

# Oxford Transport Strategy

## Preliminary Investigation into Park & Ride

Oxfordshire County Council

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# Table of contents

Chapter	Pages
<b>1. Introduction</b>	<b>1</b>
<b>2. Drivers for change</b>	<b>2</b>
OTS challenges & objectives	2
<b>3. Why Relocate Park &amp; Ride?</b>	<b>4</b>
Park & Ride concept	4
Alternative interventions	5
<b>4. Oxford Park &amp; Ride proposals</b>	<b>7</b>
Location identification	7
Suggested capacities	8
<b>5. Implementation</b>	<b>11</b>
Link to BRT and the bus network	11
Phasing	12
Costs	13
<b>Tables</b>	
Table 2-1 Opportunities for P&R to meet selected OTS challenges and objectives	3
Table 3-1 SWOT Analysis for Park & Ride alternatives	6
Table 4-1 Summary of the proposed remote Park & Ride sites	10
Table 5-1 Estimated cost of delivery	13
<b>Figures</b>	
Figure 4-1 Road corridors and potential Park & Ride catchment areas	7
Figure 5-1 BRT and bus links to the proposed Park & Ride sites	11

# 1. Introduction

- 1.1. This note sets out the rationale behind the proposed amendments to the structure of Oxford's Park & Ride sites as a suitable intervention package to help deliver the aims and objectives of the Oxford Transport Strategy (OTS). The note goes on to examine how the provision of 'remote' sites over expansion of existing sites, what locations would be suitable to fulfil the objectives of the OTS, and what potential schemes would need to be implemented in order to deliver the new sites.
- 1.2. This work represents part of the very earliest stage of the Transport Appraisal Process, option development. The operation of the proposed schemes has not been tested, nor have designs, costs or feasibility been subjected to a rigorous level of review.
- 1.3. It is envisaged that the preliminary work undertaken here will be taken forward by Oxfordshire County Council (OCC) to complete Stage 1 of the Transport Appraisal Process and develop WebTAG compliant business cases.

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## 2. Drivers for change

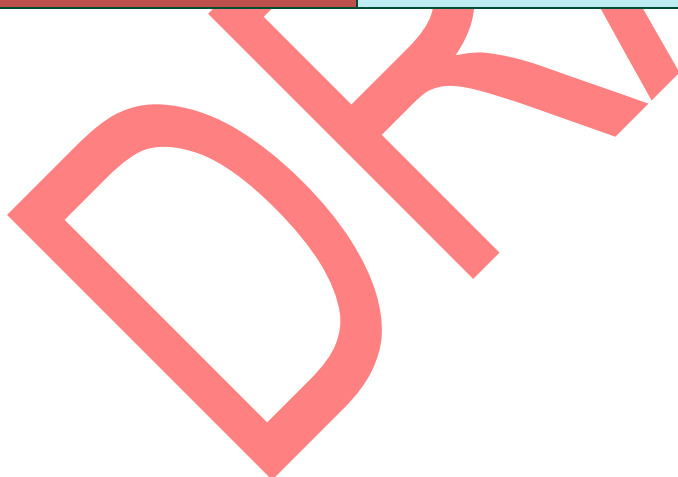
### OTS challenges & objectives

- 2.1. In TN1 – ‘Changing patterns of growth and travel’ and TN2 – ‘Scale of the Challenge and OTS objectives’, we examined how Oxford’s success as a centre of business, as an attractive place for living and as a world renowned visitor destination has, and will continue to, provide substantial challenges to the operation of the transport network in the city.
- 2.2. One of the most apparent challenges is how the level of traffic, especially during peak times, causes serious congestion on the city’s (and much of central Oxfordshire’s) road network. With high levels of congested traffic comes delay and unreliability in journey times, as well as the significant negative impacts on the environment, road safety and accessibility.
- 2.3. The popularity of the existing Park & Ride sites has added to the issue of congestion, particularly on the ring-road.
- 2.4. OCC have invested heavily in capacity improvement schemes along the ring-road (schemes are currently being implemented at Hinksey Hill Interchanges and Kennington Roundabout, whilst plans for Wolvercote and Cutteslowe roundabouts are being progressed).
- 2.5. However, even with these schemes in place, the predicted increase in traffic flows as a result of the significant levels of housing and job growth within the county is likely to consume any capacity improvements meaning further mitigation will be required in future and continued road-building is neither an attractive, nor strategically viable, option.
- 2.6. As a component of the OTS, a review of the city’s Park & Ride network has the opportunity to mitigate for some of these challenges. Table 2.1 provides an overview of these opportunities in response to the identified challenges and objectives for the OTS.

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Table 2-1 Opportunities for P&R to meet selected OTS challenges and objectives

OTS Challenge	OTS Objective	Opportunity for P&R
1. Oxford's economy is growing and changing.	1. Support the growth of Oxford's economy by providing access to appropriately skilled employees and key markets.	Providing increased capacity in more appropriate locations on strategic corridors for in-commuting to grow without adding to traffic on city roads
2. Economic growth is happening in new locations and needs effective connectivity.	2. Ensure business sectors are well connected to each other and are provided with effective and reliable access to strategic networks	Locating P&R close to the emerging centres for employment
3. More people are travelling into Oxford and travel patterns are changing.	3. Provide effective travel choices for all movements into and within the city	Influencing shift from private car will allow for reallocation of road space to other modes
4. Oxford is experiencing rapid population growth and demographic change.	4. Promote modes of travel and behaviours which minimise traffic and congestion	Provide larger and better facilities for encouraging mode shift, for at least the last leg of the journey
5. Housing demand is not being met and we need high quality new neighbourhoods.	5. Focus development in locations which minimise the need to travel and encourage trips by sustainable transport choices	Appropriate locations could influence planning decision-making on where growth will happen
7. We need to better balance different needs in the city centre.	7. Provide an accessible city centre which offers a world class visitor experience	P&R has already had a huge influence on reducing trips to city centre, but in combination with other measures more can be done.
8. There are major challenges with the urban environment and air quality.	8. Tackle the causes of transport-related noise and poor air quality within the city	Improving connectivity to areas where people do not see P&R as an effective choice



### 3. Why Relocate Park & Ride?

#### Park & Ride concept

3.1. Oxford opened the world’s first Park & Ride site in the 1970s. The Park & Ride system has grown since to provide over 5,000 parking spaces, helping to reduce traffic in the city centre by providing an easy and attractive option for traffic entering the city. All five sites are located close to the ring road, and are a popular choice for longer-distance commuting, and visitor trips.

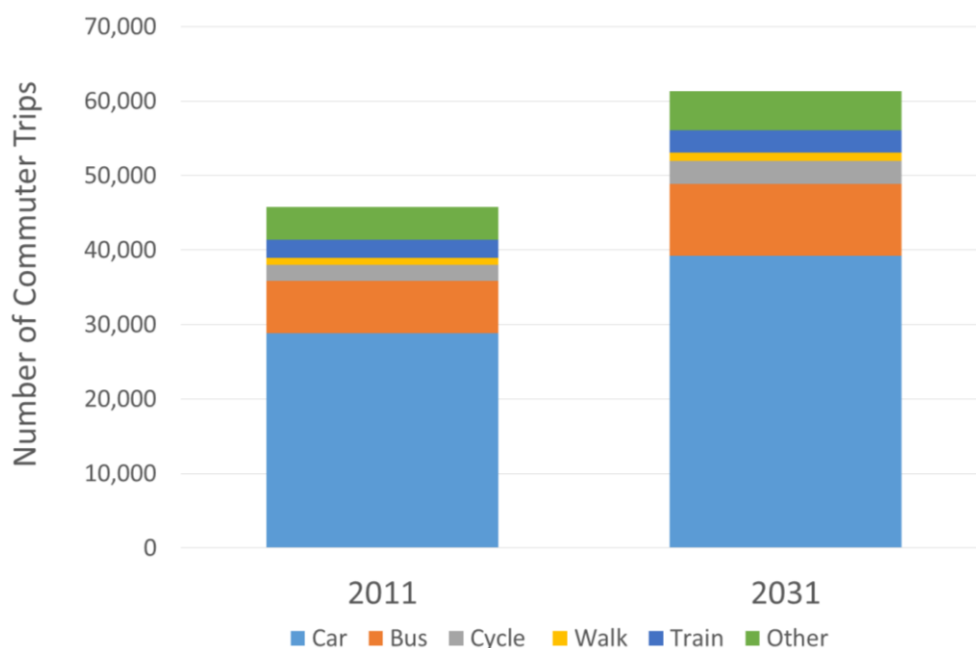
#### The need for relocation

3.2. As Oxford’s economy has grown, so has the number of daily commuters travelling into the city, with an increasing proportion of them travelling from well beyond city boundaries. As can be seen in Figure 3-2 overleaf, congestion in the morning peak now extends as far north as Kidlington and is experienced around all approaches the outer ring road. Particular hotspots are located to the west (A420, A40), north-west (A44) and south (A3, A4074).

3.3. As traffic has grown, so have arrivals at Park & Ride facilities which adds further pressure to already congested junctions. For instance, arrivals in the morning peak hour at the Peartree, Water Eaton, Redbridge and Seacourt P&R sites result in a combined 460 car trips at the three A34 interchanges to the west of the city. Removing this demand through capturing those users further from the city would have an immediate positive impact on the operation of the A34 and the other roads that it intersects with at junctions.

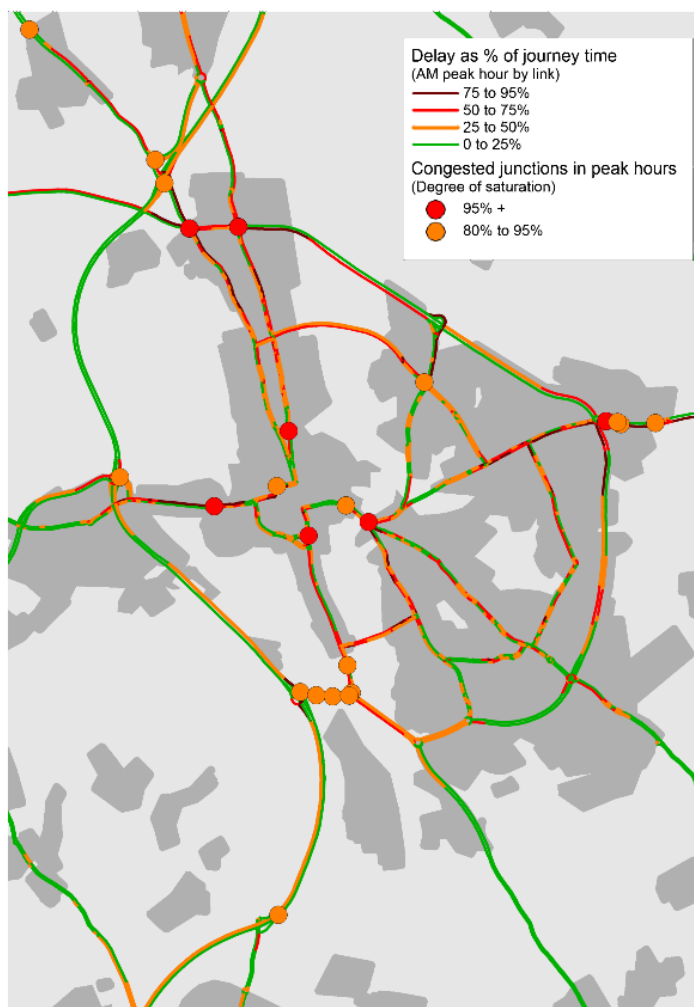
3.4. Future housing and employment growth within Oxfordshire is set to further exacerbate congestion on these corridors, unless traffic can be captured before they reach them. An assessment based on the recent Strategic Housing Market Assessment for Oxford<sup>1</sup> suggests that at current levels of household travel demand, commuter trips into Oxford are forecast to grow by 34% between 2011 and 2031 (Figure 3-1). Without a shift in travel behaviour, this would represent an additional 10,000 vehicles travelling into Oxford.

**Figure 3-1 AM peak congestion on key into and around corridors into Oxford**



<sup>1</sup> See ‘Investigation into additional trips’ analysis

Figure 3-2 AM peak congestion on key into and around corridors into Oxford



### Alternative interventions

- 3.5. During stakeholder consultation sessions for the OTS, invitees were asked to discuss the potential options for the evolution of Oxford’s Park & Ride network. These sessions presented a number of themes around why and how Park & Ride services should change but predominately these fell into two options:
- Expansion of existing sites; and
  - Build new sites further out.
- 3.6. Another topic which was repeatedly raised was the issue of parking charges at the sites, and how they have resulted in a downturn in usage as people choose to drive the entire distance of their journey, even if that means a slightly higher cost.
- 3.7. Table 3-1 sets out a Strength-Weakness-Opportunity-Threat (SWOT) analysis of the two options (along with a do-nothing option).
- 3.8. Despite, being the most expensive solution, the potential strengths and opportunities of the remote Park & Ride option mean that it is likely to be the most advantageous in delivering the objectives of the OTS and LTP4.



Table 3-1 SWOT Analysis for Park & Ride alternatives

System	Do nothing	Expanded sites	Remote sites
<b>Strengths</b>	<ul style="list-style-type: none"> <li>The cheapest option.</li> <li>Maintenance of the site and some upgrades to facilities will be the only ongoing costs.</li> </ul>	<ul style="list-style-type: none"> <li>The sites already have high numbers of users with an established pattern of behaviour.</li> <li>Small expansion could solve short term increased demand.</li> </ul>	<ul style="list-style-type: none"> <li>Will be able to intercept car driver trips much closer to their points of origin.</li> <li>Routes will pass through more residential areas further than existing sites and will encourage mode shift.</li> </ul>
<b>Weakness</b>	<ul style="list-style-type: none"> <li>The existing sites are already well used and can come close to capacity.</li> </ul>	<ul style="list-style-type: none"> <li>Exacerbating congestion on parts of the ring road, particularly the A40 and A34 in North Oxford.</li> <li>Increased traffic will impact on the effectiveness of mass transit to provide an efficient option for travel into the city centre.</li> <li>Expansion would require either land purchase or expensive decking and will require capacity at access junctions to be significantly increased.</li> </ul>	<ul style="list-style-type: none"> <li>Suitable sites will need to be identified and acquired.</li> <li>Access from the strategic road network may result in high costs of new junctions.</li> <li>Increased cost for longer distance bus journeys will likely be passed onto passengers.</li> <li>The level of bus priority between the new sites will need to be substantially increased.</li> </ul>
<b>Opportunity</b>	<ul style="list-style-type: none"> <li>Improving Park &amp; Cycle facilities may take some pressure off bus services.</li> </ul>	<ul style="list-style-type: none"> <li>Significantly reduce the need to drive into many parts of the city.</li> <li>Because of other traffic management interventions (Workplace Parking Levy, increased parking charges) the overall cost of using P&amp;R will be cheaper than other options.</li> </ul>	<ul style="list-style-type: none"> <li>Connecting to the BRT service will significantly reduce the need to drive into many parts of the city, including the Eastern Arc.</li> <li>Would better cater for the more complex movements being made in Oxford.</li> <li>Because of other traffic management interventions (Workplace Parking Levy, increased parking charges) the overall cost of using P&amp;R will be cheaper than other options.</li> <li>Existing sites could be redeveloped for other purposes, including transport.</li> </ul>
<b>Threat</b>	<ul style="list-style-type: none"> <li>The existing sites are likely to fail to meet additional demand, leading to longer searches (and journeys) for spaces at alternative locations.</li> </ul>	<ul style="list-style-type: none"> <li>Predicted growth to the city is so large that the sizes of the P&amp;Rs could impact on surrounding land uses</li> </ul>	<ul style="list-style-type: none"> <li>P&amp;R in remote sites may encourage existing intra-urban bus users to drive to the P&amp;R instead of bus from point of origin.</li> </ul>

## 4. Oxford Park & Ride proposals

### Location identification

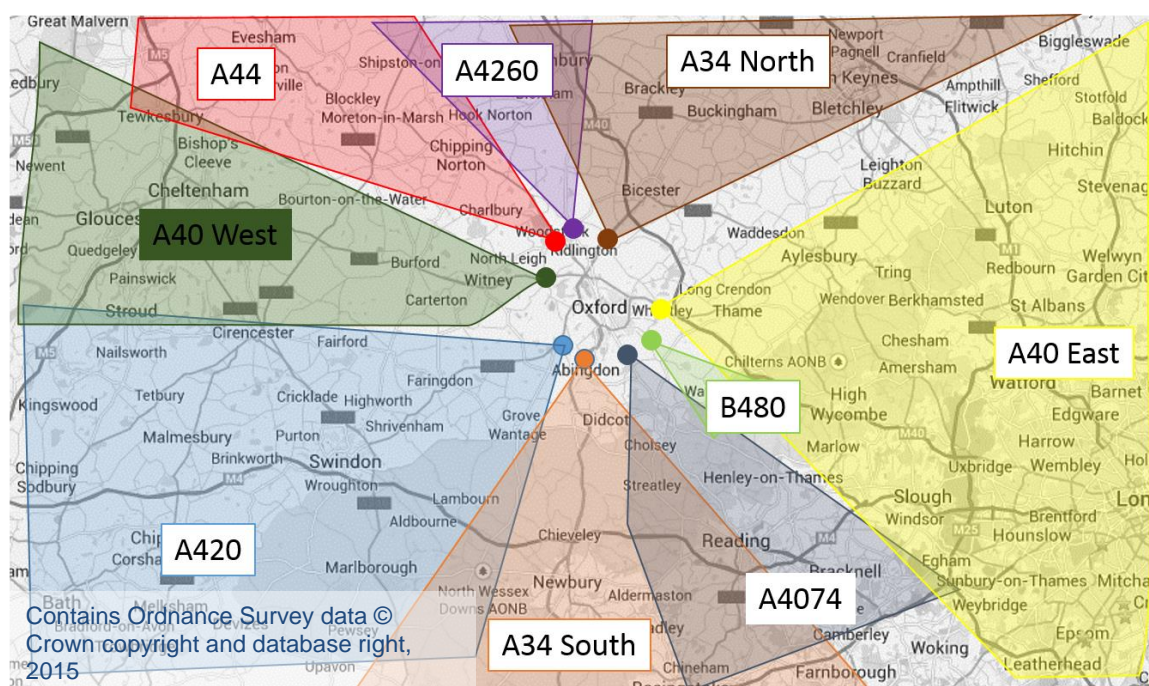
4.1. Given the early stage of this work, this note does not identify specific sites for the potential Park & Ride sites. Instead general locations have been identified which fulfil the criteria of:

- Being within a strategic corridor on the approach to the city;
- Would be able to replace an existing site; and
- Has potential sites with access close to the strategic road and within a reasonable distance of the city.

### Corridor selection

4.2. Potential broad locations for remote sites were identified on nine corridors which each have a direct road access to the ring road or city. The strategic importance of each corridor was then considered by studying the expected catchment area that each could be served by a new Park & Ride site (shown in Figure 4-1).

**Figure 4-1 Road corridors and potential Park & Ride catchment areas**



- 4.3. Several catchments overlap, however only the A44 and A4260 which run in parallel south from Wooton, would easily be served by a joint site.
- 4.4. Of the nine corridors to the city, only the B480 Watlington Road should be discounted immediately, due to the limitations of its catchment area and ability to cater for traffic volumes over and above current levels. Additionally, projected development and population growth on the corridor is not deemed sufficient to warrant a new park & ride facility.
- 4.5. To the east of the city, Thornhill Park & Ride already performs the role of a ‘remote’ site, with less impact on the ring-road than the other existing sites. Thornhill performs a Park & Ride function for London as well as Oxford, with commuters travelling there to catch the express bus services into

the capital. It is not felt that there would be any advantage of relocating Thornhill further east along the A40.

### Opportunity to replace existing sites

4.6. The above filtering exercise leaves six corridors with the potential for a new remote Park & Ride site. The next consideration was the ability of a site based in those corridors to replace an existing site. Given that the catchments areas of the corridors broadly correspond with those of the existing sites (which were placed in specific locations for that exact purpose) we would suggest the following:

- Seacourt – replaced by A40 west and A420
- Water Eaton and Peartree – replaced by A44/A4260 and A34 north.
- Redbridge – replaced by A34 south and A4074.

### Location and access opportunities

4.7. A major factor in users choosing to use Park & Ride will be the cost of the service – increased distance will lead to increased operating costs and associated higher ticket prices. We have therefore considered that 10km from the city centre (straight line distance) to be the maximum distance for a site. This will keep operating costs down (and potentially infrastructural costs as a result of providing prioritisation for bus services), whilst being able to include several large residential areas which could generate ‘bus only’ trips on the Park & Ride services.

4.8. Because of Oxford’s relatively remote location from any other major conurbations, most of the selected corridors would have multiple options for site location directly served from the main road.

4.9. There would appear to be few accessible locations on the A34 corridor between Oxford and Abingdon. However, OCC have been considering a scheme to add south facing slips to the Lodge Hill interchange, at the cost of approximately £12m, to improve access to Abingdon. The ability to serve a Park & Ride, and potentially an HGV parking area or a freight consolidation centre, from Lodge Hill would add value to the scheme.

### Suggested capacities

4.10. A five-step process<sup>2</sup> was undertaken to determine the proposed capacities which would be required at each site (the capacities are shown in Table 4-1):

1. Identification of the origins (by corridor) of trips to the existing sites in the AM peak hour (taken from OSM);
2. Extrapolation of a total demand to sites (based on capacity) by origin;
3. Allocating existing demand to the new sites (for trips with origins located between the new P&R site (e.g Kidlington or Cumnor) and the city, it is assumed that those trips would transfer to bus only mode;
4. Calculating the additional demand as a result of SHMA<sup>3</sup>;

<sup>2</sup> Available within the spreadsheet “2014 11 26 Anticipated Park & Ride demand.xlsx”

<sup>3</sup> Data from 2014 12 02 Investigation into additional trips.xls

5. Calculate the demand resulting from a 20% mode shift of existing commuter trips to the Eastern Arc (this is an estimate achievable through the combination of other OTS measures of direct BRT, WPL, access restrictions etc).

4.11. In order to build upon the success of Park & Ride, attract new users and cater for the new demand generated by growth, the new sites (along with an increase at Thornhill) will provide almost double the existing total capacity. This increased capacity of 9,400 spaces will be essential as more of Oxford's workforce originate from outside the city.

### **Site summary**

4.12. The provision of new, remote sites on strategic corridors with increased capacity will be particularly important in providing attractive points for drivers to transfer from their cars to mass transit services across the city: either making use of direct services or being able to seamlessly transfer between services at key interchanges across the network.

4.13. Table 4-1 summarises the potential locations for the remote Park & Rides.

**Table 4-1 Summary of the proposed remote Park & Ride sites**

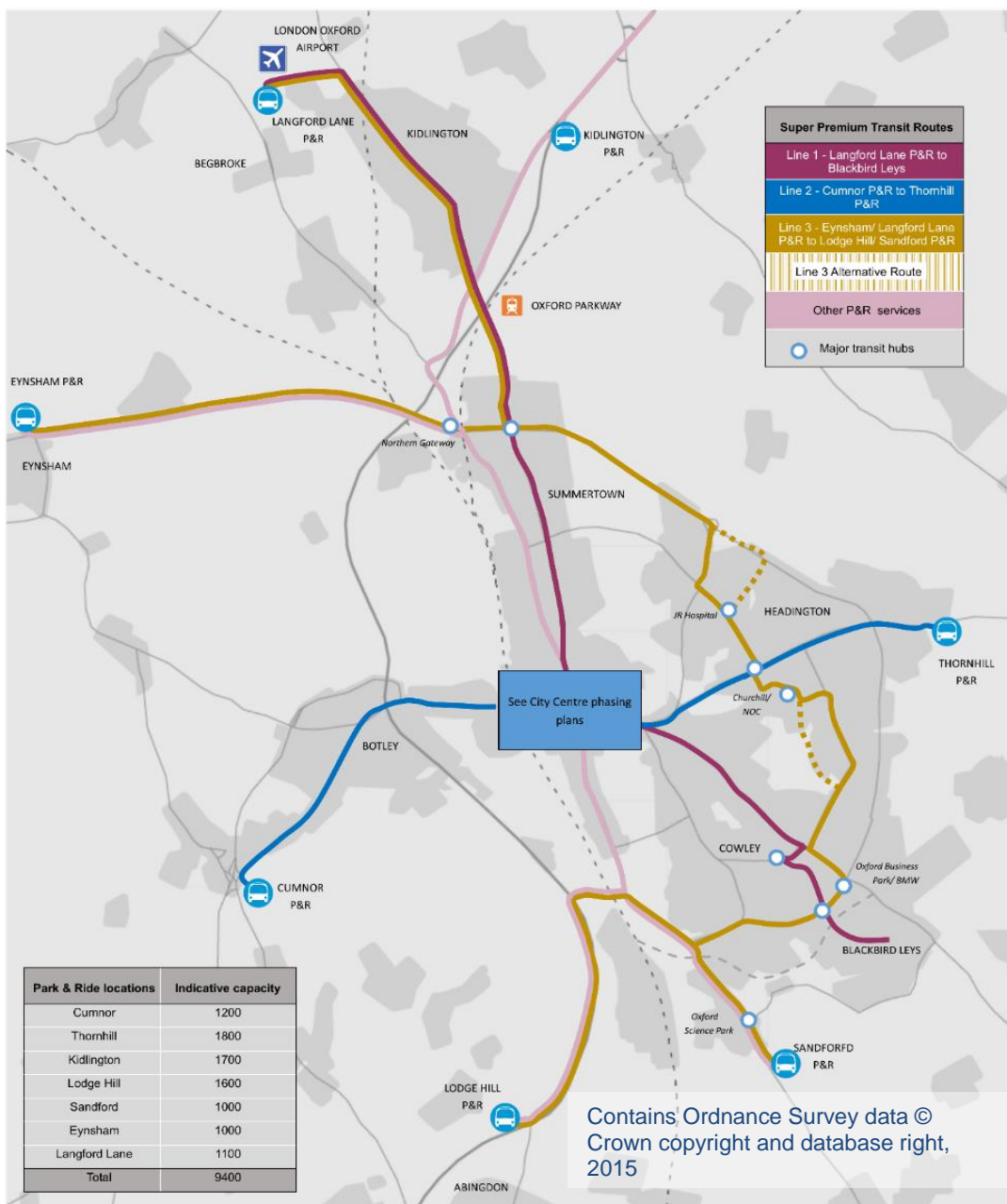
Corridor(s)	Location	Strategic catchment for P&R users	Catchment for bus-only users	Replaces	Approximate distance from city centre	Potential access opportunity	Suggested capacity
A40 (west)	<b>Eynsham</b>	Witney, Carterton, Cheltenham, Gloucester	Eynsham	Seacourt	9 km	A40 north of Eynsham	1,000
A44, A4260	<b>Langford Lane</b>	Chipping Norton, Banbury, Worcestershire, Warwickshire	Kidlington	Water Eaton, Peartree	9 km	Langford Lane/ A44	1,100
A34 (north)	<b>East of Kidlington</b>	Bicester, Banbury, Milton Keynes, Bedfordshire	Kidlington	Water Eaton, Peartree	8 km	Islip interchange	1,700
A420	<b>Cumnor</b>	Faringdon, Swindon, Wiltshire	Botley, Cumnor	Seacourt	5 km	Cumnor Hill/ A420	1,200
A34 (south)	<b>Lodge Hill</b>	Abingdon, Didcot, Science Vale, Newbury, Hampshire	Abingdon (bus/cycle)	Redbridge	6 km	Lodge Hill interchange	1,600
A4074	<b>Sandford</b>	Wallingford, Didcot, Henley, Reading, Berkshire	Sandford	Redbridge	6 km	A4074 south of Sandford	1,000

# 5. Implementation

## Link to BRT and the bus network

5.1. Figure 5-1 shows how the proposed Park & Ride sites will be served by BRT and other dedicated P&R services which have been proposed within the OTS. Other local and inter-urban bus services will also serve the sites.

Figure 5-1 BRT and bus links to the proposed Park & Ride sites



## Phasing

- 5.2. It is envisaged that delivering all of the Park & Ride sites will take 10 to 15 years.
- 5.3. Taking advantage of the Local Growth Deal-funded A40 bus improvements, Eynsham is suggested as the first of the new sites which could be delivered (by 2020), followed by a site near Cumnor, thus allowing Botley to be reduced and then closed.
- 5.4. To the south of Oxford, Lodge Hill and Sandford are suggested for delivery in tandem between 2020 and 2025 to allow for the closure of Redbridge.
- 5.5. After 2025, it is envisaged the sites to the east and west of Kidlington could be delivered with Peartree and Water Eaton closing.
- 5.6. The development of Park & Ride sites provides the opportunity to deliver high quality, energy-efficient facilities. Based on examples of good design practice sites should be provided with:
- High quality modern terminal buildings with comfortable and well-lit waiting areas;
  - Real-time information on all services using the site;
  - Convenient electric vehicle charging points;
  - Cycle storage (and possibly cycle hire / servicing facilities);
  - WIFI facilities; and
  - Automated and integrated ticketing facilities
- 5.7. Other options could include priority parking for those with multi-occupancy or low emission vehicles. For larger sites, it may also be appropriate consider multiple collection and drop-off points to reduce the need to walk to a main terminal.
- 5.8. Sites should seek to maximise available land and minimise their environmental impact. Where appropriate, car parks may be decked to minimise the footprint of the parking area and maximise capacity. Surface water drainage from the sites will be managed using various SUDS components to ensure that discharge from the car park to nearby watercourses is limited. Opportunities to capture solar or wind technology should also be considered.

## Costs

- 5.9. Based on recent Park & Ride schemes elsewhere in the country, we would anticipate that in order to deliver the sites would require a total of approximately £79 million (broken down in Table 5-1).

**Table 5-1 Estimated cost of delivery**

Location	Site cost (based on £8000 per space)	Access cost
Eynsham	£8,000,000	£250,000
Langford Lane	£8,800,000	£250,000
East of Kidlington	£13,600,000	£250,000
Cumnor	£9,600,000	£250,000
Lodge Hill	£13,800,000 (including an 80 space HGV park)	£13,000,000 (including access from A34)
Sandford	£8,000,000	£250,000
Thornhill (expansion)	£2,400,000	£100,000
<b>Total</b>	<b>£64,200,000</b>	<b>£15,100,000</b>



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