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**ROYAL BOROUGH OF
KINGSTON UPON THAMES**

**Permanent Park and Ride for
Kingston Town centre**

FINAL REPORT

Project No: 60591
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1. INTRODUCTION

1.1 The study

1.1.1 Colin Buchanan and Partners (CBP) was commissioned by the Royal Borough of Kingston-upon-Thames (RBK) in November 2001 to undertake the Kingston Permanent Park and Ride (P & R) Study.

1.1.2 The objective of the study is to investigate the feasibility of introducing an all-year round P & R system for Kingston Town Centre (KTC). (Since 1993 RBK has supported the operation of a Christmas period-only P & R site at Chessington World of Adventures.) The study brief specifies a long list of nine potential sites, including Chessington, to be investigated as part of the study.

1.1.3 CBP structured the study into tasks within phases of work as follows:

Phase 1

- Reviews of the policy context and available existing information;
- Initial review of the long list sites.

Phase 2

- New surveys of the travel behaviour of users of KTC;
- Establish the most promising locations for P & R sites based on where people driving to KTC are travelling from; establish 'areas of search' for, and add, potential sites to the long list of sites as necessary;
- Development of 'PRIDE' - a demand model for trips to KTC, to forecast the level of patronage for any given P & R site option or system configuration;
- Appraise the long list of sites and establish a short list of promising sites for detailed investigation.

Phase 3

- Examine the performance of shortlisted sites under policy scenarios for parking in the town centre (supply, control and pricing), and park & ride system configurations (frequencies, fares, routings, hours of operation);
- Appraise the shortlisted sites according to viability and feasibility, including with respect to environmental impact and the potential for winning planning permission for P & R car parks at the sites;
- Outline designs and business case for the recommended P & R system option.

1.2 This report

1.2.1 This report is structured as follows:

- Chapter 2 sets out the reviews of the context for the study and the pre-existing available data;
- Chapter 3 describes the requirements for a good P & R site;
- Chapter 4 describes the survey work undertaken and summarises the results;
- Chapter 5 describes the long list of potential park & ride sites;
- Chapter 6 describes the modelling work undertaken and sets out the appraisal of the long list sites;
- Chapter 7 describes the shortlisted scheme options;
- Chapter 8 sets out the appraisal of the shortlisted scheme options;
- Chapter 9 sets out the conclusions and recommendations of the study.

2. REVIEWS OF THE STUDY CONTEXT

2.1 Introduction

2.1.1 The review in this chapter is structured as follows:

- access to KTC: the geographical context;
- the policy context;
- a discussion of current best practice and issues in park & ride, and what park & ride can offer Kingston.

2.2 Access to KTC

2.2.1 Kingston lies on the Surrey bank of the River Thames, on the historic road from London to Portsmouth, and at a historic bridging point of the river for the royal road from London to Hampton Court and thence to Windsor. Kingston has always been an important market town and has served as the administrative centre for the county of Surrey, even after its incorporation into the county of Greater London in 1964. The Royal Borough of Kingston contains Kingston town plus a number of London suburbs including Surbiton, New Malden, Tolworth, Hook and Chessington. The population of the borough is 150,000.

2.2.2 KTC is a strategic town centre for south-west Greater London and Surrey, serving a catchment extending well beyond the boundaries of the borough. Kingston has enjoyed great economic success in the past decades, and the town centre is a vibrant mixed-use centre. About 7,000 people are employed in the core area of KTC.

2.2.3 The town centre has in particular seen remarkable growth in retailing, with a range of comparison goods shopping virtually unrivalled outside central London, all located within a compact walkable central area. As a result, retailing is the largest employer in the core town centre area and shopping is the dominant activity amongst its visitors.

2.2.4 Outside the core central area, as bounded by the town centre relief road, but within 5-10 minutes walk of it, are a number of large establishments which generate significant amounts of activity. These include on the south side of the town centre, around Penrhyn Road: Kingston College, the Crown Court, Surrey County Council's County Hall and Kingston University; to the east, around Fairfield Road/London Road: the Library and Museum, Kingfisher Leisure Centre, Kingston Grammar School and Tiffin School; to the north, on Richmond Road, the College of Further Education and the Kingsgate Business Centre.

Kingston Hospital is in Norbiton, about 1.5km east of the town centre, a little further than a convenient walking distance from it.

The road network

2.2.5 In terms of the road network, the major through route now bypasses KTC. The old A3 London-Portsmouth road bypasses Kingston and Esher before regaining its original line. However, Kingston remains a key focus within the non-primary road network. A map locating KTC is shown in **Figure 2.1**. A diagram simplifying the nine main radial road routes to the town centre is shown in **Figure 2.2**, and described in **Table 2.1** below.

Table 2-1 Radial roads to KTC

Radial (local distributor road)	Name on approach to KTC	Direction
A307 (N)	Richmond Rd	Richmond
A308 (E)	Kingston Hill, London Rd	A3 Wandsworth, Central London
A238	Coombe Rd/Coombe Lane	Raynes Park, Wimbledon
A2043	Cambridge Rd	New Malden, Worcester Park, Sutton, Cheam
A240	Ewell Rd, Surbiton Hill, Penrhyn Rd	Surbiton, Tolworth, Ewell, Epsom
A243 (then either A30 or A240)	Hook Rd, Brighton Rd	Surbiton, Chessington, Hook, M25 J9, Leatherhead
A307 (S)	Portsmouth Rd	Esher, A3 Guildford
A308 (W)	Hampton Court Rd	Hampton Court, Sunbury, Staines
B358	Park Rd/Sandy Lane	Teddington, A312/A316 at Apex Cnr
A310	Hampton Wick High St/ Upper Teddington Rd	Teddington, Twickenham

2.2.6 The A310 and B358 meet the A308 (west) at Hampton Wick on the west bank of the river, and cross the river at Kingston Bridge. East of the town centre, west of Norbiton, the A238 and the A2043 join the A308 (east), and enter the town centre as London Road. Therefore the above nine radial routes enter the town centre as five main roads feeding into the town centre inner relief road system. **Figure 2.3** shows how the town centre relief road system keeps through traffic out of the core central area. This has allowed the creation of a pedestrian priority area about 0.5km in diameter, consisting of pedestrianised and lightly trafficked access-only streets, penetrated by the majority of bus routes. This core area is pleasantly extensive but is also severed from its hinterland by the heavily-trafficked relief road. The road presents a barrier to the physical outward growth of the town centre, although not an insurmountable one.

This is demonstrated most strikingly by the recent John Lewis development, which bridges the road at Horse Fair to gain access to the riverside, and also by the new Rotunda development on the Bentalls Depository site.

Figure 2.1 Location of KTC

Figure 2.2 Schematic diagram of road network to KTC

Figure 2.3 KTC relief road system

The public transport network

2.2.7 KTC is a focal point of the local distributor road network, but unfortunately is not a focal point of the rail network. This means that although there is direct rail access to KTC from the west, north and east, there is no direct rail access from its extensive catchment area to the south and south west.

2.2.8 **Figure 2.4** shows the standard off-peak rail service pattern serving the borough. KTC is served by 4 trains/hour to/from New Malden, Raynes Park, Wimbledon, Clapham Junction and Waterloo, operated by South West Trains. Two per hour run on the loop line via Twickenham and Richmond to Clapham Junction and 2/hour on the branch to Shepperton. This means north and west of Kingston there are four trains/hour to and from Hampton Wick and Teddington.

2.2.9 A much superior service to Waterloo of 10 trains/hour is available from Surbiton, 2km south of the town centre. The basic service pattern is as follows:

- from Hampton Court, 2 per hour, slow
- from Woking, 2 per hour, slow
- from Guildford via Effingham Junction, 2 per hour, semi-fast
- from Guildford via Woking, 2 per hour, semi-fast
- from Portsmouth/Basingstoke, 2 per hour, fast.

2.2.10 Hence Surbiton is directly linked by rail to many of the places in Kingston's south-western catchment (e.g. Esher, Walton-on-Thames, Claygate, Oxshott) in a way that Kingston itself is not.

Figure 2.4 Rail services in RB Kingston

2.2.11 Further services of the South West Trains network branch west of Raynes Park. Hence places in Kingston's southern catchment, both within the borough (such as Hook and Chessington), and outside it (such as Epsom and Leatherhead), can only access Kingston by rail via a change at Raynes Park - not an attractive proposition.

2.2.12 The rail network is supplemented by an extensive bus network, which is focused on KTC. The bus network serving the town centre is shown in **Figure 2.5**.

2.2.13 The Council has designated seven strategic bus route corridors, which correspond well with the roads carrying the most buses serving the town centre. The strategic routes are as follows:

- 65 Kingston – Richmond – Ealing;
- 71 Kingston – Chessington;
- 131 Kingston – Wimbledon;
- 213 Kingston – Sutton;
- 281 Tolworth – Kingston – Teddington – Hounslow;
- 285 Kingston – Teddington – Heathrow Airport;
- 726 Bromley – Croydon – Kingston – Hampton Court – Heathrow Airport.

2.2.14 KTC has two bus stations, Fairfield and Cromwell Road, on the east side of the inner relief road. Two services from Richmond Road (65 and 371) terminate on the south side of the town centre. Most services are designed to penetrate the core area of the town centre within the inner relief road to pick up and set down passengers, along Eden Street or Clarence Street.

2.2.15 Kingston Railway Station is on Wood Street, on the north side of the inner relief road. There is no interchange or direct links between it and the bus station. The station feels somewhat severed from the town centre and the bus stations by the need to cross the inner relief road. The linkage between the station and the town centre core area is made by a very wide pedestrian crossing across Wood Street to Fife Road.

Figure 2.5 Bus network directly serving KTC

Parking in KTC

2.2.16 The total number of car parking spaces in the town centre, excluding residents' parking, is estimated to be 7,965. **Table 2.2** sets out this total by type of parking, on weekdays.

Table 2-2 Weekday car parking in KTC

Type	Spaces
RBK-owned public car parks	2,116
Other operators' public car parks	3,427
On-street Pay & Display (Town Centre CPZ)	404
Other on-street (Kingston N & S)	656
Private non-residential (PNR) – large car parks >100 spaces	399
PNR – small car parks <100 spaces	963
Total	7,965

Note: These figures exclude car parking at Surrey County Council

2.2.17 **Figure 2.6** is a plan of the location of public car parks with the number of spaces at each. There are 880 weekday workplace car parking spaces which are opened to the public on Saturdays or Saturdays and Sundays. These are:

- Bittoms multi-storey 500 additional spaces (Sat)
- Kingston University 150 spaces (Sat)
- Brook Street NCP 100 spaces (Sat/Sun)
- Kingston College 130 spaces (Sat/Sun).

2.2.18 Car park charges are as set out in Table 2.3. Shoppers' parking prices range between 70p - £1.40/hour, with the price for 8 hours ranging from £7 - £14, depending on the car park. All car parks providing for the commuter market have season ticket arrangements. Prices range from £384 - £518/quarter. On street meter/pay & display charges vary from 40p - £1.20/hr, with a maximum stay of 1, 2 or 4 hours, depending on location.

Figure 2.6 Location of car parks in KTC

Table 2-3 Car parking prices, car parks open to public all days

Car park	Operator	Type	Spaces	Cost/hr	Cost/ 8 hours	Cost/month (Mon-Sun)
Ashdown Rd	RBK	Surface	94	£1.40	£14.00	N/A
Lady Booth Rd	RBK	Surface	67	£1.40	£14.00	N/A
Cattle Mkt	RBK	Surface	113	£1.40	£14.00	N/A
Cattle Mkt	RBK	Underground	497	£0.90	£9.00	£183.60
Drapers	RBK	Multi-storey	432	£0.90	£9.00	£183.60
Bittoms	RBK	Surface/M-storey	813	£0.80	£8.00	£163.20
Canbury Pl	RBK	Surface	100	£0.80	£8.00	£163.20
Bentalls	Bentalls Centre	Multi-storey	1185	£0.70	£12.00	N/A
Eden Wk	Lasalle Inv. Mgt.	Multi-storey	725	£0.80	£14.00	£150.00
John Lewis	John Lewis Ptshp	Under building	710	£0.70	£13.00	N/A
Bishops Hall	Euro Car Parks	Under building	70	£1.00	£10.00	N/A
Fairfield	NCP	Multi-storey	301	£1.40	£11.00	N/A
St James Rd	NCP	Multi-storey	381	£1.40	£9.50	N/A
Kingsgate Rd	Guardian	Surface	60	£0.70	£7.00	N/A
TOTAL		(average price)	5548	£1.02	£10.89	£168.72

2.2.19 In the areas adjoining the town centre itself there is of course a large amount of street parking, and private off-street parking space. It is evident that a significant number of people destined for the town centre park on street (and free of charge) in the surrounding neighbourhoods and walk to the town centre. This parking will be affected by the introduction of CPZs around the town centre.

2.3 Policy background to the study

2.3.1 KTC is a success story for the Royal Borough, and, clearly, the objective of Council policy is to safeguard and encourage its continuing success.

2.3.2 The accessibility of the town centre has a key part to play in this. The town centre needs to be both conveniently accessible for all the people who wish to visit it, and be a good quality environment for them when they arrive. However, policy on the accessibility of the town centre has to sit within the wider transport policy challenges facing the Borough, of which the biggest is road traffic.

Kingston's traffic problem and the policy response

2.3.3 There is a great mismatch between traffic demand and the capacity of the borough's road network to accommodate it. (The Council's Interim Transport Plan (ITP) document makes the interesting point that a

Kingstonian from 1950 would consider environmental conditions on the borough's main roads to be intolerably bad.) At the same time, it is generally accepted that it is neither possible nor desirable to increase road capacity to meet the potential for traffic growth into the future. Therefore the Council has for a number of years sought to pursue a dual 'carrot and stick' transport policy: improving public transport and walking/cycling facilities as alternatives modes to the car, whilst restraining traffic growth by (a) controlling parking, and (b) no major increases to road network capacity.

2.3.4 Inevitably some tension will be generated between the Council's general policy on traffic and the need to maximise the attractiveness of the town centre to shoppers and other visitors. The car parking issue is an excellent example of this. The existing town centre car parks in KTC are often full to capacity, with visitors experiencing a frustrating search and/or wait for a parking space. However, to build more car parking spaces in the town centre would inevitably exacerbate the existing bad congestion problem on Kingston's main roads.

2.3.5 A park & ride scheme for the town centre is one potential means of meeting the Council's transport policy objectives. The introduction of a permanent all year round P & R service has long been a policy aim of the Council. The Christmas P & R scheme was introduced in 1993, and there has been an aspiration to make it year-round ever since. The study by MTRU in 1994/1995 into the feasibility of permanent P & R showed a positive public reaction to the concept, but there have been no further specific studies since. The aim of this study is to develop more concrete proposals.

2.3.6 The Council's main continuing activity in the area of traffic restraint has been to develop and roll out its Controlled Parking Zone (CPZ) programme. The proposed extended Kingston Town CPZ should help to reduce commuter traffic congestion around the town centre, but will also further increase the need for additional car park space – whether this be in the town centre, or somewhere else, linked to the town centre by park & ride.

2.3.7 As well as tension between the dual objectives of town centre accessibility and traffic restraint, there is also inevitably some tension between the clear need identified by the Council to improve the accessibility of the town centre by public transport (overcoming some of the fundamental shortcomings of the public transport system described in Section 2.2), and the fact that the Council cannot itself deliver improvements to public transport on its own. The Council has policies for bus services and for rail to improve services for the benefit of residents and the business community. However, service changes can only be implemented through persuasion and lobbying of TfL (London Buses), the rail companies and the Strategic Rail Authority to act on its

residents' behalf. The Council's main powers are principally to influence traffic through its responsibility as the highway and traffic authority, but even then, it must bid to TfL for capital funds to spend money on its roads.

2.3.8 The Council's approach in the circumstances is a sensible one. It has participated enthusiastically in the pan-London programmes for introducing bus priority schemes (the London Bus Priority Network and the London Bus Initiative) and cycling facilities (the London Cycle Network).

2.3.9 Meanwhile, it has joined forces with the other South West London boroughs to develop schemes and lobby for improved bus and rail services, through its participation in SWELTRAC (the South West London Transport Conference). SWELTRAC has first studied, then lobbied for, a number of credible public transport improvement schemes which would improve accessibility and help cut traffic in South West London. The main focus of its efforts has been on the issue of improving orbital public transport access to Heathrow Airport. Heathrow is one of the largest traffic generators in the region, contributing to problems at many of the key traffic congestion hotspots (e.g. Kingston Bridge). SWELTRAC's 'SWOPTION' proposal to link Heathrow to Gatwick by rail via Kingston, Wimbledon and Croydon would be of major benefit to the public transport accessibility of KTC from a wide catchment area.

2.3.10 There remains an argument for substantial investment in new public transport, even beyond the SWELTRAC proposals, to make the town centre's accessibility by public transport benefit its status as a strategic town centre for South West London. In the past the Council has developed ideas for light rail serving the town centre. Three potential routes envisaged were: the town centre to Hampton Court, to Surbiton and to Chessington/Epsom (via a new alignment from the town centre to Tolworth along the Hogsmill River, then along the Chessington branch line). Kingston's potential for 'intermediate modes' (light rail or other segregated medium-volume public transport) scored reasonably well in London Transport's 1995 study 'New Ideas for public transport in outer London', but it did not reach the shortlist of schemes for further development, and the ideas have not been further developed since.

2.3.11 Nevertheless, consideration is being given to the extension of Croydon Tram Link, although a precise alignment is yet to be determined, extension of the Hackney Chelsea line with an onward link to Kingston (Crossrail 2), as well as the possible introduction of a metro/underground system to KTC. All these initiatives are some way off and it is not expected that any implementation would take place before 2010.

2.3.12 More recently, the ORBIT Study Interim Report was published which examined the multi-modal options for the London Orbital motorway. Whilst this study is still to be finally reported, the needs to cater for orbital movements, in particular by public transport, are known to be paramount to ease congestion especially on the western sections of the motorway.

2.3.13 The Department for Transport study on ‘The Future of Air Transport in the United Kingdom: South East’ reported in July 2002. Amongst the airport extensions evaluated, Heathrow was identified for potential expansion including a third run-way. This would place increased pressure on the transport network in west London and the impact of this would almost certainly be felt in Kingston. The effect of transport infrastructure proposals such as the ‘Airtrack’ proposals (Guildford, Reading via Bracknell and Waterloo via Richmond) could well complement strategic P & R sites.

Previous studies

2.3.14 The following reports of previous study work were made available to CBP:

- RBK Car Park Study, Statistical Analysis of survey data (Halcrow Fox, Nov 1991)
- Bus P & R Study (for Bromley and Kingston), Draft report on Stages 2 & 3 (MTRU, Apr 1995)
- Kingston Integrated Transport Strategy, Draft Final Report (Halcrow Fox, Jul 1998)
- Kingston CONTRAM model, Model Validation Report (Halcrow Fox, Mar 2000).

2.3.15 RBK’s Interim Transport Plan 2001-2002 (RBK, Jul 2000) was also supplied.

Current wider policy context

2.3.16 The wider policy context for the Council’s transport policies and programme is now set by the Mayor of London’s Transport Strategy. The Council must produce a (Mayor’s Transport Strategy) Local Implementation Plan (LIP), a document setting out the Council’s transport policies. The LIP must demonstrate its compliance with the Mayor’s Strategy.

2.3.17 The Mayor also now controls funding to the Council for its transport capital spending programme. The borough must produce an annual Borough Spending Plan (BSP), which is a bid to Transport for London for grant (for the following financial year) to implement the LIP. The format of the BSP, and the type of schemes for which bids are encouraged, are prescribed by TfL's BSP Guidance.

2.3.18 The Council's existing 'carrot and stick' policies are very much in line with the Mayor's Transport Strategy, so there are no problems right now: for example, the Mayor's Transport Strategy (proposal 4G.12) looks to achieve zero traffic growth in outer London town centres between 2001 and 2011. But the Council's freedom of action to change its transport policies (for example, to move away from traffic restraint) is now much more constrained than it was prior to the new system, because of the need for compliance with the Mayor's Transport Strategy, and TfL's control over its BSP grant. .

2.3.19 The latest BSP guidance is supportive of borough bids for 'town centre flagship schemes' or 'local area treatments' – packages of access and streetscape improvements which together will add up to a major investment in the appearance of key town centres.

2.3.20 The main disappointment for Kingston in the Mayor's Transport Strategy is the lack of any firm proposals for major infrastructure projects involving Kingston which would assist in the achievement of the zero traffic growth target.

2.3.21 Therefore, to maintain the continued success of the town centre, the Council must focus its attention on achieving growth in trips by sustainable transport modes. In conclusion, in terms of the overall policy context, there is good potential for the Council to develop a strong bid to TfL for capital funding of a P & R car park and for bus priority measures along the route into the town centre. There is also potential for revenue support towards P & R bus (or rail) services and these need to be explored in the context of demand and revenue forecasts, as well as the overall financial and social/economic cost-benefit appraisal of a potential scheme.

3. ASSEMBLING THE LAND FOR PARK & RIDE SITES

3.1 Identifying and selecting the land for P & R sites

3.1.1 A key policy issue which needs to be tackled head on is determining land for the car park. A park & ride car park needs to be of a substantial size to make a frequent bus service to it viable: at least 350 spaces would typically be required; more to make it financially self-supporting. This requires a substantial area of land, unless decked or multi-storey car parking is to be contemplated, the cost of which would normally be prohibitive.

3.1.2 In most historic towns contemplating park & ride, the logical place for the site is on the edge of the built up area, typically at the point where a high capacity inter-urban arterial road meets or changes into a lower capacity urban radial road to the town centre. However almost all historic towns have Green Belts or other restrictive land use planning policies to prevent urban sprawl at the town perimeter.

3.1.3 Kingston, located at the edge of the Greater London conurbation, has a more complicated spatial context, but broadly the same fundamental problem. Almost all land at the urban perimeter is designated Green Belt, and this is strongly protected by the planning authority. Where there are suitable redevelopment sites, these are relatively scarce and have great potential value for much higher yielding use than park & ride car parking. Typically, it is only on designated Green Belt where land or rent is adequately cheap to make park & ride use viable.

3.1.4 This is a key problem for national integrated transport policy, and the government has responded by issuing planning policy guidance on park & ride in the Green Belt (DTLR PPG2 Green Belts, paras 3.17-3.20). This states that, notwithstanding the general presumption against development in the green belt:

‘Park & ride development is not inappropriate in Green Belts, provided that:

- a) a thorough and comprehensive assessment of potential sites has been carried out, including both non-green belt and, if appropriate, other green belt locations, having regard to sustainable development objectives, and the need to be flexible about size and layout;*

- b) the assessment establishes that the proposed green belt site is the most sustainable option taking account of all relevant factors including travel impacts;*
- c) the scheme will not seriously compromise the purposes of including land in green belts, as set out in paragraph 1.5;*
- d) the proposal is contained within the Local Transport Plan (or in Greater London the Local Implementation Plan) and based on a thorough assessment of travel impacts; and*
- e) new or re-used buildings are included within the development proposal only for essential facilities associated with the operation of the park-and-ride scheme.*

3.1.5 This study is intended to meet the requirements to investigate options thoroughly. However, any promising park & ride scheme option which is on designated Green Belt land must take the above guidance into consideration at all times, and a very robust case will be required.

3.2 What makes a good park & ride system?

3.2.1 This section discusses the criteria for making a successful park & ride. The reasons for providing a park & ride can be summarised as follows:

- To contribute to the vitality and viability of town centres, without damaging their environment;
- To reduce congestion on their approaches;
- To provide an alternative to the car for at least the destination end of the trip.

3.2.2 In the case of Kingston, these aims would seem to be one way in which to directly address the traffic and parking problems currently existing in the town centre. CBP's survey has shown that 47% of respondents would use a P & R service if one were available.

3.2.3 It follows from the aims identified above that the design of a P & R system must be demand led. P & R aims to intercept car journeys and must therefore be planned to achieve such interception.

3.2.4 RPG3 (1996) identifies the opportunity for P & R in outer West London where there is scope for schemes which provide good quality parking away from town centres. The guidance recommends that London Boroughs consider P & R and allocate land for it in their UDPs. However, the Boroughs are advised that P & R should not make car use more attractive and should only be considered as part of a wider transport strategy aimed at reducing overall car use.

Criteria for P & R

3.2.5 In the early days of providing advice on the introduction of park & ride, the Department of Transport used to draw up lists of the characteristics of good operation. However they soon discovered that for every ‘essential’ good characteristic there was usually a park & ride scheme which worked well without it. The ingredients of success are therefore not always easy to define, though attempts are interesting.

3.2.6 TAS mention important factors as being:

- Cheaper parking on the park & ride site
- A good image
- High quality vehicles
- Car park security
- Bus priority.

3.2.7 A recent study, commissioned in 1998 by DETR from consultants WS Atkins (*The Travel Effects of Park & Ride*), included a survey of users’ motives in choosing to use park & ride. In descending order of priority these were:

- Cheaper than parking in the centre
- Convenient/easy
- Frequent bus
- Reliable
- Difficult to park in the centre
- Quicker than driving
- Good secure parking at park & ride site
- Less stress/hassle
- Easy access to site
- Saves sitting in traffic
- Bus service is better than stopping one.

Reasons for Mode Choice

3.2.8 When designing a park & ride the reasons people have for choosing a specific mode will need to be considered if their reluctance to use the facility is to be overcome. In the 1998 Atkins report the following reasons behind mode choice are listed in order preference:

- Time available, length of stay and length of journey
- Congestion and availability of parking by time of day
- Multiple journeys
- Weather
- Amount of shopping

- Convenience
- Cost of parking and whether PNR parking available
- Criticisms of public transport
- Car availability and ease of using a car
- Whether or not travelling alone
- Health / leisure

Negative aspects

3.2.9 Park & ride is not without its critics who identify some of the negative aspects. If the park & ride is to be successful it must guard against the consequential negative aspects and show that the benefits more than outweigh any disbenefits. The critics may argue that the following are disbenefits:

- abstraction of passengers to park & ride from existing public transport services;
- park & ride increasing vehicle mileage;
- park & ride freeing up urban road capacity, releasing suppressed local trips;
- park & ride sites at public transport interchanges can restrict high density development at the interchange;
- park & ride sites can damage environmentally sensitive locations.

4. THE DEMAND FOR TRAVEL TO KTC

4.1 Introduction

4.1.1 The development of P & R scheme options must flow from an understanding of the existing pattern of demand for travel to KTC.

4.1.2 This chapter describes how the study sought to establish the size and characteristics of the travel market segments which would be targeted by a P & R service – those trips currently being made by people driving to the town centre by car and parking in it. The travel market segments are defined in terms of:

- time period (day of week; arrival time in town centre);
- trip purpose/duration of stay in town centre;
- origin location of trip to town centre (and destination after leaving town centre).

4.1.3 A number of data sources were used to establish the total number of trips by car to the town centre area in each relevant time period. The data from these sources are provided in Appendix A and are summarised below.

4.1.4 In addition, new surveys were undertaken by CBP to understand the nature of the travel markets, and gather the input data needed for the demand forecasting for P & R scheme options. Two surveys were undertaken, corresponding to the two main travel markets which might be targeted by P & R scheme in Kingston:

- workplace survey (travel to work – mainly weekdays, arriving in the morning peak and staying all day);
- shoppers car parks survey (shopping/personal business – mainly weekdays, arriving after the morning peak, plus weekends, staying for 1 – 5 hours).

4.1.5 Further details on the CBP surveys are shown in Appendix B and are summarised below.

4.2 The number of person trips by car to KTC

4.2.1 The weekday number of person trips by all modes of travel to KTC between 0715 and 1600 is estimated to be 98,250 trips. The equivalent number of person trips by car terminating in KTC is calculated at 36,353 trips (or the equivalent of 26,535 cars).

4.2.2 8,040 of the car trips are carried out between 0715 and 0930 and the remaining 18,495 trips are between 0930 and 1600.

4.3 The CBP surveys

4.3.1 Two new surveys were undertaken by CBP in December 2001 with the objective of collecting the necessary data to develop the PRIDE demand forecasting model for any P & R scheme option:

- the car parks survey (or ‘unparking survey’): face to face interviews with people departing from five of the largest town centre car parks;
- the workforce survey: a self-completion questionnaire distributed to staff at four major employers in the town centre.

4.4 Car Park Survey Results Summary

4.4.1 The majority of respondents to the car park survey were visiting KTC to undertake a shopping trip. This very much reflected the time of year in which the survey took place i.e. in the weeks immediately prior to Christmas.

4.4.2 The survey shows that the catchment area of the origin of trips to KTC is extensive, particularly to the west, south-west and south-east, up to and beyond the M25. There is a smaller percentage of trips from the north.

4.4.3 The survey revealed the following:

- that the average car trip journey to KTC was 37 minutes.
- the average length of stay in a car park was 2 hours and 26 minutes.
- The average length of time between arriving in KTC and finding a parking space was 10 minutes.
- The average charge paid for parking was £2.42.
- 83% of survey respondents returned to the same address as their trip origin. This suggest that for 17% of trips, P & R may not be convenient because of an indirect return trip origin.

- Overall, 33% of respondents were aware of the Christmas P & R service. More local residents know of the scheme e.g. 50% of Epsom respondents and 81% of Chessington respondents confirmed their awareness.
- Overall, 48% of people said they would consider using a permanent P & R scheme to KTC is one were made available.
- The survey responses showed there is more likelihood of a person using P & R relative to the higher level of parking charge paid and the longer the search time for a parking space.

4.5 Workforce Survey Results Summary

4.5.1 40% of the workforce live in the Borough and most of them travel to work by car or bus as shown in the table below:

Table 4-1: Table of mode share amongst workforce

Travel Mode	%
Car	38.3
Bus	37.0
Walk	11.1
Train	7.4
Cycle	3.7
Other	2.2
P & R	0.3
	100.00

4.5.2 The survey shows that the catchment area of the workforce trips by car to KTC is similar to that of the shoppers, with the majority living to the west and south-east of KTC.

4.5.3 The survey revealed the following key points:

- 65% of people travelling to work by car park on street.
- The average time to walk to the workplace from parking was 11 minutes.
- The average travel time from home to work in total was 44 minutes (33 minutes car drive plus 11 minutes walk).

- 70% of respondents did not pay anything for parking. This was made up mostly of people who parked free of charge on the street.
- 30% of respondents paid for parking, the average daily cost being £4.98.
- 33% of respondents said they would consider using P & R if on-street parking was made impossible.
- When asked which of the P & R sites they might choose, 20% said Tolworth, 11% said Chessington and 11% said Hampton Court Green.
- 36% of respondents replied that they did not know which of the sites they would use whilst 32% said they would not use any of the sites.

5. THE LONG LIST OF POTENTIAL P & R SITES

5.1 Introduction

5.1.1 The following nine sites were considered in outline as potential P & R car park sites (letters in accordance with brief):

A	Chessington World of Adventure
B	M25 junction 9
C	Sandown Park
D	Kempton Park
E	Hampton Court
F	Hawker Centre
H	Roehampton Vale
J	Tolworth
K	Raynes Park (identified by CBP)

5.1.2 **Figure 5.1** shows the location of the long list potential park & ride sites locations in the study brief.

5.1.3 Site visits and investigations were made with respect to each site. Summaries of the site descriptions and outline comments on the car park details are given as follows:

Figure 5.1 Location of long list sites

5.2 A. Chessington World of Adventures

Site description	Chessington World of Adventures is a leisure theme park located on the A243 Leatherhead Road between Malden Rushett and Hook. The main (north) car park for the theme park is currently used for the Christmas P & R service by agreement with the World of Adventures, which is closed in the winter months. The main car park would not be available for use by a year-round P & R scheme, as it is needed for customers of the theme park. The site under consideration for a year-round P & R is the existing southern overflow car park, on the south side of the theme park and reached by a separate access road off the A243
Car Park Details	The site would need to be resurfaced and the access road would require some upgrading. Signal control of the junction with the A243 would be preferable but a protected right turn filter lane on the main road in a simple priority junction layout might also be acceptable.
Site area (ha)	0.77
No. of spaces	262
Route to KTC	The route into Kingston is reasonably direct. There is scope for bus priority at some of the congestion points along the route (e.g. the A243/A3 junction at Hook), but not at others.
Land designation	Green belt
Ownership	Chessington World of Adventure
Planning Authority	RBK

5.3 B. M25 Junction 9 Leatherhead

Site description	<p>This proposed car park location is adjacent to the complex interchange between the M25 and the A243 (M25 J9), on the northern edge of Leatherhead. The site under consideration is off Barnett Wood Lane adjacent to the southern roundabout (M25 westbound off and on slip), to the west of the A243 and north of the A245 Leatherhead By-Pass Road.</p> <p>The site is ideally placed to intercept traffic leaving the M25 from the east and heading for KTC. Although the flow off the M25 is high, the proportion of it actually heading for KTC is low. The location is ideal for a park & ride site, but not necessarily one focused on serving Kingston only.</p>
Car Park Details	Resurfacing would be required along with a substantial access junction arrangement e.g. signals, from either the A245 or the link road between the two junctions forming J9 of the M25.
Site area (ha)	3.71
No. of spaces	1,200
Route to KTC	The route to Kingston is via the A243, past Site A, and thence the same route as Site A. This location is the furthest site from KTC. Potential traffic congestion is related to the motorway junction and Leatherhead traffic.
Land designation	Green belt
Ownership	Private
Planning Authority	Mole Valley

5.4 C Sandown Park

Site description	The proposed car park location is on the site of Sandown Park racecourse on the A307 Portsmouth Road. The location could be suitable to intercept traffic on the A307 from Cobham, (and M25/A3 via Pains Hill junction) and from the A244 (from Walton, Horsham, Feltham, Leatherhead) and from the M25/A3 via Gypsy Lane junction. The race course car parks are large and are being extended. A key problem is that although the existing car parks are large, they are filled to capacity on race days, which happen 26 days/year, all year round, both weekdays and weekends. The car parks are also used for other conferences, fairs and sales events.
Car Park Details	Upgrading of an area of existing overflow car park would be required. This would include resurfacing. Improved access to the site would also be required possibly in the form of a signalled junction.
Site area (ha)	0.6 – 2.26
No. of spaces	200-800
Route to KTC	The route into Kingston is direct, along the A307 (Portsmouth Road). There is the opportunity for bus priority at some congestion spots along the route (e.g. at the Scilly Isles roundabout, junction with A309), but a continuous priority route is certainly not possible. Trains from Esher station do not serve Kingston, requiring a change to bus at Surbiton.
Land designation	Green belt
Ownership	United Racecourses
Planning Authority	Embridge BC

5.5 D. Kempton Park, Sunbury

Site description	<p>This proposed car park location is also the site of Kempton Park race course on the A308 Staines Road east. The location is strategically very well placed to intercept traffic coming off the A316/M3 junction and also the A308 from Staines. The route to Kingston is along the A308 via Hampton Court. This is often badly congested with few opportunities for bus priority. However, the site does have the advantage of the neighbouring Kempton Park railway station (open race days only).</p> <p>There is scope here for the ‘Ride’ element to be via Rail rather than bus. These modal choices are discussed in the subsequent chapter on the site short list.</p> <p>As with Sandown Park, the car parks for the race course are extensive and could be used, but this would need to be programmed with race days. However, there also exists a strip of land directly to the north of Kempton Park station, in the ownership of the racecourse. This could form a suitable car park location with access from the A316. This option needs further detailed examination.</p>
Car Park Details	Utilising the current racecourse car park would require no additional surfacing. However, if the land to the north of the station is used, this would require upgrading with new surfacing and access junction.
Site area (ha)	0.93 – 2.8
No. of spaces	280 – 900
Route to KTC	Shepperton rail line but alternative bus operation in the short term is a possibility
Land designation	Green belt
Ownership	United Racecourses
Planning Authority	Spelthorne BC

5.6 E. Hampton Court Green

Site description	<p>Hampton Court Green is alongside the A308 Hampton Court Road, north of the A309 Hampton Court Bridge and opposite the grounds of the royal palace. This proposed car park location is on the eastern section of Hampton Court Green. A P & R site on the green adjacent to the north end of the bridge (A308/A309 roundabout) would be a highly strategic location to intercept traffic from both sides of the river heading for the KTC along Hampton Court Road.</p> <p>There would be considerable traffic congestion benefits at Hampton Wick and Kingston Bridge if modal switch to P & R could be achieved here. However, it would be dependent on the introduction of bus priority.</p>
Car Park Details	<p>There is an existing free car park on the Green a quarter of a mile west of the roundabout, owned and operated by the Royal Palace, but it is small and would need to be substantially enlarged to accommodate a park & ride site. The issue of converting part of Hampton Court Green to a car park would clearly be a highly controversial one. The proximity of the grounds of the Royal Palace is a matter of national heritage importance. However, given that the road network around the Palace is so badly blighted by traffic, and that a P & R scheme would offer the opportunity to reduce some traffic flow on the A308 Hampton Court Road between Hampton Court and KTC thereby reducing congestion, it ought to be given sensible consideration.</p> <p>To overcome the environmental sensitivity issue, the idea of operating park & ride with a ‘heritage tramway’ has been mooted in the past. However, the controversy over land take for the car park itself would remain.</p>
Site area (ha)	1.02
No. of spaces	348
Route to KTC	<p>Bus routing to KTC would be along the A308.</p> <p>As well as bus based P & R, Park & sail is also possible, utilising boats from Hampton Court Pier to Kingston Pier. This would be an attractive leisure activity, which could be promoted now on</p>

	existing services. However, the concept of park & sail for everyday utility use is not a good one. The journey is slow, access to the piers is not particularly convenient, and the cost of providing the dedicated fleet of boats necessary to offer a ‘turn up and go’ service frequency would be prohibitive.
Land designation	Green Belt
Ownership	Royal Palace
Planning Authority	LB Richmond

5.7 F. Hawker Centre, Lower Ham Road, North Kingston

Site description	<p>The proposed car park site is north of Kingston adjacent to Lower Ham Road, just west of the A307 Richmond Road. A park & ride located here would be well placed to intercept traffic from the A307 north (Richmond direction).</p> <p>The site is the playing fields of the Hawker Athletic Club, which was linked to the former Hawker aircraft factory now redeveloped for housing.</p>
Car Park Details	<p>The playing fields have an existing car park, but too small to support a park & ride bus service, and clearly needed for the playing fields themselves. Any extension of the car park would be on to the playing fields, and this could be difficult to justify in terms of environmental and also recreation policies.</p>
Site area (ha)	0.35
No. of spaces	Approx 120
Route to KTC	A307
Land designation	Recreation
Ownership	Private
Planning Authority	RBK

5.8 H. Kingston University, Roehampton Vale

Site description	The proposed car park is on the south east side of the A3 Roehampton Vale just north east of the A3 Robin Hood junction. It is currently a car park for Wimbledon Common and sports club training fields. It is adjacent to Kingston University's Roehampton Vale campus, which has a large amount of its own parking. Adjacent to the north-east is the large Asda superstore, which also has a large car park. Both of these have spare capacity which is potentially complementary – on Saturdays the Asda car park is full but the University site is mostly empty, and on weekday daytimes the University is busy, but Asda has more spare capacity.
Car Park Details	In terms of a dedicated park & ride car park, there are two potential sites to the south-west of the university campus. Site H1 on the plan is to the west of Beverley Brook and is part of Wimbledon Common. Site H2 on the plan is the existing car park of the current Wimbledon FC training ground. Both sites together would provide capacity for approximately 400 spaces. Site H2 alone is probably too small to support a park & ride bus service on its own.
Site area (ha)	1.06
No. of spaces	424
Route to KTC	A park & ride at this location would be well-placed to intercept traffic approaching Kingston from the A3 (traffic coming from inner London). Buses could reach the town centre directly via the A308, along which some bus priority measures could be implemented.
Land designation	Green belt
Ownership	LB Wandsworth – LB Wandsworth have proposed to develop a P & R site in this location for a service to Wandsworth town centre and central London.
Planning Authority	LB Wandsworth

5.9 J. Tolworth, Jubilee Way junction with the A240 Kingston Road (PS43)

Site description	<p>The proposed car park is at the north west corner of the A240 Kingston Road junction with Jubilee Way. It is a good location to intercept traffic from both the A3 and the A240.</p> <p>Two potential sites are under consideration: J1, land at Jubilee Way junction with A240 Kingston Road, south of Tolworth station and J2, the former Government Building site north of Tolworth station.</p> <p>There are extensive areas of redundant land around Tolworth Station which could be used for parking. There is also the opportunity to develop some of the land e.g. with a foodstore, leisure development, which could be used to fund the implementation of the site and also provide some cross-linking of trips.</p>
Car Park Details	The site would require resurfacing throughout. A new minor access in to the site would be required from Jubilee Way but the signalised junction on the A240 would be adequate to accommodate the additional traffic movements.
Site area (ha)	1.8 – 5.2 (with government building)
No. of spaces	700 – 1730 (with government building)
Route to KTC	The proximity of Tolworth Station could mean that the P & R could link to the rail service. However, this would be for trips to central London rather than Kingston. For Kingston, a bus would have to route from the site along the A240.
Land designation	Recreation / leisure
Ownership	RBK
Planning Authority	RBK

5.10 K Raynes Park

Site description	A site at Raynes Park was identified by CBP due to the high demand for trips from the east and south east of Kingston to KTC. A specific site has not been identified and indeed it would appear that currently there is no obvious land available. However, a site in close proximity to Raynes Park railway station would satisfy a demand for trips from the east of Kingston.
Car Park Details	No specific site identified.
Site area (ha)	N/A
No. of spaces	N/A
Route to KTC	The route to KTC could be via the A238 to KTC if road based. However, a better solution would be to have a rail based P & R with an improved service frequency on the branch line to KTC.
Land designation	N/A
Ownership	N/A
Planning Authority	LB Merton

6. APPRAISAL OF THE LONG LIST OF POTENTIAL P & R SITES

6.1 Introduction

6.1.1 CBP has taken a ‘demand-led’ approach to option development and the appraisal of the long list of sites required to be undertaken. The demand-led approach takes as its starting point the balance of costs between driving all the way to park in the town centre, and choosing to divert to a park & ride service. The reasoning is simple: any park & ride site serving the town centre must generate adequate patronage for it to be viable. It is entirely possible - and this has been CBP’s experience before in other major UK cities - that if there is plentiful and cheap parking available in the town centre, then there are no sites, wherever they might be located, which will generate any patronage whatsoever for a park & ride service.

6.1.2 This is unlikely to be the case in Kingston, where there is clearly a parking shortage. However, appropriately accurate demand forecasting remains absolutely necessary as the starting point for calculating potential revenues, and hence the financial and cost-benefit case for the scheme. It is also the best starting point for appraisal of the long list of sites, in order to identify a shortlist for more detailed option development.

6.1.3 The approach adopted has been to build a demand forecasting model, PRIDE. In the first instance this has been used to establish which of the long list sites are best located in relation to the town centre’s catchment area – the origin addresses of people currently driving to the town centre - and to intercept them from the routes to the town centre that they actually use.

6.1.4 This is just the beginning of the appraisal process, however. The issues of the planning policy difficulties involved in developing suitable sites for park & ride have been discussed, and the cost of site development/engineering is also clearly crucial to the cost-benefit assessment of any scheme.

6.1.5 In this chapter:

- Section 5.2 describes the development of the PRIDE model;
- Section 5.3 describes the appraisal criteria used to assess the long list;
- Section 5.4 sets out the appraisal scores
- Section 5.5 sets out the conclusions on the recommended shortlist.

6.2 Development of the PRIDE model

6.2.1 PRIDE is a transportation assessment model developed by CBP to assist in demand forecasting for P & R scheme options.

6.2.2 For trips to the town centre from any given location or traffic zone, PRIDE calculates the generalised cost (that is, the total cost in money, time and inconvenience) of the alternatives ‘drive all the way’ and ‘use P&R’. From the cost differential between the alternatives, PRIDE calculates the ‘diversion rate’ to use P&R from that zone, using a logit-type model. From the diversion rate, and other inputs such as average car occupancy and average length of stay, PRIDE can then calculate the number of tickets that will be sold on the park & ride service and the maximum occupancy of the car park.

6.2.3 Surrey County Council collaborated with CBP to use the Surrey County Traffic Model (SCTM) to generate the key input data for the Kingston PRIDE model, and SCC’s help is gratefully acknowledged. A ‘cost skim’ was taken from the Surrey model, giving data for the cost of driving from each traffic zone in the Surrey model to the town centre, and to each of the 9 park & ride site options. The model has 772 zones, covering the wider area of south and west London outside the county boundary in good detail.

6.2.4 To this was added the other elements of the generalised cost calculation for the alternatives ‘drive all the way’ and ‘use P&R’ for each of the long list site options:

- search time for parking in the town centre;
- cash cost of parking in the town centre;
- walk and wait time at P&R site
- ride time on P&R service
- cash cost - parking cost at site/fare on the P&R service

6.2.5 Trip distribution (the number of trips from each traffic zone) was calculated from the findings of the CBP surveys, grossed up to the total number of terminating trips in the town centre in the CONTRAM model, as described in Section 3.2 above.

6.2.6 The diversion to P&R was modelled for three time periods/market segments:

- 0715-0930 travel to work (stay all day);
- 0715-0930 other (stay less than all day – average 2 hours);
- 0930-1600 all trips.

6.2.7 The values of the logit model constants were derived from previous CBP P & R studies. An attempt was made to calibrate the model against the observed level of demand for the Christmas P & R service at the Chessington site.

Assignment of the CBP demand matrix to the Surrey traffic model

6.2.8 In addition to the cost skim from the Surrey traffic model, the opportunity was taken to assign the CBP demand matrix to the Surrey model's road network. This calculates the route taken by all trips terminating in the town centre.

6.2.9 A resulting map plot, for morning peak travel to work traffic, is shown in **Figure 6.1**, and for all interpeak traffic in **Figure 6.2**. Figure 5.1 shows the number of car trips on the network in the AM peak hour (0730-0930) with a destination in KTC and with a trip purpose of 'journey to work'. Figure 6.2 show the number of car trips on the network in the interpeak period between 0930 and 1630 with a destination in KTC and for all trip purposes.

6.2.10 The plot shows clearly where the routes taken by traffic to the town centre converge onto the main radial approaches. The traffic flows highlighted in red broadly correspond to the flow of traffic adequate to make a P & R site viable, if a reasonable diversion rate is achieved. The location of the long list sites in relation to these flows is clear. (However, it should be noted that the PRIDE demand forecasts are not based merely on the diversion from the adjoining road, but on the balance of costs from the overall catchment area – meaning that some people will divert to the P & R site from other town centre approach routes, if it benefits them to do so.)

Figure 6.1 Assignment of CBP matrix to SCTM – am peak work trips

Figure 6.2 Assignment of CBP matrix to SCTM – interpeak trips

6.3 Appraisal criteria

6.3.1 The long list sites were ranked against the following criteria:

Demand criteria

- Based on the output from the PRIDE model

Transport issues criteria:

- location with respect to the KTC catchment area and key routes to it;
- ease (and likely cost) of providing competitive ride time on P&R service to town centre;
- potential to serve other destinations.

Planning issues criteria:

- size/potential size of the site;
- land ownership, potential availability for P & R use, synergy with other development opportunities;
- planning policy considerations;
- environmental sensitivity of the site;
- impact on neighbours.

Site engineering criteria:

- ease (and likely cost) of providing convenient site access;
- ease (and likely cost) of cost of constructing car park;
- ease (and likely cost) of expansion on the site.

6.4 Long list appraisal results

6.4.1 The sites were scored in rank order against each of the criteria under the three headings. These were summed to produce a ranking or 'league table' of the sites. The rankings against the four headings were then also summed to produce a final ranking of the long list sites. The ranking formed the basis for the judgement made on the content of the shortlist, as described in the text.

6.4.2 It is important to stress that the ranking is not an absolute measurable score, but merely a simple means of summarising the performance of each site option against the relevant criteria, and of informing the judgement required to be used in determining the shortlist.

Demand criteria

6.4.3 The results of testing the long list of sites using PRIDE were as follows:

Table 6-1: Long list PRIDE Results (0730-1600)

Site	Total Trips	P & R Trips	Interception rate	Ranking
Hampton Court	9329	1860	0.20	1
Raynes Park	8820	1624	0.18	2
Sandown Park	7399	1435	0.19	3
Kempton Park	7396	1304	0.18	4
Tolworth	6562	1112	0.17	5
Hawker Centre	3668	655	0.18	6
Chessington W of E	4278	584	0.14	7
Roehampton Vale	2001	405	0.20	8
M25 junction 9	1695	169	0.10	9

Note: The lower the ranking the higher the demand

6.4.4 Table 6-1 shows the attractiveness of the various sites in terms of demand. Hampton Court is the most effective site attracting 1860 trips in the period 0730 to 1600. The M25 site is the least effective attracting only 169 trips in the same period. Hampton Court and Roehampton Vale site have the highest interception rate but in the case of Roehampton, the site is located on a corridor with few trips with a destination in KTC.

6.4.5 It is clearly apparent that the top five sites are easily the most successful at abstracting car users. Sites six to nine show a stepped reduction in the amount of trips they will attract. These sites are unlikely to represent effective P & R locations for Kingston but could still prove effective if other objectives are to be satisfied e.g. strategic London sites, gateway sites for Heathrow etc.

Transport criteria

6.4.6 The ranking of the sites for their location with respect to the catchment area of the town centre was a judgement based on the origin of trips to the town centre as revealed by the surveys (see Figure 3.4 and 3.6), by the Surrey Traffic Model assignment (see Figures 6.1 and 6.2), and by the proximity of the site to the primary road network.

6.4.7 The ranking for the P & R service was a judgement based on two elements:

- 1) The potential **round trip journey time** for the park & ride service between the site and town centre – this determines the number of vehicles required to offer a high frequency service, and hence a large share of the cost of operating it.
- 2) The competitiveness of the **potential ride time on the service relative to driving all the way** – this is determined by the opportunities for giving priority to the P & R service on its route in to

town centre. For Kempton Park, a rail service was assumed. For the other sites, a bus service was assumed.

6.4.8 The sites were also ranked by their potential to serve other destinations which are major attractors for car-borne trips on the Kingston road network, in addition to the KTC. Key attractors included central London by rail and Heathrow Airport.

6.4.9 The ranking of the sites on transport criteria is shown in Table 6-2:

Table 6-2 Long list sites – ranking against transport criteria

			Location wrt catchment	Time on route in	Serve other locations	Score
1	J	Tolworth	1	6	3	10
2	E	Hampton Court Green	3	2	7	12
3	C	Sandown Park	2	5	6	13
4	R	Raynes Park	5	7	1	13
5	D	Kempton Park	6	4	4	14
6	H	Roehampton Vale	7	3	5	15
7	F	Hawker Centre	8	1	7	16
8	A	Chessington World of Adventures	4	8	7	19
9	B	M25 J9	9	9	2	20

Note: The lower the score, the better the site

Planning criteria

6.4.10 The Planning criteria was based on an assessment of the deliverability of the sites in terms of the planning process and land assembly. In particular the sensitivity of the sites in terms of the environment and the local community were assessed as these factors could result in objections which could be difficult to resolve. The ranking by land use planning criteria is shown in Table 6-3:

Table 6-3 Long list sites – ranking against land use planning criteria

			Size	Land owner- ship	Plann- ing powers	Site environ- ment	Neigh- bours	Score
1	J	Tolworth	4	1	1	4	1	11
2	A	Chessington World of Adventures	7	2	1	1	1	12
3	D	Kempton Park	2	2	4	1	3	12
4	C	Sandown Park	3	2	4	1	3	13
5	B	M25 J9	1	5	4	5	3	18
6	F	Hawker Centre	8	5	1	6	6	26
7	H	Roehampton Vale	6	5	4	6	6	27
8	E	Hampton Court Green	5	5	4	8	8	30

Note: The lower the score, the better the site

Site engineering criteria

6.4.11 Site engineering considered the sites in terms of practical ease of implementation. In particular access to the site and cost of construction were key determining factors. In addition, the opportunities to expand the site were considered. The ranking by site engineering criteria is shown in Table 6-4:

Table 6-4 Long list sites – ranking against site engineering criteria

			Cost of access	Cost of car park	Cost of expansion	Score
1	C	Sandown Park	5	1	1	7
2	D	Kempton Park	5	1	1	7
3	J	Tolworth	4	4	1	9
4	B	M25 J9	5	4	1	10
5	E	Hampton Court Green	5	4	1	10
6	F	Hawker Centre	1	4	6	11
7	H	Roehampton Vale	1	4	6	11
8	A	Chessington World of Adventure	5	1	6	12

Note: The lower the score, the better the site

Overall ranking of long list

6.4.12 The overall ranking of the long lists of sites is shown in Table 6-5:

Table 6-5 Long list sites – overall ranking

			Demand	Transport	Planning	Site engineering	Score
1	C	Tolworth	2	3	4	1	9
2	J	Sandown Park	4	1	1	3	10
3	D	Kempton Park	3	4	2	1	10
4	E	Hampton Court Green	1	2	8	4	15
5	A	Chessington World of Adventure	6	7	2	8	23
6	F	Hawker Centre	5	6	6	6	23
7	H	Roehampton Vale	7	5	7	6	25
8	B	M25 J9	8	8	5	4	25

Note: The lower the score, the better the site

6.4.13 The top ranked site overall was Tolworth, which was the top ranked site on both the transport and planning criteria. In transport terms, it is well-placed at the A3/A420 junction, and is accessible from the entire catchment served by the A3, as well as more directly from one of the main radial routes serving the south-east quadrant of the catchment area, an area that generates a large number of trips to the town centre.

6.4.14 Sandown Park was ranked second, due to its location at the confluence of three radial routes from the extensive south-west quadrant of catchment area, which generates a large number of car-borne trips the town centre. Third was Kempton Park, which is well-located for traffic from the south-west, west and north-west.

6.5 Conclusions and shortlisting

Table 6-6 Recommendations for shortlisting

		Site	Comment
1	J	Tolworth	Shortlist for bus P&R scheme
2	D	Kempton Park	Shortlist for rail P&R scheme
3	C	Sandown Park	Shortlist for bus P&R scheme
4	E	Hampton Court Green	Not recommended initially; possibly reinstate later if no progress on Kempton Park site
5	A	Chessington World of Adventure	Not recommended initially; possibly reinstate later if no progress on Tolworth site
6	B	M25 J9	Not recommended initially; requires separate investigation in context of a strategic P&R for Heathrow / Gatwick / Stansted
7	F	Hawker Centre	Not recommended
8	H	Roehampton Vale	Not recommended
9	R	Raynes Park	Not recommended; further study of redevelopment/upgrade of the station interchange recommended.

7. THE SHORTLIST OF POTENTIAL P & R SCHEMES

7.1 Sandown Park

Summary of the key points on Sandown Park as a P & R

7.1.1 The site is a good strategic intercept location for catchment areas to the south-west of KTC.

7.1.2 The site has existing car parks with spare capacity but these are **not available for exclusive all-year-round use.**

7.1.3 A previous planning application for a Millennium Dome related P & R car park was opposed by residents and refused by Elmbridge Council.

7.1.4 Potential for P & R requires careful negotiation with a) United Racecourses, b) with local residents and c) with Elmbridge Borough Council.

7.1.5 A strategy for operating the car park serving both United Racecourse land use interests and a P & R service would be to designate a 200 space 'core' P & R car park. On 'non-race days' the P & R car park space could be extended up to a maximum of 800 spaces.

7.1.6 The P & R service would provide an enhanced, limited stop, regular (e.g. every 10 minute) service between Esher and KTC, available to non-car users.

General comments

7.1.7 Sandown Park is a commercial racecourse, owned by United Racecourses Ltd. It is located on the A307, 0.5km east of Esher in Elmbridge Borough.

7.1.8 It is at a highly promising strategic location for park & ride serving KTC. The A244 from Hersham & Weybridge, the A307 from Cobham and the A244 from Oxshott converge at Esher, and each radial route serves part of the south-west quadrant of KTC's catchment, which generates a significant number of trips to Kingston, but is very badly served by direct public transport services to it.

7.1.9 The racecourse has 26 race days in the year, spread evenly throughout the seasons, both on weekdays and weekends. In addition the company has recently made a major investment in conference and exhibition facilities. As part of this investment, the main car parks have been refurbished and enlarged. Major events which will fill the refurbished car park facilities are held on a further 10-15 days in the year.

7.1.10 Hence there is significant spare refurbished car park capacity available on around 325 days of the year, but at other times there is not. United Racecourses has expressed interest in principle in the concept of park & ride from Sandown Park, where some rental or revenue can be earned by the company from it.

7.1.11 In fact, in 1998/99 the company submitted a planning application for park & ride car parking serving the Millennium Dome, when it was encouraged to do so by the organisers of the Millennium Experience. Points for the P & R application were:

- Relatively low number of users expected
- Usage fully predictable due to planned advanced booking system
- Forecast minimum impact on the A307 from the site
- Site to be operated for Millennium Year only

7.1.12 However, despite this, the planning application was vigorously opposed by local residents and was eventually refused by Elmbridge Borough Council. In view of this experience, United Racecourses would only entertain involving themselves in developing a park & ride scheme again in the context of firm support from Elmbridge Borough Council.

7.1.13 Hence the general approach to developing a scheme at Sandown Park, which is in most respects an excellent potential location, must be to design the scheme in a way that:

- wins the support of local residents and the local planning authority;
- has a solution for dealing with racedays and other major events where all existing car parking space are required by the company.

Otherwise the scheme may prove difficult to progress.

7.1.14 The strategy for winning the support of the local residents and planning authority is to cause the minimal possible environmental disturbance (no new land take for access roads or the car parks, and actually to enhance the appearance of the frontage of the racecourse), and

to use park & ride as a means of achieving a much upgraded bus service. A P & R bus service could be extended to Esher Town Centre, thus providing an enhanced regular (e.g. every 10 minute) service between Esher and KTC.

7.1.15 The strategy for dealing with race days is to develop a designated ‘core’ park & ride car park which is operational every day. On non-race days (330 days of the year), park & ride would use this plus some or all of the spare capacity at the existing racecourse car parks. On race days, just the core car park would be available for park & ride. The objective is to meet the racecourse’s requirements without over-inconveniencing park & ride users by closing the system down on those days.

Car Park Site Design - First concepts

7.1.16 The first concept design for Sandown Park is shown in **Figure 7.3**. The key features are as follows. The ‘core’ park & ride car park would be the existing unsurfaced overflow car park and coach park to the east of the new refurbished parking area. This car park would be sympathetically surfaced and lit, and laid out in a manner that did not affect existing mature trees and screening vegetation. The layout shown provides a capacity of 200 spaces.

7.1.17 On non-race days park & ride users would use both this site and the existing refurbished racecourse car park (in both cases, in the context of a revenue-sharing arrangement to be arranged with the racecourse). On this basis, the capacity of the site on non-race days would be as many as the racecourse wanted to accommodate in its own car park area, up to a maximum of 800 cars.

7.1.18 On race days, park & ride users would be restricted to the core car park area of 200 spaces. The parking capacity currently provided by the overflow car park would be replaced on a one-for-one basis by a new overflow car park elsewhere on the racecourse, its location to be determined in negotiation with the racecourse. Two possible adjacent sites are indicated in Figure 7.3. These are currently grassed spaces, not in any specific use. These areas could be surfaced in environmentally sympathetic materials e.g. plastic matting which allows grass to grow through it. This gives the continued appearance of a completely grassed area, whilst allowing standing for vehicles even in wet weather without damage to the surface integrity of the turf.

7.1.19 Access to the car park is proposed to be from the existing, recently upgraded, main entrance to racecourse complex, connected by an improved internal access road.

7.1.20 It is not proposed that park & ride buses would enter the site. Instead it is proposed that pedestrian access would be through the existing ornamental gateway, which would be fully restored with an improved footway to a new pelican crossing of Portsmouth Road just east of the junction with New Road. The existing eastbound bus stop (towards Kingston) would be fully improved with large, sympathetically-designed bus shelters, surfaced waiting space, and realtime information. The existing westbound bus stop would be surfaced and linked to the new pedestrian crossing.

Figure 7.1 First concept design layout of Sandown park & ride site

7.1.21 The objective of the design is to produce the minimal possible disturbance to the residents of Portsmouth Road either side of New Road, and actually to enhance the appearance of the frontage of the racecourse on Portsmouth Road facing them by carefully restoring the ornamental wall and gates.

7.1.22 The aspects of the design described above meet the need to satisfy both the interests of local residents and the racecourse. The bus operating strategy is designed to win the support of the wider local community in Esher, and is described below.

Preliminary design of bus service

7.1.23 The scheme concept is for a fast, frequent, dedicated A307 express bus service operating the route Esher Town Centre – Sandown Park – KTC.

7.1.24 Currently the direct Esher – Kingston route along Portsmouth Road is served by two bus services, as follows:

- route 470: Kingston – Esher – Walton – Guildford (2 bph)
- route 471: Kingston – Esher – Woking (1 bph).

7.1.25 The two routes do not combine to give a regular 20 minute frequency. A new Esher – Sandown – Kingston express service would supplement the existing service with a 10 minute frequency, 20 minute ride, town centre to town centre service all day long.

7.1.26 Suggested intermediate stops are Sandown Park, Station Road (for Esher Station), Giggs Hill Green, Seething Wells and Brighton Road (A243). In this way, Esher Town Centre would gain a ‘turn up and go’ combined 9 bph frequency to Esher Station, which is longer than a convenient walk away from the town centre, as well as to Kingston.

7.1.27 Operating such as a service would require 5 vehicles in the circumstances of a 40 minute round trip time from the terminus at Esher Town Centre, with a 10 minute recovery time to allow for variable traffic conditions. The operating cost of the express service is estimated at £600k/year.

7.1.28 The increased frequency on the route would justify investment in a number of simple with-flow bus lanes at points along Portsmouth Road, which would improve the speed and reliability of the service.

7.1.29 Real-time information at stops (allied to real-time regulation of the service) would increase operating costs, but would further add to passenger confidence when using the new service. The cost would be justified by contributing to significant traffic reduction effects on the A307, with mode shift away from the car for trips to Sandown Park and Esher as well as to Kingston.

7.2 Tolworth

Summary of the key points on Tolworth as a P & R

7.2.1 The site offers a good strategic intercept location for catchment areas to the south of KTC.

7.2.2 The primary site under consideration is King's Field on Jubilee Way, with an alternative option of the Government Buildings site north of the Tolworth Railway Station. Whilst Tesco have an option on this site for redevelopment, there is an opportunity for a complementary development with Tesco for a P & R car park in combination with a superstore development.

7.2.3 The two site options combined would offer future potential for a strategic P & R site serving not only KTC but additional bus services to Epsom and central London.

7.2.4 The short term proposal is for a simple P & R express bus service to KTC. There may be some concerns expressed by London Buses about this service being in competition with existing bus services, but this would be a matter for detailed service planning.

General comments

7.2.5 The site envisaged for the P & R car park is the eastern end of the King's Field site, on the corner of the A240 Kingston Road and Jubilee Way. The 1.72 ha site is owned by RBK and is Proposal Site 43 in the 1998 UDP. The site was previously disused, but has now been given a temporary use as a go-karting circuit. The site is designated in the UDP for sports/leisure use, possibly including a swimming pool. A potential commercial hotel development has also been mooted. Both of these possibilities, but particularly leisure uses with maximum parking requirement in the evening, would have good synergy with use as a P & R site, as long as adequate parking capacity for both the uses was

provided. (It should also be noted that a frequent P & R service would greatly increase the public transport accessibility of the site from Kingston, reducing traffic generation, and the amount of parking required within the site to serve the development.)

7.2.6 Less than 100m to the north of the site is Tolworth Station on the Chessington branch line. Between the site and the station entrance on Kingston Road are two other sites in third party ownership, which are currently in use as a petrol station and a bus depot.

7.2.7 A potential alternative site at Tolworth is the disused Government Buildings site sandwiched between the railway line and the A3 Hook Rise South. This site, which needs to be cleared of the existing 1940s buildings before it can be reused, is Proposal Site 43 in the UDP and has been designated for residential use. However it is understood that Tesco has taken an option on the site, and may come forward with a retail proposal at some point in the future. The site is large at 3.4ha and might be considered spacious enough to accommodate park & ride parking in addition to that associated with a superstore development. As a general policy, Tesco is interested in discussing the opportunities for synergy between potential superstore sites and park & ride.

7.2.8 Overall, the location as a whole (covering both sites) has excellent potential for park & ride use. Both sites are adjacent to the A420 and can be reached from the A3 easily and without presenting any serious traffic management problems. As well as being extremely well-placed for a bus service to KTC, either of the sites would also extend the parking capacity of Tolworth station, with the park & rail option for trips to Wimbledon, Clapham Junction and Central London. The relatively poor frequency rail service on the Chessington branch (2tph) would probably ensure that the additional parking was not swamped by rail passengers, and avoid abstraction from other rail services and ‘railheading’. The site could also serve Ewell and Epsom Town Centres as a P & R site.

7.2.9 The location also has a longer term strategic potential. At the Borough scale, the site is perfectly placed for park & ride serving the old RBK concept of achieving a new route for light rail along the Hogsmill River valley, and sharing or taking over the Chessington branch line west of Malden Manor. At the London-wide scale, Tolworth would be close to the top of any list of locations where the trunk road network intersects the rail network, and there is large scale interchange potential. It is possible to envision in the longer term a major new interchange being developed at Tolworth incorporating transfer from the strategic road network for light rail or busway to Kingston and heavy rail towards central London (and beyond, if it could be incorporated into Crossrail Line 2). This would also be a suitable location for major significant commercial redevelopment associated with a public transport interchange.

7.2.10 A relatively simple bus-based KTC P & R scheme in the short term neither precludes nor requires the later development of larger, more expensive strategic-scale scheme.

7.2.11 Therefore CBP's recommended approach is to develop an initial simple scheme with a bus P & R service to KTC, whilst looking to keep future options open. The preferred site for the initial scheme would be the King's Field site, which is immediately available and is in Council ownership.

Car Park Design - First concept

7.2.12 A first concept design for the King's Field site is shown in **Figure 7.2**. The key features are as follows.

7.2.13 The layout shown in the drawing has a capacity of approximately 700 spaces. Access for cars in and out of the car park is from Jubilee Way. A simple priority junction with a right turn pocket for traffic from the east turning into the car park. The signalised Jubilee Way/Kingston Road junction has adequate capacity for all turning movements at this location, although perhaps some adjustment of signal timings might be contemplated to assist traffic heading to and from the site.

Figure 7.2 First concept design layout of Tolworth park & ride site

7.2.14 The site, which is mostly level, can relatively cheaply be transformed into a well-landscaped surface car park, screened around its perimeter by trees. It is suggested that the spaces between the rows of car parking are initially laid out with relatively cheap, low maintenance landscaping, with passive provision for a major landscaping upgrade later (say, introduction of mature trees associated with a new leisure development). This aspiration for enhanced environmental treatment will be a common feature for each P & R site.

7.2.15 Access into the site for buses would also be taken from Jubilee Way. The design shows buses using the same access in as cars, assuming that modelling would show no significant queueing on the right turn into the site. (If this was shown, changed junction priorities or signalisation might be contemplated, or a special bus-only access into the site from Jubilee Way could be provided to the east of the car entrance.)

7.2.16 The bus stop would be provided in the northern corner of the site, close to the Kingston Road frontage, with a bus-only exit out to Kingston Road northbound, boosting the speed of the inbound bus journey to the town centre. There would also be a pedestrian access in and out of the site at this location, serving the railway station and overall pedestrian permeability of the site.

7.2.17 The preferred bus operating strategy would be always to have a bus on the stand, with passenger waiting done on the bus (in a deliberate contrast to the standard London Buses rulebook practice where the door is closed when the bus is laying over at the terminus). This method of operation would be a common feature for each P & R site.

7.2.18 Despite this, it is recommended that good quality bus shelter and waiting platform be provided, with associated information provision and emergency telephone for those occasions when there may be service disruption and no bus available to wait in. This would be integrated with a staff base for bus crew and car park attendants, also for CCTV monitoring if required. It would also be possible to provide a retail kiosk on the platform; alternatively, a pedestrian access to the existing petrol station could be provided, as shown in the layout.

7.2.19 Lighting levels would be high throughout the site, but the ambient level would be boosted here from the main road and neighbouring sites without need for additional resource. This criteria would be a common feature of each P & R site.

7.2.20 Figure 7.2 also shows reserved space within the site for the development of a leisure development on the Kingston Road frontage at a later date. The development would clearly displace some P & R parking. Possible extensions to the site are indicated.

Preliminary design of the bus service

7.2.21 The scheme concept has been designed around a dedicated P & R service bus, operating limited stop from the site to the town centre. Special P & R fares would be charged (with the scope to subsume the charge for parking entirely within the bus fare), and Travelcards would not be accepted. This is the established system used by the Christmas P & R service. This would be a common feature as far as possible for each P & R scheme.

7.2.22 It is suggested that intermediate stops be made at Tolworth Broadway, Surbiton (Ewell Road/St Marks Hill) and County Hall/Kingston University, in order to provide a park & ride facility for these key trip generators also. The proposed route and stops are shown in **Figure 7.2**.

7.2.23 With or without these stops, it is estimated that that a 40 minute round trip time from the site to the town centre and back to the site could be achieved in the peaks with existing bus priority measures along the route. Five vehicles would be required to provide a 10 minute (6bph) peak frequency, with a 10 minute layover at the site, enabling the operating strategy of always having a waiting bus on the stand at the car park. The potential to employ fewer vehicles in the interpeak could be explored, but it is suggested that an all-day 10 minute frequency service should be the aim. An operating cost of £600,000/year for this service is estimated for budgeting purposes.

7.2.24 An alternative strategy would be to integrate the P & R service into the regular bus network. Two options are described for this:

- 1) boosting the existing routes 406 & 418 Kingston – Epsom bus service
- 2) extending route 281 Tolworth - Kingston

7.2.25 Tolworth Station is currently served by 2 London Buses-regulated routes, the 406 (Kingston – Tolworth – Ewell – Epsom) and the 418 (Kingston – Tolworth – West Ewell – Epsom – Guildford). Both routes are provided at a 30 minute frequency, combining to provide 4bph north of Ruxley Lane (j/w Kingston Road), just south-east of the borough boundary.

Figure 7.3 Shortlisted sites – park & ride service routes to KTC

7.2.26 The service could be boosted to run a combined frequency of 6bph between Epsom and Kingston, with limited stop running north of Tolworth. This option would have the advantage of allowing the site to serve Epsom Town Centre in addition to Kingston, as well as improving the speed and quality of the bus service between Kingston and Epsom & Ewell District, and would merit discussion with London Buses and Surrey County Council, as a possible means of extracting more value from the scheme. However, the strategy of having waiting on the bus at the car park would be lost, and traffic problems in Epsom could lead to gaps in the service inbound to Kingston being experienced at the site.

7.2.27 The second option would be to extend route 281 (Tolworth – Kingston – Twickenham – Hounslow) from its current terminus at Tolworth Broadway to the site. The service runs at 7.5bph (8 min frequency) in the peaks and 4-6 bph in the interpeak. This would be cheapest of all the bus options, including a dedicated service. The two main drawbacks would be running all stops to KTC, which would be slow, and the tendency towards gaps in the service resulting from the length of the route.

7.3 Kempton Park

Summary of key points on Kempton Park as a P & R site

7.3.1 The site offers a good strategic location for catchment areas to the west / north-west of KTC.

7.3.2 Existing car park has spare capacity but as with Sandown Park, exclusive use of the car park **is not available all-year-round**.

7.3.3 The strategy for operating the car park serving both United Racecourse land use interests and a P & R service would be to designate a 280 space ‘core’ P & R car park. On ‘non-race days’ the P & R car park could extend into the rest of the car park with the potential to utilise all the remaining racecourse parking spaces.

7.3.4 As Kempton Park is some 5 miles from KTZ, and there will be limited scope for introducing bus priority measures on the A308, a bus based service for P & R would not be attractive as the journey time would be up to 40 minutes. Therefore, the alternative of a rail service is proposed.

7.3.5 Kempton Park Station is on the Shepperton – Wimbledon – London railway service. Kempton Park Station would require

considerable structural improvements to enable it to be utilised for a P & R. However, the current rail timetable provides for a 15 minute journey time between the nearby Sunbury Station and Kingston. Thus rail would offer a feasible ride mode in journey time, subject to partnerships with Railtrack and the train operator SWT to provide train stock and increase the existing service frequency from every 30 minutes to every 15 minutes.

General comments

7.3.6 Like Sandown Park, Kempton Park is also a commercial racecourse, owned by United Racecourses Ltd. It is located 0.5km north of Sunbury-on-Thames, between the A308 Staines Road East and the Shepperton – Fulwell Junction branch railway line. The local planning authority is Spelthorne District Council.

7.3.7 Kempton Park is also at a highly promising strategic location for park & ride, being just east of Junction 1 of the M3 motorway. Long distance traffic from the M3 heading for Kingston could transfer to park & ride before having driven half a kilometre on non-motorway roads, or before having crossed the Greater London boundary. In addition the site would intercept traffic along the A308 from areas such as Ashford and Staines, both significant generators of car trips to KTC, but with poor direct public transport links to it.

7.3.8 Kempton has a rather slow and narrow road link to Kingston, being the A308 Upper Sunbury Road/Hampton Court Road through historic Hampton and Hampton Court. However, Kempton Park has a direct rail link to Kingston, on the Shepperton branch. The racecourse has a fully specified railway station, with footbridge and covered platforms, but which is only open on race days. Therefore the suggested strategy is to develop the concept of Kempton Park as a rail based park & ride site for Kingston.

7.3.9 Like Sandown, Kempton has extensive car parking. The existing car parks are basically only used to a significant degree on race days, and are only filled on a few race days in the calendar. Like Sandown, the racecourse has a clear interest in the revenue-earning potential of park & ride, but would obviously look to achieve no loss in maximum car park capacity on the race days when it is really needed. As with Sandown, therefore, the proposed strategy is to replace an existing overflow car park with a year-round every-day ‘core’ park & ride car park, supplemented on non-race days by the existing car parks.

Preliminary design of rail service

7.3.10 As well as the existing station at Kempton Park, the key factors in making rail park & ride a realistic possibility for Kempton Park to KTC is the existence of the west-facing bay platform (Platform 1) at Kingston station. It is therefore feasible to propose to SWT the operation of a rail service shuttle between Shepperton and Kingston, and without significant impact on their other services into Waterloo.

7.3.11 Currently the bay platform is only used by one or two trains a day. Most of the day after 0800 there are 4 tph through Kingston: 2 tph on the Shepperton Branch and 2 tph on the Richmond loop. It would be relatively easy to schedule additional trains up and down the Shepperton branch from the bay platform at Kingston via Fulwell Junction, without any negative effect on the existing timetable.

7.3.12 Three options are available for the rail service:

- 1) 1 tph shuttle all stations Kingston – Shepperton;
- 2) 2 tph shuttle non-stop Kingston – Kempton Park;
- 3) 2 tph shuttle all stations Kingston – Shepperton.

7.3.13 The first option would give a combined frequency of 4 tph from the park & ride site, the second and third options would give 6 tph. An all stations service would give a journey time between Kingston and the park & ride site of 21 minutes, whilst a non-stop service could be done in 11 minutes. The first two options could be achieved with a single trainset, the third would require two.

7.3.14 The advantage of a rail park & ride option is that it provides the customer with an option that is perhaps more appealing than a bus, and the advantage of Kempton Park is that the rail infrastructure is already there. Despite this, the major disadvantage of the rail option is cost.

7.3.15 Kempton Park Station would require some considerable infrastructure improvements and rail crossover provision, and a rail shuttle service to KTC to make it fully accessible for interchange with the P & R. This has approximately been estimated by SWT to be in the region of £1.5 million.

7.3.16 It would be simplest if the service was procured from the local incumbent train operating company, South West Trains, who would probably only bid to run the service on the basis of a gross cost contract. Operating costs are very high indeed in the rail industry, and would incorporate Railtrack track access charges (fixed and variable) and rolling stock leasing charges, as well as SWT's direct costs. Even with

older cascaded rolling stock, operating costs per trainset could amount to £1.5m/year.

7.3.17 However, despite this, the scheme has the potential to be looked on favourably for a Rail Passenger Partnership (RPP) bid to the Strategic Rail Authority (SRA).

First concept design of site

7.3.18 The first concept design for the site is set out in **Figure 7.4**. The concept is that a core park & ride site car park would be created from the existing racecourse overflow car park, adjacent to the railway station on the north side, suitably upgraded with surfacing and lighting. The layout shown has a capacity of 280 spaces. A simple new pedestrian access to the rail platforms from the car park would need to be constructed. The existing infrastructure at the railway station is in good condition. It would be necessary to introduce a new ticket sales and information point, preferably staffed by a car park attendant.

7.3.19 On non-race days, this would be supplemented by use of the existing main racecourse car parks, under an appropriate revenue-sharing agreement with the racecourse. On race days only the core car park would be available for park & ride customers. For racecourse visitors, the existing overflow capacity would be replaced on a one-for-one basis by a new overflow car park elsewhere on the main site, its location to be determined in negotiation with the racecourse.

7.3.20 A suggested location would be an extension of the existing main car park onto the adjacent grassed area. The area could be surfaced with plastic matting which allows grass to grow through it, giving an virtually unchanged visual appearance, whilst allowing standing for vehicles even in wet weather without damage to the surface integrity of the turf. The overall objective is to ensure that there is adequate car park capacity to allow the park & ride site to run year-round, including on most race days, whilst having no net impact on the existing amount of overflow parking available, and actually enhancing its environmental quality.

7.3.21 The proposed access to the core car park on the north side of Kempton Park Station would be from the A316 via the Sunbury roundabout (M3/A308/A316 junction) and Hanworth Road. To make this work best, it would be necessary to control the parking of large commercial vehicles on the carriageway by businesses located in the Summit Business Park. If this could be achieved, then the environmental impact of access traffic to the site would be minimal.

Figure 7.4 First concept design - Kempton Park park & ride site

8. REVENUES, COSTS AND ECONOMIC APPRAISAL

8.1 Introduction

8.1.1 This chapter assesses the economic and financial position of the proposed P & R scheme. A number of scenarios are examined based on adjustments to fares and service levels.

8.1.2 P & R schemes can provide differing benefits depending on an area's overall transport policy. At one level they can move parking provision from the town centre to an out of town location thereby freeing up space previously used for parking in the centre for other economic uses and reducing town centre congestion. Or they can provide additional parking capacity to serve the town centre without having to increase town centre parking provision and road capacity thereby maintaining and enhancing the town's viability and vitality at a much reduced cost.

8.1.3 CBP's 2001 Car Parking Study for RBK identified a definite indication that many of the visitors travelling by car to KTC would opt for P & R if it were made available. Furthermore, problems and frustrations in finding parking availability were reported by many visitors. As a result, if no additional capacity is provided this will lead to persons diverting to other centres reducing the rate of economic growth in the town.

8.2 Revenues

8.2.1 The revenue generated from the P & R scheme is dependent on the number of vehicles and or persons using the facility and the scale of charges levied. In assessing the level of charge, account needs to be taken of the town centre's access objectives and the project's fundability. A range of complementary measures including altering town centre parking charges, bus priority and parking supply can also influence the demand.

8.2.2 For the revenue calculations it has been assumed that the service operates for 6 days a week for 50 weeks of the year i.e. 300 days per year. It may be considered worthwhile to operate on Sundays in the run up to Christmas and during the summer which will boost revenue but by omitting these days a 'worst case' scenario is presented.

8.2.3 Existing park-and-ride schemes operate three main forms of pricing with differing impacts on users:

- A parking charge with a free bus service
- Free parking with payment for use of the bus
- Both a car parking charge and payment on the bus

8.2.4 A payment for parking makes the scheme analogous to town centre car parks and helps to reduce its misuse by persons who are working near the P & R site. As with town centre car parks the charge can be dependent on length of stay to either encourage or discourage certain types of users e.g. commuters or shoppers and can be varied by time of exit and/or entry again to influence its use by different type of users. Charges of this nature encourage use by families and groups who are less likely to travel by public transport. Bus loading times are also faster reducing turn around times.

8.2.5 However, depending on the type of parking payment system installed, parking times may be increased, raising the risk of people missing a bus if they have to go to a ticket machine and then go back to their car to display a parking ticket. The system is also open to abuse by non car park users accessing the free bus service thereby abstracting revenue from local bus routes.

8.2.6 Free parking with a charge on the bus is the most common form of payment used in this country. Payment is either for each passenger, children often going free, or occasionally a single payment for all the occupants of a car. The advantages and disadvantages tend to the opposite of those outlined above. Namely bus boarding times are longer potentially leading to a degree of unreliability, parking spaces are more likely to be used by those working nearby and families and groups are less likely to use the service. Some schemes provide off bus pre-ticketing machines to minimise boarding time.

8.2.7 A payment for both parking and the bus is uncommon and tends to be used when there are competing commercial bus routes serving the P & R site.

8.2.8 Given the concern that abstraction from other local bus routes could take place, it is proposed that payment be made for travel on the bus with parking being free. Some enforcement of the car parks maybe necessary to ensure the spaces are not used by local employees but given the location of the sites, this is unlikely to be a significant problem. The proposed fare ranging from £1.20 to £1.60 for a return ticket will make the P & R a competitive alternative to the town centre car parks. No

account has been taken of discounts, which may be offered for regular users.

8.2.9 The following specifications have been used in the analysis of the sites:

Table 8-1: Input values for ‘drive all the way’ option

Market segment	Parking search time + walk to destination from parking space (Min)	Parking charge (£)	Average duration of stay (hrs)
AM work-pay	8.9	5.21	7
AM work-don't pay	26.9	0.02	7
AM other	6.4	2.79	3.4
IP Other	12.2	2.25	2.6

Notes: Data based on CBP survey 2001

Table 8-2: Input values for ‘divert to P & R option’

Site	Walk time at site + walk time to town centre destination	Wait time at site (mins)	P & R fare (£)	Transit time on P & R service	Equivalent time by car
Tolworth	5	5, 7.5	1.20, 1.60	20	22.3
Sandown	5	5, 7.5	1.20, 1.60	13	13.6
Kempton	5	5, 7.5	1.20, 1.60	21 (rail)	17.7
Chessington	5	5, 7.5	1.20, 1.60	25	26.3

Notes: Wait times based on average wait time for 10 and 15 minute frequencies
Travel times based on travel time skims from SCC traffic model

8.2.10 It has been assumed that for all the P & R sites no additional bus priority measures have been introduced other than the ones already implemented.

Forecast 1: Fare = £1.20 Frequency = 10 minutes

8.2.11 The results for the analysis are shown in Table 8-3.

Table 8-3: Demand (based on £1.20 fare and 10 minute frequency)

SiteName	Purpose	PR Car Trips	PR Person Trips	All Trips ¹	All Person Trips	PR Revenue / yr
Sandown Park	AM Work -Pay	215	318	271	401	£ 114,332.29
	AM Work - no pay	36	53	633	937	£ 18,935.84
	AM Other	280	414	1455	2153	£ 149,016.26
	IP All	906	1340	5040	7459	£ 482,479.70
	TOTAL	1435	2124	7398	10950	£ 764,764.09
Tolworth	AM Work -Pay	259	384	333	493	£ 138,210.06
	AM Work - no pay	41	61	777	1151	£ 21,830.67
	AM Other	214	317	1283	1899	£ 114,051.34
	IP All	598	885	4169	6170	£ 318,643.12
	TOTAL	1112	1646	6563	9713	£ 592,735.20
Kempton Park	AM Work -Pay	213	315	271	401	£ 113,486.40
	AM Work - no pay	36	53	633	936	£ 19,180.80
	AM Other	268	397	1483	2195	£ 142,790.40
	IP All	787	1165	5009	7413	£ 419,313.60
	TOTAL	1304	1930	7396	10946	£ 694,771.20

Notes: ¹ All trips refers to trips within the catchment of the P & R site

8.2.12 The demand forecast reveals that, on the basis that the daily person trips to Kingston equals around 36,353, Sandown, Tolworth and Kempton P & R schemes would attract about 6%, 5% and 5%

respectively of all these trips. This is the equivalent of removing daily 1435, 1112 and 1112 cars respectively from the highway network within a 3 – 5 mile radius of KTC.

8.2.13 Of the commuter car trips, which would otherwise have parked in town centre car parks, between 193 and 259 car trips will switch to P & R. This would free up between 3 and 5 per cent of all public parking spaces for additional short stay parking which is usually associated with shopping and hence potentially generating additional income for the town.

Forecast 2: Fare = £1.60 Frequency = 10 minutes

8.2.14 Sensitivity testing has been undertaken to examine what the effects of increasing the bus fare would be. The table below shows the demand forecast for increasing the return fare to £1.60.

Table 8-4: Demand (based on £1.60 fare and 10 minute frequency)

SiteName	Purpose	PR Car Trips	PR Person Trips	All Trips	All Person Trips	PR Revenue / yr
Sandown Park	AM Work -Pay	193	286	271	401	£ 137,107.20
	AM Work - no pay	23	34	633	937	£ 16,339.20
	AM Other	194	287	1455	2153	£ 137,817.60
	IP All	625	925	5040	7459	£ 444,000.00
	TOTAL	1035	1532	7398	10950	£ 735,264.00
Tolworth	AM Work -Pay	232	343	333	493	£ 164,812.80
	AM Work - no pay	27	40	777	1151	£ 19,180.80
	AM Other	148	219	1283	1899	£ 105,139.20
	IP All	409	605	4169	6170	£ 290,553.60
	TOTAL	816	1208	6563	9713	£ 579,686.40
Kempton Park	AM Work -Pay	167	247	271	401	£ 118,636.80
	AM Work - no pay	16	24	633	936	£ 11,366.40
	AM Other	129	191	1483	2195	£ 91,641.60
	IP All	372	551	5009	7413	£ 264,268.80
	TOTAL	684	1012	7396	10946	£ 485,913.60

8.2.15 Contrasting Table 8-3 with Table 8-4 shows that by increasing the fare from £1.20 to £1.60, the demand will decrease such that the overall revenue is not offset by the fare increase. The least sensitive to fare increases is Tolworth which loses just over 2% of its revenue. Sandown loses nearly 4% and Kempton 5%.

Forecast 3: Fare = £1.20 Frequency = 15 minutes

8.2.16 Forecast 3 represents a sensitivity test to examine the effects of reducing the level of service from the P & R sites to a bus departure every 15 minutes. The results are shown below.

Table 8-5: Demand (based on £1.20 fare and 15 minute frequency)

SiteName	Purpose	PR Car Trips	PR Person Trips	All Trips	All Person Trips	PR Revenue / yr
Sandown Park	AM Work -Pay	194	287	271	401	£ 103,363.20
	AM Work - no pay	24	36	633	937	£ 12,787.20
	AM Other	199	295	1455	2153	£ 106,027.20
	IP All	640	947	5040	7459	£ 340,992.00
	TOTAL	1057	1564	7398	10950	£ 563,169.60
Tolworth	AM Work -Pay	234	346	333	493	£ 124,675.20
	AM Work - no pay	28	41	777	1151	£ 14,918.40
	AM Other	151	223	1283	1899	£ 80,452.80
	IP All	419	620	4169	6170	£ 223,243.20
	TOTAL	832	1231	6563	9713	£ 443,289.60
Kempton Park	AM Work -Pay	193	286	271	401	£ 102,830.40
	AM Work - no pay	24	36	633	936	£ 12,787.20
	AM Other	190	281	1483	2195	£ 101,232.00
	IP All	553	818	5009	7413	£ 294,638.40
	TOTAL	960	1421	7396	10946	£ 511,488.00

8.2.17 Contrasting Table 8-3 with Table 8-5 shows that by lowering the service level to a bus every 15 minutes, the demand will decrease by 26% for Sandown, 25% for Tolworth and 36% for Kempton Park.

Forecast 4: Fare = £1.60 Frequency = 15 minutes

8.2.18 As for forecast 3, forecast 4 has a service level of a bus departure every 15 minutes. However, the fare has been increased to £1.60.

Table 8-6: Demand (based on £1.60 fare and 15 minute frequency)

SiteName	Purpose	PR Car Trips	PR Person Trips	All Trips	All Person Trips	PR Revenue / yr
Sandown Park	AM Work -Pay	169	250	271	401	£ 120,057.60
	AM Work - no pay	16	24	633	937	£ 11,366.40
	AM Other	135	200	1455	2153	£ 95,904.00
	IP All	433	641	5040	7459	£ 307,603.20
	TOTAL	753	1114	7398	10950	£ 534,931.20
Tolworth	AM Work -Pay	202	299	333	493	£ 143,500.80
	AM Work - no pay	18	27	777	1151	£ 12,787.20
	AM Other	102	151	1283	1899	£ 72,460.80
	IP All	281	416	4169	6170	£ 199,622.40
	TOTAL	603	892	6563	9713	£ 428,371.20
Kempton Park	AM Work -Pay	167	247	271	401	£ 118,636.80
	AM Work - no pay	16	24	633	936	£ 11,366.40
	AM Other	129	191	1483	2195	£ 91,641.60
	IP All	372	551	5009	7413	£ 264,268.80
	TOTAL	684	1012	7396	10946	£ 485,913.60

8.2.19 Again, contrasting Table 8-3 with Table 8-6 shows that by lowering the service level to a bus every 15 minutes and increasing the fare will decrease demand by 30% for Sandown, 28% for Tolworth and 30% for Kempton Park.

8.2.20 For both forecasts 3 and 4, the lower level of service will also mean a lower level of costs. The deficit between the costs and the revenues are discussed below under 'Overall financial evaluation'.

8.2.21 The forecasts show that if the market segmentations are examined in more detail, it is apparent that the work trips (whereby commuters pay in the town centre for parking) actually generate more revenue through fare increases i.e. the extra revenue generated by the fares off-sets the loss of demand for this market segment. Whilst the demand for P & R

from this market segment decreases with fare increases, it appears that demand amongst these users is less sensitive. To boost revenue, it would be possible to target these users and this could be achieved by increasing town centre parking charges.

8.3 Costs

8.3.1 The total cost of each scheme comprises its capital and operating elements. The capital costs are primarily the car park and associated junction access. Operating costs include the cost of the P & R bus/rail service, maintenance of the car park and business rate levy.

Capital Costs

8.3.2 The costs for construction of each of the sites is shown in the schedule in Appendix C. These are initial construction costs and would need to be verified by a site survey and land inspection. The costs of construction for each site can be summarised as follows:

Table 8-7: Site construction costs

	Sandown	Tolworth	Kempton
Site clearance	£19,759	£18,000	£9,630
Earthworks	£102,090	£16,250	£226,070
Drainage	£37,400	£65,500	£57,150
Fencing	£11,500	£15,000	£15,100
Pavement	£354,420	£672,880	£433,120
Services	£40,000	£40,000	£40,000
Lighting	£46,950	£52,150	£52,150
CCTV & ticket machines	£48,000	£48,000	£48,000
Landscaping	£22,500	£22,500	£19,500
Street Furniture	£22,600	£11,000	£22,600
Bus infrastructure	£42,000	£26,000	£1,000*
Highway access	£86,600	£83,600	£103,500
Prelim/Cont	£291,835	£374,808	£359,737
TOTAL	£1,126,000	£1,446,000	£1,388,000

Notes: * This figure represents an amount of money to operate a temporary bus service from the P & R site. Ideally, a rail service would operate in partnership with Railtrack and SWT. This would cost an estimated £150k in infrastructure improvements.

8.3.3 The total capital costs for each scheme excludes any land purchase costs and professional costs e.g. design, planning application etc. The

table shows that Tolworth is the most expensive site to develop. This is by virtue of its greater size compared to the other sites.

8.3.4 The Kempton site assumes that the land to the north of the station is developed. It is the second most expensive and this is in part due to the highway access arrangements which require both an immediate access to the site and also some highway remedial works in the vicinity of the junction of Hanworth Road and junction 1 of the M3. This site could be much cheaper if the existing car parks at Kempton racecourse were utilised.

8.3.5 Sandown Park is the cheapest site as more minor works would be required to construct the site and as the site is the smallest, lower quantities of construction materials are required.

Operating Costs

8.3.6 Annual operating costs for the P & R service will be in the region of £120,000 per bus based on the following service patterns:

Table 8-8: Bus service specification

Site	2-way travel time (mins)	Hours	Days	Freq. (mins)	Peak vehicle requirement	Total cost / year (£ 000)
Tolworth	42 ¹	07.30 to 20.00	Mon-Sat	15-10	4-6	480-720
Sandown	40 ²	07.30 to 20.00	Mon-Sat	15-10	4-6	480-720
Kempton (bus mode)	50 ³	07.30 to 20.00	Mon-Sat	15-10	4-6	480-720
Kempton (train mode)	15 ⁴	07.30 to 20.00	Mon-Sat	15-10	2	1500

Notes: Assumed to operate for 300 days per year

¹Based on travel time for route 406

²Based on travel time for route 471

³Based on travel time for route 216

⁴Based on a travel time for route Sunbury – Kingston service

8.3.7 All service specifications operate from 07.30 to 20.00 Monday to Saturday. Allowance has been made for a minimum 10 minute (5 minutes at each end of the route) lay-over time for each service. Each service has been designed to provide a minimum 10 minute frequency (although additional sensitivity tests have been carried out using a frequency of 15 minutes which lowers the vehicle requirements). It maybe feasible to provide a service from each site with one less vehicle, if very high quality bus priority measures are implemented. However to ensure a reasonably robust service six buses for a 10 minute frequency

and four buses for a 15 minute frequency have been budgeted for, costing a total of £720,000 and £480,000 respectively per annum.

8.3.8 In the case of Kempton Park, two service options have been shown. One is for a bus based service and the other for a rail based service. Ideally, and as explained in Chapter 6, Kempton Park would be based around a rail operation using the existing station facilities at the race course. However, the rail option requires the co-operation of the rail operators and SRA which could take time to negotiate. Therefore a bus based option has been shown that could act as an interim arrangement. The bus infrastructure would remain of benefit to enable alternative provision for Railtrack maintenance days when rail services would be suspended.

8.3.9 To these costs must be added car park maintenance costs, which based on CBP's experience for Chester and Oxford P & R sites should have a budget allowance of £20,000 a year. In addition, an allowance should be made for business rate charges. Experience from CBP's studies of P & R elsewhere has shown that this is typically £50,000 per annum.

8.3.10 It has been assumed that the P & R site will operate without the need for any additional on-site staff.

8.4 Overall Financial Evaluation

8.4.1 Based on forecast revenue and operating costs, the tables below highlight the net position for each of the sites being evaluated. Each site is based on a five year build-up of revenue on the basis that years 1, 2, 3, 4 and 5 are 60%, 70%, 80%, 90% and 100% respectively of the final forecasted demand.

Table 8-9: Revenue deficit forecast for Sandown

Sandown	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Person trips / day	1274	1487	1699	1912	2124	8496
Revenue / yr	£ 458,784.00	£ 535,248.00	£ 611,712.00	£ 688,176.00	£ 764,640.00	£ 3,058,560.00
Service cost	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 3,950,000.00
Revenue deficit	£ 331,216.00	£ 254,752.00	£ 178,288.00	£ 101,824.00	£ 25,360.00	£ 891,440.00

8.4.2 Table 8-9 shows the revenue deficit for Sandown builds up over five years such that in the fifth year the site is just £25,000 short of breaking even. However, this assumes no changes to town centre parking or travel times for cars in the corridor. It can therefore be expected that after this time the site will start to show a profit.

Table 8-10: Revenue deficit forecast for Tolworth

Tolworth	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Person trips / day	988	1152	1317	1481	1646	6584
Revenue / yr	£ 355,536.00	£ 414,792.00	£ 474,048.00	£ 533,304.00	£ 592,560.00	£ 2,370,240.00
Service cost	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 3,950,000.00
Revenue deficit	£ 434,464.00	£ 375,208.00	£ 315,952.00	£ 256,696.00	£ 197,440.00	£ 1,579,760.00

8.4.3 Table 8-10 shows the revenue deficit for Tolworth for the five year period. In year five the site is £200,000 short of breaking even. As with the Sandown site, it maybe possible that this shortfall could be covered through town centre constraints on car use such as increase parking charges. Additionally, with the Tolworth site it may be possible to generate patronage along the corridor and merge the operation with existing bus services so reducing service costs. Again this could be expected to off-set the revenue shortfall. After five years it is a quite likely that the service could reach profitability.

Table 8-11: Revenue deficit forecast for Kempton

Kempton	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Person trips / day	1158	1351	1544	1737	1930	7720
Revenue / yr	£ 416,880.00	£ 486,360.00	£ 555,840.00	£ 625,320.00	£ 694,800.00	£ 2,779,200.00
Service cost	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 790,000.00	£ 3,950,000.00
Revenue deficit	£ 373,120.00	£ 303,640.00	£ 234,160.00	£ 164,680.00	£ 95,200.00	£ 1,170,800.00

8.4.4 Table 8-11 shows the revenue deficit for Kempton (based on a bus service operation). This shows that after five years the service is £95,000 short of breaking even. However, it maybe possible to boost patronage and cover the shortfall by making the service attractive to other destinations as well as Kingston. For example, if the train option is considered, Wimbledon and New Malden could prove attractive destinations which the P & R could serve.

8.4.5 The sensitivity testing indicates that it could be possible to lower the revenue deficit using a different service level and fare regime. The most effective scenario for achieving this objective was forecast 3 whereby the fare remains at £1.20 and the service level is provided at four buses per hour. The results of this run of the model are shown below.

Table 8-12: Revenue deficit for Sandown (forecast 3)

Sandown	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Person trips / day	938	1095	1251	1408	1564	6256
Revenue / yr	£ 337,824.00	£ 394,128.00	£ 450,432.00	£ 506,736.00	£ 563,040.00	£ 2,252,160.00
Service cost	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 2,750,000.00
Revenue deficit	£ 212,176.00	£ 155,872.00	£ 99,568.00	£ 43,264.00	-£ 13,040.00	£ 497,840.00

8.4.6 Table 8-12 shows that by year 5 Sandown would be making a profit under this forecast scenario. Whilst the demand is less than it would be if six buses per hour are running, the operating costs of running just four buses per hour are off-set by the revenue.

Table 8-13: Revenue deficit for Tolworth (forecast 3)

Tolworth	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Person trips / day	739	862	985	1108	1231	4924
Revenue / yr	£ 265,896.00	£ 310,212.00	£ 354,528.00	£ 398,844.00	£ 443,160.00	£ 1,772,640.00
Service cost	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 2,750,000.00
Revenue deficit	£ 284,104.00	£ 239,788.00	£ 195,472.00	£ 151,156.00	£ 106,840.00	£ 977,360.00

8.4.7 Table 8-13 shows that by year 5 Tolworth will not break even but that the deficit is lower than would be the case with buses operating every 10 minutes. As indicated above, it is likely that this shortfall could be off-set by town centre parking charge increases or by integration of the service with the existing bus network.

Table 8-14: Revenue deficit for Kempton (forecast 3)

Kempton	Year 1	Year 2	Year 3	Year 4	Year 5	Total
Person trips / day	853	995	1137	1279	1421	5684
Revenue / yr	£ 306,936.00	£ 358,092.00	£ 409,248.00	£ 460,404.00	£ 511,560.00	£ 2,046,240.00
Service cost	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 550,000.00	£ 2,750,000.00
Revenue deficit	£ 243,064.00	£ 191,908.00	£ 140,752.00	£ 89,596.00	£ 38,440.00	£ 703,760.00

8.4.8 Table 8-14 shows that Kempton will nearly break even by year 5. This is on the basis that a bus service operates rather than a train service. Again, it should be possible to off-set the short fall by creative use of the existing bus network.

8.4.9 In conclusion, it is apparent that the P & R scheme can be made to be financially viable. However, this may require that the fares charged vary between the sites to generate additional revenue to compensate for the revenue shortfall and that service levels are varied to reflect demand. Alternatively, complementary measures, such as increased town centre charges, could be introduced at the same time to off-set the required increase in fares.

8.5 Economic Appraisal

8.5.1 Even without such complementary measures the economic benefits of the P & R scheme outweigh any financial shortfalls.

8.5.2 In any appraisal the do something option should be appraised against a do nothing or do minimum option. P & R facilities provide additional town centre parking out of town. The do nothing option is therefore not to provide any additional car parking. It implies no further growth in terms of town centre leisure and retail spending and therefore a decline relative to other competing centres risking a long term steady decline or at best stagnation in the town's vitality and viability. This is a difficult concept to measure in a qualitative manner. An alternative option is therefore to compare a P & R facility with the cost of providing the same quantity of parking in the town centre and thus achieve the same vitality and viability benefits.

8.5.3 The P & R facility frees up parking space in the town centre providing more space for shoppers, visitors or commuters. Recent surveys undertaken by KTC Management suggest that the greatest proportion of visitors to Kingston spend between £20 and £50 per shopping trip.

8.5.4 If on average 1000 of the town centre spaces are freed up daily by those using the P & R site and these trips are replaced by new shoppers to the town centre then the additional revenue flowing into the town centre over a 5 year period equates to some £36m (based on a spend of £30 per person) as shown in table 8.4. National spending and employment data suggests that each £65,000 of retail expenditure supports one job in the wholesaling and retail sector. The additional expenditure outlined in table 8.4 will therefore support an extra 83 jobs in year 1 rising to 138 jobs by year 5.

Table 8.4: Additional monies spent in KTC as a result of the provision of park-and-ride scheme

Year	Daily trips	Additional spend £'000 / year	Additional jobs
1	600	5,400	83
2	700	6,300	97
3	800	7,200	110
4	900	8,100	125
5	1000	9,000	138
Total		36,000	553

8.5.5 The other alternative is the provision of additional car parking space in the town centre. This would be via a multi-storey car park at a cost of some £8,600 a space or a total of £5.2m (based on 600 spaces) with recurrent maintenance costs of £580k a year. Whilst it may be assumed that such a facility would have a similar revenue stream to the P & R site, the initial capital outlay would be much higher (£5.2m compared to £1.5m for the P & R).

8.5.6 The P & R scheme offers other benefits, which have not been quantified such as reduced town centre congestion and pollution. If parking space was moved from the town centre to the P & R site freeing up land in the centre then this could be used for other economic activities. Given present rental values in London for commercial premises and the amount of land freed up this could provide office space generating a significant rental stream each year.

8.6 Conclusion and Policy Implications

8.6.1 Demand for parking in Kingston is at a premium. This is demonstrated by the data CBP have received for Bentalls car park which indicates that the car park is at capacity on a weekday between 1100 and 1900 hours. The proposed P & R schemes provide a means to relieve

this pressure and offer the lowest cost option of increasing the overall supply of car parking spaces serving the town centre.

8.6.2 In addition to the proposed P & R scheme the Royal Borough of Kingston Upon Thames has already introduced or proposed a number of changes which will improve the efficiency of parking provision and traffic flow in the town centre and enhance the financial viability of the former. These include:

- Rigorously tackling the problem of illegal parking acts
- Reducing the extent of on street parking by the phased introduction of controlled parking zones and allocating more of the remaining space for residents parking
- Changing the structure of parking charges to encourage short stay at the expense of long stay parking

8.6.3 In addition to these proposed or actioned measures further steps could be taken to both reduce the cost of the proposed P & R schemes and increase their patronage. The cost of the scheme could be reduced by the following measures:

- Reduce the number of buses from 6 to 4 – this would reduce the level of service from a bus every 10 minutes to a bus every 15 minutes. This would increase the risk of unreliability making the service possibly less attractive to users. However, the majority of users are attracted to P & R off-peak when road congestion is less and when journey time and service reliability can be maintained thus sustaining the attraction.
- Increasing patronage by increasing town centre parking charges.
- Introducing a workplace parking levy to further discourage the provision of commuter car parking within the town centre, thereby reducing traffic congestion during the peak

8.6.4 Even with no complementary measures it should be possible to develop either of the P & R schemes such that they will break even within five years. In addition the wider economic benefits that will arise as a result of providing additional car parking space to serve the town, or the cost avoided of providing the required additional space in the town centre via a new multi storey car park more than compensate for any initial revenue support that the scheme may require.

9. BUS PRIORITY MEASURES

Tolworth P & R bus priority corridor

9.1 Introduction

9.1.1 From site observation the CBP has identified the following proposed bus priority measures along the Tolworth to KTC corridor. The route runs as shown on *Figure 9.1* from Kingston Hall Road, Kingston-Upon-Thames, to Kingston Road, south of Tolworth railway station.

9.2 Bus Priority Measures

9.2.1 Approaching the area between Penrhyn Road and Surbiton Hill Road travelling towards Tolworth parking restrictions would be of benefit as shown on the plan. At present, this area is pay and display and the movement of cars on both sides of the road obstructs buses. This area could be subject to peak hour parking restrictions. Furthermore, it was observed that buses had problems leaving the bus cages and joining the main traffic stream owing to parked cars. Therefore, bus boarders could also be considered as a solution to this part of the corridor.

9.2.2 Opportunities for bus priority measures southbound to the junction at Surbiton Hill Road and Lamberts Road are limited, owing to the narrow carriageway width and also the steep gradient. There is queuing on both the northbound and southbound approaches to this junction. However, as shown on the plan on the northbound approach to the junction, south of the railway line there is an opportunity for a queue relocation scheme, the bridge across the railway line acting as a pinch point. This scheme will work with cars queuing at a point south of the railway line operated by a signalised lane. Buses will be able to pass through on the west side of the carriageway in a bus only designated lane.

9.2.3 Further south CBP have identified opportunities for a bus lane on the approach to Kingston to be located on the west side of the carriageway where there is currently intermittent parking. In addition, parking restrictions on the east side in the peak hour would be of benefit to ensure parking does not affect the free flow of general traffic adjacent to the suggested bus lane. The peak hour parking restrictions would be of benefit in this area, from Berrylands to Browns Road owing to pressures from both retail and community facilities being located in this area. There would also be the opportunity to consider bus boarders along

this retail section of Ewell Road. This is as a result of the width of the carriageway and the problem of vehicles obstructing bus cages in this area.

9.2.4 Bus boarders, as shown on the plan could be implemented near Browns Road on both sides of the carriageway to prevent the obstruction of bus cages.

9.2.5 Southbound of the junction of Ewell Road with Kingsdowne Road there is an opportunity to review parking restrictions from this section of road to the Tolworth Broadway area. This area on the east side of the carriageway is mainly residential with some retail. This would address some of the parking issues around bus cages in this area. For the purposes of a bus corridor in both peak and off-peak hours parking restrictions should be reviewed. At Beaconsfield Road, for example there was parking on both sides of the road in the retail areas thereby allowing less space for buses to exit from the bus cage. On this section of road there is also enough width to allow bus boarders to be constructed on the east side. In addition, as many of the houses already have drives along this section of road, a review of parking restrictions is suggested.

9.2.6 There is also the possibility of having a bus lane extending on the west side of the carriageway to the Tolworth Broadway area. From site observation the Tolworth Broadway retail area is busy, with congestion and vehicles leaving and entering parking spaces on both sides of the carriageway. It is here that a review of parking restrictions would be of most benefit.

9.2.7 South of the roundabout junction with the A3 on Kingston Road there is an opportunity for an off-side bus lane on the southbound carriageway on the approach to the junction with Jubilee Way. In addition, CBP notes that there is an opportunity for a bus lane on the northbound carriageway on the approach to roundabout into Kingston. This could take the form of a morning peak bus lane.

9.2.8 There is an opportunity to improve the bus/rail interchange at Tolworth Railway Station using existing land. The bus stop at this location is already set back from the carriageway and there would be potential space for P & R buses to pick-up passengers thereby incorporating a useful shuttle service from the railway station to KTC.

9.3 Summary and Conclusions

9.3.1 The Tolworth P & R corridor offers a number of opportunities for bus priority improvements to overcome the existing congestion caused by

traffic feeding to and from the A3 and also the four retail zones identified along the corridor. For some of the corridor there is the opportunity to implement bus lanes, bus boarders and also to review parking restrictions. The quality of the corridor for P & R services would be much improved by addressing parking restrictions at the retail areas.

Sandown park, P & R bus priority corridor

9.4 Introduction

9.4.1 From site observation the CBP has identified the following bus priority measures along the Sandown to Kingston town centre corridor. The route for the P & R buses is shown on *Figure 9.1* from Sandown Park Racecourse, to KTC via Kingston Hall Road.

9.5 Bus Priority Measures

9.5.1 From site observation at Sandown Park Racecourse, as shown on the *Figure 9.1* there is an area bordering the racecourse currently taken up by large grass verges that could be used for waiting P & R buses

9.5.2 For the majority of this corridor there is not enough carriageway width to be able to accommodate a bus lane. However, in some places bus boarders could be of benefit such as on the village high street area from where Kings Road meets the Portsmouth Road and finishes near Windmill Road. This may be of most benefit during the peak hour on the corridor. In the off-peak traffic flows quickly from the proposed site into Kingston. This is due to a number of factors allowing the free flow of traffic such as the low density of property on the north side of the route, such as the racecourse, golf course, woodland, sports ground, Gigs Hill Village Green and finally, the River Thames, which borders a section of the route. This reduces congestion as demand for parking along the route is significantly lower.

9.6 Summary and Conclusions

9.6.1 Bus priority measures along this corridor are limited in opportunity although this is offset by the ability for traffic to move quickly along most parts of the route, such as from Sandown Park racecourse to the Thames Ditton High Street area. It is also enhanced by the clear nature of the route arising from the low density of the route and demand for parking. There are as noted some opportunities for bus boarders along the route such as in the village high street area. In conclusion, the good access at Sandown Park and only small retail facilities along the corridor afford the proposed P & R site a relatively quick and direct route to KTC.

10. CONCLUSIONS AND RECOMMENDATIONS

10.1 Summary

10.1.1 The purpose of this report has been to advise RBK on the most suitable site for a permanent P & R to serve KTC and represents the culmination of three phases of the study; Phase 1: preliminary review of the sites and available information, Phase 2: survey of town centre visitors and development of demand forecasting model for chosen long list of sites, and Phase 3: detailed evaluation of the sites shortlisted from Phase 2.

10.1.2 A initial long list of nine sites consisted of the following:

- Sandown Park
- Hampton Court
- Kempton Park
- Tolworth
- Hawker Centre
- Chessington World of Adventure
- Roehampton Vale
- M25 Junction with A243
- Raynes Park (addition by CBP see paragraph 9.3.3)

10.1.3 An initial assessment was undertaken to narrow the list down to a short list of three sites in accordance with the study brief. This assessment was informed by several sources of information. Interview surveys of town centre visitors who used public car parks and questionnaire surveys of town centre employees were undertaken in 2001. In addition, data from car park exit counts, RBK's traffic model, Surrey County Council's traffic model and KTC Management's questionnaire survey results were used in CBP's PRIDE model analysis and determined the likely demand at each site.

10.1.4 The results revealed that the greatest numbers of visitors to KTC came from regions to the south and west of Kingston and clear corridors of travel demand were identified along the M3, A3 and A240 corridors.

10.1.5 In addition to the demand analysis, an assessment of each site was made in terms of the following criteria:

- Satisfying transport criteria objectives
- Meeting Town Planning process criteria
- Engineering feasibility and ease of implementation

10.1.6 With these criteria in mind, the long list of sites was reduced down to the following three high scoring sites:

- Sandown Park
- Tolworth
- Kempton Park

10.1.7 However, whilst the site long list has been reduced to just three sites, CBP believes that all the sites, with the exception of Roehampton Vale and the M25 J9 sites, could make successful P & R sites. Likewise, the two exceptions may not be ruled out altogether especially if other destinations (i.e. beyond the scope of this study) are to be served e.g. Epsom, central London and Heathrow Airport.

10.1.8 Of the three sites short listed, each could be operated as successful permanent P & R site. Sandown Park generated the greatest demand of all the sites and the analysis found that if a P & R operated from this location, approximately 1400 cars daily could be removed from KTC. The site is well positioned to intercept a significant volume of demand from the west and south of Kingston. Furthermore, a direct route along Portsmouth Road for the bus leg of the journey would make the site an attractive prospect for Kingston visitors. However, Sandown Park is in private ownership (United Race Courses) and therefore would require a negotiated position to be reached on the operation of the P & R. This would probably include some form of revenue sharing from the service. Additionally, Elmbridge Borough Council and Surrey County Council would need consulting and potential political conflicts of interest resolved.

10.1.9 Tolworth intercepts a high level of demand of visitors to Kingston from the south and west of Kingston being accessed from either the A240 or the A3. The demand forecasting found that the site could

attract approximately 1100 car trips per day freeing-up KTC of a significant number of car parking spaces. The site is well positioned to have buses running directly to KTC along the A240. CBP has also identified the potential for bus priority measures along this corridor. The Tolworth site is owned by RBK and therefore land ownership issues will remain internal to the Council. The site is identified for leisure type development in the UDP but CBP believes that this could complement P & R offering benefits especially in delivering the site.

10.1.10 Like Tolworth, Kempton Park attracts a similar number of users. The modelling work indicated that approximately 1100 cars daily could be removed from KTC. As with the other sites, Kempton is located on a key arterial route to Kingston and benefits from high levels of demand. Ideally Kempton Park would be operated with the public transport leg of the journey being by rail. For this to be an attractive proposition, the level of service would need to be increased to at least four trains an hour. This would require negotiation with the train operators, Railtrack and the Strategic Rail Authority. However, it would also be possible to run buses from the site as an interim arrangement. Again, agreement on the operation and sharing of revenue would have to be agreed with United Race Courses.

10.2 Recommended next steps on the BSP bid

10.2.1 Having identified the most suitable sites for the P & R, the next step is to take each site forward for detailed design, consultation, planning approval, contractual negotiation and finally, implementation. Whilst there are many benefits in having all the sites operating, the most appropriate approach would be to develop each site on a phased basis. Different phases could run concurrently i.e. implementation of one site takes place whilst planning approval is sought for another site.

10.2.2 Funding will therefore be required through the Borough Spending Plan (BSP) bid for further development of the sites. CBP would recommend that the Tolworth site is set as the top priority by virtue of its deliverability and that funding is secured for its progression. However, it would be beneficial to continue to progress the other sites, especially Kempton Park and Sandown.

10.3 Strategic possibilities for further study

10.3.1 Strategic P & R with access to Heathrow T5 and central London is likely to be high on the agenda in the near future. The possibilities this

offers could be investigated in particular the opportunities this might offer Kingston in terms of new transport links.

10.3.2 Access to KTC by Light Rail has been investigated in the past but not progressed any further than a study. The recent successes of the Croydon Tram Link and London Transport's identification of intermediate mode corridors could again create opportunities for light rail. The attractiveness of Kingston as a destination may well make such a mode a possibility.

10.3.3 CBP identified Raynes Park as a potential location for a P & R from purely a demand perspective. However, no suitable site was immediately apparent. Redevelopment opportunities within this area in the near future may create the potential to develop a site. Therefore early identification of sites within the planning process could be of benefit.

10.4 Conclusion

10.4.1 This report has described the evaluation undertaken by CBP of the sites identified by RBK as having the potential to fulfil the role as permanent P & R sites. An initial list of nine sites was examined and after a preliminary assessment, refined to a short list of three sites; Sandown Park, Tolworth and Kempton Park. A more detailed assessment which examined demand for the sites by time of day and for different market segmentations, and which also included a financial appraisal showed that the best site would be Sandown Park, followed by Tolworth and Kempton Park.

10.4.2 Each one of these sites offers the potential to be a successful P & R. Furthermore, for each site there are potential problems in their delivery i.e. Sandown Park requires a negotiated contract with the race course owners and agreement of Elmbridge Planning Authority, Kempton Park requires the same and if it is to be served by train, a further negotiation with the rail authorities, and Tolworth may require re-designation in the UDP. On this basis CBP would recommend that each of the three selected sites are developed further and as part of a comprehensive network of satellite sites serving Kingston. However, CBP believes that Tolworth represents the site with least technical obstacles to overcome and in the short term will be the easier site to deliver.

10.4.3 Overall, CBP would recommend that Sandown Park, Tolworth and Kempton Park are all pursued as permanent P & R sites but that Tolworth forms RBK's first priority site.

