.00	£224,420.00
% of Total Offered		42.94%	3.09%	3.93%	4.19%	4.11%	4.89%

The revenue produced by the two fee-collecting car parks offered has in the last four financial years ranged from £7336.00 to £11544.00 which is between 3.92% and 4.89% of the total turnover.

Revenue

Crossfields car park at 19 spaces is smaller than Homs road car park at 70 spaces but produces about three times the revenue due to a higher occupancy rate. The difference is

probably due to location and demand, it is tempting to suggest that increasing the size of Crossfields car park would produce more revenue, but it would be wise first to see if it is possible to ascertain if it is just its location which makes it popular or whether there are any other factors involved.

Season ticket revenue has been concentrated in Kings Acre (Upper) and Kyrle Street car parks with Homs Road only attracting £400.00 revenue in 2013/14.

Cost of management

Assuming that Ross took control of the three car parks from Herefordshire council, the cost of management and maintenance needs to be considered as well as any capital costs that may be necessary. Business rates have to be paid unless the organisation involved is a charity but other costs will still need to be met and provisions made for maintenance, landscaping, grass cutting, shrubs trimmed and in particular where trees are involved regular inspections by tree surgeons is likely to be an insurance requirement. Other costs would include insurances, enforcement software and appeals.

Known Cost - Business Rates £10,580.00

Estimated Costs

Landscaping Maintenance could be in excess of £5,000.00

Surfacing/Patching provision is likely to be in excess of £1000.00

Management of maintenance would be needed and would involve everything from issuing and managing Parking Tickets (including appeals) to initiating and supervising maintenance and repair the costs involved must be in excess of £5,000.00/annum.

The cost of administering any PCN's would be in excess of £3500.00+VAT

Wilton Road car park has its problems and the extent of works that would be the minimum will not be able to be determined until a survey with levels is completed, a budget estimate to adjust levels and re-surface could be as high as £70,000.00 it will not be known if it is possible to reduce this until after a survey is completed. If charges were to be introduced parking control equipment would be required which dependant on type of system may need a budget of about £30,000.00.

Benefits

1 Off street parking exists to support local shops and businesses; it is not an end in itself and serves no other purpose than to help people get to their destination.
2 Car park tariffs cannot be decided entirely on the basis of what revenue they will raise, they must relate to the perception of the driver as to whether the amount charged is worth it relative to their opinion of the attractions of the destination. People do not visit a town because they want to visit the car parks.
3 Tariffs need to be based upon demand such that prices are set at a level such that there are 10% to 15% of the spaces free at any one time, usually measured at the peak use period. Having visible empty spaces encourages people to stop and shop rather than go elsewhere.

Discussion

1 Control of three car parks in Ross would place a responsibility in the hands of the Town Council to manage them for the benefit of the residents and businesses of Ross but at no cost to the council tax payer. The risk is that managing three car parks would not place the Ross Town Council control of the parking in Ross because as Herefordshire Council controls the remainder they will control the price ceiling.

2. Current Revenue in FY13-14 was £11544.00, there is no guarantee that this will either rise or stay at this level.

3. Business Rates are £10580.00 although if the car parks were managed by a charity this could be reduced by 50% and perhaps 100%.

4. Costs of management and maintenance have to be budgeted for and these are likely to exceed the current income level, a far more detailed study is needed to accurately detail all activity and overhead costs needed to manage the three car parks. Costings have been obtained from a contractor who could administer the "Penalty Charge System" for offenders at a cost or about £3500.00+VAT per annum plus a percentage of fine revenue, the Town Council would still be responsible for issuing the Penalty Charge Notices

5. Wilton Road car park needs improvement regardless of whether charges are levied for parking; it would not be reasonable to charge for parking in its current condition. Cost of control equipment, dependant on type, could be in excess of £30000.00.

6. Crossfields has a high level of income per space and it may be that using "Grass Reinforcement" some additional spaces could be created at a lesser cost than normal construction.

7. If the Town Council took control of the three offered car parks with only two having any revenue the risk is that unavoidable costs will be greater than income.

Ways to increase revenue

If the car parks were transferred to the town council initially I would expect that if in Homs Road season ticket price and perhaps the daily tariff were reduced below those in adjacent car parks there could be an increase in usage, but its peripheral location is likely to be unhelpful.

It has been suggested that car boot sales could be introduced in Homs Road or Wilton Road, thought would need to be given as to whether the level of income that could generated was likely to cover all costs and the use of specialist companies with a good track record should be considered. I would also suggest thought be given as to how such an event could be made unique to Ross.

Conclusion

Although, for the benefit of local residents, it may be desirable for the Town Council to control as many of the assets in the town as is possible, and in particular car parking the dilemma is that known revenue (for the three car parks offered) in the last four years has ranged from £7336 to £11544, there is no guarantee that it will stay at the current level.

There is unlikely to be the funding available for even a minimum level of repairs to Wilton Road car park.

If one looks at the proportion of Herefordshire costs for the management of parking on the basis of spaces, Herefordshire spends over £97,000.00 for all Ross car park costs and even if one perhaps accepts that due to higher costs elsewhere the actual figure is probably less and even if you discount the business rates, costs are likely to remain in the tens of thousands, and in excess of income.

Annex 8: Full budget for proposals

The following table assumes that finance is unlimited and outlines steps that would be required to provide all the car parks in the town with a good physical environment, and the technical means to manage them to the benefit of all stakeholders.

Gant Chart	Month 1	Month 2	Month 3	Month 4	Month 5	Month 6	Cost of Work	Betts Consulting	Specialist Consultants	Source	Status
Land Survey	■								£5,000	Woodford	Confirmed
Utilities Enquiry		■					£7,751.52				
Design car park Levels and layout		■					£217,763.70		£17,000.00		
Reconstruct Wilton Road to base course			■								
Resurface Car parks				■							
Reline all car parks					■		£3,945.06			Stillwell	Confirmed
Obtain quotes for control equipment		■					£433,650.00		£12,000.00	Manny Rasores	Confirmed
Install Parking Control Equipment			■								
Obtain quotes & Supervise VMS Signage		■									
Erect VMS Signage			■								
Connect VMS Signage				■			£409,558.80		£35,000.00	Mott Macdonald	Confirmed
Obtain quotes for Lighting		■							£14,000.00	Stainton	Confirmed
Install Lighting			■				£286,209.00		£12,000.00		Confirmed
Confirm CCTV price		■					£92,032.50				
Install CCTV				■						Secure Eng	Confirmed
Tidy up Landscaping, trim trees	■						£12,600.00				
Purchase 5000 copies of the new Parking App					■						
							£1,463,510.58	£19,800.00	£95,000.00	TOTAL	£1,578,310.58

Annex 9: Development Partner Invitation

The following invitation was sent by the Workpackage 4 leader to a number of UK companies which are specialist in parking management systems.

'rTown' Project

ProxiPark

Powered by
ProxiSmart

Innovate UK
SBRI – 'Re-imagining the High Street'

ProxiPark Solution

Background

Innovate UK (formerly the Technology Strategy Board), an executive, non-departmental public body sponsored by the Department for Business, Innovation and Skills are funding a Small Business Research Initiative (SBRI) into ways of 'regenerating the High Street'. This initiative is looking for technologically based solutions that will help to drive footfall into the High Street and Market Towns of the UK which has seen a slump in fortunes over recent years.

AMS Consulting have successfully secured funding from this initiative and under the project title of 'rTown' are looking to deploy a number of schemes, under pilot, backed by funding from this initiative, in the market town of Ross on Wye in Herefordshire. ProxiSmart Ltd have been employed to research and develop ideas that specifically relate to using technology to help deliver on the remit of the rTown project. More specifically, this involves the introduction of a platform that can help to market the Location as a 'single business entity', thereby drawing on the strengths and diversity of a co-operative branding and approach.

rTown is now about to submit an application for further (significant) funding that will facilitate deployment to PILOT of a number of recommendations, options and findings that have been researched during the last 6 months. One of the requirements for the funding application is that there are associated commercial opportunities for any solutions developed under the scheme that can be replicated across the primary (High Streets / Market Towns) and other target sectors elsewhere around the UK (initially).

ProxiSmart Ltd are now looking for a development partner who are specialists in car park management systems to help deliver on a solution called ProxiPark which forms part of the rTown bid.

If the rTown bid for additional funding is successful, the development costs for this project would be funded by the government backed initiative (and would thereby enjoy significant press and marketing). Beyond PILOT there is significant commercial opportunity associated with the solution with around 500 additional Locations (UK only) having already been identified as potential clients.

Annex 10: DfT Circular

Department for Transport

From the Parliamentary
Under Secretary of State
Robert Goodwill MP

Great Minster House
33 Horseferry Road
London
SW1P 4DR

Tel: 020 7944 2566
Fax: 020 7944 4309
E-Mail: robert.goodwill@dft.gsi.gov.uk

Web site: www.gov.uk/dft

All Parking Managers in England with Civil
Parking Enforcement powers

Dear Colleagues

1 6 SEP 2014

LOCAL AUTHORITY CAR PARK ENFORCMENT

I understand that some of you are intending to withdraw your off-street parking operations from the parking enforcement framework in the Traffic Management Act 2004 (TMA) so that enforcement is carried out through contractual terms and conditions as if the car parks are privately owned. It is also my understanding that a couple of you may already be operating your car parking operations through contract law - I would hope this is not the case.

Let me assert, that although you may think the land is "unregulated" by virtue of revoking the parking orders made under the Road Traffic Regulation Act 1984 (RTRA), I am of the view that the land remains regulated because under Section 32(1)(a) of the RTRA, a Council retains the status of a Local Authority providing off-street parking places.

Part 6 to the TMA was enacted in 2008 with the aim of improving local authority on-street and off-street parking enforcement arrangements by enabling local authorities to take effective enforcement action, but to protect the motorists when a mistake has been made by a local authority. Any intention to operate outside this statutory regime would clearly go against the will of Parliament, Government policy and the expectations of local electorates.

I should warn you that should you have any plans to submit an application to the DVLA for access to keeper data on the basis of recovering unpaid charges for enforcement through contract law, this will more than likely not be approved because the Council will not be operating as an enforcement authority under the TMA.

The Department made a conscious decision to exempt local authorities from the provisions in Schedule 4 to the Protection of Freedom Act 2012 which provides for an enforcement regime and appeals system for privately owned car parks. This clearly demonstrates the will of Government to separate local authority off-street parking enforcement arrangements from the parking operations on private land.

As you know, local authorities are expected to comply with the relevant legislation and guidance, and are accountable to their electorates. I would hope that you would reconsider any plans to enforce your off-streets outside the parking framework in the TMA.

Yours sincerely

ROBERT GOODWILL

Annex 11: Market size detail

National market

According to the British Parking Association (BPA) in 2014[ix], there are 17000 public car parks in general use, of which 93% are surface car parks like those in our sample. These provide somewhere between 8 and 11 million parking places. Car parking space occupancy is between 50% and 80% in local authority operated car parks, and 80% in those run by private operators.

The same BPA figures indicate that most short term (i.e. hourly) parking costs approximately £1 per hour, that an average household spend on parking is £47 annually compared to a spend on fuel, per vehicle, of £1600.

According to the BPA, "*the primary driver of demand for car parking is the extent of car ownership and destination parking (most especially commuter parking, but also for shopping, leisure and related activities). In addition, travel (and parking) demand is affected by: demographics, economic activity, transport options, land use patterns, prices and, also, demand management strategies. In addition to the state of the economy, other main drivers of parking demand include commercial development, popularity and price of alternative transportation, the cost of parking, and changes in work practices such as flexible hours and home working.*"

Local Authority

According to the RAC foundation 2014 report[x] Department for Communities and Local Government figures[xi] show that local authorities in England in 2013/14 collected just over £1.43 billion from parking tickets, permits and penalties, spent just under £0.76 billion, and made a surplus of nearly £0.67 billion. After capital charges (interest and depreciation) of around £0.12 billion, the net surplus was £0.55 billion, which by law must be used for transport projects.

The surplus after capital charges are taken into account amounted to 7% of all local authority transport expenditure. On-street income rose by only 1% over the 2012/13 figure. On-street penalty income fell by 3%.

Capital charges for on-street parking, although small, fell sharply, while those for off-street have risen marginally. Overall the surplus after capital charges was £549 million, a 19% increase compared with £460 million the previous year. This surplus must, by law, be used for transport projects. The surplus before capital charges contributed 14% of all local transport expenditure and 7% after capital charges are taken into account.

According to the government figures, just over 64 thousand people are employed by local authorities in managing and enforcing off-street car parking, with just over 101 thousand for on-street parking (it is not clear if there is any overlap within these figures, though the BPA figures suggest a total of 82 thousand).

It is difficult to calculate capital costs accurately due to the way in which government finances are presented, but if the same figures are analysed with respect to car parks operated by local authorities as external trading accounts a capital cost of 16.6% of gross income, or 70.2% of the net surplus. Using the revenue outturn numbers for internally operated services the capital costs are a lower proportion at 56.5%.

According to the BPA, "*the primary driver of demand for car parking is the extent of car ownership and destination parking (most especially commuter parking, but also for shopping, leisure and related activities). In addition, travel (and parking) demand is affected by: demographics, economic activity, transport options, land use patterns, prices and, also, demand management strategies. In addition to the state of the economy, other main drivers of parking demand include commercial development, popularity and price of alternative transportation, the cost of parking, and changes in work practices such as flexible hours and home working.*"

Penalty charge notices issued in London in 2013/14 were £4.08 million, marginally higher than in 2012/13; figures for the rest of England are not yet available but based on this figure it would appear that the level of penalties has levelled off. Off-street income rose by 3% in the past year. However, local authorities have reduced their running costs – by 10% for on-street and 2% for off-street parking. As a result the surplus from on-street parking rose by 16% and by 8% from off-street, leading to an overall increase of 12% to £667 million (up from £594 million in 2012/13). Local authorities in England are budgeting for a surplus in the current year of £648 million.

If Herefordshire's capital replacement figure (£268k) used for renewing the current 40 P&D machines (£6.7k per machine) over a six-year period is taken as a guide to the lower end of end-user costs (our budget figures for ANPR in Annex 8: Full budget for proposals are 12x higher) then a conservative capital market value for parking equipment for local authority use across the UK would be £1201468 annually (assuming a that machines have the same installed life as those in Herefordshire.

If the Department for Communities and Local Government figure is used then the total capital market for parking equipment is used (assuming only 30% was allocated to control equipment in line with the proportions in our Annex 8: Full budget for proposals) control equipment spend is just under £38M. On the basis of these disparate figures a working number of £18M may be the safest working UK market size figure?

Herefordshire

The RAC foundation 2014 report[xii] shows that the revenue surplus for Herefordshire ranks 89th (up from 98th in 2013) of 353 national local authorities; a situation partly explained by the fact that it has to finance more road per head of population than any other English top tier authority.

Local Authority Parking Operations Revenue Outturn for England by level of surplus
(Current account surplus excluding capital costs. Source: Council returns to DCLG)

Annex B: In descending order of surplus

London boroughs	L
Metropolitan districts	MD
Shire districts	SD
Unitary authorities	UA

Local authority	Class	2010-11	2011-12	2012-13	2013-14	Ranking by 2013-14 surplus
		£ thousands				
North Tyneside	MD	573	813	1,341	2,041	82
Harrogate	SD	1,956	1,689	1,839	1,969	83
Greenwich	L	1,462	2,013	2,161	1,950	84
East Devon	SD	2,184	2,321	1,740	1,930	85
Kingston upon Hull UA	UA	1,190	1,682	1,906	1,913	86
Surrey	SC	-1,599	-1,267	-1,047	1,911	87
Oxfordshire	SC	-45	916	1,488	1,900	88
Herefordshire UA	UA	863	1,355	1,563	1,880	89
Horsham	SD	1,318	1,272	1,516	1,874	90
Wychavon	SD	1,327	1,397	1,489	1,867	91
Solihull	MD	2,502	2,003	1,678	1,856	92
Sutton	L	1,621	1,660	1,707	1,849	93

The following capital budget allocation was approved in November 2014 for the forthcoming three financial years. There are 10 P&D machines in the Ross car parks, with a current estimated replacement cost (to use ANPR, pay on exit, and card debiting) of more than £443k (see Annex 8: Full budget for proposals) – i.e. more than 10x the cost approved.

Herefordshire Council

SUMMARY OF CAPITAL SCHEMES
2015/16 - 2017/18

| Scheme Description | Capital Cost of Project | | | | | | | Comments |
	15/16 £'000	16/17 £'000	17/18 £'000	Future Years £'000	Total Cost £'000	Total Funding £'000	Net Cost £'000	
ESSENTIAL WORKS:								
Pay and Display Machines - replace entire stock of 60 machines (10 per annum over 6 years), implement pay on exit & accommodate the changes to coins	40	41	43	144	268	-	268	Loss of income due to downtime on old machines around £30k pa. Risk of machine suppliers not providing cover as current machines are no longer manufactured.
FINANCE	4,308	5,266	268	144	9,986	-512	9,474	
programme	854	399	214	-	1,467	-	1,467	As approved in the councils capital strategy
TOTAL CAPITAL SCHEMES	14,072	14,285	17,132	12,844	58,333	-47,392	10,941	

Commercial

According to the BPA List of Approved Operators - December 2014 [xiii] there are 146 approved operators of which 46 are currently operating one or more ANPR systems, of which just 6 are licensed for debt recovery (though it should be noted use of the latter is only applicable to private car parks). This indicates developing private sector growth in ANPR provision, though local authorities are at present constrained by Department for Transport guidance.

The BPA states that "*turnover figures from the private sector are not readily collated and are in any case not comprehensive for all non-local authority parking provision. The relative sizes of the public and private sectors suggest that private sector turnover will be higher than that of local authorities. Further research is needed to form a more authoritative overall turnover figure.*"

International

On the basis of the working UK parking controls market size figure of £18M then Europe, on a population ratio basis of 60:741 (thus ignoring the relative effects of GDP and investment in infrastructure), could be expected to have a market worth of £222M.

On a similar basis (60:1803009300, where the continental populations are corrected for development status) then a global market figure of £ 541B emerges.

Bibliography

http://www.parkeon.co.uk/parkreg-off-street-parking-automatic-number-plate-recognition-based-parking-solutions.html

[i]   Sjoerd Stienstra, S & Betts, I; You Pay For What You Get - Parking fees related to the quality of a city center: http://www.worldparkingsymposium.ca/parking-library/download/135/00000135_d090012pr.pdf

[ii]   Workpackage 4 report: http://www.rTown.org.uk

[iii]   Workpackage 2 report: http://www.rTown.org.uk

[iv]   Workpackage 1 report: http://www.rTown.org.uk

[v]   Local Transport Plan, Parking Strategy: https://www.herefordshire.gov.uk/media/6606457/ltp_parking_strategy_v2_0_12_02_13.pdf

[vi]   Councils in the Driving Seat? Local authorities and traffic enforcement: http://www.lgiu.org.uk/Workpackage -content/uploads/2014/02/Councils-in-the-driving-seat-Local-authorities-and-traffic-enforcement.pdf

[vii]   Workpackage 6 report: http://www.rTown.org.uk

[viii] ANPR: http://www.britishparking.co.uk/how-does-anpr-work

[ix]   The size and shape of the UK's parking profession (pdf) - April 2013, http://bit.ly/BPA-UK2014

[x]   Leibling, D; RAC report 2014: http://bit.ly/rTownWP3LeiblingRAC2014

[xi]   https://www.gov.uk/government/collections/local-authority-revenue-expenditure-and-financing

[xii]   RAC foundation 2014 report: http://bit.ly/rTownWP3parkingRAC2014

[xiii] http://www.britishparking.co.uk/Approved-Operators