
Title: Possible Housing Growth Site Clusters
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Author: Neil Taylor, Stephanie Norris, Rachel Tate
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1 INTRODUCTION

- 1.1 This Technical Note draws on findings from a Red/Amber/Green (RAG) assessment of spatial options identified by the Oxfordshire Growth Board as potential sites that could accommodate Oxford City's unmet housing need of 15,000 dwellings (as highlighted through the Local Plan process). It sets out a series of possible clusters of spatial options that could be considered as 'Oxford overspill' growth packages, around which accompanying transport infrastructure proposals could be developed and tested to facilitate future sustainable growth in line with aims and objectives of Connecting Oxfordshire – the strategic Local Transport Plan (LTP) for the county.
- 1.2 The work shared at this juncture represents an early stage of thinking, which will be subject to further discussion and refinement based on other infrastructure and land-use planning considerations. This process will include consideration of the broader RAG assessment being conducted by LUC, and timescale trajectories being developed by BBP, on behalf of the Oxfordshire Growth Board.
- 1.3 The remainder of this Technical Note is structured around the following clusters of spatial options that have been identified:
- Sites which scored strongly / less well in the RAG assessment of spatial options for accommodating Oxford's unmet housing need.
 - Sites which are located close to current and proposed rail infrastructure serving Oxford.
 - Sites which will be served by, or benefit from, significant proposed local sustainable transport investments. Specifically, this includes Rapid Transit corridors 1, 2 & 3 and their accompanying cycle routes/Park & Ride sites.
- 1.4 In preparing these initial clusters of spatial options, it is important to recognise that ITP has:
- Not considered any specific transport mitigation packages, or enabling works, that may be proposed by developers or promoters for specific housing growth sites. It reflects the high-level, strategic, nature of the work being conducted at this stage.
 - Used all currently available data on transport scheme proposals set out in the Connecting Oxfordshire LTP, Local Plan Infrastructure Delivery Plans, and spatial allocations for housing and employment growth (based on GIS data shared by District Councils). This information drew on the Devolution Deal mapping activities undertaken by Oxfordshire County Council, and may need to be updated prior to more detailed appraisal of transport schemes in relation to the housing growth options.
 - Not conducted any initial sift of the deliverability or desirability of proposed transport schemes, for example using the [Df T 's Ear ly A ssessment and Sif t ing T ool \(EAST\)](#). This is likely to be necessary as part of the process for defining packages of transport measures.
 - Not conducted any transport modelling. It is anticipated that this will form part of a later stage of work, through which the impacts of different combinations of housing growth spatial options and transport investment packages are tested and compared.

2 SPATIAL OPTIONS THAT SCORED STRONGLY / LESS WELL IN THE RAG ASSESSMENT

Sites which scored strongly in the RAG assessment (Green)

2.1 Of the 36 spatial options being considered through the RAG assessment, 12 were assessed as being predominantly green (or green/amber) on the basis that they:

- Were scored 'Green' on at least two of the seven key RAG assessment metrics¹.
- Were scored 'Red' on no more than two metrics of the seven key RAG assessment metrics.

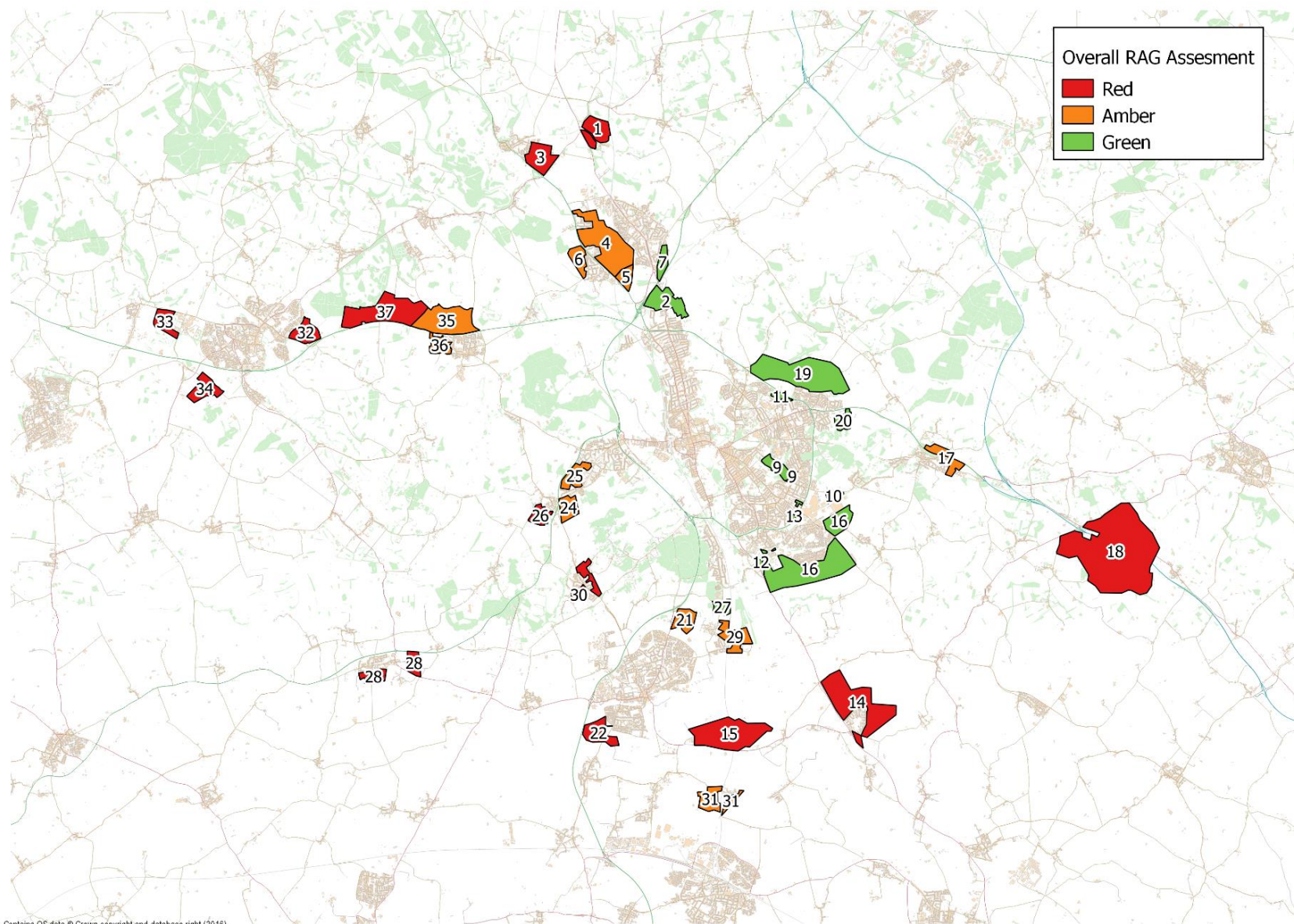
2.2 These options have been presented in Table 2-1 and are illustrated as sites shaded green in Figure 2-1.

Table 2-1: Spatial options that scored strongly in the transport-focused RAG assessment

Site	District	Houses	RAG Metrics						
			1	2	3	4	5	6	7
2 - Land north of Oxford	Cherwell	2,200							
16 - Land SE of Oxford (Grenoble Rd)	South Oxon	2,200							
8 - Enhanced growth	Oxford	0							Unknown
9 -Oxford Golf Club	Oxford	1,100							
10 - Horspath site (BMW/Mini site) land	Oxford	550							
13 - Land at Oxford Business Park	Oxford	400							
20 - Land adj to Thornhill P&R	South Oxon	550							
19 - Wick Farm	South Oxon	2,200							
7 - Land SE of Kidlington	Cherwell	550							
12 - Land at Oxford Science Park	Oxford	350							
11 - Land N of Old Headington	Oxford	550							
27 - Kennington	White Horse	550							

¹ As explained in the RAG Assessment Technical Note that accompanies this one, the road safety metric was scored individually, but not included in the overall RAG assessment and site grouping on the basis that the majority of sites are close to road safety incident locations and enabling works to develop the sites would seek to ameliorate existing road safety issues in order to reduce the numbers of road traffic collisions and incidents experienced in the future.

Figure 2-1: Map showing sites that scored strongly, and less well, through the transport-focused RAG assessment



- 2.3 In total, these 12 spatial options have the capability to deliver an estimated 11,200 houses by 2031. The sites which received the strongest scores in the RAG assessment were:
- Site 2: Land north of Oxford (6 green RAG ratings)
 - Site 16: Land SE of Oxford (Grenoble Road) (5 green RAG ratings)
 - Site 8: Enhanced growth in Oxford City (4 green RAG ratings and no Red ratings)
 - Site 9: Oxford Golf Club (4 green RAG ratings and no Red ratings)
- 2.4 These sites could accommodate around 5,500 dwellings if they were developed, and are considered the best-connected locations among the spatial options in respect of access to public transport and key local highways. These sites generally scored well in respect of their proximity to funded future transport improvements, and the extent to which they support other development sites.
- 2.5 Subject to detailed comparisons with LUC's broader RAG assessment of these sites (which covers a wider range of land-use planning considerations) and BBP's refined site capacities and trajectories; this group of sites could represent a possible package of spatial options. A possible next step would be to define a package of potential transport infrastructure investments (drawing on schemes defined in the Connecting Oxfordshire LTP, and Local Plan Infrastructure Delivery Plans) that support these spatial options. These transport schemes could then be sifted using the DfT's EAST tool, prior to inclusion in a future growth scenario for testing in the Strategic Transport Model for Oxfordshire and comparison against other packages of options.

Sites which scored predominantly Amber or Amber and Green/Red through the RAG assessment (Amber)

- 2.6 A second group of 11 spatial options did not meet the defined criteria for achieving an overall Green RAG score, but performed more strongly in the RAG assessment than the definition for an overall Red score (see below for details). These sites are presented in Table 2-2, and could accommodate an estimated 11,500 dwellings by 2031 based on BBP's trajectories.
- 2.7 These sites are shaded amber on Figure 2-1. Their RAG scores suggest they could potentially accommodate Oxford's unmet housing need, but are likely to require a greater scale of sustainable transport connectivity investments to improve access to jobs in Oxford, limit car-based travel, and mitigate congestion on existing roads in their vicinity. This appears particularly true in the case of sites at Wheatley (17), Eynsham North (35) and Eynsham West (36); where the RAG scores were mixed on the basis of proximity to currently funded transport investments/investments serving other sites and connectivity, current traffic congestion levels, and connectivity to Oxford jobs. In particular, the part-funded A40 strategy and Park and Ride improvements at Eynsham could support development at sites 35 and 36.

- 2.8 Spatial options from this group could supplement those in the Green cluster set out in Table 2-1, as needed, but may require additional transport investment and ultimately achieve less sustainable outcomes in transport connectivity terms. Testing using the Oxfordshire Strategic Transport Model may be appropriate to determine the impact of some of these sites alongside those listed in Table 2-1.

Table 2-2: Spatial options that scored an overall Amber rating in the transport-focused RAG assessment

Site	District	Houses	RAG Metrics						
			1	2	3	4	5	6	7
17 - Land at Wheatley	South Oxon	550							
35 - Eynsham North	West Oxon	2,200							
36 - Eynsham West	West Oxon	550							
21 - North Abingdon	White Horse	1,100							
29 - Radley	White Horse	2,200							
5 - Land E of Yarnton	Cherwell	550							
4 - Begbroke	Cherwell	1650							
6 - Land W. of Yarnton	Cherwell	550							
31 - Appleford	White Horse	1,100							
24 - Botley	White Horse	550							
25 - Chawley	White Horse	550							

Sites which scored less well in the RAG assessment (Red)

- 2.9 The remaining 13 spatial options (accommodating 18,000 dwellings) scored less well against the seven key RAG assessment metrics. They are shaded red on Figure 2-1, on the basis that the RAG scores they received gave them 'predominantly red' outcomes, as shown in Table 2-3. These spatial options are currently among the least well-connected by public transport and local highways, and only three (37: Eynsham Park, 15: Culham, and 26: Cumnor) display amber scores against Metric 1 – which considers existing travel to work mode share as a proxy for sustainability (from a transport perspective) of each spatial option. The sites with weakest RAG assessment scores were:

- Site 22: South Abingdon (7 red RAG ratings)
- Site 1: Shipton Quarry (6 red RAG ratings)
- Site 30: Wootton (5 red and no Green RAG ratings)
- Site 28: Land S and E of Kingston Bagpuize (5 red and no Green RAG ratings)
- Site 3: Land SE of Woodstock (5 red and no Green RAG ratings)

Table 2-3: Spatial options that scored less well in the transport-focused RAG assessment

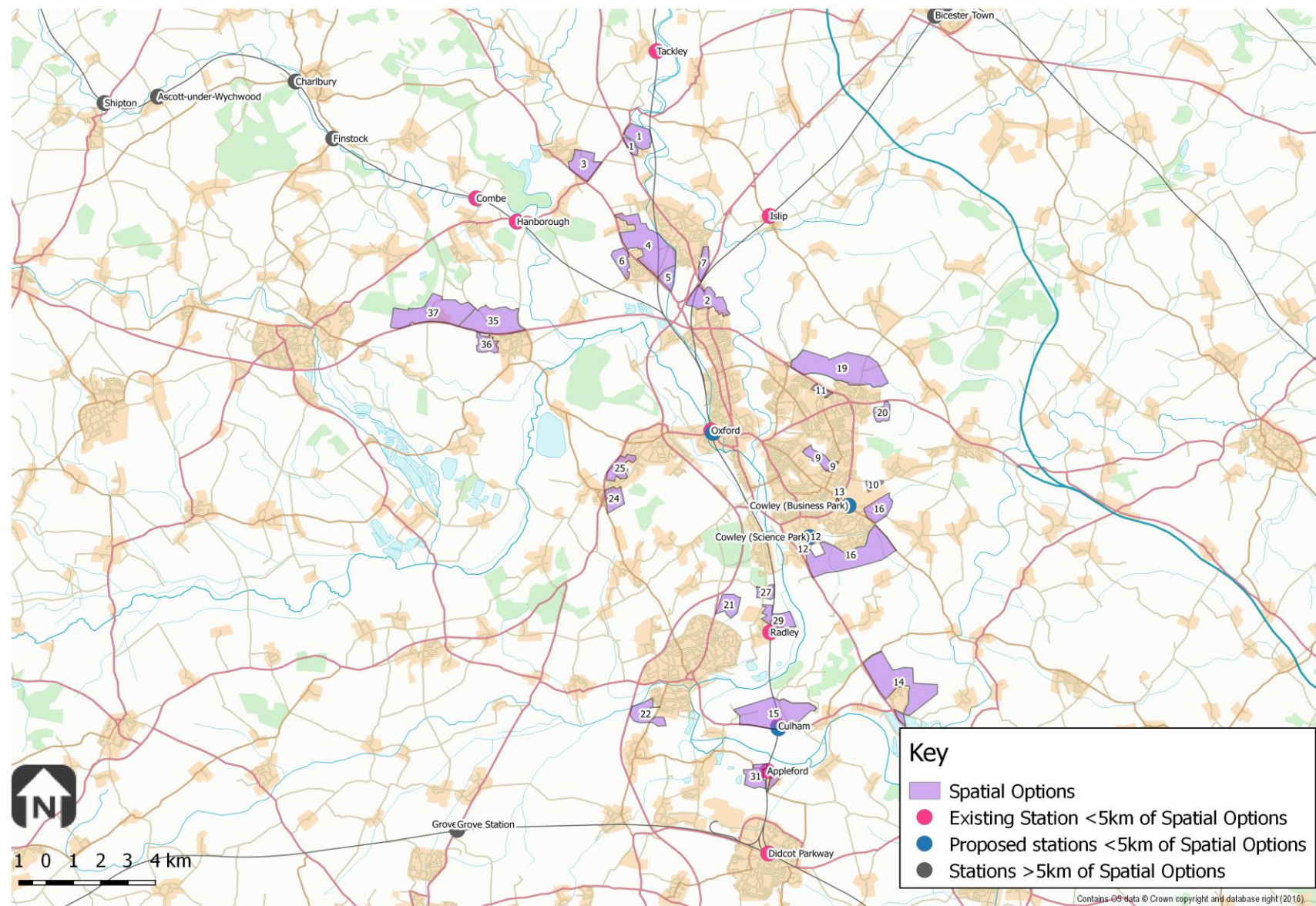
Site	District	Houses	RAG Metrics						
			1	2	3	4	5	6	7
37 - Eynsham Park	West Oxon	2200							
15 - Culham	South Oxon	2200							
26 - Cumnor	White Horse	550							
14 - Berinsfield	South Oxon	2200							
32 - Witney NE	West Oxon	1300							
18 - M40 J7	South Oxon	2200							
33 - Witney Downs Road	West Oxon	550							
34 - Witney South	West Oxon	1100							
3 - Land SE of Woodstock	Cherwell	1300							
28 - Land S and E of Kingston Bagpuize	White Horse	1100							
30 - Wootton	White Horse	1100							
1 - Shipton Quarry,	Cherwell	1100							
22 - South Abingdon	White Horse	1100							

- 2.10 A possible next step is to treat the sites listed in Table 2-3 as a package of locations that could accommodate Oxford's unmet housing need, but which are likely to require considerable un-programmed investment and ultimately expected to achieve less sustainable transport outcomes for Oxfordshire. Developing a package of possible transport investments for this cluster of spatial options would allow for sifting using the DfT's EAST tool, and subsequent testing in the Strategic Transport Model for Oxford (as proposed for the strongest performing sites from the RAG process) to enable comparative analyses based on forecast traffic and public transport patronage impacts arising from development. This group of sites should also be subject to detailed comparisons with LUC's broader RAG assessment of these sites (which covers a wider range of land-use planning considerations) and BBP's refined site capacities and trajectories in order to identify any sites that are unlikely to be suitable for development due to broader land-use planning and sustainability constraints.

3 SPATIAL OPTIONS CLOSE TO CURRENT AND PROPOSED RAIL INFRASTRUCTURE

- 3.1 Ongoing, and second phase works to improve East-West rail links across Oxfordshire, coupled with proposals to open the Cowley branch line (currently reserved for rail freight) to passenger rail services, are anticipated to improve public transport connectivity and capacity in the county. Geospatial analyses presented in Figure 3-1 revealed that 28 of the 36 spatial options are within 5km of current and proposed rail stations in Oxfordshire.
- 3.2 According to BBP's trajectories to 2031, the 8 locations outside these catchment areas could deliver 8,450 houses, and were also among the sites that scored Amber or Red in the RAG assessment (see Table 2-2 and Table 2-3). They include:
- 17: Land at Wheatley – 550 houses
 - 18: M40 J7 – 2,200 houses
 - 26: Cumnor – 550 houses
 - 28: Land S and E of Kingston Bagpuize – 1,100 houses
 - 30: Wootton – 1,100 houses
 - 32: Witney NE – 1,300 houses
 - 33: Witney Downs Road – 550 houses
 - 34: Witney South – 1,100 houses
- 3.3 A different 8 spatial options are particularly close to current or proposed rail stations, and could play a role in helping to reduce short vehicle trips that are often made as part of longer trip chains involving rail journeys. Three sites (marked with a * in the list below) are among spatial options that performed less-well in the RAG assessment. It is possible that current/improved rail access at these locations could support housing growth that is well-connected (by rail) to employment sites in the centre of Oxford:
- 2: Land north of Oxford – 2,200 houses
 - 7: Land SE of Kidlington – 550 houses
 - 12: Land at Oxford Science Park – 350 houses
 - 13: Land at Oxford Business Park – 400 houses
 - 15: Culham – 2,200 houses*
 - 16: Land SE of Oxford – 2,200 houses
 - 29: Radley – 2,200 houses*
 - 31: Appleford – 1,100 houses*
- 3.4 A key issue is the range of destinations offered, and service capacity into Oxford/nearby employment centres. ITP understands more jobs are based at sites outside the city centre than within it, so direct rail connectivity to these locations (e.g. along the proposed Cowley branch line) and interchange with other travel modes will be critical if this cluster of rail-based options is to be feasible. No account has been taken of service capacity on local rail services, which could be tested using a transport model. Since rail infrastructure funding tends to come from regional/national sources, it may be appropriate to separately test a rail-based package of sites the basis for identifying the transport impacts of these options in respect of accommodating Oxford's unmet housing need.

Figure 3-1: Spatial options within 5km of current and proposed rail stations around Oxford



4 POTENTIAL SITE CLUSTERS FRAMED AROUND RAPID TRANSIT CORRIDORS

- 4.1 An alternative approach to identifying which spatial options could accommodate Oxford's unmet housing need is to focus on their potential contribution to funding strategically important transport investments. Such a Transit-Oriented Development (TOD) approach involves siting housing and employment developments in locations where their function and scale supports significant investment in improved sustainable transport infrastructure and services. More sustainable development outcomes can be achieved as the location of homes and jobs supports fast, frequent, and high-quality alternatives to private car use for a larger proportion of trips and destinations.
- 4.2 Embracing this concept, ITP has made an initial attempt to develop three TOD-led clusters of spatial options framed around the three Rapid Transit lines that are proposed in the Connecting Oxfordshire LTP. These have been prepared to highlight the potential for adopting this approach in respect of accommodating Oxford's unmet housing need, through coordinated development along transit corridors that have been identified as strategically important for connecting future and existing employment and housing sites.
- 4.3 It is possible that connectivity to some spatial options for housing growth could be unlocked through extension or variation of the rapid transit route alignments that are currently proposed. As such it may be appropriate to consider a small number of alternative route options as part of more detailed work to test the transport impacts and scheme implementation costs associated with each of the current rapid transit line proposals using the Oxfordshire Strategic Transport Model.

Rapid Transit Line 1 cluster

- 4.4 Figure 4-1 shows the range of transport options and spatial options considered as part of the Rapid Transit Line 1 corridor approach to clustering development. Appendix Gi contains an MS Excel spreadsheet that documents all of the transport measures, and site options covered by this analysis. These have been calculated in a modular way, based on phased portions of each rapid transit line – reflecting the basis on which they may be delivered.
- 4.5 In summary, a total of 13 transport schemes were included in this package. They incorporate Rapid Transit Line 1; the Park & Rides on the A44 and at Peartree; and cycle routes along Cowley Road, Garsington Road, Watlington Road, Iffley Road, the B4495, Banbury Road, Woodstock Road, and the Northern Gateway – Oxford Parkway.
- 4.6 As shown in Table 4-1, the average cost per house of funding these 12 schemes would be around £2,800 per dwelling based on current funding gaps. As well as serving spatial options that are under consideration on the basis of their potential to accommodate Oxford's unmet housing need, this public transport corridor would support development sites allocated for housing and employment growth that have already been identified in the relevant District Council's Local Plans. The variable shading of spatial allocations in Figure 4-1 shows that some of the proposed housing growth sites are directly served by the public transport corridors, while others are likely to benefit from proposed transport investments that are nearby (e.g. Park and Ride sites connected to rapid transit routes).

Figure 4-1: Spatial options linked to Rapid Transit Line 1 corridor

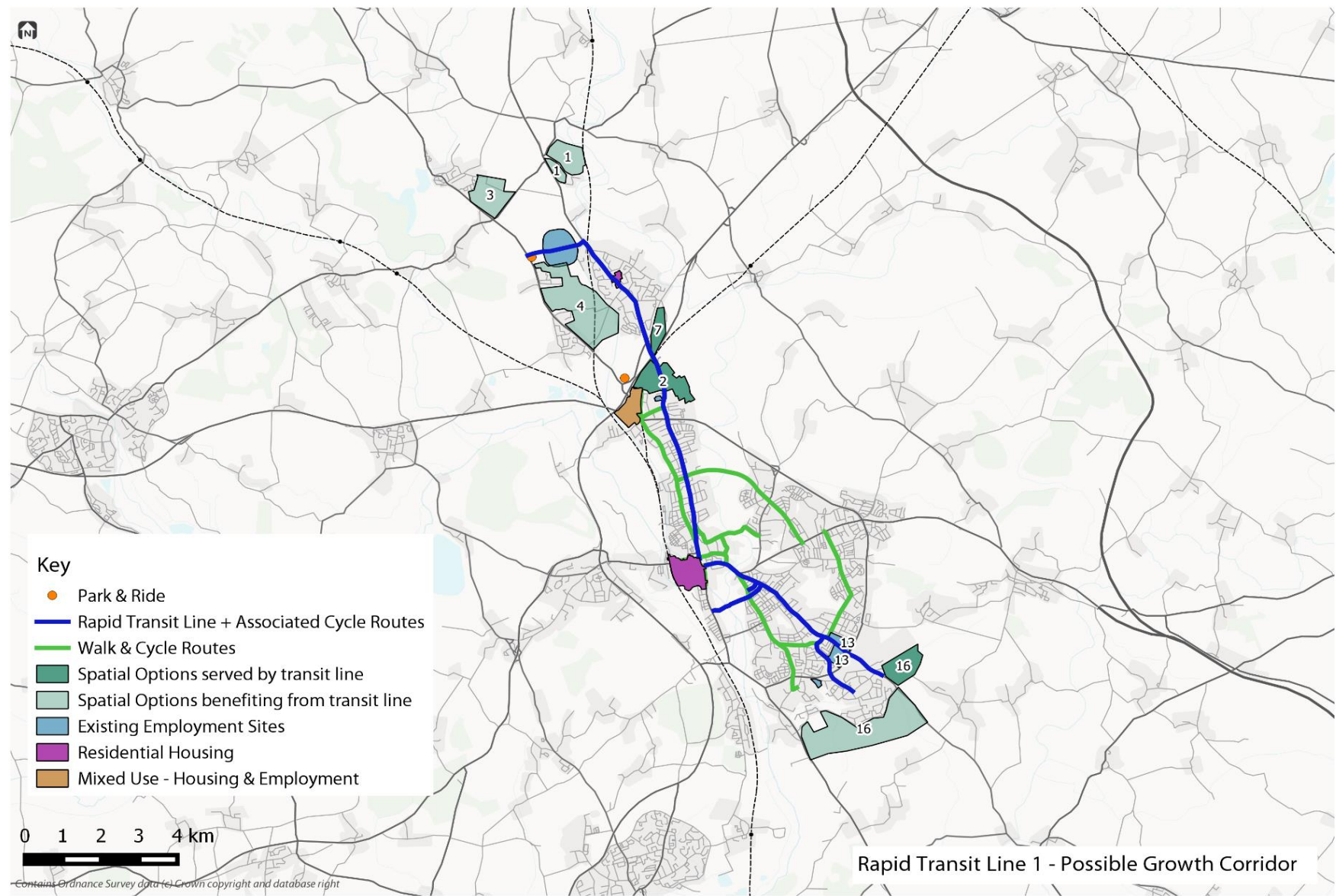


Table 4-1: Summary of transport investment costs and housing development served

Rapid Transit Line 1 corridor-based approach		
Number of Oxford unmet need spatial options served	4	Average investment cost per new house
Number of Oxford unmet need spatial options benefitting	3	
Number of other development sites served	8	
Total number of new houses served by 2031 (including other sites, where known)	9,800	
Total number of jobs	Not known	
Total transport scheme costs	£31,900,000	£3,255
Total unfunded transport scheme costs	£27,850,000	£2,842

- 4.7 Connecting Oxfordshire suggests 64,251 people live / 54,499 work within 400m of this rapid transit corridor. This would increase if the spatial options shown in Figure 4-1 and Table 4-1 are developed.

Rapid Transit Line 2 cluster

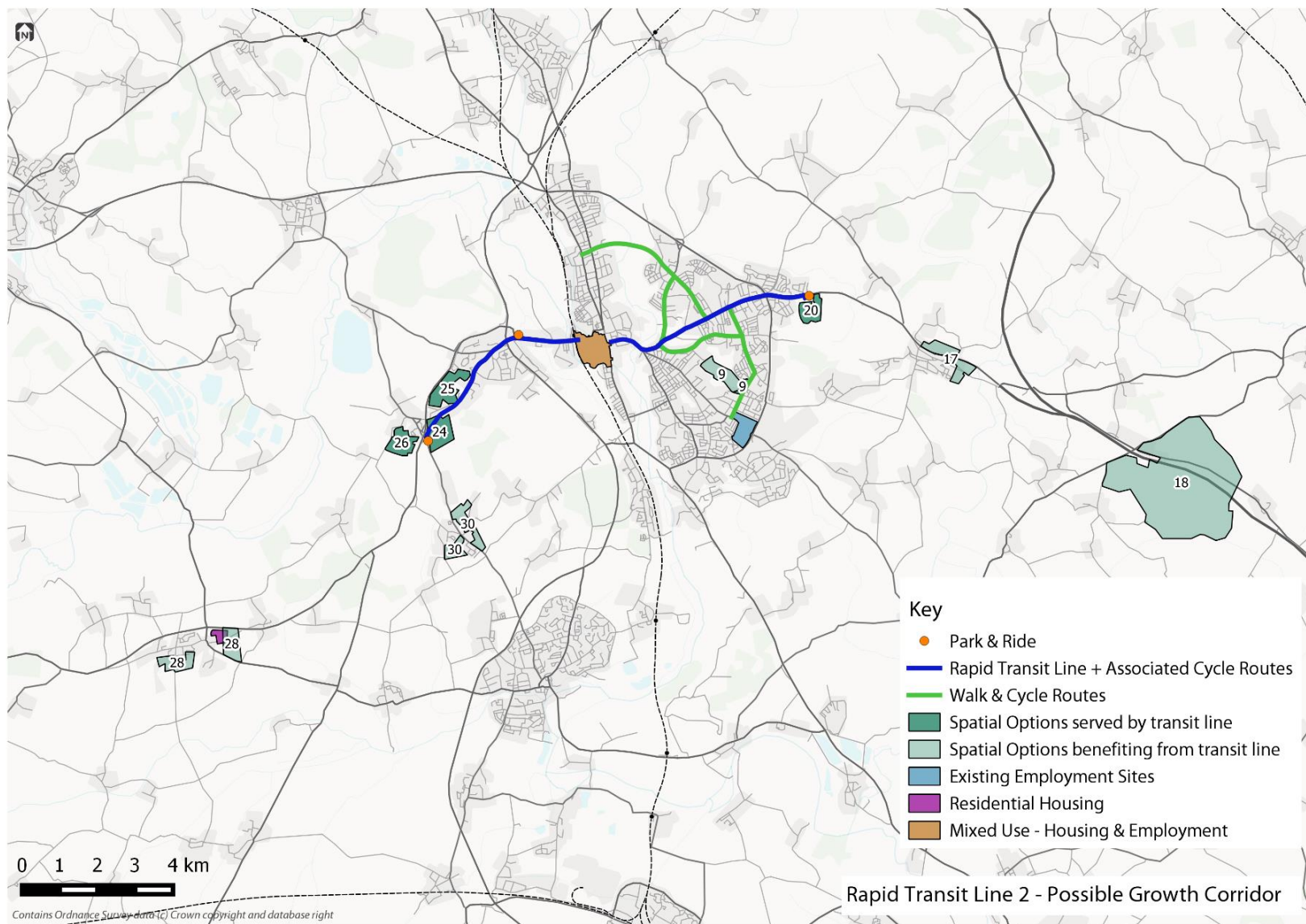
- 4.8 Figure 4-2 shows the range of transport options and spatial options considered as part of the Rapid Transit Line 2 corridor approach to clustering development. As above, these are fully documented in Appendix Gi.
- 4.9 In summary, a total of 10 transport schemes were included in this package. They incorporate Rapid Transit Line 2; the Park & Ride sites at Thornhill, Seacourt, and on the A420 corridor; and cycle routes along Botley Road, London Road, Morrell Avenue, B4495, and Marston Road.
- 4.10 As shown in Table 4-2, the average cost per house of funding these 10 schemes would be around £4,600 per dwelling based on current funding gaps. As well as serving spatial options that are under consideration on the basis of their potential to accommodate Oxford's unmet housing need, this public transport corridor would support development sites allocated for housing and employment growth that have already been identified in the relevant District Council's Local Plans.

Table 4-2: Summary of transport investment costs and housing development served

Rapid Transit Line 2 corridor-based approach		
Number of Oxford unmet need spatial options served	4	Average investment cost per new house
Number of Oxford unmet need spatial options benefitting	5	
Number of other development sites served	4	
Total number of new houses served by 2031 (including other sites, where known)	5,230	
Total number of jobs	Not known	
Total transport scheme costs	£26,935,000	£5,150
Total unfunded transport scheme costs	£24,017,500	£4,592

- 4.11 Evidence from the Connecting Oxfordshire Oxford Transport Strategy suggests that 38,916 people live, and 35,567 work within 400m of this rapid transit corridor. This would increase if the spatial options identified in are developed. Several outlying spatial options (e.g. sites 17, 18, 28 and 30) have been included on the basis that they are likely to benefit from Park & Ride sites on the way to Oxford that would be served by rapid transit services.

Figure 4-2: Spatial options linked to Rapid Transit Line 2 corridor



Rapid Transit Line 3 cluster

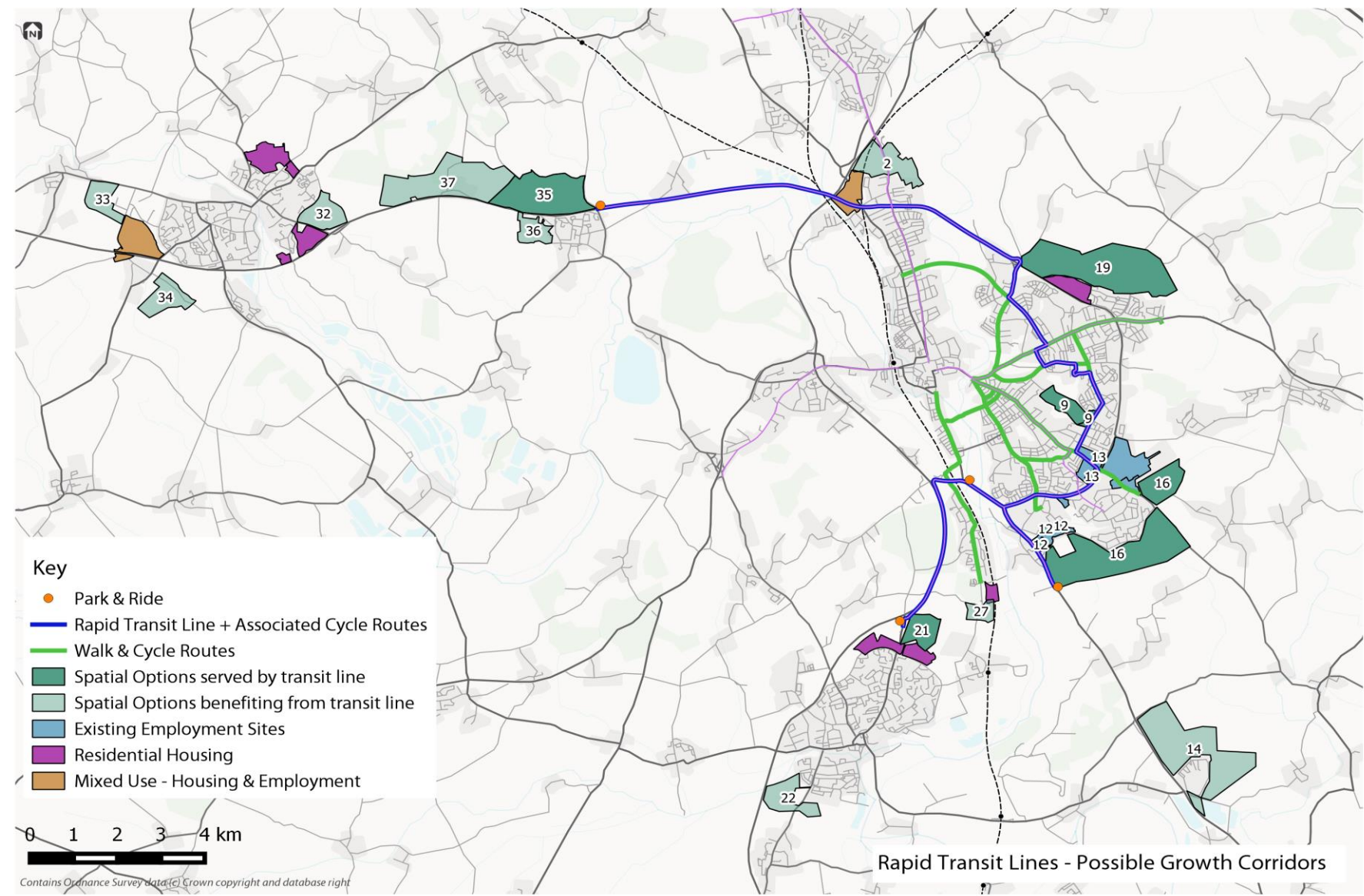
- 4.12 Figure 4-3 shows the range of transport options and spatial options considered as part of the Rapid Transit Line 3 corridor approach to clustering development. Further detail on the composition of sites and transport scheme proposals included in this analysis can be found in Appendix Gi.
- 4.13 In summary, a total of 14 transport schemes were included in this package. They incorporate the three components of Rapid Transit Line 3; the Park & Rides at Eynsham (A40 West), Redbridge, Sanford (A4074), and Lodge Hill (A420); and cycle routes along Hollow Way, Morrell Avenue, Marston, Cowley Road, Garsington Road, Watlington Road, B4495, Iffley Road, and Abingdon Road.
- 4.14 As shown in Table 4-3, the average cost per house of funding these 14 schemes would be around £300 per dwelling based on current funding gaps. As well as serving spatial options that are under consideration on the basis of their potential to accommodate Oxford's unmet housing need, this public transport corridor would support development sites allocated for housing and employment growth that have already been identified in the relevant District Council's Local Plans.

Table 4-3: Summary of transport investment costs and housing development served

Rapid Transit Line 1 corridor-based approach		
Number of Oxford unmet need spatial options served	7	Average investment cost per new house
Number of Oxford unmet need spatial options benefitting	9	
Number of other development sites served	12	
Total number of houses served (including other sites, where known)	25,770	
Total number of jobs	Not known	
Total transport scheme costs	£59,600,660	£2,406
Total unfunded transport scheme costs	£7,650,330	£309

- 4.15 Evidence from the Connecting Oxfordshire Oxford Transport Strategy suggests that 53,743 people live, and 37,418 work within 400m of this rapid transit corridor. This would increase if the spatial options identified in are developed.
- 4.16 For all of the rapid transit line clusters set out in this section, further work will be needed to accurately define the composition of transport schemes, and the sites/numbers of jobs they would serve if they are to be used as the basis for comparative analysis using the Oxfordshire Strategic Transport Model. As an example, there is considerable overlap between the Rapid Transit Line 1 and 3 corridors, so there may be a need to recalculate the costs of investment based re-apportioned packages of transport schemes and spatial options. Similarly, there may be a need to include enabling highways schemes (which were not included within these initial packages) that are required to complement the sustainable transport initiatives and unlock congestion pinch-points/add capacity to accommodate rapid transit alignments. These have not been taken into consideration through ITP's initial analyses set out in this note.
- 4.17 It will also be appropriate to consider BBP Regeneration's trajectories and estimated timings for development at each site. Development early in the next 15 years may be required to secure the funding needed to unlock strategic major transport schemes.

Figure 4-3: Spatial options linked to Rapid Transit Line 3 corridor



5 NEXT STEPS FOR SIFTING AND PRIORITISING SITE AND TRANSPORT OPTIONS

5.1 This site clustering exercise has built on the transport infrastructure focused RAG assessment conducted by ITP. The findings from this work are being shared with the Oxfordshire Growth Board on 6th June 2016, alongside the RAG assessment evidence. Subject to discussion and critical appraisal, the following pieces of follow-up work may be appropriate in order to further refine range of options under consideration and consider forecast transport capacity constraints so as to prioritise transport investment opportunities linked to local housing and employment growth:

- **Continuing refinement of the initial GIS database updated through ITP's work to-date** in order to add further detail (wherever possible) on each proposed transport scheme, its funding requirement, anticipated sources of funding, and current funding gap. This would establish a consistent geospatial evidence base that each District Planning Authority could draw on when developing or updating their sovereign Local Plans over the coming months and years.
- **Collating up-to-date data from District Planning Authorities and SQW's economic forecasting on the housing, employment, and mixed-use development land allocations;** so that these sites and numbers (of jobs and houses) can be included in the GIS database described above and any subsequent transport modelling work. A current concern is that the data included in current analyses does not fully encapsulate all of the adopted and proposed land-use allocations in Oxfordshire District Council's Local Plans.
- **Using the outcomes of LUC and BBP's assessments to refine this a set of initial proposals on potential clusters of spatial options and transport investments.** It may also be appropriate to develop other clusters for further testing.
- **Using the [Department for Transport's Early Assessment and Sifting Tool \(EAST\)](#) as the basis for testing (in high-level terms) the strategic contribution that major transport schemes proposed in the Connecting Oxfordshire strategy.** This could be used to rapidly test the major transport schemes proposed in order to:
 - o Identify which transport investment options are likely to make the most significant contribution to existing local transport issues, support future growth site options, and deliver on the strategic objectives set out in the LTP.
 - o Prioritise transport schemes that could support development at the spatial option sites being considered, based on their deliverability and likelihood of funding.
 - o Identify trade-offs and adverse impacts to aid package development.
 - o Filter out 'non-runner' options at an early stage ahead of more detailed appraisal, which would ultimately be the responsibility of District Council's as part of their Local Plan development/review processes.
- **Liaise with the team responsible for maintaining the Strategic Transport Model for Oxfordshire, in order to understand the latest status of the model:**
 - o Validation reports should document key assumptions and transport schemes that are included in the latest round of updates to the model.
 - o These would need to be verified to ensure the most recent version of the model provides a sound basis from which further option testing can be conducted.
 - o It would then be possible to define scenarios for comparative testing in the model, then outputs of which could be used by Oxfordshire County Council to provide strategic advice to the District Council Planning Authorities in respect of their combined approach to accommodating Oxford's unmet housing need.