Stantec

Sustainable Connectivity and Vehicle Trip Distribution Study

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Reading Borough Council

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Sustainable Connectivity and Vehicle Trip Distribution Study

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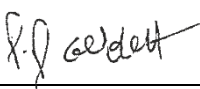**Sustainable Connectivity and Vehicle Trip Distribution Study**

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Appendix A   Proposed LPPU Sites Forecast Trip Generation

1 Introduction

1.1.1 Stantec has been commissioned by Reading Borough Council (RBC) to provide transport support to the development of its Local Plan Partial Update (LPPU)

1.1.2 The LPPU process has identified 38 potential new sites (see **Appendix A** for development within the borough, as well as potential intensification of development at site with allocations in the existing Local Plan. This report reviews the sustainable connectivity and likely vehicle trip distributions of new development sites only; forthcoming highway modelling work (see **Section 3.3**) will consider the likely highway impact of the overall development proposals including intensification at existing sites.

1.1.3 The 38 sites considered within this report are shown in Figure 1.1.

Figure 1.1: LPPU Proposed Development Sites
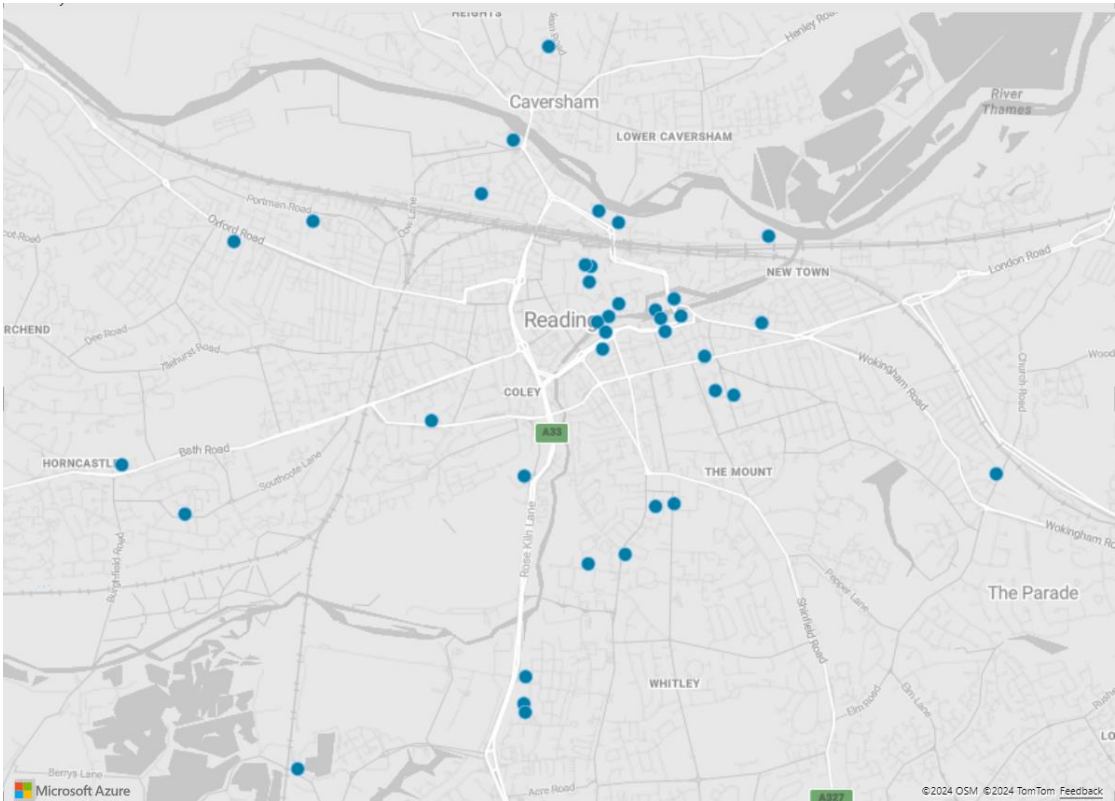
1.1.4 These have been assessed in terms of their sustainable travel connectivity to facilities, and an assessment of the potential vehicular trip generation and distribution of the sites has also been made. The results of these assessments are outlined in this report.

1.1.5 The assessment work outlined in this report does not rule in or rule out sites, but provides information as to their current connectivity, to inform LPPU and form part of the wider LPPU evidence base. It does not consider the impacts that nearby sites could have on connectivity through the provision of facilities and services.

2 Connectivity Assessment

2.1 Overview

2.1.1 The Connectivity Assessment reviews the connectivity of sites to local facilities and employment via sustainable travel modes (walking, cycling and public transport).

2.1.2 A Baseline assessment has been undertaken, reviewing connectivity of the proposed sites utilising the existing transport network, and including committed improvements, such as public transport priority outlined in RBC's Bus Service Improvement Plan. Potential sustainable travel improvements that could be delivered by the assessed developments has then been incorporated to test a Sustainable Case.

2.1.3 Additionally, a Sensitivity Test has been undertaken to review the potential impact of redevelopment of the Royal Berkshire Hospital (RBH) site. It should be noted that the redevelopment of RBH is not assessed in the main Sustainable Case assessment.

2.2 Methodology

2.2.1 In order to assess sustainable connectivity to facilities and employment, travel times from each site to various facilities (i.e. different destinations and services) have been determined, by walking, cycling and public transport. A scoring system has been developed for each facility type, with these individual scores then combined to create an overall connectivity score by mode.

Facility Selection

2.2.2 In addition to employment, connectivity of sites by walking, cycling and public transport to the following local facilities has been assessed:

- Primary state schools

- Secondary state schools

- Supermarket

- Parades, local centres and shopping areas

- GP surgeries (NHS)

- Pharmacies

- Leisure centres

- Green open spaces

2.2.3 The sites have been assessed in terms of their connectivity by walking to:

- Bus stops (daytime service frequency at least every 15 minutes)

- Railway stations (peak period service frequency at least three per hour in at least one direction)

2.2.4 Facilities have been selected as outlined in Table 2.1.

Table 2.1: Facility Type Data Sources

Facility Type	Data Source
Bus stop	Bus Open Data Service
Employment	Business Register and Employment Survey
Entertainment	OpenStreetMap
GP	OpenStreetMap
Green space	OpenStreetMap
Hospital	OpenStreetMap
Local shops	OpenStreetMap
Pharmacy	OpenStreetMap
Place of worship	OpenStreetMap
Primary education	OpenStreetMap
Railway station	OpenStreetMap
Secondary education	UK Gov Data
Sports facilities	OpenStreetMap
Supermarket	OpenStreetMap

Journey Time Calculations

2.2.5 Conveyal accessibility software[1] has been used to undertake the assessment. This calculates the fastest journey time between a set of origins and destinations within a set time period using public transport timetable data, road network information and a range of user-defined parameters, including mode selection. Conveyal has been used to determine the travel time within the AM and PM peak periods between each assessment site and local facilities and employment (as outlined previously) by public transport, walking and cycling. Journey times are based on actual routes, and not direct distance (as the crow flies). Key input parameters and data for Conveyal are outlined in Table 2.2.

Table 2.2: Conveyal Input Parameters and Data Sources

Parameter/Data	Source/Value	Additional Information
Public transport timetables	General Transit Feed Specification bus timetable data[2]	-
Committed public transport improvements	RBC Bus Service Improvement Plan[3] Liaison with RBC officers	Committed public transport improvements in terms of both new services and public transport priority infrastructure have been included.
Committed walking and cycling improvements	Liaison with RBC officers	Committed new walking and cycling links have been included. Note that improvements to existing links, whilst likely to have beneficial impacts on the propensity for active travel, are not included, as this assessment focuses purely on connectivity, rather than the propensity for mode choice.
Active travel network	OpenStreetMap	-

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[1] Conveyal - Evaluate changes to your public transportation system

[2] Department for Transport, 2024. Open Bus Data Service.

[3] Reading Borough Council, 2021. Reading Bus Service Improvement Plan 2021-26

Parameter/Data	Source/Value	Additional Information
Walk speed	4.8 km/h	This is the walk speed when not using public transport. It applies to access/egress to the services and transfer between services.
Cycle speed	12 km/h	This is the cycle speed when not on the highway network. It only applies to the cycle between an origin and the highway network, and the highway network and a destination.
Maximum access / egress time	20 mins	This is the maximum time allowed for access/egress/transfers to a PT service. If a destination is accessible within this time, Conveyal will allow a connection directly using no PT service. A long time has been selected, as this assessment focuses purely on connectivity, rather than propensity to use a service; a longer connection time will result in increased travel time and therefore a site's score will be reflective of its poorer public transport connectivity.
Number of interchanges permitted	1	This is the maximum number of interchanges between public transport services permitted.

2.2.6   The Conveyal outputs take the form of origin-destination journey time matrices, with a matrix per mode (walking, cycling and public transport). These matrices have been analysed to determine the shortest journey time from each site to each facility type.

Scoring

2.2.7   For each site, the shortest travel time by each mode to each facility type has been determined. This has then been converted to a connectivity score, using relevant supporting evidence setting out best practice for connectivity of each facility type, and professional judgement.

2.2.8   Facilities types have been split into two categories:

- Sites where a discrete score of either 0 or 1 is assigned, depending on whether a facility of that type can be reached within a defined travel time

- Sites where access to multiple facilities of that type is beneficial, and therefore a scaled score between 0 and 1 is assigned, with a score of 1 being assigned to the site that can reach the greatest number of facilities of that type within a defined travel time

2.2.9   The scoring system is outlined in Table 2.3.

Table 2.3: Scoring System and Travel Time Thresholds

Facility Type	Maximum Travel Time (minutes)	Supporting Evidence	Score Type
Bus stop	5	Recommended[4] maximum walk distances vary from 250 metres to 500 metres, depending on location and service frequency.	Variable

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[4] The Chartered Institute of Highways & Transportation, 2018. Buses in Urban Developments.

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Facility Type	Maximum Travel Time (minutes)	Supporting Evidence	Score Type
Employment	30	National Travel Survey	Variable
Entertainment	10	Sustrans Walkable Neighbourhoods[5] (equivalent to 800m walk distance)	Variable
GP	10	Active Travel England Standing Advice Note: Active travel and sustainable development[6] (equivalent to 800 m walk distance)	Discrete
Green space	10	Active Travel England Standing Advice Note: Active travel and sustainable development[6] (equivalent to 800 m walk distance)	Variable
Hospital	30	Nearly half of Reading residents are within 30 minutes travel time of a hospital by PT.[7] 30 minutes travel time also aligns with DfT Accessibility Indicators[8] as the lower threshold (median travel time for hospital travel trip purpose).	Discrete
Local shops	5	51% of shoppers travel 0.25 miles (approximately 400m; a 5-minute walk) or less[9]	Discrete
Pharmacy	10	Active Travel England Standing Advice Note: Active travel and sustainable development[6] (equivalent to 800 m walk distance)	Discrete
Place of worship	10	Active Travel England Standing Advice Note: Active travel and sustainable development[6] (equivalent to 800 m walk distance)	Variable
Primary education	10	Active Travel England Standing Advice Note: Active travel and sustainable development[6] (equivalent to 800 m walk distance)	Discrete
Railway station	10	Active Travel England Standing Advice Note: Active travel and sustainable development[6] (equivalent to 800 m walk distance)	Discrete
Secondary education	20	National Travel Survey evidence[10] suggests significant proportions of children travel by car when distance to school is over 2 miles. A reasonable proportion travel by car over 1 mile. The Institution of Highways and Transportation[11] suggested 1600m (a 20-minute walk) as a maximum. This is further supported by Fareham Borough Council's research[12].	Discrete
Sports facilities	20	Sport England[13] advises a maximum of 1,600 m (a 20-minute walk), dependent on local circumstances	Variable
Supermarket		Active Travel England Standing Advice Note: Active travel and sustainable development[6] (equivalent to 800 m walk distance)	Discrete

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[5] Sustrans, 2022. Walkable Neighbourhoods

[6] Active Travel England, 2023. Standing Advice Note: Active travel and sustainable development

[7] Department for Transport, 2019. Local Authority Indicators data table JTS0406

[8] Department for Transport, 2014. Accessibility Statistics: Guidance

[9] Association of Convenience Stores, 2023. The Local Shop Report

[10] Department for Transport, 2022. National Travel Survey data table NTS0614

[11] The Institution of Highways and Transportation, 2000. Guidelines for Providing for Journeys on Foot.

[12] Fareham Borough Council, 2018. Background Paper: Accessibility Study

[13] Sport England, 2014. Assessing Need and Opportunities Guide for Indoor and Outdoor Sports Facilities

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2.2.10 To determine the overall score for a site by each mode, each individual score for each facility and the job score has been combined based on the weightings shown in Table 2.4. These have been determined using National Travel Survey journey purpose and trip mode data for 2022, alongside DfT public transport usage information.

2.2.11 Connectivity to bus stops and railway stations is not included as a part of the overall walking and cycling scores, as these are not destinations in their own right. The connectivity to bus stops and railway stations is included within the overall public transport score weightings, as this enables wider connectivity to the public transport network to be reflected.

Table 2.4: Overall Mode Score Facility Type Weightings

Facility Type	Weighting		
	Walking	**Cycling**	**Public Transport**
Bus stop	-	-	15.9%
Employment	21.6%	21.6%	17.2%
Entertainment	9.9%	9.9%	7.9%
GP	0.7%	0.7%	0.5%
Green space	9.5%	9.5%	7.6%
Hospital	0.7%	0.7%	0.5%
Local shops	14.9%	14.9%	11.9%
Pharmacy	1.4%	1.4%	1.1%
Place of worship	1.4%	1.4%	1.1%
Primary education	13.4%	13.4%	10.7%
Railway station	-	-	4.3%
Secondary education	9.8%	9.8%	7.8%
Sports facilities	2.0%	2.0%	1.6%
Supermarket	14.9%	14.9%	11.9%

Assessment Scenarios

2.2.12 Three scenarios have been assessed, as outlined below:

- Baseline: the Baseline assesses the sustainable connectivity of each site, in the absence of any specific sustainable travel improvements linked to the developments

- Sustainable Case: the Sustainable Case assesses the impact of sustainable travel improvements that it is reasonably expected could be delivered (either significantly or wholly funded by) the developments. These improvements are outlined in the next section of this report.

- Royal Berkshire Hospital (RBH) Sensitivity Test: the RBH Sensitivity Test assesses the potential impact of the RBH relocating outside Reading, and the existing RBH site being replaced by a residential-led development.

Sustainable Connectivity Improvement Schemes

2.2.13 Given the relatively small scale of the majority of sites, it is considered unlikely that significant new walking and cycling links, or new/improved public transport services would be directly linked to development. In the majority of cases, it is likely that development would contribute towards a sustainable travel fund, to improve sustainable travel across Reading.

2.2.14 However, a number of specific measures that are considered likely to be able to be significantly or fully funded through developments were identified in conjunction with RBC officers.

2.2.15   The identified improvements are:

- Increased daytime, evening and weekend frequency of the BUZZ18 bus service, to enable bifurcation of the route to the east of the town centre, connecting half of journeys to Napier Road.

- An improved Sunday service between Reading Link Retail Park and the town centre

- Reinstated bus stops on Napier Road

- Highway layout changes at Vastern Road to provide additional priority for buses exiting the northern interchange of Reading Station

2.2.16   Whilst not having a direct impact on this assessment, it is noted that a number of additional measures were identified by RBC officers that would improve the quality of existing connections. This included measures such as:

- Bus stop upgrades to provide real time passenger information and shelter

- Improved surfacing of walking and cycling connections

- Junction reviews to rationalise long and complex pedestrian crossings and improve the public realm

- Accessibility improvements

Royal Berkshire Hospital Sensitivity Test

2.2.17   Redevelopment of RBH would be anticipated to have a significant detrimental impact on public transport within Reading. The RBH sensitivity test adopts a number of assumptions that have been prepared in conjunction with RBC officers:

- Services 19/19a/19b/19c and services 9/BUZZ9 would be cancelled

- Service 3 would be re-routed via Christchurch Road

- A new 20-minute frequency service between Reading Station and the University of Reading via Whiteknights Road would be operated

2.3   Baseline Connectivity Results

2.3.1   Table 2.5 shows the overall scores by mode for each site, alongside the ranking for each site (where 1 is highest, and 38 is lowest), with priority given first to walk, then cycle and finally public transport, in line with the transport hierarchy.

2.3.2   The sites' walk, cycle and public transport (AM and PM peak hour) scores are shown geographically in Figure 2.1, Figure 2.2, Figure 2.3 and Figure 2.4 respectively.

Table 2.5: Baseline Site Connectivity Scores

Site Reference	Rank	Connectivity Score		
		Walking	**Cycling**	**Public Transport (Peak Hour Average)**
Reading Central Library, Abbey Square	1	0.953	0.976	0.933
160-163 Friar Street	2	0.946	0.978	0.922

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Site Reference	Rank	Connectivity Score		
		Walking	Cycling	Public Transport (Peak Hour Average)
20-22 Duke Street	3	0.940	0.970	0.876
Former Debenhams, The Oracle	4	0.933	0.939	0.848
Vue Cinema, The Oracle	5	0.932	0.948	0.777
100 Kings Road	6	0.917	0.981	0.766
John Lewis Depot, Letcombe Street	7	0.910	0.923	0.730
Kennet Place, Kings Road	8	0.860	0.968	0.708
33 Blagrave Street	9	0.794	0.975	0.804
2 Norman Place	10	0.792	0.952	0.677
Aquis House, 49-51 Forbury Road	11	0.780	0.967	0.774
Crowne Plaza Reading, Richfield Avenue	12	0.729	0.877	0.539
11 Basingstoke Road	13	0.729	0.871	0.579
Queens Wharf, Queens Road	14	0.723	0.984	0.593
Havell House, 62-66 Queens Road	15	0.709	0.976	0.557
Sapphire Plaza, Watlington Street and Royal Court, Kings Road	16	0.705	0.970	0.582
Princes House, 73A London Road	17	0.694	0.969	0.506
Part of Reading College, Kings Road	18	0.624	0.914	0.462
85-87 Basingstoke Road	19	0.600	0.526	0.406
Hemdean House School, Hemdean Road	20	0.596	0.618	0.392
Land at Warwick House, Warwick Avenue	21	0.578	0.861	0.453
Land at 132--134 Bath Road	22	0.550	0.652	0.390
Royal Berkshire Hospital, London Road	23	0.535	0.746	0.403
Reading Bridge House, George Street	24	0.529	0.955	0.468
Land adjacent to 17 Craven Road	25	0.524	0.915	0.395
51 Church Road, Earley	26	0.506	0.760	0.381
72 Berkeley Avenue	27	0.491	0.814	0.355
Land west of Milford Road	28	0.474	0.874	0.299
Southcote Library, Coronation Square	29	0.443	0.496	0.333
Tunbridge Jones, Cradock Road	30	0.435	0.467	0.314
1-15 St George's Road	31	0.411	0.594	0.361
Part of car park, Tesco, Portman Road	32	0.409	0.721	0.196
Part of car park, Tesco Extra, Napier Road	33	0.376	0.720	0.228

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Site Reference	Rank	Connectivity Score		
		Walking	**Cycling**	**Public Transport (Peak Hour Average)**
Reading Link Retail Park, Rose Kiln Lane	34	0.323	0.832	0.112
Former Sales and Marketing Suite, Drake Way	35	0.257	0.499	0.220
Land at Drake Way (South)	36	0.253	0.500	0.209
Land at Drake Way (North)	37	0.253	0.499	0.208
Site at Green Park Village, Flagstaff Road	38	0.174	0.375	0.139

Figure 2.1: Baseline Site Connectivity Scores – Walking

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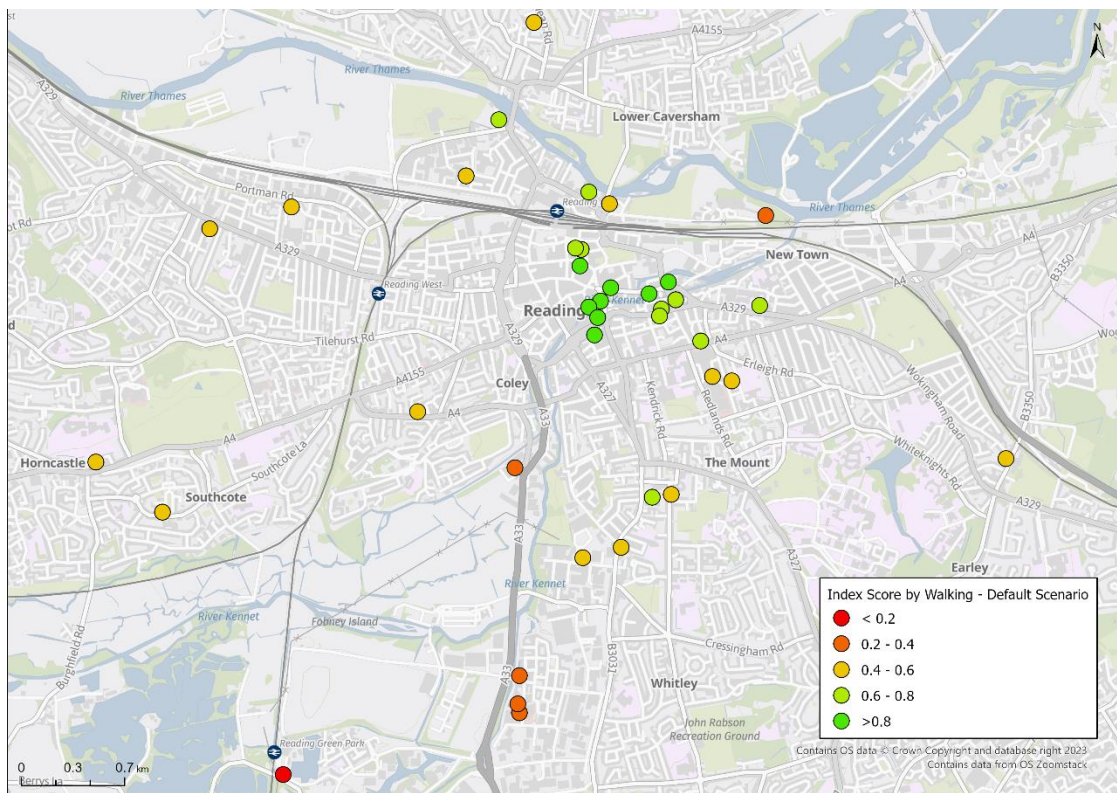
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Figure 2.2: Baseline Site Connectivity Scores – Cycling

Figure 2.3: Baseline Site Connectivity Scores – Public Transport AM Peak Hour

Figure 2.4: Baseline Site Connectivity Scores – Public Transport PM Peak Hour

2.4 Sustainable Case Connectivity Results

2.4.1 Table 2.6 shows the overall scores by mode for each site, alongside the ranking for each site (where 1 is highest, and 37 is lowest), with priority given first to walk, then cycle and finally public transport, in line with the transport hierarchy. It should be noted that the redevelopment of the RBH site is not included from this assessment.

The sites' walk, cycle and public transport (AM and PM peak hour) scores are shown geographically in Figure 2.5, Figure 2.6, Figure 2.7 and Figure 2.8 respectively.

Table 2.6: Sustainable Case Site Connectivity Scores

Site Reference	Rank	Connectivity Score		
		Walking	**Cycling**	**Public Transport (Peak Hour Average)**
Reading Central Library, Abbey Square	1	0.953	0.976	0.933
160-163 Friar Street	2	0.946	0.978	0.919
20-22 Duke Street	3	0.940	0.970	0.876
Former Debenhams, The Oracle	4	0.933	0.939	0.847
Vue Cinema, The Oracle	5	0.932	0.948	0.777
100 Kings Road	6	0.917	0.981	0.766
John Lewis Depot, Letcombe Street	7	0.910	0.923	0.730
Kennet Place, Kings Road	8	0.860	0.968	0.711
33 Blagrave Street	9	0.794	0.975	0.803

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Site Reference	Rank	Connectivity Score		
		Walking	**Cycling**	**Public Transport (Peak Hour Average)**
2 Norman Place	10	0.792	0.952	0.679
Aquis House, 49-51 Forbury Road	11	0.780	0.967	0.777
Crowne Plaza Reading, Richfield Avenue	12	0.729	0.877	0.559
11 Basingstoke Road	13	0.729	0.871	0.578
Queens Wharf, Queens Road	14	0.723	0.984	0.593
Havell House, 62-66 Queens Road	15	0.709	0.976	0.556
Sapphire Plaza, Watlington Street and Royal Court, Kings Road	16	0.705	0.970	0.581
Princes House, 73A London Road	17	0.694	0.969	0.506
Part of Reading College, Kings Road	18	0.624	0.914	0.462
85-87 Basingstoke Road	19	0.600	0.526	0.406
Hemdean House School, Hemdean Road	20	0.596	0.618	0.395
Land at Warwick House, Warwick Avenue	21	0.578	0.861	0.453
Land at 132--134 Bath Road	22	0.550	0.652	0.390
Reading Bridge House, George Street	23	0.529	0.955	0.468
Land adjacent to 17 Craven Road	24	0.524	0.915	0.394
51 Church Road, Earley	25	0.506	0.760	0.381
72 Berkeley Avenue	26	0.491	0.814	0.354
Land west of Milford Road	27	0.474	0.874	0.318
Southcote Library, Coronation Square	28	0.443	0.496	0.332
Tunbridge Jones, Cradock Road	29	0.435	0.467	0.314
1-15 St George's Road	30	0.411	0.594	0.359
Part of car park, Tesco, Portman Road	31	0.409	0.721	0.281
Part of car park, Tesco Extra, Napier Road	32	0.376	0.720	0.234
Reading Link Retail Park, Rose Kiln Lane	33	0.323	0.832	0.112
Former Sales and Marketing Suite, Drake Way	34	0.257	0.499	0.221
Land at Drake Way (South)	35	0.253	0.500	0.209
Land at Drake Way (North)	36	0.253	0.499	0.208
Site at Green Park Village, Flagstaff Road	37	0.174	0.375	0.139

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Figure 2.5: Sustainable Case Site Connectivity Scores – Walking

Figure 2.6: Sustainable Case Site Connectivity Scores – Cycling

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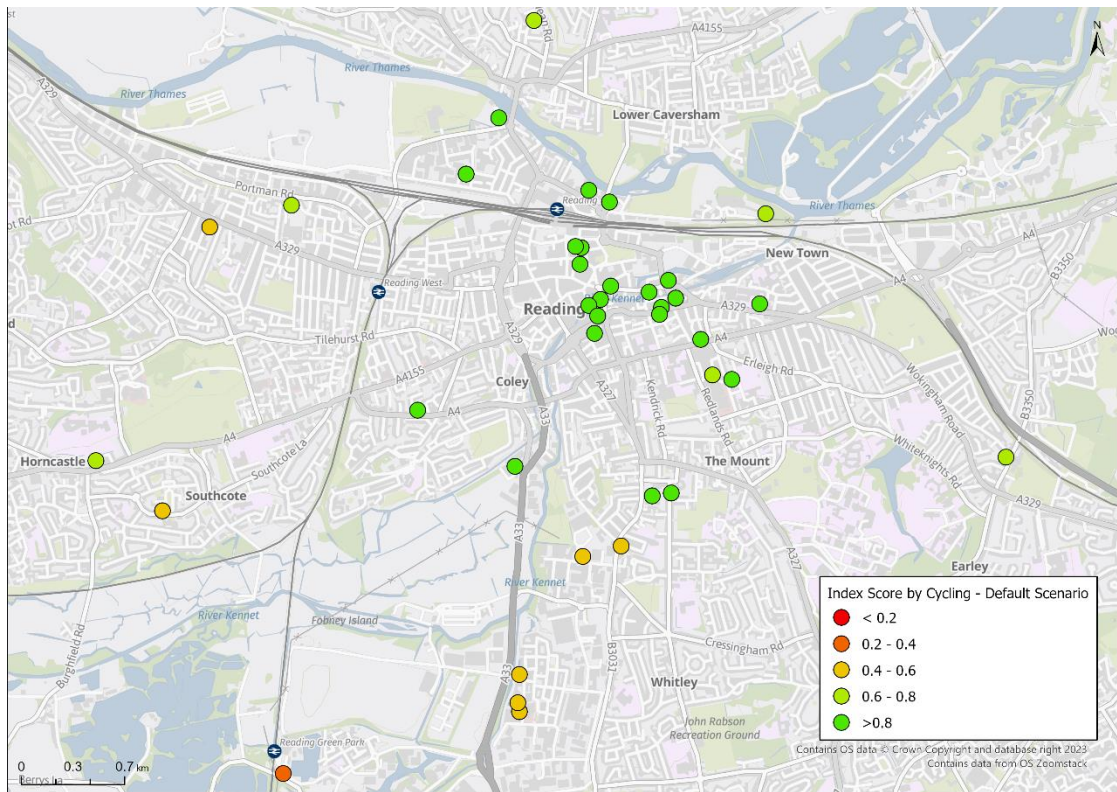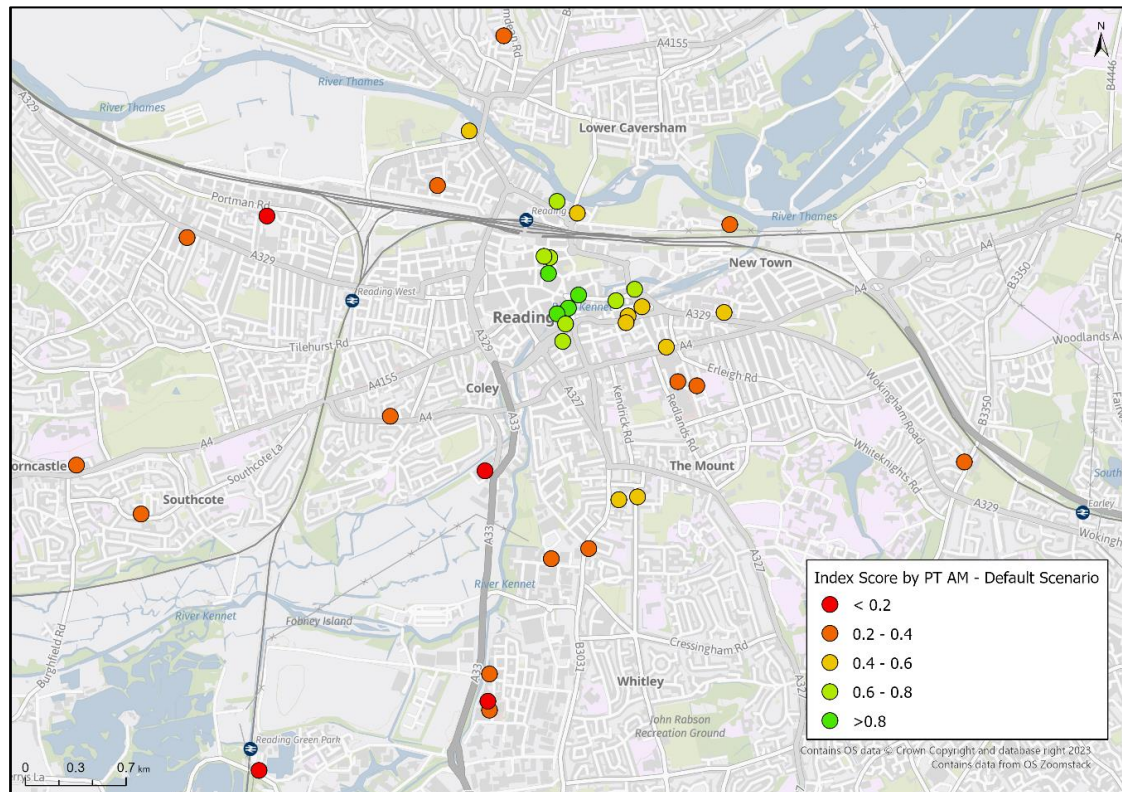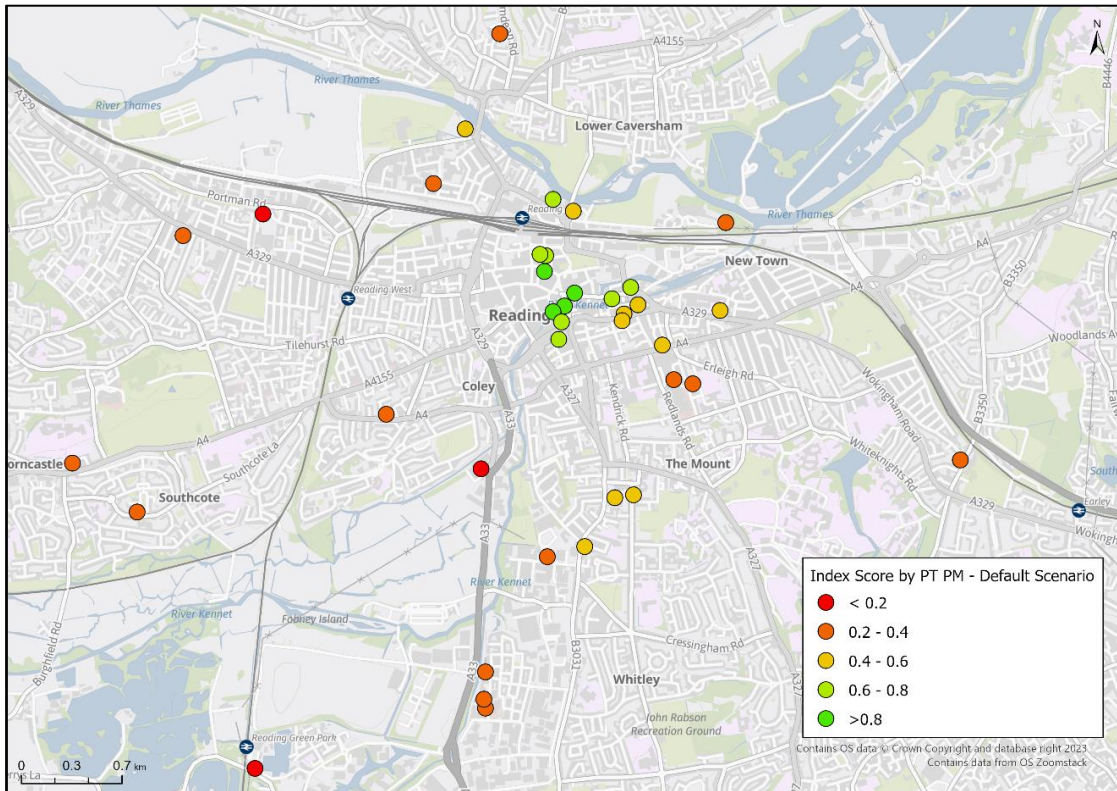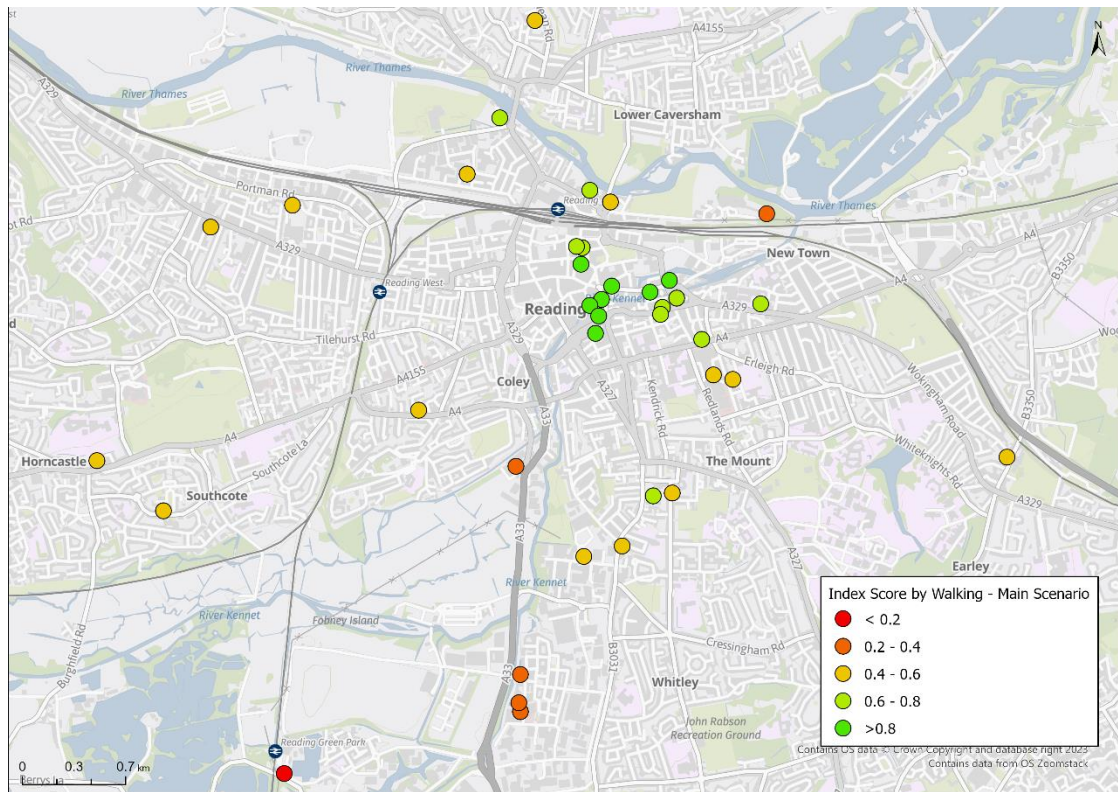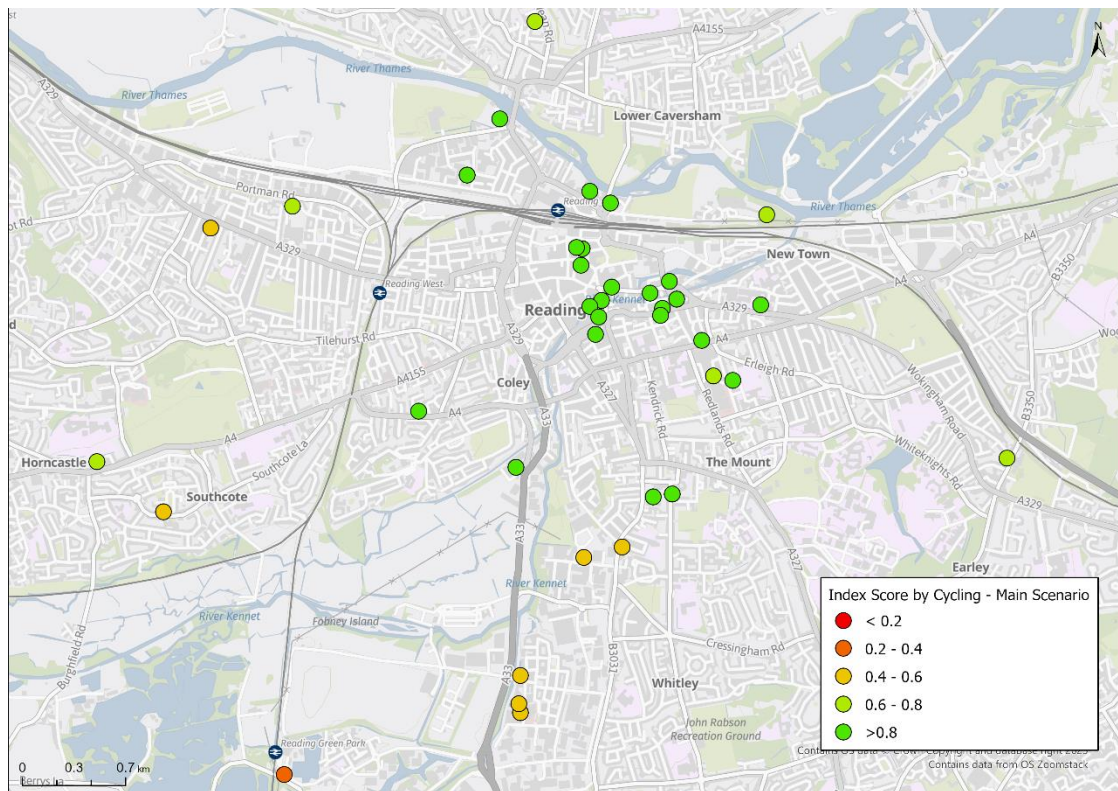Figure 2.7: Sustainable Case Site Connectivity Scores – Public Transport AM Peak Hour
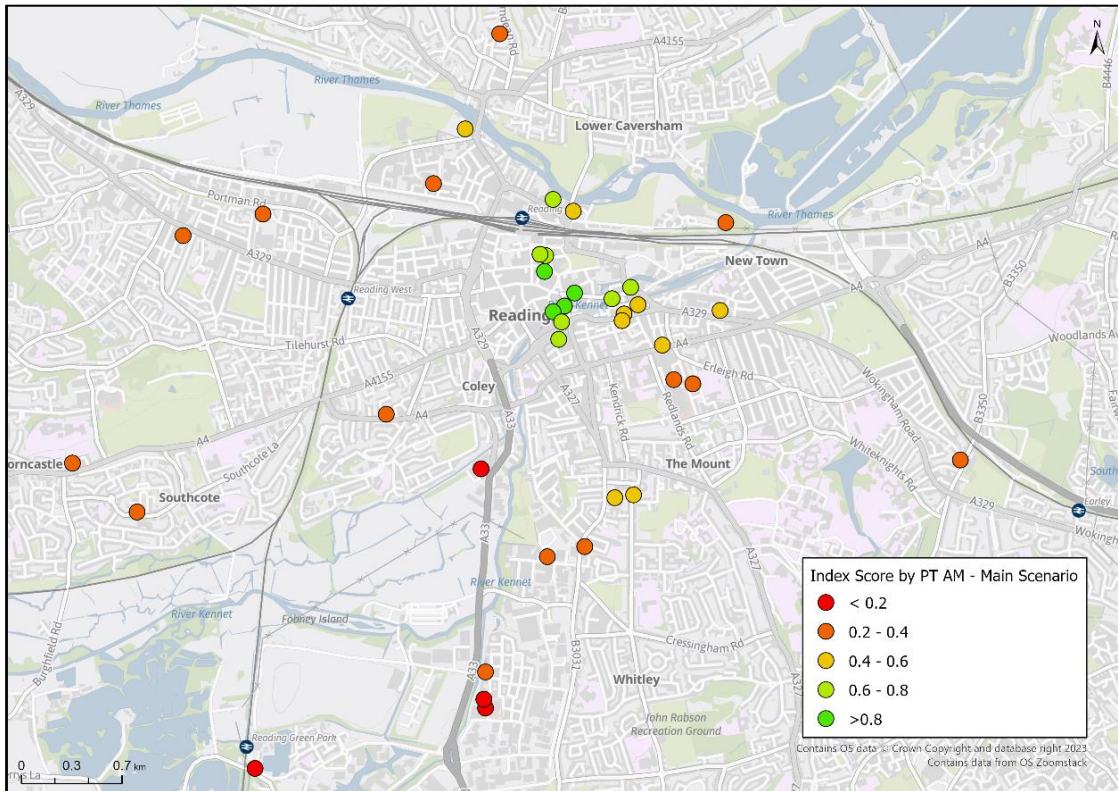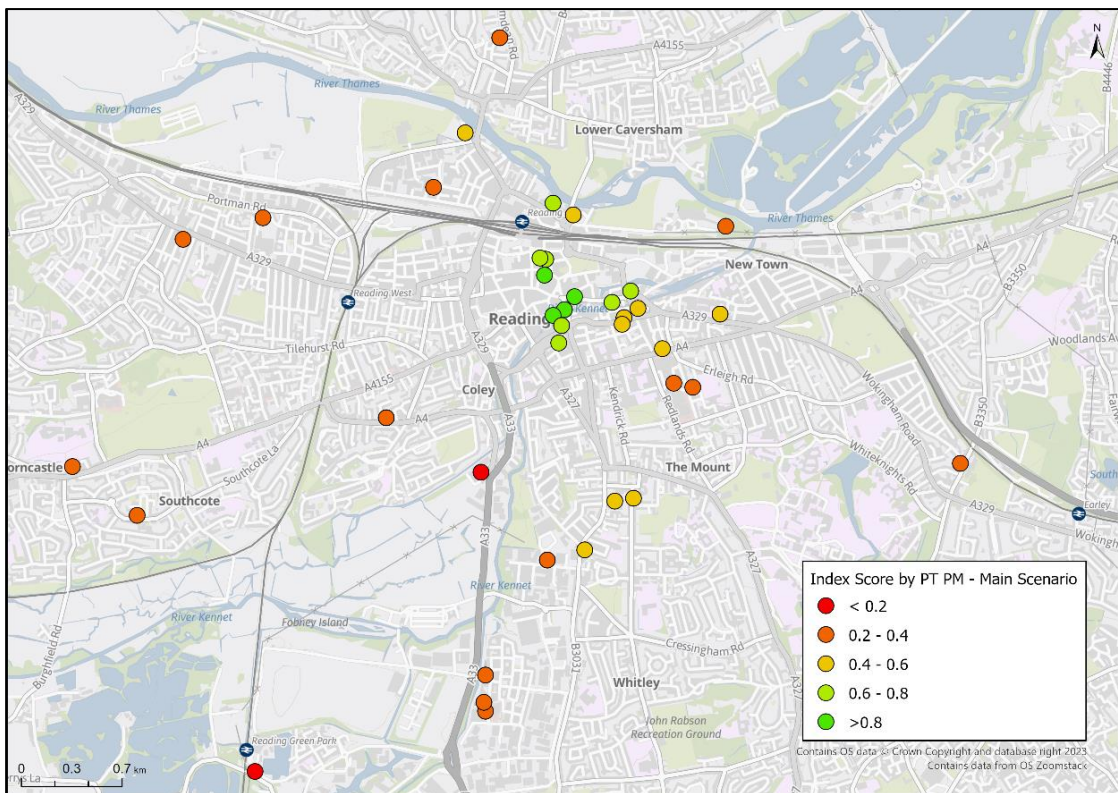

Figure 2.8: Sustainable Case Site Connectivity Scores – Public Transport PM Peak Hour

2.5   Royal Berkshire Hospital Sensitivity Test

2.5.1   Table 2.7 shows the overall scores by mode for each site, alongside the ranking for each site (where 1 is highest, and 38 is lowest), with priority given first to walk, then cycle and finally public transport, in line with the transport hierarchy.

The sites' walk, cycle and public transport (AM and PM peak hour) scores are shown geographically in Figure 2.9, Figure 2.10, Figure 2.11 and Figure 2.12 respectively.

Table 2.7: Royal Berkshire Hospital Sensitivity Test Site Connectivity Scores

Site Reference	Rank	Connectivity Score		
		Walking	Cycling	Public Transport (Peak Hour Average)
Reading Central Library, Abbey Square	1	0.947	0.969	0.924
160-163 Friar Street	2	0.939	0.971	0.915
20-22 Duke Street	3	0.933	0.963	0.872
Former Debenhams, The Oracle	4	0.927	0.932	0.839
Vue Cinema, The Oracle	5	0.925	0.941	0.776
100 Kings Road	6	0.911	0.974	0.755
John Lewis Depot, Letcombe Street	7	0.904	0.917	0.729
Kennet Place, Kings Road	8	0.853	0.962	0.699
33 Blagrave Street	9	0.787	0.968	0.901
2 Norman Place	10	0.785	0.945	0.671
Aquis House, 49-51 Forbury Road	11	0.773	0.961	0.768
Crowne Plaza Reading, Richfield Avenue	12	0.729	0.870	0.557
11 Basingstoke Road	13	0.722	0.864	0.571
Queens Wharf, Queens Road	14	0.716	0.977	0.586
Havell House, 62-66 Queens Road	15	0.702	0.969	0.549
Sapphire Plaza, Watlington Street and Royal Court, Kings Road	16	0.698	0.964	0.569
Princes House, 73A London Road	17	0.687	0.962	0.485
Part of Reading College, Kings Road	18	0.617	0.907	0.450
85-87 Basingstoke Road	20	0.593	0.519	0.403
Hemdean House School, Hemdean Road	19	0.596	0.611	0.394
Land at Warwick House, Warwick Avenue	21	0.571	0.854	0.447
Land at 132--134 Bath Road	22	0.550	0.645	0.389
Royal Berkshire Hospital, London Road	23	0.528	0.739	0.373
Reading Bridge House, George Street	24	0.522	0.948	0.460

Site Reference	Rank	Connectivity Score		
		Walking	Cycling	Public Transport (Peak Hour Average)
Land adjacent to 17 Craven Road	25	0.517	0.908	0.370
51 Church Road, Earley	26	0.506	0.753	0.362
72 Berkeley Avenue	27	0.491	0.807	0.353
Land west of Milford Road	28	0.474	0.868	0.314
Southcote Library, Coronation Square	29	0.443	0.489	0.331
Tunbridge Jones, Cradock Road	30	0.429	0.460	0.314
1-15 St George's Road	31	0.411	0.587	0.356
Part of car park, Tesco, Portman Road	32	0.409	0.714	0.279
Part of car park, Tesco Extra, Napier Road	33	0.369	0.713	0.228
Reading Link Retail Park, Rose Kiln Lane	34	0.316	0.825	0.110
Former Sales and Marketing Suite, Drake Way	35	0.257	0.492	0.220
Land at Drake Way (South)	36	0.253	0.494	0.208
Land at Drake Way (North)	37	0.253	0.492	0.207
Site at Green Park Village, Flagstaff Road	38	0.174	0.368	0.139

Figure 2.9: Royal Berkshire Hospital Sensitivity Test Site Connectivity Scores – Walking

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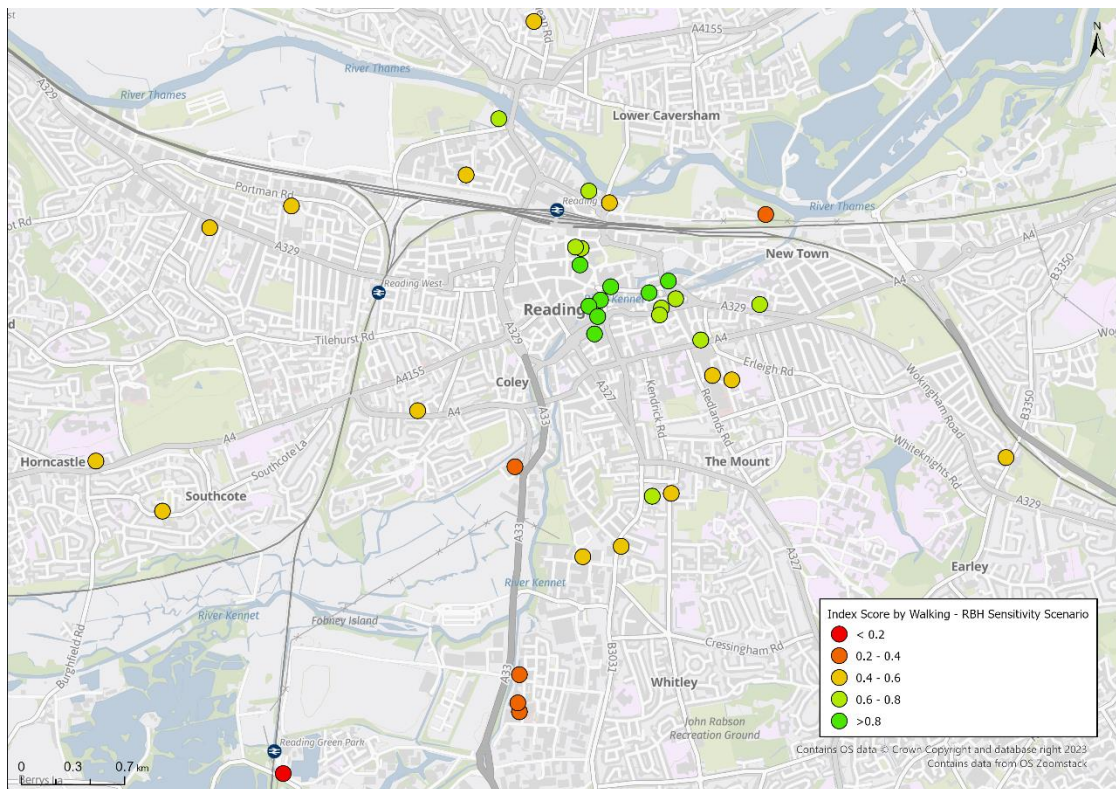
Figure 2.10: Royal Berkshire Hospital Sensitivity Test Site Connectivity Scores – Cycling
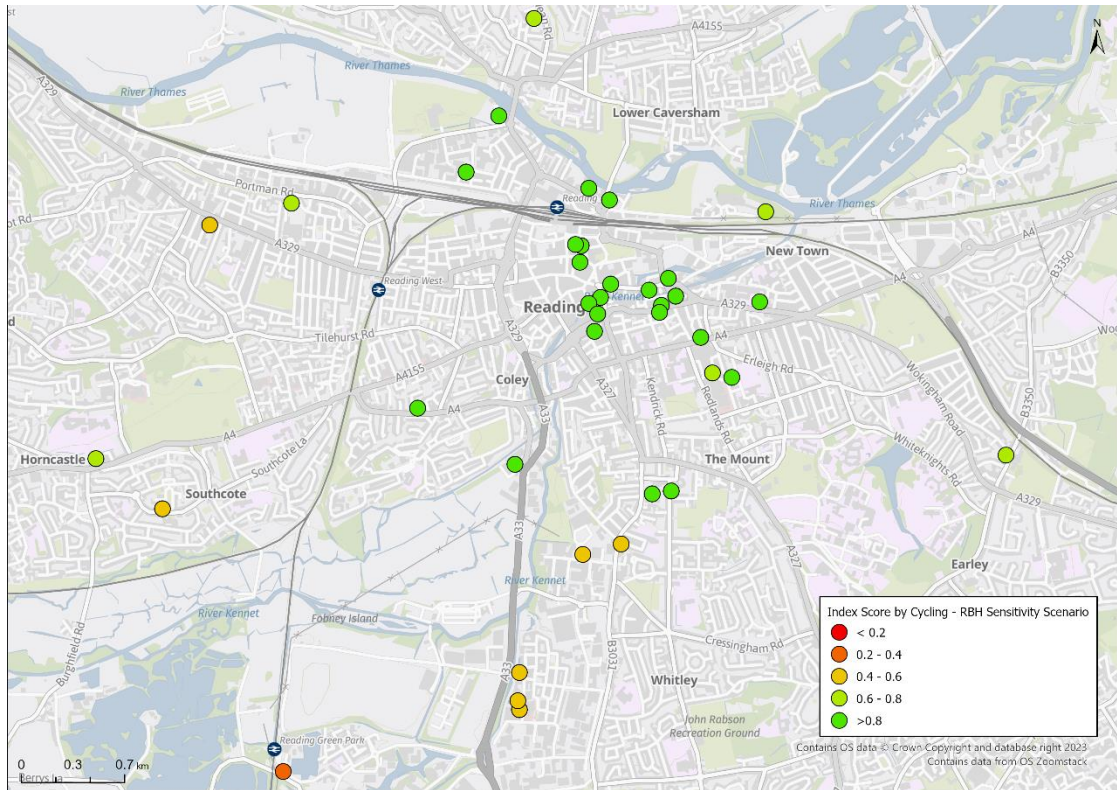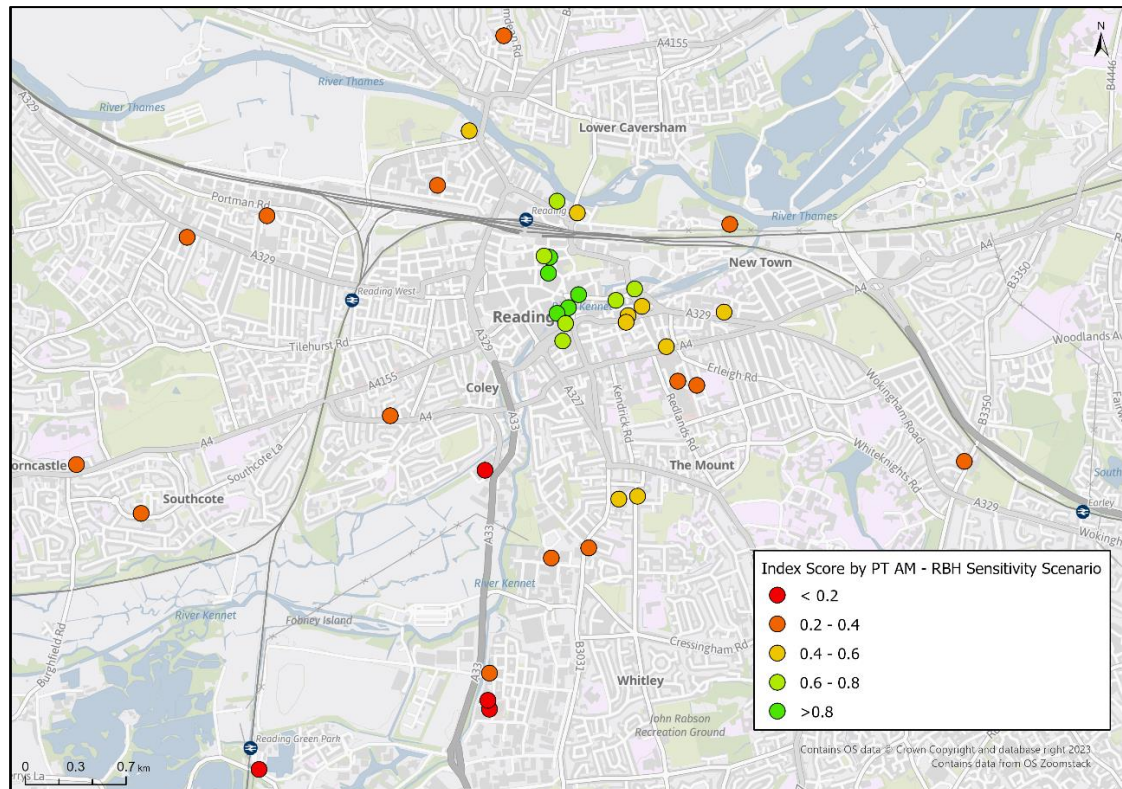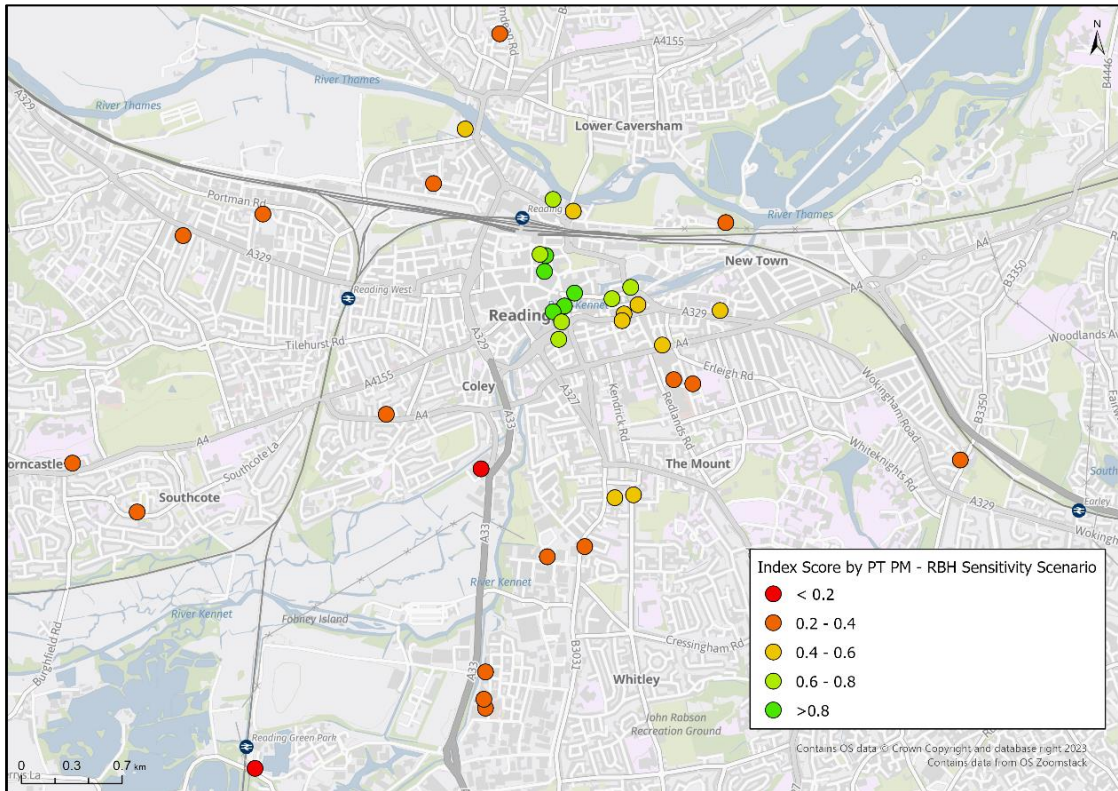

Figure 2.11: Royal Berkshire Hospital Sensitivity Test Site Connectivity Scores – Public Transport AM Peak Hour

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Figure 2.12: Royal Berkshire Hospital Sensitivity Test Site Connectivity Scores – Public Transport PM Peak Hour

3 Trip Distribution Study

3.1 Overview

3.1.1 A high-level analysis of likely vehicular trip generation and distribution of the proposed LPPU sites has been undertaken, to understand potential impacts of development. This considers the likely trip distribution of vehicle trips associated with proposed development at the new sites identified within the LPPU. It does not consider impacts of reductions in trips associated with extant uses of these sites, nor does it consider increases in trip generation associated with intensified development at existing Local Plan allocated sites.

3.2 Methodology

Sectoring

3.2.1 In order to quantify the number of trips generated by each of the proposed LPPU sites, the sites were classified into 8 land use types and four sectors based on their location. The 8 land use types are:

- Residential

- Office

- Non-Food Retail

- Leisure

- Warehousing

- Hotel

- Hospital

- Theatre

3.2.2 The sectoring was undertaking based on the geographical location of the Local Plan sites and utilised the "Revised Parking Standard and Design" document adopted by RBC in 2011 as reference to produce a sector level of trip rates. The four sectors set out are:

i. Sector 1, Central Core Area – Primarily retail and commercial with the best transport hubs

ii. Sector 2, Primary Core Area – Areas directly surrounding the core area, well served by public transport.

iii. Sector 3, Secondary Core Area – Variety of land uses, with 400m walk of high frequency bus services.

iv. Sector 4, Wider Urban Area – Mostly open space and residential, some support by direct bus services and other less accessible by public transport. Areas are generally not with walking distance or a railway station.

3.2.3 Figure 3.1 illustrates the sector plan and the sites that fall into which sector.

Figure 3.1: Trip Rate Sectors Used for Local Plan Sites
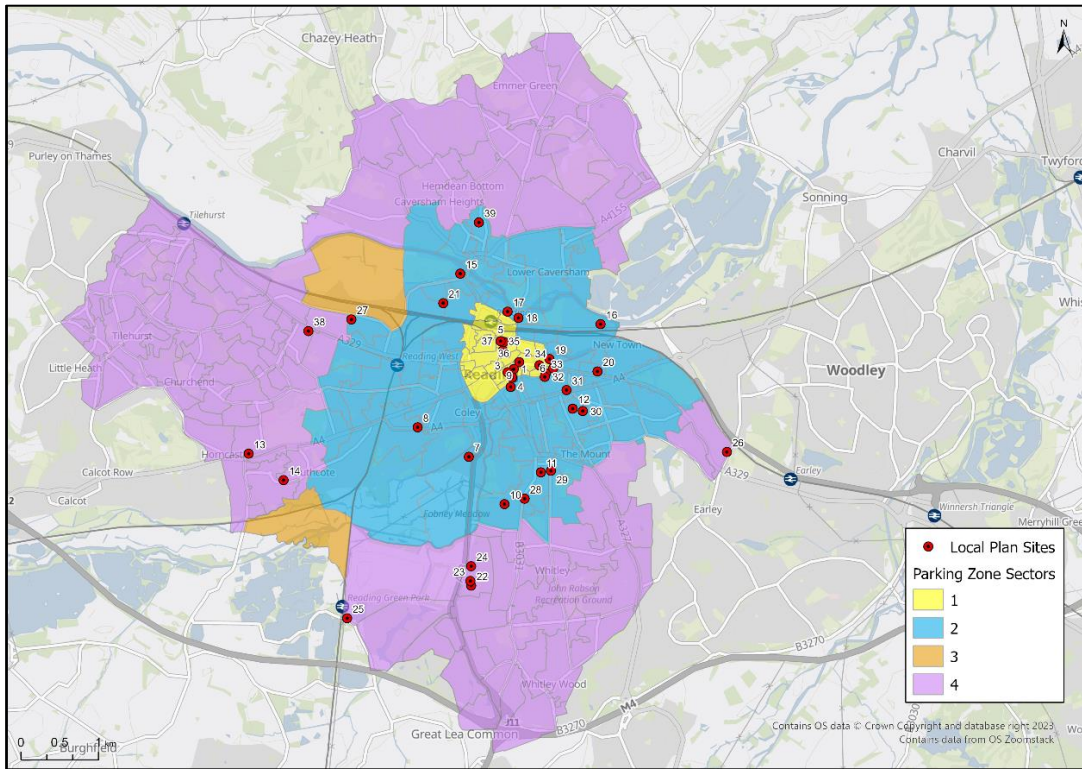
Trip Generation

3.2.4   An interrogation of TRICS has been undertaken to compare trip rates against those that are used within the Reading Transport Model and the assessment undertaken to inform the Local Plan Transport Evidence Base, for the adopted Local Plan.

3.2.5   The outcome demonstrated negligible differences between current TRICS data and the previous work undertaken. Therefore the trip rates used for the adopted Local Plan assessment have been retained.

3.2.6   Table 3.1 to Table 3.4 summarise the trip rates used for each of the land uses of the Local Plan sites by time period i.e. AM peak hour (0800-0900), IP peak hour (1000-1600) and the PM peak hour (1700-1800).

Table 3.1: Sector 1 Car Trip Rates

Sector 1 - Car							
Land Use	Unit	AM in	AM out	IP in	IP out	PM in	PM out
Residential	Dwelling	0.020	0.112	0.039	0.038	0.107	0.040
Office	100m^2	0.667	0.104	0.287	0.281	0.089	0.550
Non-Food	100m^2	0.164	0.078	0.343	0.337	0.162	0.316
Leisure	100m^2	0.104	0.082	0.116	0.109	0.200	0.204
Warehousing	100m^2	N/A	N/A	N/A	N/A	N/A	N/A
Hotel	100m^2	0.301	0.502	0.219	0.236	0.400	0.219

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Sector 1 - Car							
Hospital	100m²	0.741	0.258	0.373	0.388	0.240	0.602
Theatre	100m²	N/A	N/A	N/A	N/A	N/A	N/A

Table 3.2: Sector 1 OGV Trip Rates

Sector 1 - OGV							
Land Use	Unit	AM in	AM out	IP in	IP out	PM in	PM out
Residential	Dwelling	0.000	0.001	0.001	0.001	0.000	0.000
Office	100m²	0.003	0.003	0.001	0.001	0.000	0.000
Non-Food	100m²	0.002	0.003	0.002	0.001	0.002	0.002
Leisure	100m²	0.002	0.002	0.000	0.000	0.000	0.000
Warehousing	100m²	N/A	N/A	N/A	N/A	N/A	N/A
Hotel	100m²	0.010	0.010	0.002	0.002	0.000	0.000
Hospital	100m²	0.006	0.005	0.005	0.006	0.002	0.002
Theatre	100m²	N/A	N/A	N/A	N/A	N/A	N/A

Table 3.3: Sectors 2,3 and 4 Car Trip Rates

Sectors 2,3,4 - Car							
Land Use	Unit	AM in	AM out	IP in	IP out	PM in	PM out
Residential	Dwelling	0.104	0.230	0.125	0.125	0.224	0.126
Office	100m²	1.296	0.215	0.285	0.298	0.156	1.168
Non-Food	100m²	3.684	3.301	4.624	4.624	4.649	4.967
Leisure	100m²	0.202	0.167	0.207	0.187	0.446	0.444
Warehousing	100m²	0.458	0.223	0.266	0.275	0.106	0.394
Hotel	100m²	0.346	0.553	0.208	0.251	0.398	0.229
Hospital	100m²	N/A	N/A	N/A	N/A	N/A	N/A
Theatre	100m²	0.000	0.000	0.481	0.313	0.855	0.823

Table 3.4: Sectors 2,3 and 4 OGV Trip Rates

Sectors 2,3,4 - OGV							
Land Use	Unit	AM in	AM out	IP in	IP out	PM in	PM out
Residential	Dwelling	0.000	0.001	0.001	0.001	0.000	0.000

Office	100m²	0.006	0.004	0.003	0.003	0.001	0.002
Non-Food	100m²	0.106	0.078	0.068	0.070	0.018	0.023
Leisure	100m²	0.002	0.002	0.001	0.001	0.000	0.001
Warehousing	100m²	0.019	0.021	0.021	0.021	0.006	0.008
Hotel	100m²	0.004	0.004	0.005	0.007	0.002	0.002
Hospital	100m²	N/A	N/A	N/A	N/A	N/A	N/A
Theatre	100m²	0.000	0.000	0.000	0.000	0.000	0.000

3.2.7   **Appendix A** summarises the forecast vehicular trip generation of the proposed LPPU sites.

Trip Distribution

3.2.8   The distribution of the trips to and from each proposed LPPU site has been determined utilising distribution data associated with their respective zone within the 2015 Reading Transport Model. The zones within model are deemed to have similar characteristics in terms of land use and location, and therefore the trip distribution is considered an appropriate proxy.

3.2.9   A Select Link Analysis by origin/destination was utilised to estimate the trip distribution for each of the zones which contain the proposed LPPU sites. For each of the LPPU sites, the trips generated as a proportion of their respective zonal trips was used as a factor which was then applied to the distribution of the Select Link Analysis.

3.2.10   This approach provides a validated trip distribution based on the proportion of trips for each proposed LPPU site.

3.2.11   Figure 3.2 to Figure 3.5 illustrate the distribution of trips to/from the proposed LPPU sites.

3.2.12   Vehicular trips on key routes are shown in Table 3.5, and will be used to inform further assessment work detailed in Section 3.3.

Table 3.5: Proposed LPPU Sites Vehicular Trip Impacts (Two-Way) on Key Routes

Key Routes	**AM Peak Hour**	**PM Peak Hour**
Cemetery Junction	83	109
A33 Bridge	70	80
Reading Bridge	42	48
Caversham Bridge	47	53
Oxford Road	20	29
Bath Road (Coley)	59	70

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Figure 3.2: Proposed LPPU Sites Origin Vehicle Trip Distribution AM
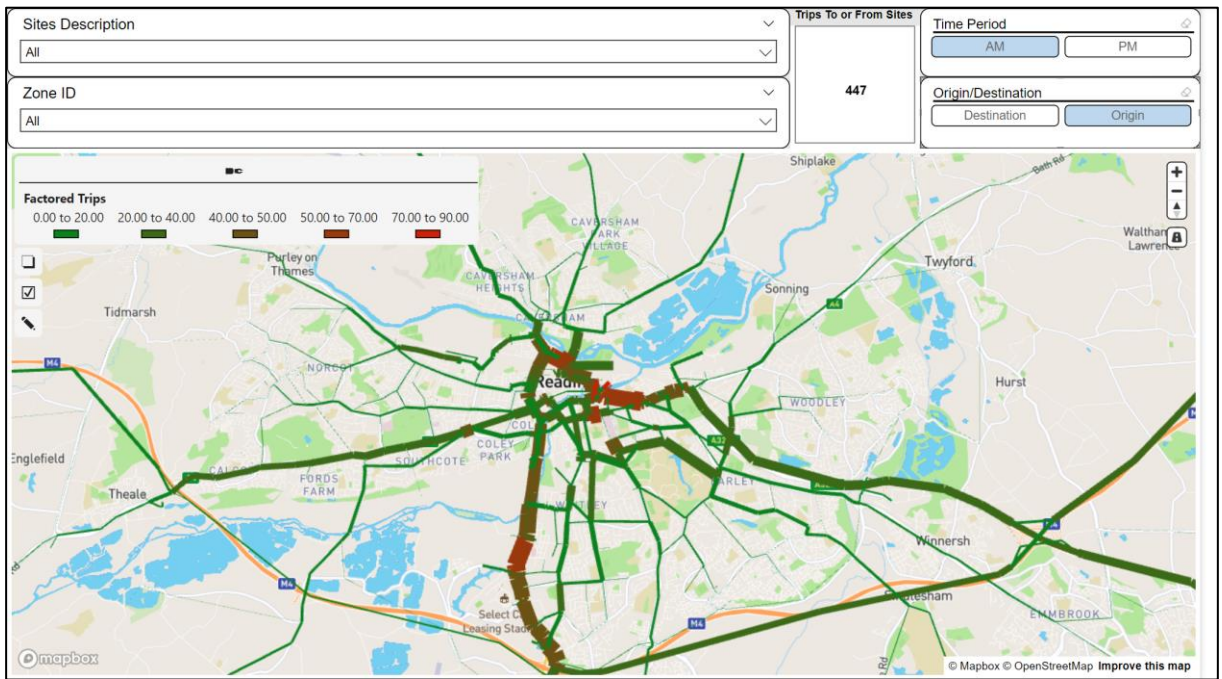
Figure 3.3: Proposed LPPU Sites Destination Vehicle Trip Distribution AM
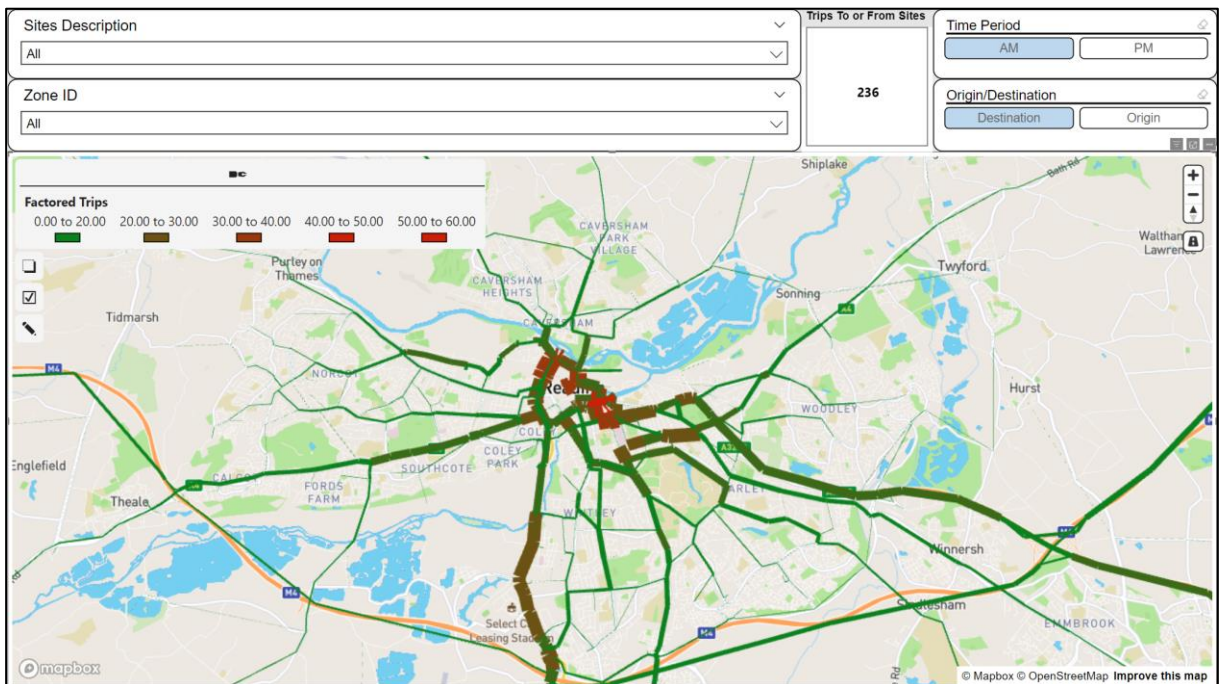
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Figure 3.4: Proposed LPPU Sites Origin Vehicle Trip Distribution PM
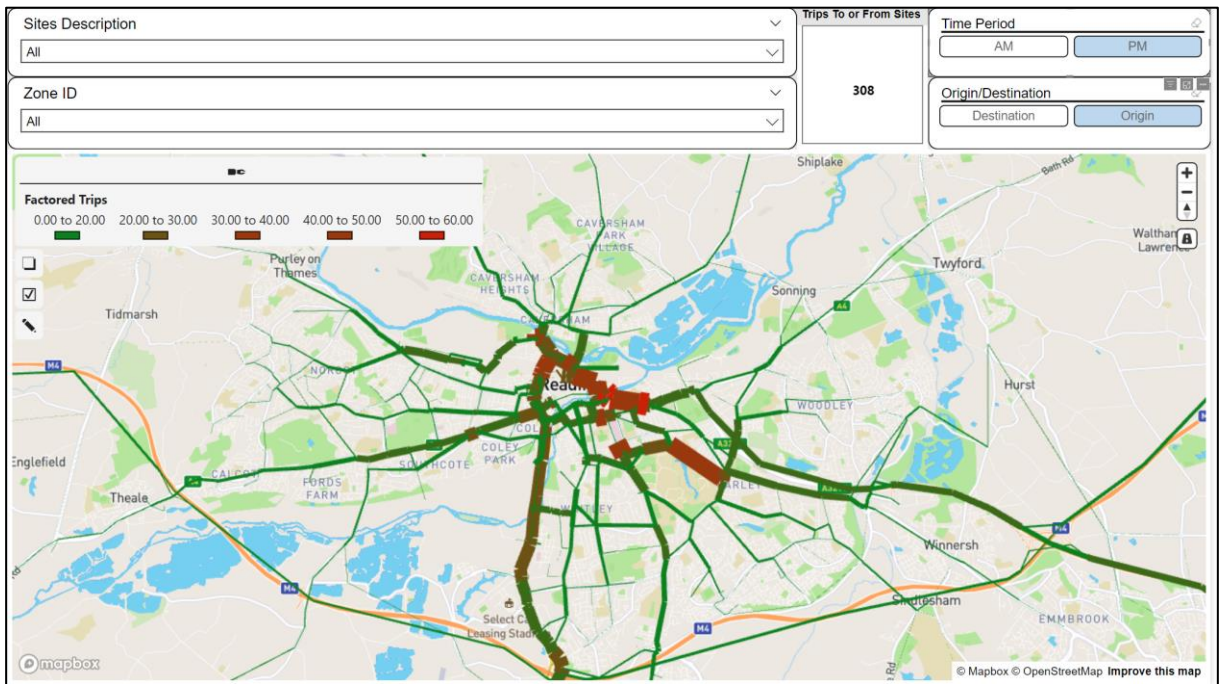
Figure 3.5: Proposed LPPU Sites Destination Vehicle Trip Distribution PM
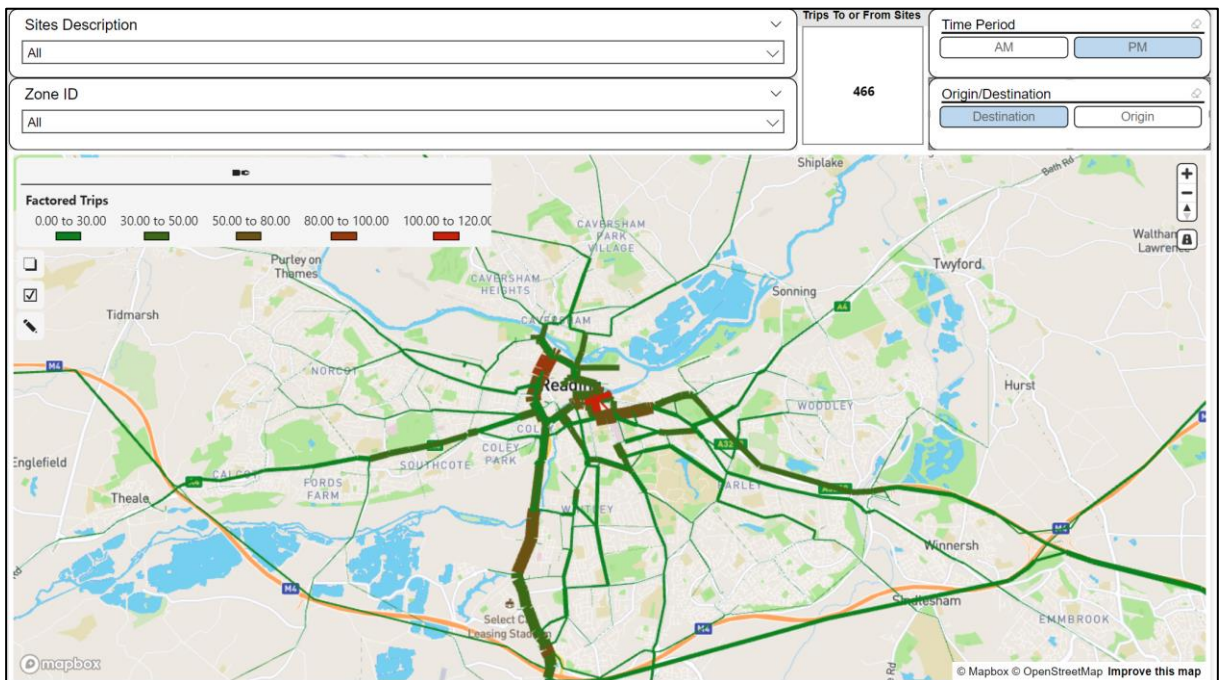
3.3 Next Steps

3.3.1 The outputs from the trip generation and distribution exercise show the routes and junctions where development trips are deemed to reach. This provides a high-level view of where the trips will potentially impact on the highway network.

3.3.2   These outputs are used within transport modelling work to be published shortly, which includes a proportionate approach to highway modelling, including a verification exercise of the model, comparing the 2015 model against data from 2024 and minor modelling updates to create a present day forecast model, which is then used to assess direct impacts on the highway network.

3.3.3   The trip generation and distribution information feed into new forecast models, which are added on top of background growth, associated with committed developments and background growth from DfT National Trip End Model, outside of Reading. There are two model scenarios, representing the end of the Local Plan Partial Update horizon year, as follows:

   ▪   Scenario 1 – Future Year Baseline (without proposed LPPU developments)

   ▪   Scenario 2 – Future Year with proposed LPPU developments

3.3.4   The assessment highlights locations where the proposed LPPU developments may lead to impacts on the network that may require mitigation. In the first instance, for any locations identified, a link is made back to the sustainability assessment and whether any of the measures included within that assessment are considered likely to mitigate any adverse impacts. Likely residual impacts are then noted and considered.

Appendix A   Proposed LPPU Sites Forecast Trip Generation

Site	Quantum	Land Use		Sector	Cars						OGVs					
					AM in	AM out	IP in	IP out	PM in	PM out	AM in	AM out	IP in	IP out	PM in	PM out
20-22 Duke Street	15	Residential	Dwelling	1	0	2	1	1	2	1	0	0	0	0	0	0
Reading Central Library, Abbey Square	27	Residential	Dwelling	1	1	3	1	1	3	1	0	0	0	0	0	0
Former Debenhams, The Oracle	190	Residential	Dwelling	1	4	21	7	7	20	8	0	0	0	0	0	0
Former Debenhams, The Oracle	2408	Non-Food	100m2	1	4	2	8	8	4	8	0	0	0	0	0	0
Vue Cinema, The Oracle	120	Residential	Dwelling	1	2	13	5	5	13	5	0	0	0	0	0	0
Vue Cinema, The Oracle	2279	Leisure	100m2	1	2	2	3	2	5	5	0	0	0	0	0	0
Aquis House, 49-51 Forbury Road and 33 Blagrave Street	137	Residential	Dwelling	1	3	15	5	5	15	5	0	0	0	0	0	0
Sapphire Plaza, Watlington Street and Royal Court, Kings Road	97	Residential	Dwelling	1	2	11	4	4	10	4	0	0	0	0	0	0
Reading Link Retail Park, Rose Kiln Lane	185	Residential	Dwelling	2	19	43	23	23	41	23	0	0	0	0	0	0
72 Berkeley Avenue	11	Residential	Dwelling	2	1	3	1	1	2	1	0	0	0	0	0	0
John Lewis Depot, Letcombe Street	95	Residential	Dwelling	1	2	11	4	4	10	4	0	0	0	0	0	0
11 Basingstoke Road	168	Residential	Dwelling	2	17	39	21	21	38	21	0	0	0	0	0	0
Royal Berkshire Hospital, London Road	650	Residential	Dwelling	1	13	73	25	25	70	26	0	1	1	1	0	0
Royal Berkshire Hospital, London Road	7500	Hospital	100m2	1	56	19	28	29	18	45	0	0	0	0	0	0
Land at 132--134 Bath Road	21	Residential	Dwelling	2	2	5	3	3	5	3	0	0	0	0	0	0
Southcote Library, Coronation Square	19	Residential	Dwelling	2	2	4	2	2	4	2	0	0	0	0	0	0
Crowne Plaza Reading, Richfield Avenue	10727	Leisure	100m2	2	22	18	22	20	48	48	0	0	0	0	0	0
Part of car park, Tesco Extra, Napier Road	71	Residential	Dwelling	1	1	8	3	3	8	3	0	0	0	0	0	0
2 Norman Place	160	Residential	Dwelling	2	17	37	20	20	36	20	0	0	0	0	0	0
Reading Bridge House, George Street	192	Residential	Dwelling	1	4	22	7	7	21	8	0	0	0	0	0	0

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Site	Quantum	Land Use		Sector	Cars						OGVs					
					AM in	AM out	IP in	IP out	PM in	PM out	AM in	AM out	IP in	IP out	PM in	PM out
Kennet Place, Kings Road	105	Residential	Dwelling	1	2	12	4	4	11	4	0	0	0	0	0	0
Part of Reading College, Kings Road	39	Residential	Dwelling	2	4	9	5	5	9	5	0	0	0	0	0	0
Part of Reading College, Kings Road	240	Theatre	100m2	2	0	0	1	1	2	2	0	0	0	0	0	0
Land at Drake Way (South)	25	Residential	Dwelling	2	3	6	3	3	6	3	0	0	0	0	0	0
Former Sales and Marketing Suite, Drake Way	19	Residential	Dwelling	2	2	4	2	2	4	2	0	0	0	0	0	0
51 Church Road, Earley	16	Residential	Dwelling	2	2	4	2	2	4	2	0	0	0	0	0	0
Part of car park, Tesco, Portman Road	57	Residential	Dwelling	2	6	13	7	7	13	7	0	0	0	0	0	0
100 Kings Road	50	Residential	Dwelling	1	1	6	2	2	5	2	0	0	0	0	0	0
Queens Wharf, Queens Road	11	Residential	Dwelling	1	0	1	0	0	1	0	0	0	0	0	0	0
Havell House, 62-66 Queens Road	17	Residential	Dwelling	1	0	2	1	1	2	1	0	0	0	0	0	0
Aquis House, 49-51 Forbury Road	49	Residential	Dwelling	1	1	5	2	2	5	2	0	0	0	0	0	0
Aquis House, 49-51 Forbury Road	4386	Office	100m2	1	29	5	13	12	4	24	0	0	0	0	0	0
33 Blagrave Street	25	Residential	Dwelling	1	1	3	1	1	3	1	0	0	0	0	0	0
160-163 Friar Street	35	Residential	Dwelling	1	1	4	1	1	4	1	0	0	0	0	0	0
160-163 Friar Street	389	Non-Food	100m2	1	1	0	1	1	1	1	0	0	0	0	0	0
1-15 St George's Road	17	Residential	Dwelling	2	2	4	2	2	4	2	0	0	0	0	0	0
Hemdean House School, Hemdean Road	28	Residential	Dwelling	2	3	6	4	4	6	4	0	0	0	0	0	0
Princes House, 73A London Road	26	Residential	Dwelling	1	1	3	1	1	3	1	0	0	0	0	0	0
Land adjacent to 17 Craven Road	28	Residential	Dwelling	1	1	3	1	1	3	1	0	0	0	0	0	0
85-87 Basingstoke Road	15	Residential	Dwelling	2	2	3	2	2	3	2	0	0	0	0	0	0
Land at Warwick House, Warwick Avenue	10	Residential	Dwelling	2	1	2	1	1	2	1	0	0	0	0	0	0

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