

Appendix A: Accessibility by Sustainable Modes

Ver	Date	Author	Review	Approve	Comments
0.1	25-7-16	DF			Initial Draft for comments
0.2	11-8-16	DF	NE		Revised Scraptoft PT to remove 800m walk to access the bus
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1 Executive Summary

1.1.1 This note looks at the accessibility by sustainable modes (walk, cycle and public transport) to locations of possible residential development in East and South East quadrant of Leicester within the borough of Oadby & Wigston (O&W) and the district of Harborough (HDC). The sites chosen for this analysis do not reflect specific allocations but are provided in order to obtain a strategic understanding of the possible impacts, and implications of development in these areas. This information can then be used to help inform decisions on what transport measures might be required in order to support development in one or more of the areas.

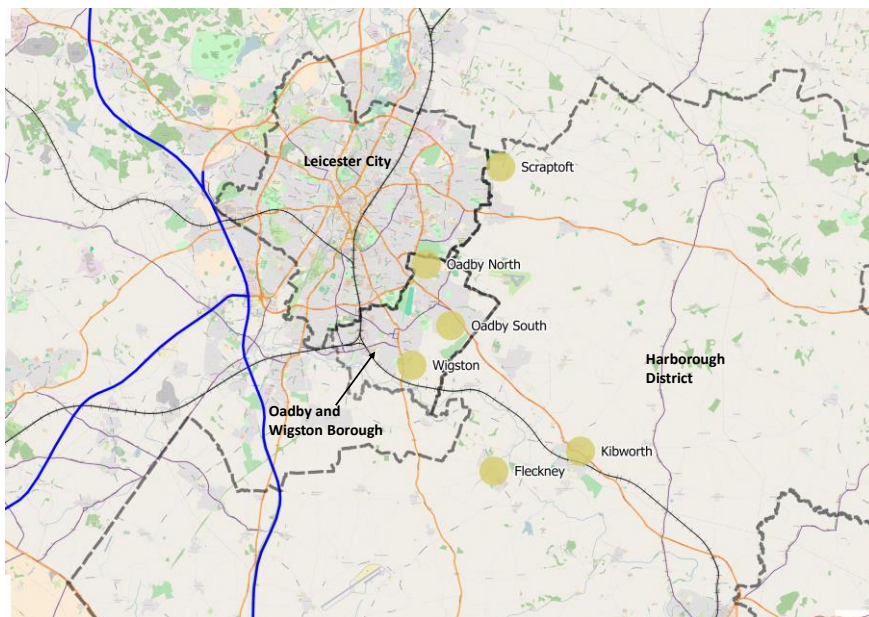


Figure 1: Broad locations of development considered within this study

1.1.2 This note provides:

- Details of the totals and spatial distribution of population and workers from the 2011 Census;
- An analysis of accessibility contours by sustainable transport modes to proposed development locations on the periphery of Leicester within Oadby & Wigston and Harborough districts;
- An analysis of how different locations for development differ in their accessibility to potential workplaces.

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3 Workers at their workplace and working age Population at the home

- 3.1.1 The 2011 Census provides details of the number and location of the working-age population¹ (at home) and workers (at their workplace).
- 3.1.2 Census Tables WP613EW and QS613EW provide data that categorises workers into social groups:
- All Workers/Population: All
 - AB Workers/Population: Managerial/Professional
 - C1 Workers/Population: Clerical/Supervisory
 - C2 Workers/Population: Manual Skilled
 - DE Workers/Population: Manual Unskilled (& not employed for population)
- 3.1.3 Table 1 shows the totals for the Leicester City Council, Oadby and Wigston Borough Council, Harborough District Council and Leicestershire County Council areas. Figure 2 and Figure 3 show this graphically.

Table 1: Totals of population (16-64) and Workers by social group in 2011

Social Group	Leicester		Oadby and Wigston		Harborough		Leiceseter & Leicestershire	
	Population (16-64)	Workers	Population (16-64)	Workers	Population (16-64)	Workers	Population (16-64)	Workers
All	216,760	159,067	33,570	20,320	52,524	40,359	623,990	450,095
AB: Managerial/Professional	28,089	33,491	8,056	4,229	16,791	9,208	127,080	100,096
C1: Clerical / Secretarial	61,735	49,602	10,672	5,752	16,533	11,463	188,027	134,795
C2: Skilled Manual	40,878	34,728	7,594	5,410	11,287	9,885	139,698	111,433
DE: Unskilled / Unemployed	86,058	41,246	7,248	4,929	7,913	9,803	169,185	103,771
AB: Managerial/Professional	13%	21%	24%	21%	32%	23%	20%	22%
C1: Clerical / Secretarial	28%	31%	32%	28%	31%	28%	30%	30%
C2: Skilled Manual	19%	22%	23%	27%	21%	24%	22%	25%
DE: Unskilled / Unemployed	40%	26%	22%	24%	15%	24%	27%	23%
All		0.73		0.61		0.77		0.72
AB: Managerial/Professional	Jobs per working age resident	1.19	Jobs per working age resident	0.52	Jobs per working age resident	0.55	Jobs per working age resident	0.79
C1: Clerical / Secretarial		0.80		0.54		0.69		0.72
C2: Skilled Manual		0.85		0.71		0.88		0.80
DE: Unskilled / Unemployed		0.48		0.68		1.24		0.61

Note:

- Workers at the Workplace, Population (16-64) at the home location
- Social Group estimated by the Household Reference Person from Census 2011

¹ Note that the population at the home end includes those not in employment

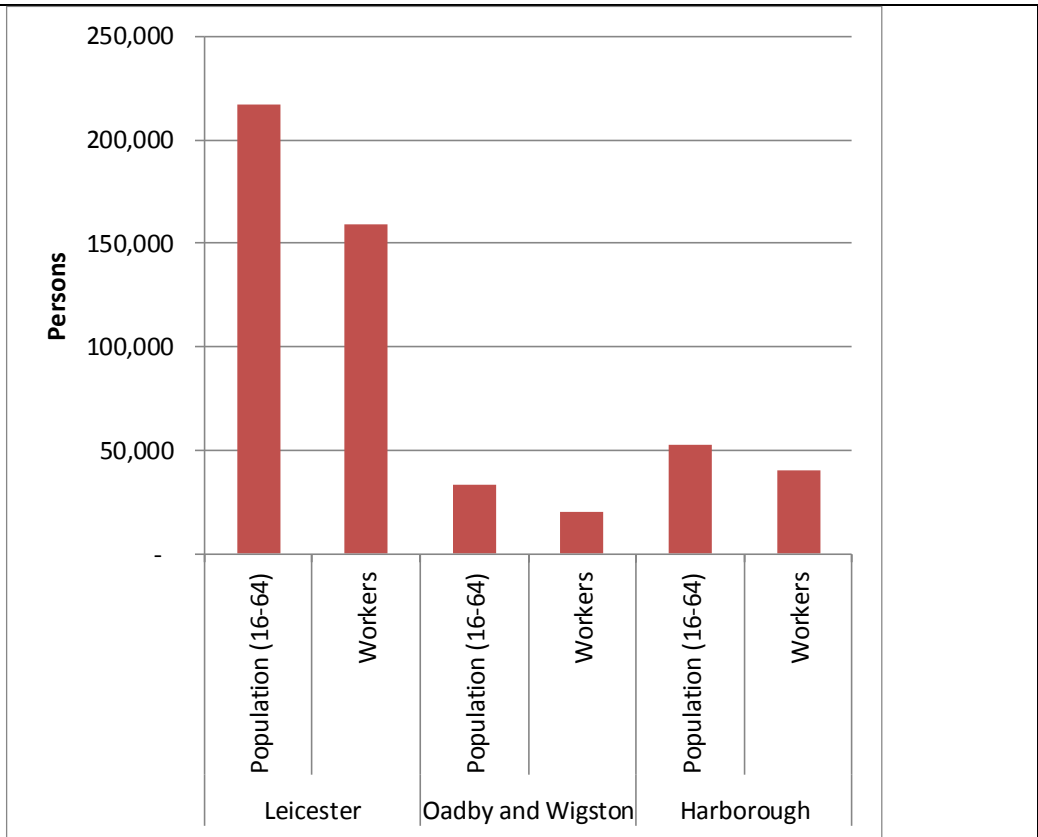


Figure 2: All Social Groups

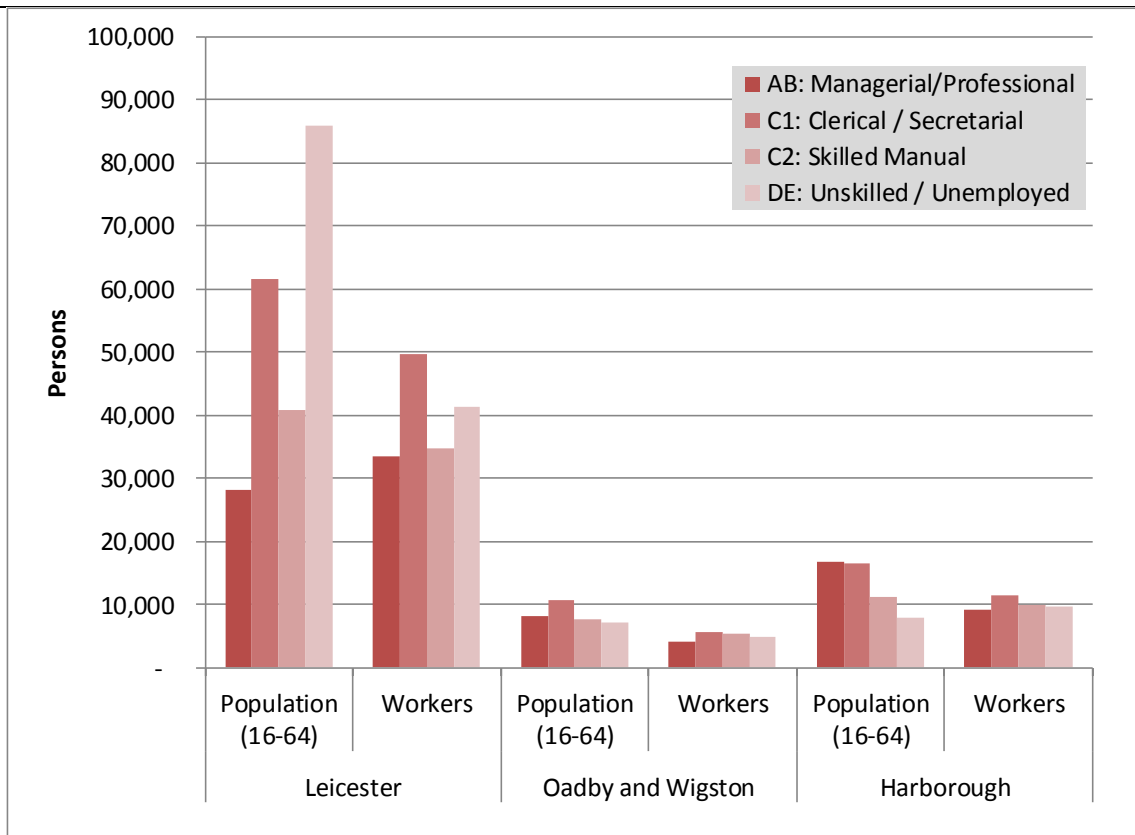


Figure 3: segmented by social group

3.1.4 Figure 4 shows the distribution of the working-age population at their home location. Whilst Figure 5 shows the location of workers at their workplace. Purple dots show a lower density, whilst white areas are higher density.

3.1.5 This clearly shows how the districts surrounding Leicester City have high levels of both employment and residents close to the city administrative boundary. This is noticeable to the South into the borough of Oadby & Wigston and districts to the West and North of Leicester City. To the East the limit of activity matches closely to the city boundary.

3.1.6 The chart also shows how workplaces are more concentrated than homes.

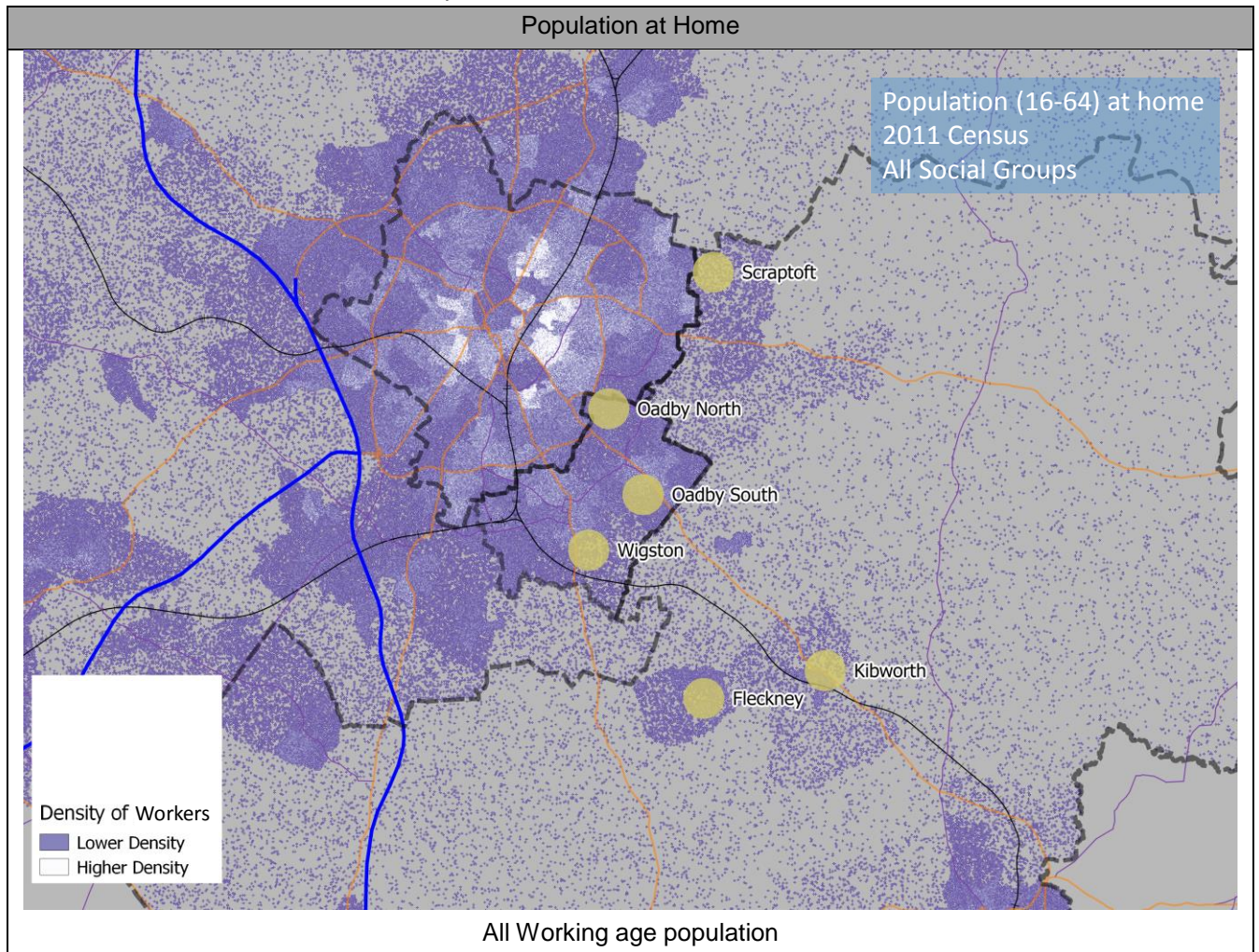


Figure 4: Density of working age population (at home)

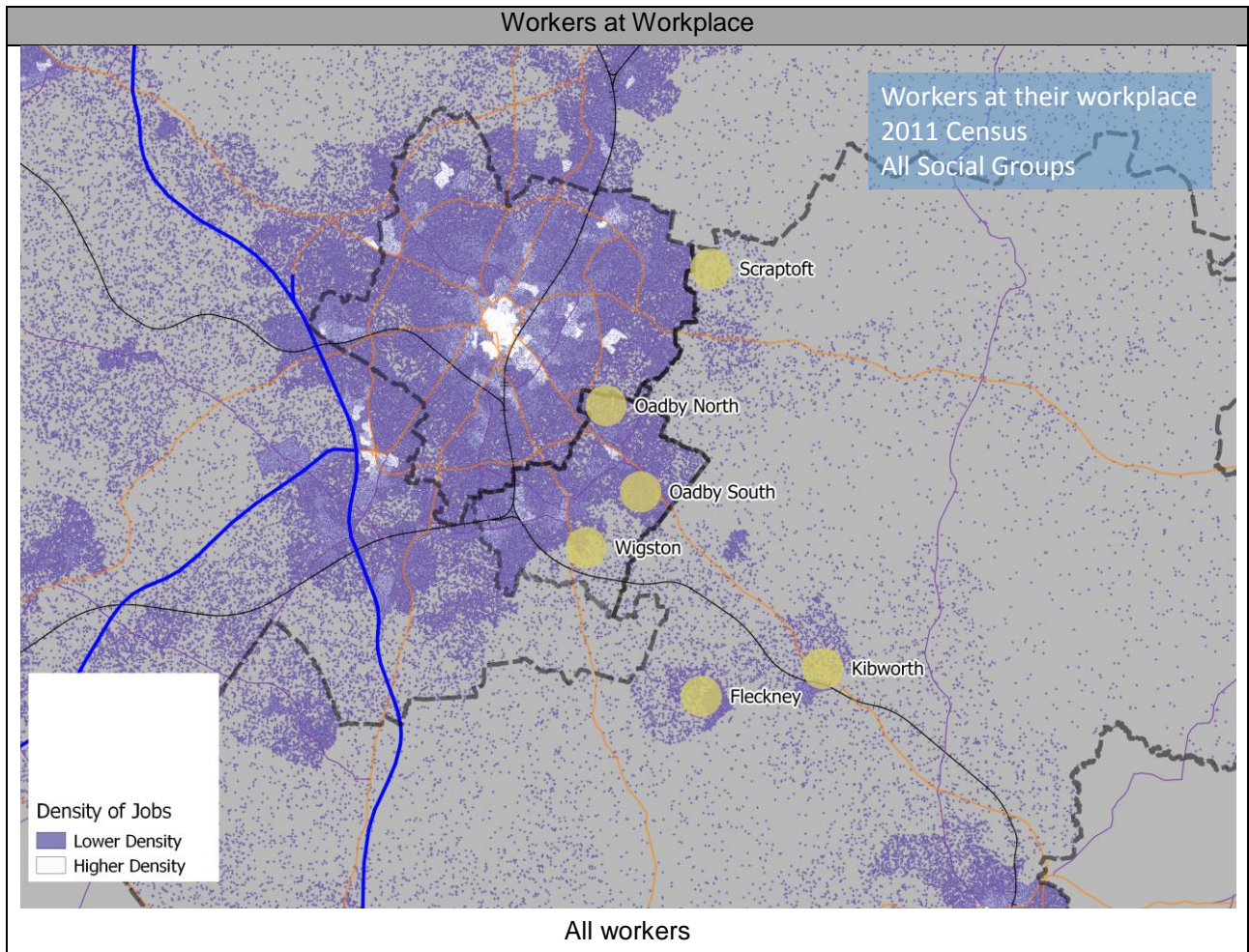
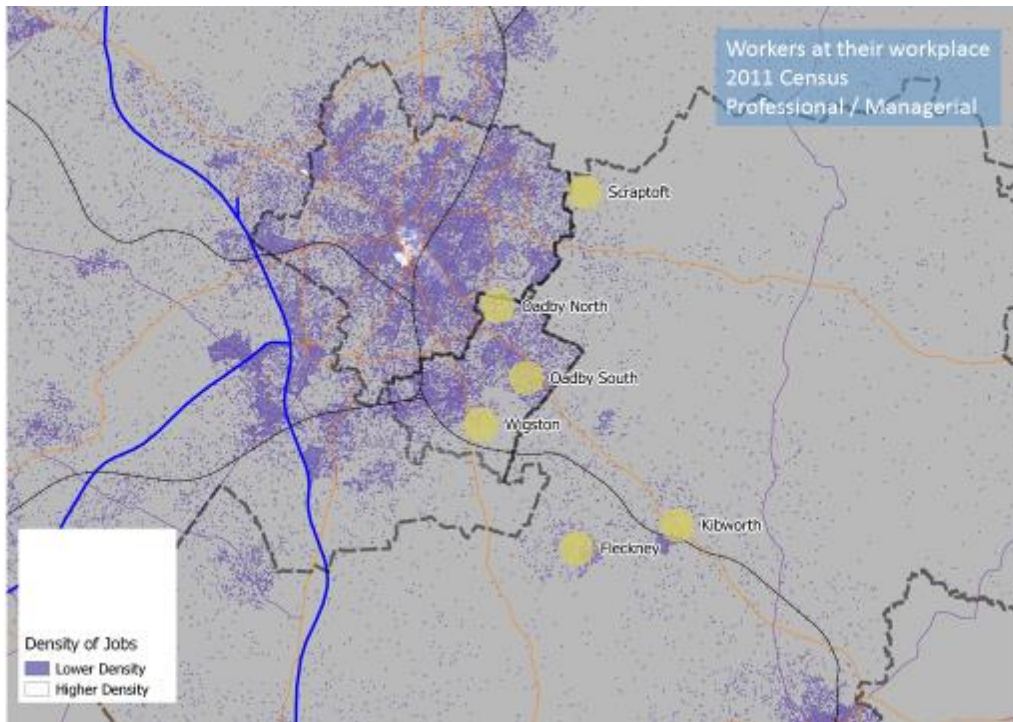


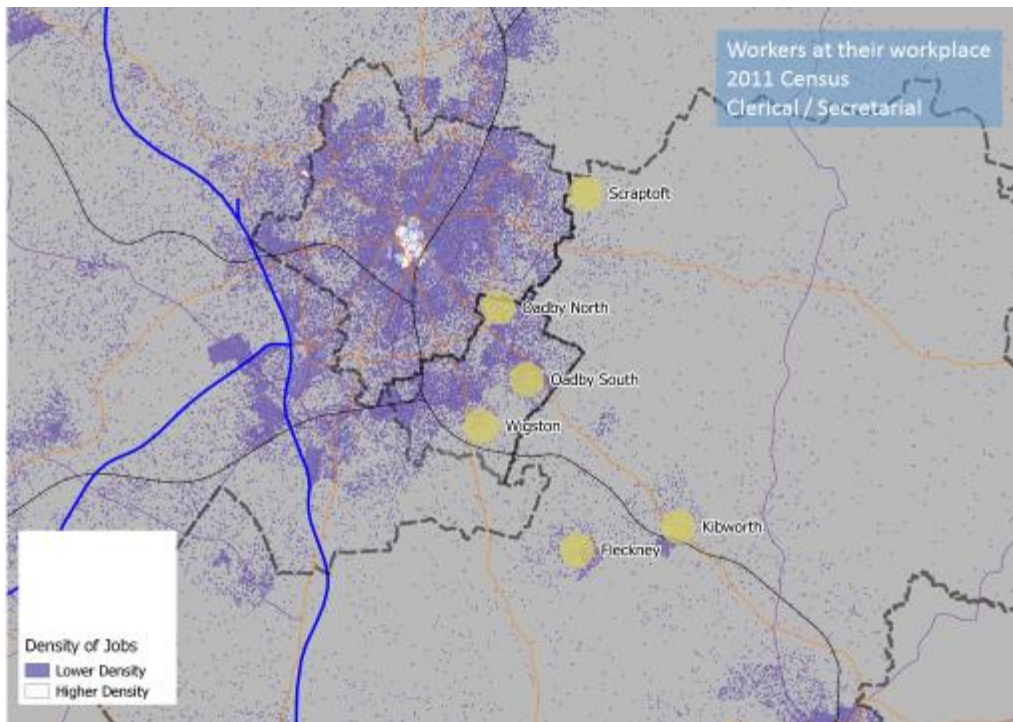
Figure 5: Density of workers (at the workplace)

3.1.7 Figure 6, Figure 7, Figure 8 and Figure 9 and show the distribution of workers by their social group. Information from these charts were used to estimate the numbers of workers and therefore amount of employment within 30 minutes of the possible residential development locations in the borough of Oadby and Wigston and Harborough district close to the Leicester City administrative boundary.



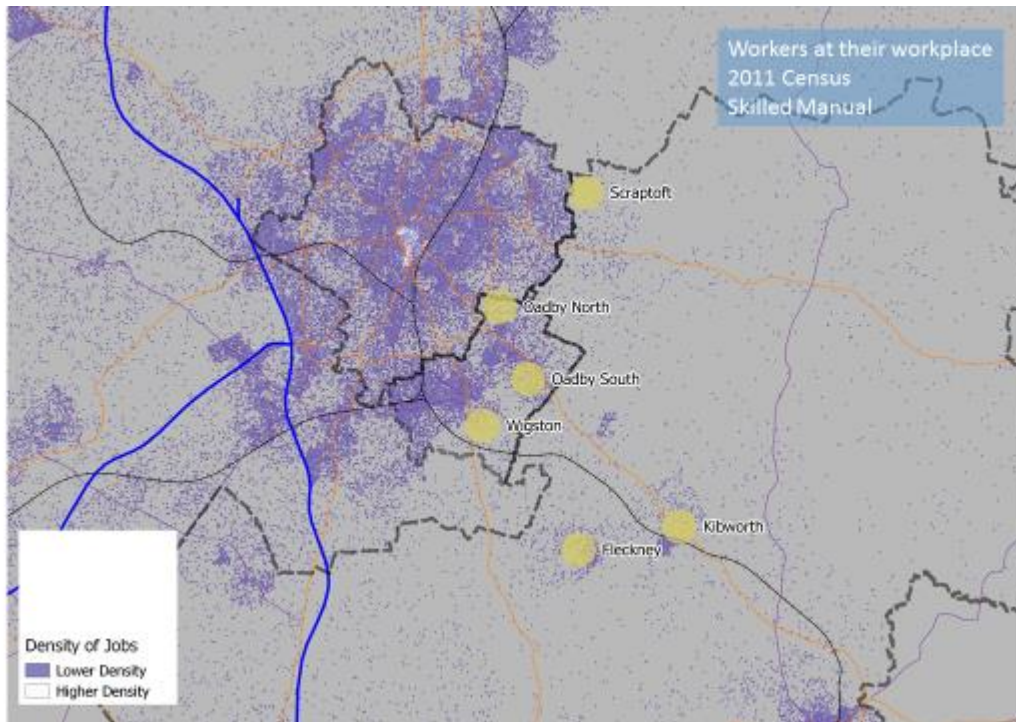
AB

Figure 6: Distribution of professional/managerial workers at their workplace



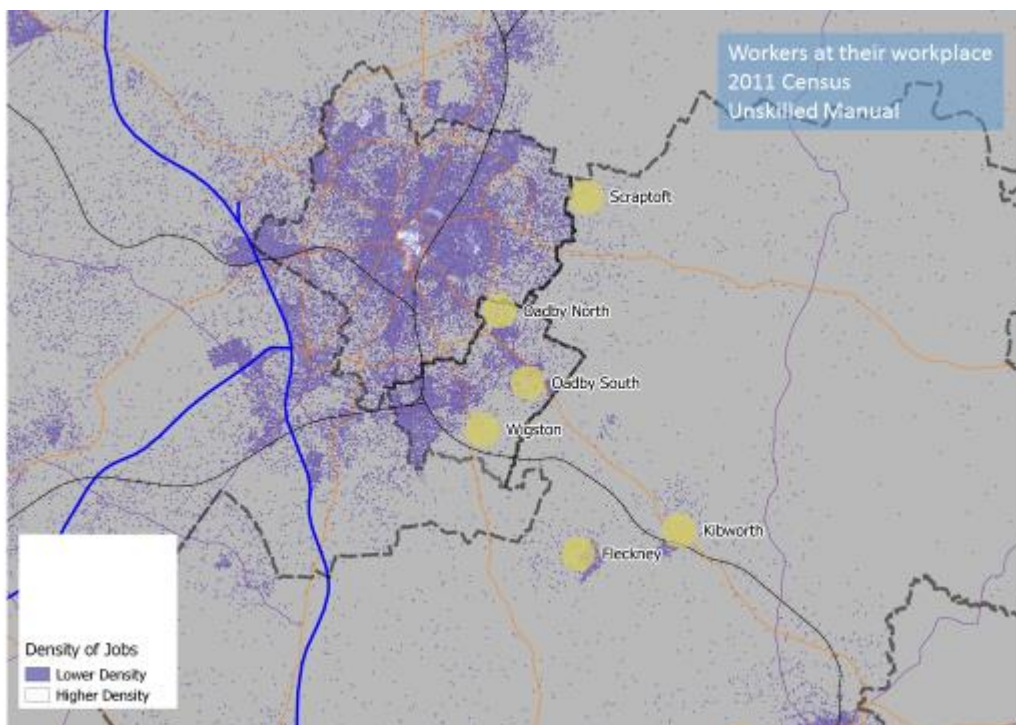
C1

Figure 7: Distribution of Clerical/Supervisory workers at their workplace



C2

Figure 8: Distribution of skilled manual workers at their workplace



DE

Figure 9: Distribution of unskilled manual workers at their workplace

4 Accessibility to Employment Locations

- 4.1.1 The accessibility measuring tool TRACC² was used to estimate the travel time from broad locations of new developments by public transport, walk and cycle.
- 4.1.2 The software uses a highways network, augmented by footpaths and cycleways, to estimate journey times to a specified destination. It assumes specific average speeds³ for each mode of travel, and assumes a 2015 morning peak bus service⁴. Whilst the analysis does not explicitly include the effects of congestion, the relatively low average car speeds implicitly include this effect.
- 4.1.3 Figure 10 to Figure 15 show the 30-minute travel contours for the sustainable modes using the existing transport infrastructure and Public Transport (PT) services. The contours are overlaid on a plot showing the density of jobs obtained from the 2011 Census.
- 4.1.4 The results highlight how residents of new developments in rural locations are less likely to have local jobs close by (within 30-minute travel) and are thus less likely to walk or cycle.

Fleckney (Figure 10)	<p>Situated in a rural location the accessibility by sustainable modes is more limited</p> <p>PT: Existing bus services would provide access to the South East quadrant of the PUA on the A5199 corridor and to the outskirts of Market Harborough. There are no major employment sites within 30-minutes travel time.</p> <p>Walk: The rural location limits the opportunities for finding employment within the village and immediate surrounding area.</p> <p>Cycle: Kibworth and Wigston are within the range of average cyclists. However, Market Harborough and the City are beyond a 30-minute travel time.</p>
Kibworth (Figure 11)	<p>Situated in a rural location the accessibility by sustainable modes is more limited</p> <p>PT: Existing services would provide access along the A6 corridor between Market Harborough and the Victoria Park area within the city. However, the accessibility is limited by the need to walk from bus-stops located on the A6 corridor to the final destination.</p> <p>Walk: The rural location limits the opportunities for finding employment within the village and immediate surrounding area.</p> <p>Cycle: Oadby and Market Harborough are just outside of the 30-minute contour range. However, Fleckney is accessible within 30 minutes.</p>
Scraptoft (Figure 12)	<p>Situated on the edge of the Leicester Principal Urban Area (PUA) this location offers the potential opportunity to access a larger number of job locations by sustainable modes.</p> <p>PT: The analysis assumes that users from the new development would have similar journey times and services as already provided to Scraptoft. In reality unless express services (limited stop) services were introduced then the TRACC results will be optimistic. Access to the City Centre may be possible within 30 minutes and locations along the A47 corridor.</p> <p>Walk: The edge-of-town location limits the opportunity to find employment within a 30 minute walking distance.</p>

² <http://www.basemap.co.uk/tracc/>

³ Car: 32kph, cycle: 16kph, walk:4.8kph

⁴ PT is for Thursday 7 to 10am with a 400m maximum connection (to the nearest road from an Origin or from the nearest road to the Destination) & interchange distance (between bus stops along the road network if changing services). It is assumed that the maximum distance walked is 800m to the first or last bus stop

	<p>Cycle: It should be possible to cycle to many locations in the North East of the City including the city centre. The 30-minute range would approximately be bounded by the A6 in the North and South of Leicester and the Inner Ring Road to the West of the city centre. However major employment sites such as Fosse Park, County Hall, Beaumont Leys, Optimus Point are outside a 30-minute journey time.</p>
Wigston (Figure 13)	<p>Situated within the Leicester Principal Urban Area (PUA) this location provides sustainable access by public transport to the south eastern quadrant of the city together with good cycle access to the city, with the cycling range extending to the boundary of the outer ring road (A563).</p> <p>PT: Existing services would provide access along the A5199 corridor to the southern part of the City Centre and into the County to Fleckney and Kibworth. However, the accessibility is limited by the need to walk from bus-stops to the final destination.</p> <p>Walk: It is likely that residents could walk to find opportunities within Wigston.</p> <p>Cycle: The Southern part of Leicester is within a 30-minute travel time. Roughly bounded by the A47 and the Inner Ring Road (Vaughan Way) in the north and Narborough Road in the West Whilst Fosse Park is within the 30-minute travel time, major employment sites such as County Hall, Beaumont Leys, Optimus Point are outside a 30minute journey time.</p>
Oadby South (Figure 14)	<p>Situated on the edge of the Leicester PUA this location provides the opportunities to access a larger number of job locations by sustainable modes.</p> <p>PT: Existing services would provide access along the A6 corridor to the City Centre and into the County (Kibworth). There is limited accessibility to the orbital bus services. However, the accessibility is limited by the need to walk from bus-stops to the final destination.</p> <p>Walk: It is likely that residents could walk to find opportunities within the Eastern side of the borough.</p> <p>Cycle: The Southern and eastern part of Leicester is within a 30-minute travel time. Roughly bounded by the A607 in the north, A426 in the West and the Inner Ring Road (Vaughan Way) within the city centre. However major employment sites such as Fosse Park, County Hall, Beaumont Leys, Optimus Point are outside a 30minute journey time</p>
Oadby North (Figure 15)	<p>Situated on the edge of the Leicester PUA this location provides the opportunities to access a larger number of job locations by sustainable modes.</p> <p>PT: Existing services would provide access to the South Eastern quarter of Leicester including the City Centre. It would also be possible to access the northern parts of the borough of Oadby and Wigston. There is the possibility of accessing existing orbital and local bus services. The 30-minute contour does not extend beyond Oadby into Harborough</p> <p>Walk: It is likely that residents could walk to find opportunities within the Eastern side of the City and Northern part of the borough of Oadby and Wigston. The 30-minute contour could reach the Leicester General Hospital, but does not extend to the university or the City centre.</p> <p>Cycle: The Outer Ring Road (A563) provides the boundary for 30-minute travel to the North and West of the City. This means that major employment sites such as Fosse Park, County Hall, Beaumont Leys, Optimus Point are just outside a 30-minute journey time. The 30-minute contour extends to Great Glen, however it does not extend to Kibworth or Fleckney.</p>

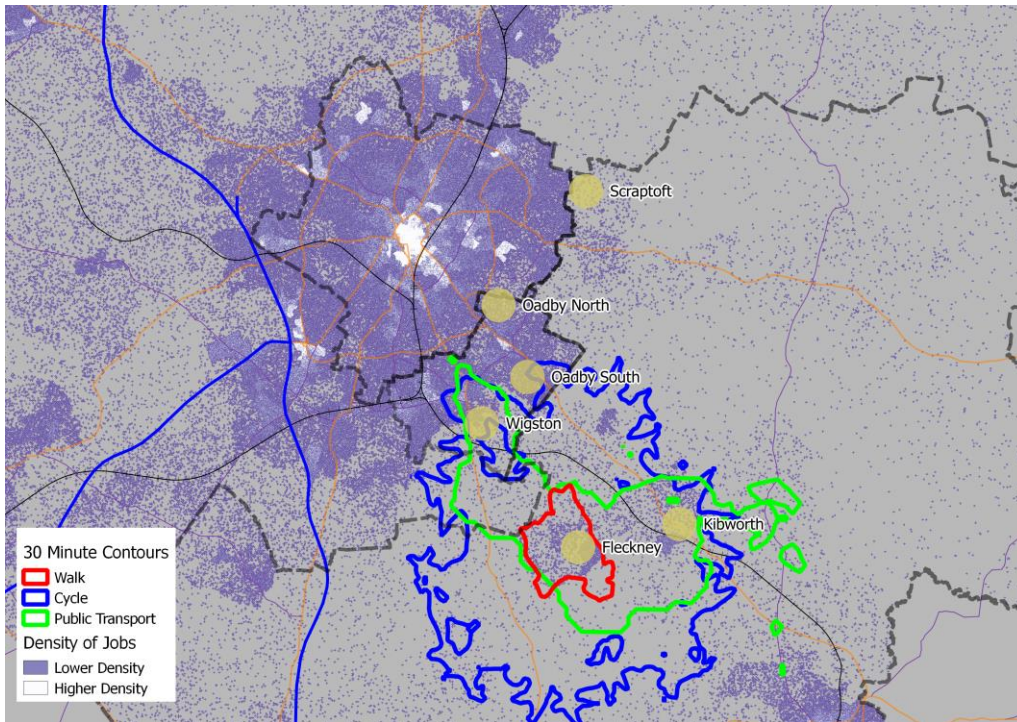


Figure 10: 30-minute travel contours for development within Fleckney

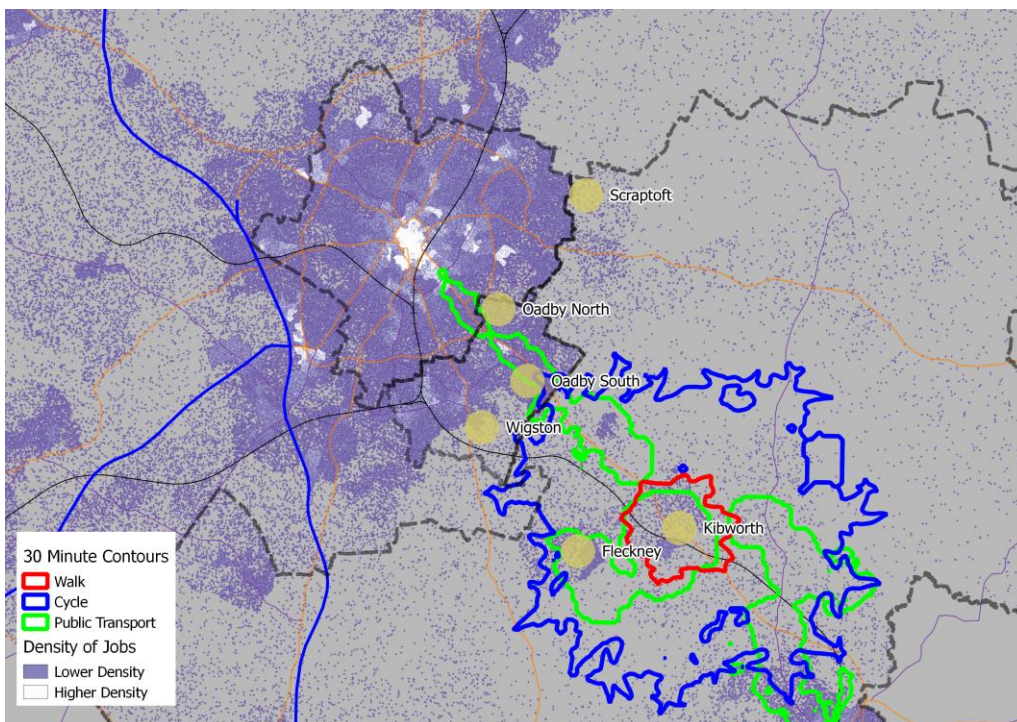


Figure 11: 30-minute travel contours for development within Kibworth

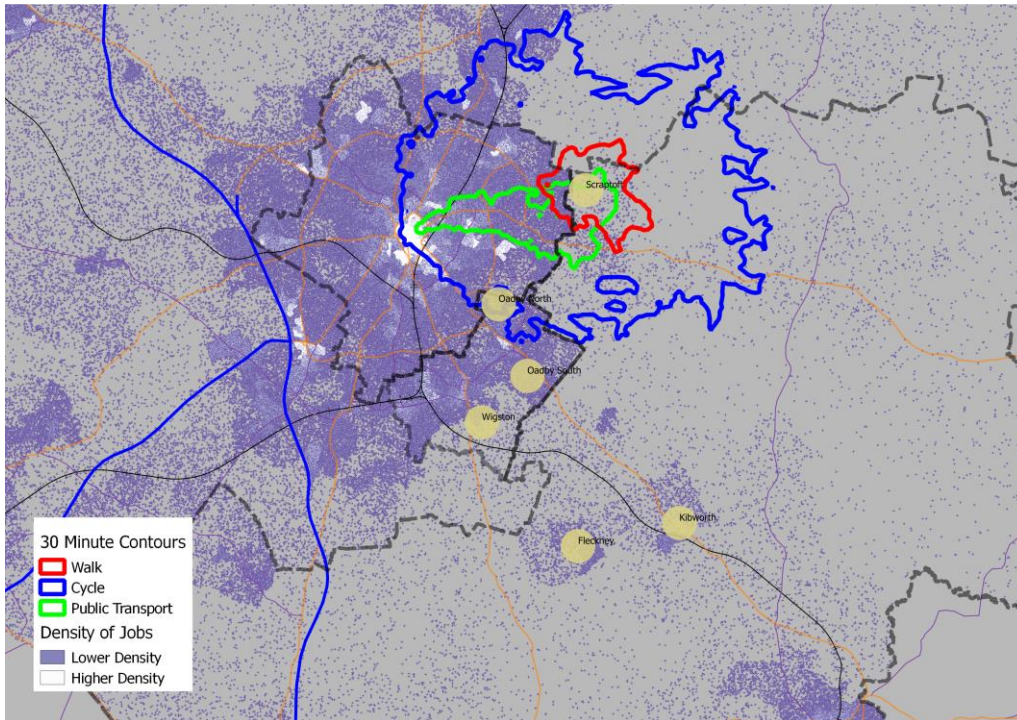


Figure 12: 30-minute travel contours for development at Scrattoft

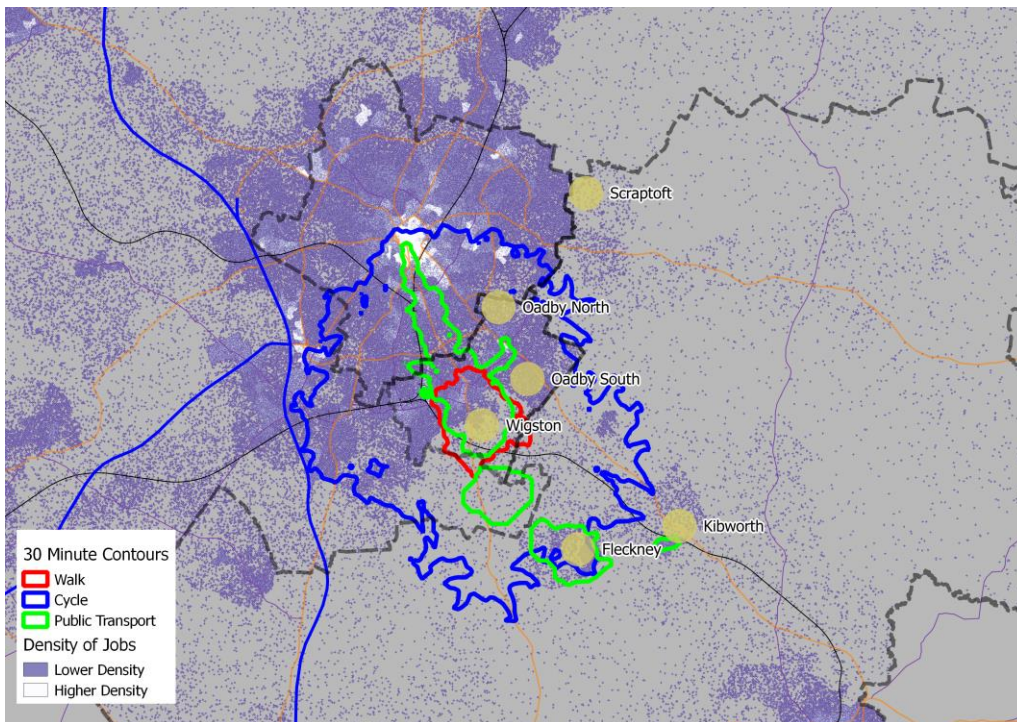


Figure 13: 30-minute travel contours for development within Wigston

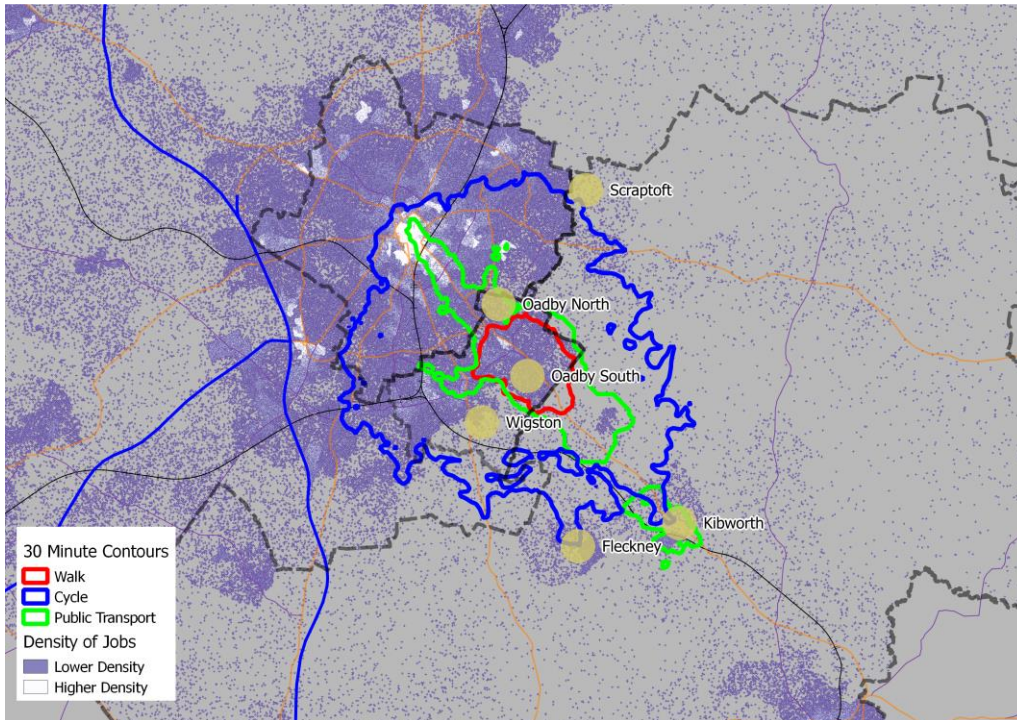


Figure 14: 30-minute travel contours for development within the southern part of Oadby

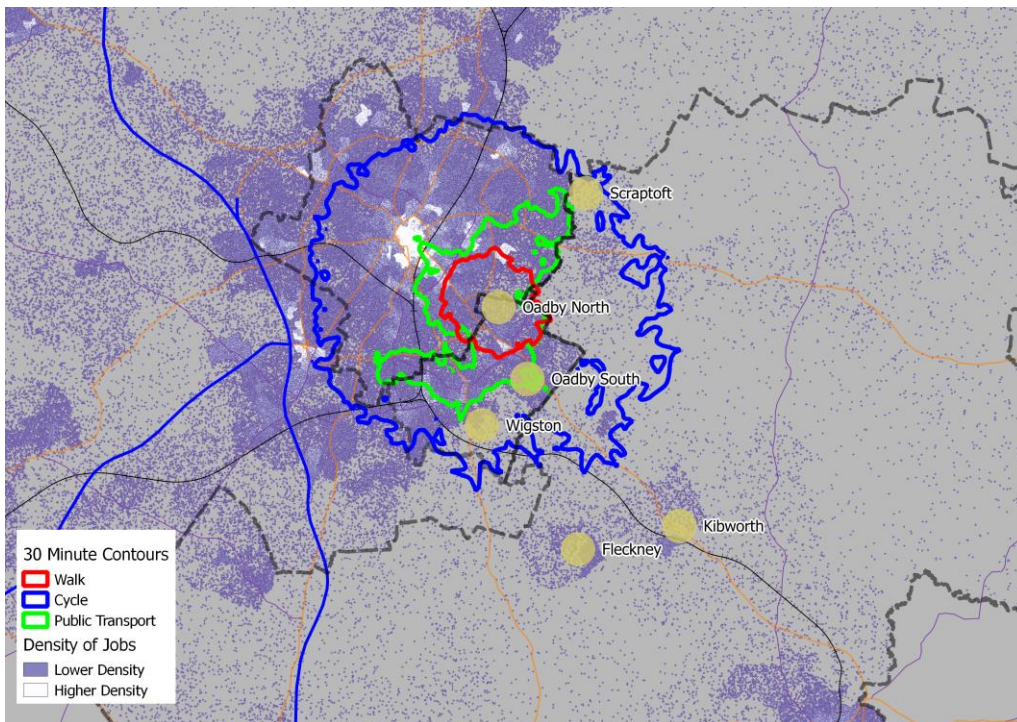


Figure 15: 30-minute travel contours for development within the northern part of Oadby

5 Jobs accessible within 30 minutes' travel time

- 5.1.1 People choose where they live based upon a whole range of factors including the quality of local schools, the nature of the local shopping and leisure opportunities and the closeness to work or potential employment opportunities. In this study we have looked the accessibility to employment opportunities as one measure of the attractiveness of new residential development. .
- 5.1.2 A reasonable commute time is subjective, however the National Travel Survey (2015)⁵ shows the average commuting trip time in 2014 was 30 minutes. We have therefore used this figure in order to determine the number of total jobs are accessible from a residential development within this time.
- 5.1.3 Section 3 of this note provides details of where people live and work according to the 2011 Census. Section 4 shows isochrones for the potential development locations in the borough of Oadby and Wigston and Harborough districts that are near to the administrative boundary of Leicester City Council.
- 5.1.4 This section brings these two pieces of information together in order to determine how many workers are within a 30-minute journey of a residential development.
- 5.1.5 Figure 16 highlights how being within an urban environment, or the outskirts of an urban environment increases the opportunities to access workplaces by sustainable modes. The results show that as you venture further into the PUA it is possible to access a greater number of jobs by sustainable modes.
- 5.1.6 Fleckney and Kibworth both have very good public transport links into the city. However, the relatively slow journey time limits the employment opportunities that can be reached. Bus services from Kibworth do allow access to the higher density employment along the A6 corridor in the city centre.
- 5.1.7 Cycling can offer opportunities to access employment in the higher density areas. Its strength is to fill in the 'gaps' between where bus services operate. Whilst the average cycling speed assumed is very low (15kph), there is no account taken of the desirability of changing/showering at the end of the journey, nor the availability of changing facilities.

⁵ NTS0406.xls

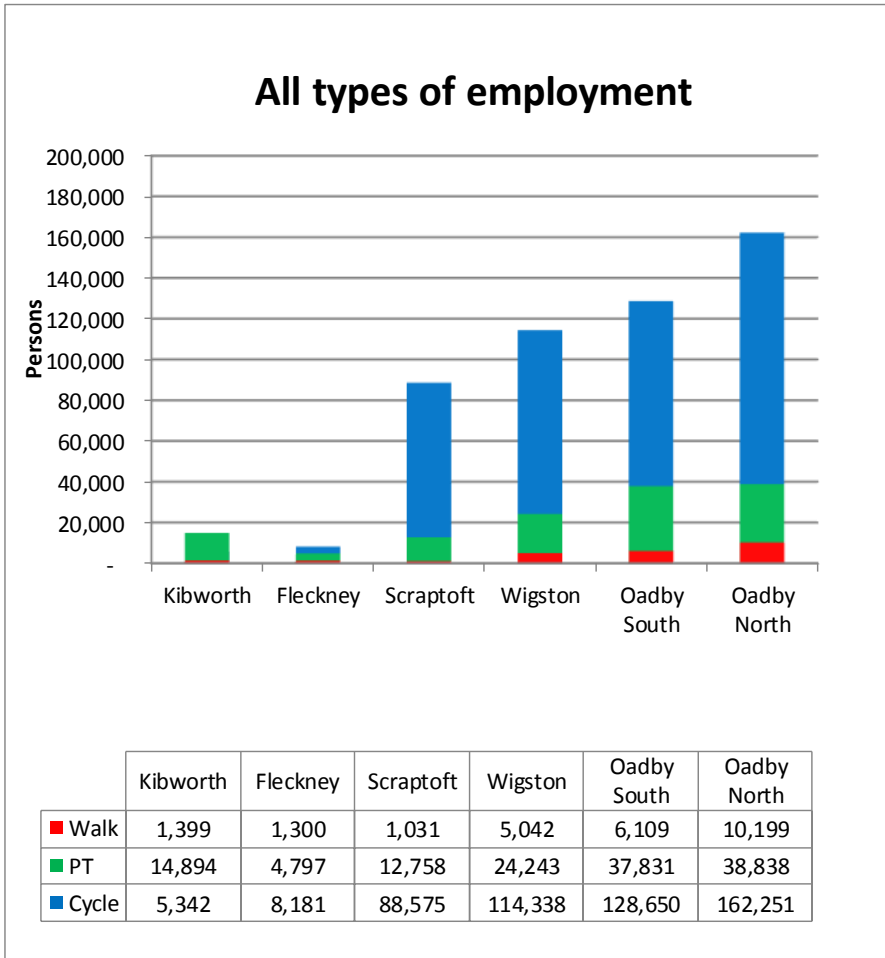


Figure 16: Number of jobs accessible within 30minutes by each mode of travel

5.1.8 Figure 17 shows the number of jobs accessible by sustainable modes for different types of worker.

5.1.9 Workers of different skills often have different travel characteristics.

- **Managerial/Professional workers:** These workers tend to have specialist skills and jobs. Specific employees will be selected for the role dependent on their individual specialisms. The workers are likely to travel further to initially take-up their job. Moving between jobs might result in a change of home location, or large travel distances.
- **Clerical/Supervisory:** This is less specialist, with skills that transfer between types of industry (eg administrator could work in construction sector or farming). The less specialist nature of the job means that workers can find employment more local employment.
- **Skilled Manual:** This may be sector specific (eg working on electronics manufacture), or it may require skills that can be taught in a relatively short period. Typically, workers may be close to their workplace. However local conditions may result in workers having to travel further to fill available rolls.
- **Unskilled Manual:** These jobs tend to be more ubiquitous, with workers able to move between jobs sectors relatively easily. Workers tend to be closer to their job. However local conditions may result in workers having to travel further to fill available rolls.



Figure 17: Number of jobs accessible within 30minutes by different modes of travel

6 Findings

- 6.1.1 The accessibility analysis, not surprisingly, highlights the greater opportunities to reach a workplace within a 30-minute travel time if you live within or on the edge of the Principal Urban Area (PUA).
- 6.1.2 Techniques to encourage the use of sustainable travel may therefore be more effective for developments broadly located within Oadby, Wigston and Scraptoft.
- 6.1.3 The locations at Kibworth and Fleckney are significantly less accessible by sustainable modes to job opportunities within the city or elsewhere in the County. The 30minute cycle contour does not extend into Market Harborough, Oadby or Wigston meaning there are more limited opportunities for cycling to work.
- 6.1.4 Existing public transport (PT) services from Kibworth allow access to opportunities along the A6 corridor to Oadby and the South East of the city and the outskirts of Market Harborough. PT users from Fleckney could access Wigston and the A5199 corridor into the city. However, Market Harborough is not accessible within 30-minutes by Public Transport.
- 6.1.5 Whilst providing additional PT services might lead to increased patronage from Fleckney and Kibworth, it is likely that alternative/innovative strategies such as express bus services, Park and Ride, or hub and spoke operation might be necessary to encourage PT uptake. Alternatively, consideration could be given to the benefits of a new railway station in the Kibworth area that would be used to support growth by increasing accessibility to Leicester and Market Harborough. One of the benefits of HS2 is the potential to release paths on the existing Midland Main Line for local services.