

University of Worcester Travel Plan – 2019 Update

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I Introduction

I.1 Overview

- 1.1.1 PJA has been commissioned by the University of Worcester (UoW) to provide an update to the University's existing 2013- 2018 Travel Plan.

I.2 Sustainable Transport Strategy

- 1.2.1 PJA produced a Travel Plan for the UoW in 2013, providing a sustainable transport strategy for the site and then produced a Technical Note in 2016 to update the Travel Plan to reflect new 2015 staff and student survey data, and include the expanded University portfolio. This note has been prepared to update the previous note in light of new staff and student survey data for 2016, 2017 and 2018/19.

I.3 Document Structure

- 1.3.1 The remainder of the document is divided into the following sections:
- Section 2 compares the historical travel situation at the main campus sites with recent staff travel survey data;
 - Section 3 compares the historical travel situation at the main campus sites with recent student travel survey data;
 - Section 4 compares the historical inter-site travel situation with recent travel survey data;
 - Section 5 compares historical carbon emissions information with the recent survey data;
 - Section 6 summarises the latest University of Worcester Mobility Plan;
 - Section 7 provides a commentary on progress towards the targets outlined in the previous Travel Plan;
 - Section 8 investigates potential remedial measures to improve progress towards targets; and
 - Section 9 summarises and concludes the report.

2 Staff Travel

2.1 Overview

- 2.1.1 The 2018/19 staff travel survey a total of 374 responses. On the survey, a response rate of 74% is specified.
- 2.1.2 It should be noted that the surveys in 2016, 2017 and 2018/19 allowed multiple answers for multiple choice questions whereas the previous surveys allowed just one answer.
- 2.1.3 The main mode of travel used by staff to access the University has been identified from historical data (2009-2012) extracted from the 2013-2018 travel plan, as well as recent survey data (2013, 2015, 2016, 2017 and 2018/19) provided by the UoW. This information is outlined in Table 1:

Table 1: Main Mode of Travel to Work – Staff

Mode of Travel	Year						
	2009	2011	2013	2015	2016	2017	2018/19
Bus	4%	4%	10%	3%	3%	7%	4%
Bicycle	12%	12%	5%	7%	9%	9%	9%
On Foot	18%	19%	18%	23%	20%	21%	17%
Train	2%	5%	5%	5%	5%	5%	4%
Motorbike	0%	0%	-	0%	0%	0%	0%
Single Occupancy Vehicle (SOV)	55%	53%	54%	58%	63%	57%	66%
Car with others	4%	3%	8%	1%	6%	7%	4%
Other (including combination)	4%	4%	1%	2%	-	-	-

- 2.1.4 Table 1 shows:
- The proportion of staff travelling by single occupancy vehicle has increased, with the current level the highest during the study period;
 - The proportion of staff travelling on foot has been decreasing since 2015 to a low of 17% in 2018/19;
 - The proportion of staff cycling has remained at a constant of 9% over the three most recent survey years – a two percent increase from the last update;
 - The number of staff who travel by bus has fluctuated from a high of 10% to a low of 3%, with 4% the most recent proportion; and
 - The number of staff car sharing decreased dramatically in 2015, however has risen since, peaking at 7% in 2017 and falling slightly to 4% in 2018/19.

2.1.5 Information regarding the distance travelled by staff in single occupancy vehicles (SOVs) is summarised in Table 2. This has been calculated based on individual responses to the question: “What is the approximate distance in miles from your home address to the campus where you work?”.

Table 2: Distance Travelled in Single Occupancy Vehicles – Staff

Distance Travelled	Year				
	2013	2015	2016	2017	2018/19
Up to 1 mile	1%	3%	1%	1%	3%
Over 1 mile and up to 2 miles	4%	13%	6%	4%	3%
Over 2 miles and up to 4 miles	12%	14%	8%	15%	13%
Over 4 miles and up to 10 miles	27%	21%	26%	26%	25%
Over 10 miles and up to 20 miles	22%	22%	22%	20%	24%
Over 20 miles and up to 50 miles	29%	23%	32%	30%	28%
Over 50 miles	5%	4%	4%	4%	5%

2.1.6 Table 2 shows:

- Since the last update in 2015, there has been a rise in the percentage of staff making trips of 4 miles and above in single occupancy vehicles;
- There has been a particularly large increase in the percentage of staff travelling between 20 and 50 miles, reaching a high of 32% in 2016; and
- The percentage of staff driving between one and two miles has remained relatively constant, apart from a spike of 13% in 2015.

2.1.7 Table 3 outlines the reasons for staff travelling to work by private car:

Table 3: Reasons for Undertaking Journeys to University by Car – Staff

Reason	2015	2018/19
Convenience	20%	12%
Lack of an alternative/public transport not available	14%	12%
Health reasons	1%	3%
Sharing a lift	2%	-
Dropping off / collecting children	17%	19%
Cost saving	2%	3%
Time saving	21%	15%
Car essential to perform job	12%	-
Personal Security	-	1%

Reason	2015	2018/19
Distance from home (too far to walk/cycle)	-	28%
Other	12%	9%

2.1.8 Table 3 indicates:

- Time saving and personal responsibilities such as dropping off children have remained popular reasons why staff travel to University by car; and
- The 2018/19 survey indicates that the main reason why staff choose to travel to work by car is due to distance from home.

2.1.9 Table 4 details a number of measures designed to encourage staff to use public transport, with the percentage figure representing the most likely to encourage this modal shift.

Table 4: Measures to Encourage more Sustainable Travel to Work - Staff

Reason	2015	2018/19
More direct bus routes	20%	16%
More frequent bus service	18%	20%
Closer train station to home	15%	19%
Closer train station to work	12%	13%
Interest free loan to purchase season tickets	3%	-
Cheaper tickets	23%	24%
More flexible tickets	8%	10%
Safer cycle routes	15%	27%
Refresher/proficiency cycle training	-	4%
Safer footpaths	5%	9%
I am happy with the way I travel to work	52%	52%
Other	10%	-

2.1.10 Table 4 shows:

- The most popular measure for encouraging sustainable travel to work is safer cycle routes, with 27% of staff choosing this answer. This represents an increase of 12% from the previous update in 2015; and
- The proportion of staff who are happy with the way they travel to work remained constant at 52%.

2.1.11 Table 5 outlines responses to the question ‘Which of the following would most encourage you to car share?’

Table 5: Measures to Encourage Travel to Encourage Car Sharing to Work (Staff)

Reason	Previous	Current
Not interested in car sharing	46%	-
Help in finding car share partners with similar work patterns	20%	23%
Reserved parking for car sharers	5%	16%
Reduced car parking charges for car sharers	6%	8%
None of these	17%	52%
Other	6%	2%

2.1.12 Table 5 shows:

- The proportion of staff who have expressed that help in finding car share partners would encourage them to car share has risen from the previous Travel Plan update; and
- The proportion of staff who have expressed that reserved parking for car shares would encourage them to car share to work has increased from the previous Travel Plan update.

Parking Permit Holders

2.1.13 Parking permit data has been collected by the University which provides an accurate record of those who have paid for parking at the university. This data indicates that there are currently 972 staff members who own a parking permit.

2.1.14 There are many who do not own a permit and Table 6 summarises the parking locations of these staff members:

Table 6: Parking Locations - Non-Permit Holders

Location	Percentage (2018/19)
Campus short stay car park	10%
Campus long stay car park	49%
Free parking on nearby street	29%
Public pay & display car park (non-University)	12%

2.1.15 Table 6 indicates that the majority of non-permit holders park in the campus long-stay car park, however there are also a large number who park on nearby streets.

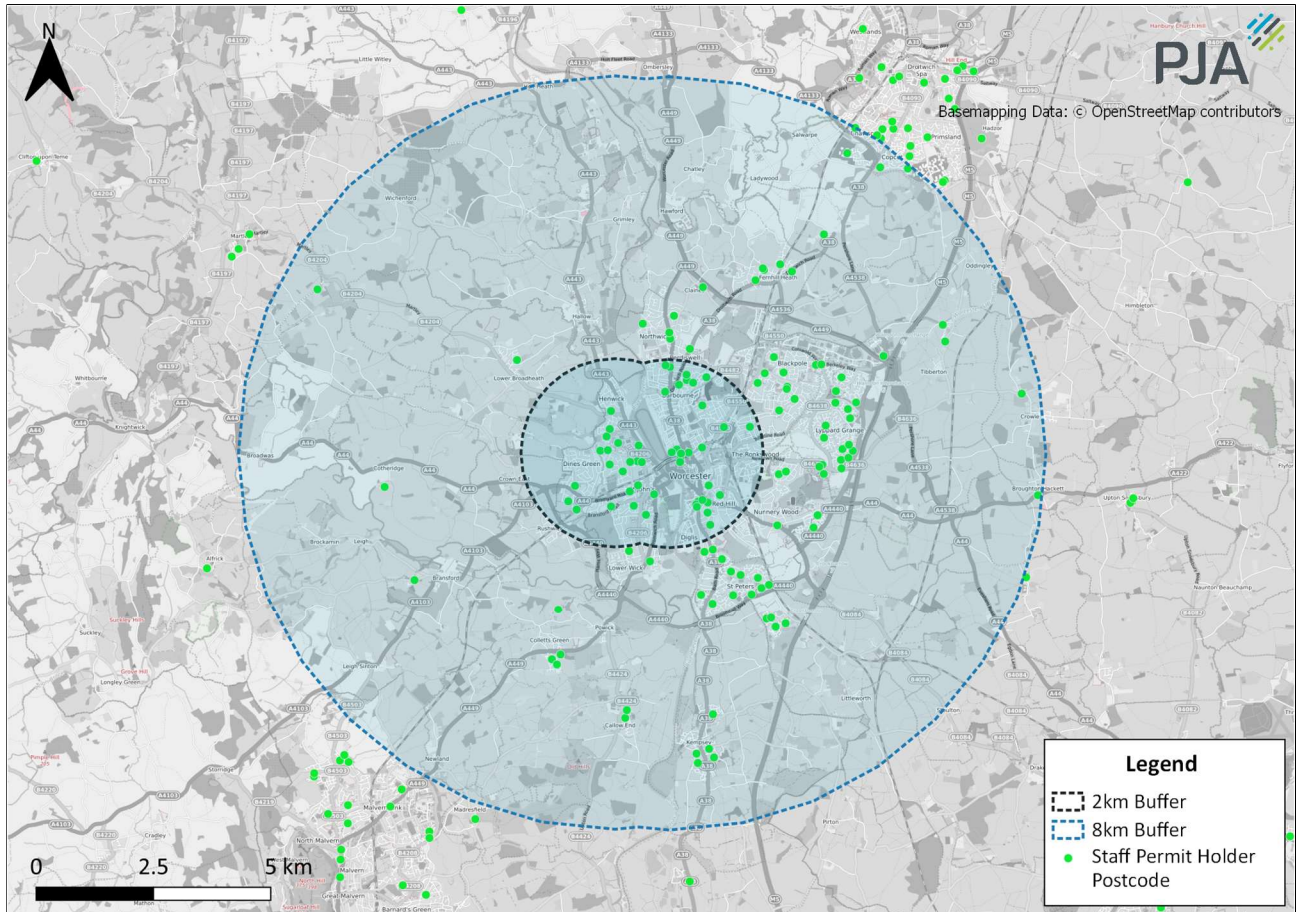
- 2.1.16 GIS analysis has been undertaken on the postcodes given in the parking permit data. This analysis was done to determine the percentage of parking permit holders who live with walking and cycling distance of a university campus.
- 2.1.17 An acceptable walking distance of 2km was used in the analysis (equivalent to a walk time of 24 minutes). This is based on guidance provided by the Institution of Highways and Transportation (IHT) in their publication 'Guidelines for Providing for Journeys on Foot' (2000), which suggests that in terms of commuting, walking to school and recreational journeys walk distances of up to 2,000 metres can be considered as a preferred maximum. A cycling distance of 8km was used in the analysis (equivalent to a cycle time of 30 minutes). This is based on guidance set out for Local Cycling and Walking Infrastructure Plans (LCWIPs) from the Department for Transport (DfT), which states that it is possible for cycling to replace trips made by other modes of transport, typically up to 10km.
- 2.1.18 Permit holder postcodes have been converted to coordinates so that staff locations can be plotted in QGIS.
- 2.1.19 The results were as follows:

Table 7: Parking Permit GIS Analysis – Results

Distance	Percentage of Parking Permit Holders
Within Walking Distance (2km)	20%
Within Cycling Distance (8km)	37%

- 2.1.20 The GIS analysis shows that:
- There are 20% of parking permit holders within walking distance of a campus site
 - There are 37% of parking permit holders that are within cycling distance a campus site.
 - This equates to a total of 194 staff permit holders who live within walking distance and a total of 360 staff members who live within cycling distance.
- 2.1.21 It should be noted that a campus site may not be the campus site where the individual staff member works.
- 2.1.22 The data is plotted visually in Figure 1.

Figure 1: Staff Parking Permit Holder Postcodes



Staff Postcode Analysis

2.1.23 As per the original Travel Plan, the home postcode locations of all staff have been examined to identify where they are travelling to the University from. Figures 1 and 2 illustrate the home locations of staff across a wider regional area and also at a more detailed level within Worcester.

Figure 2: Staff Home Locations – Worcestershire (SOURCE: University of Worcester Geography Department)

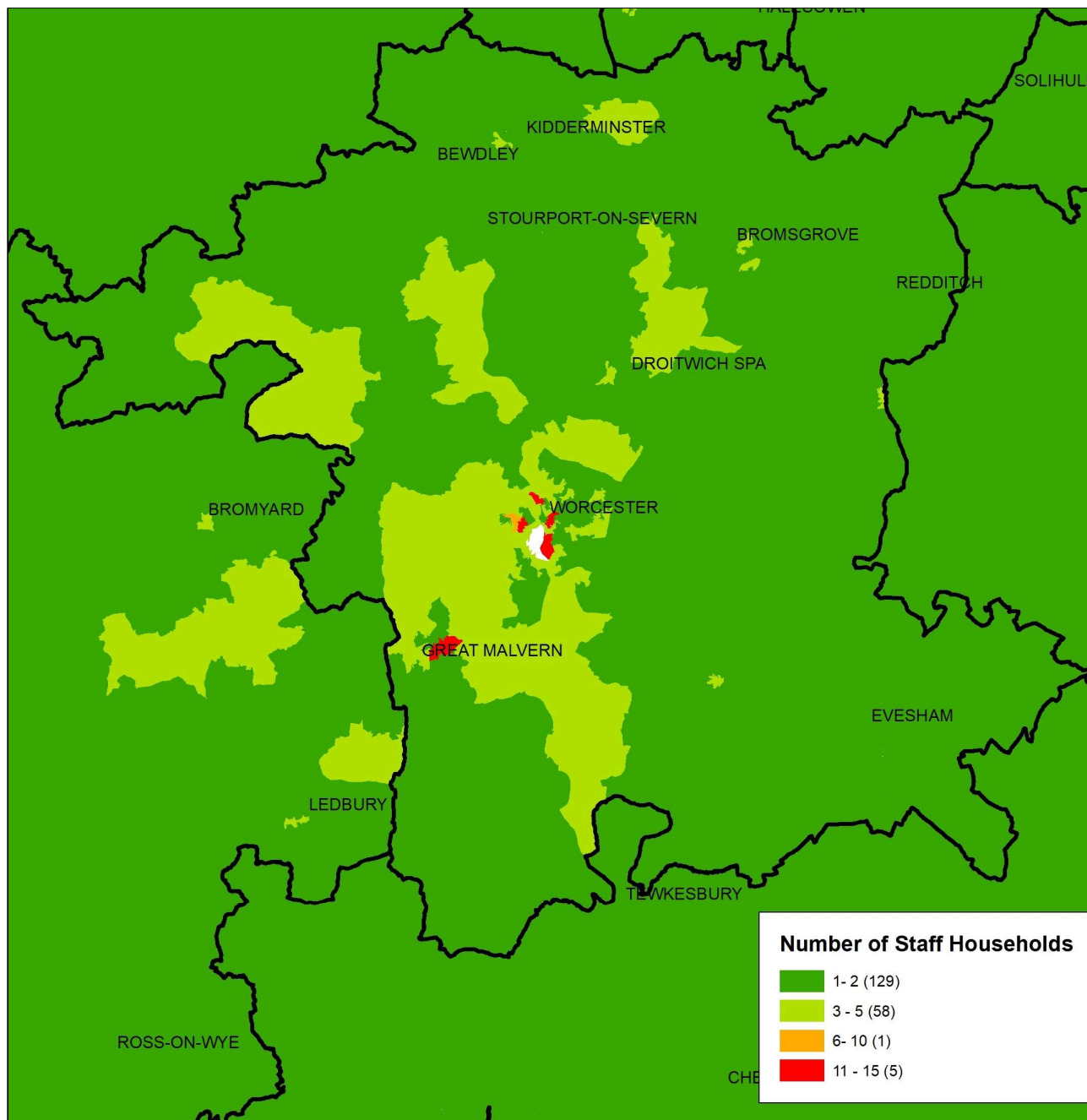
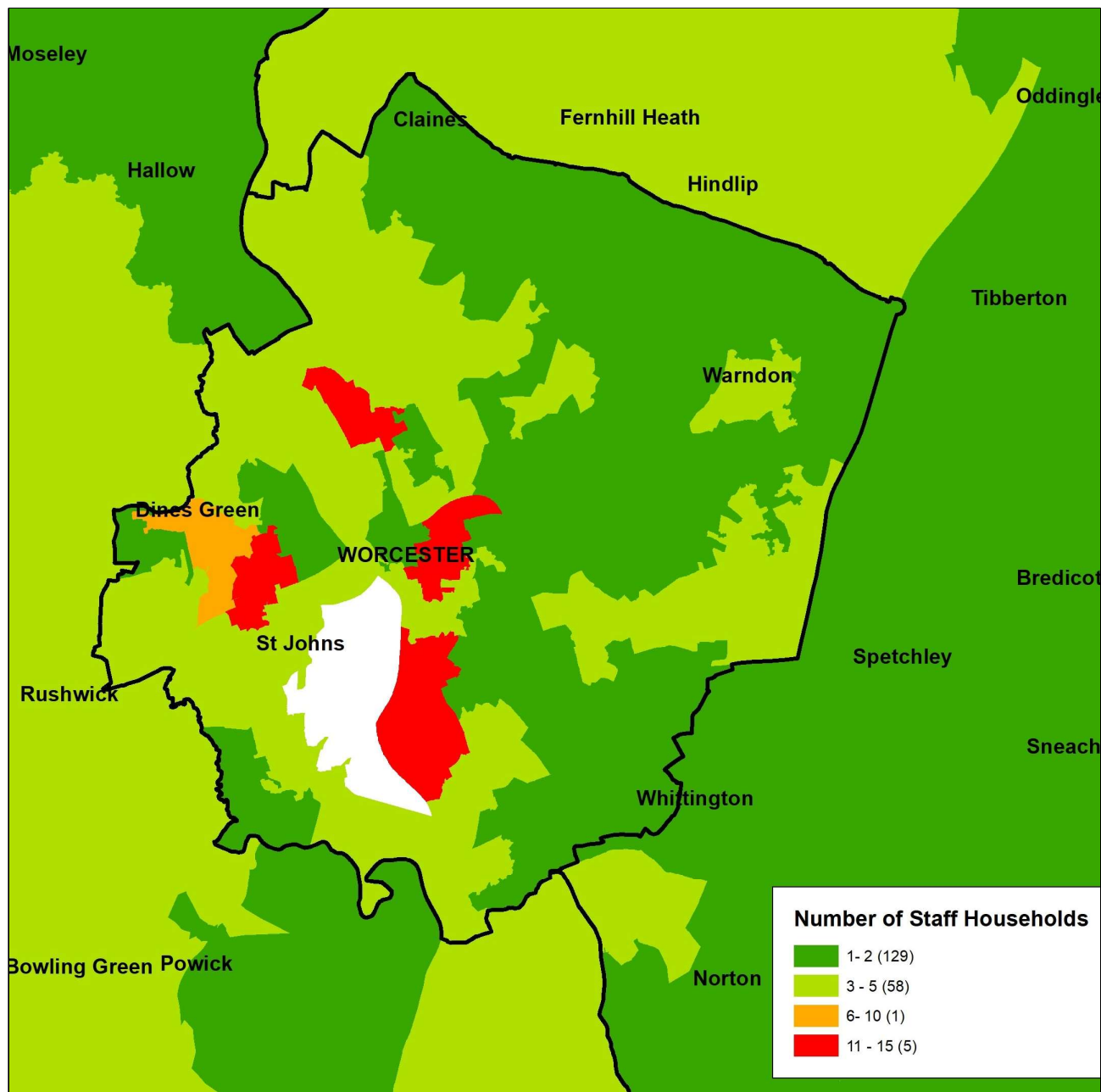


Figure 3: Staff Home Locations – Worcester (SOURCE: University of Worcester Geography Department)



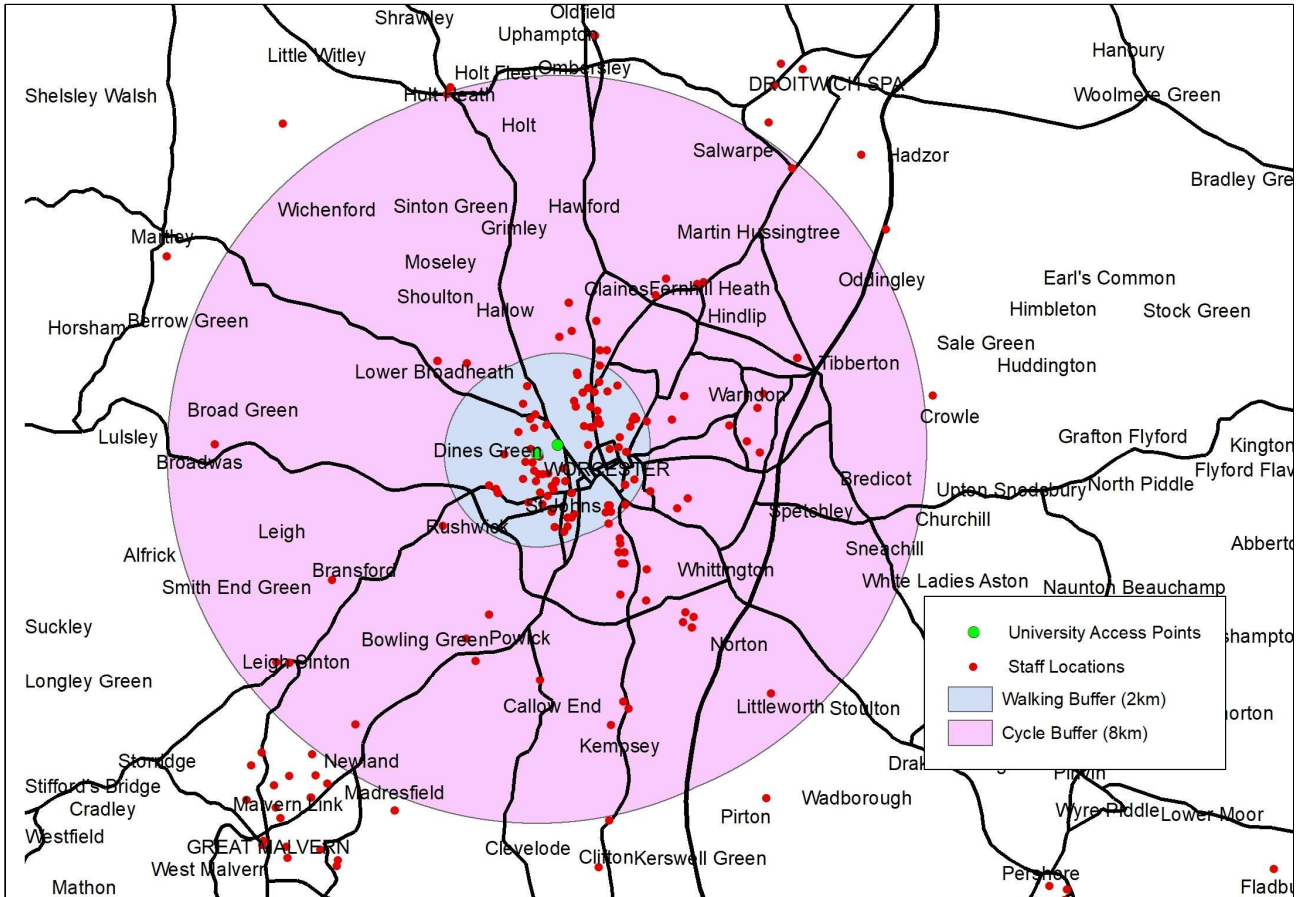
2.1.24 Figures 2 and 3 demonstrate that while staff home locations are distributed across most of Worcestershire, there are concentrations within Worcester itself and within Great Malvern.

2.1.25 Figure 4 shows a 2km and 8km buffer from the site. GIS analysis has been undertaken on the postcode locations and shows that:

- 31% of staff live within 2km walking distance (7% more than 2015) from the site; and

- 48% of staff live within 8km cycling distance (3% more than 2015) from the site.

Figure 4: Staff Postcode Locations and Walking/Cycling Buffer (SOURCE: University of Worcester Geography Department)



3 Student Travel

3.1 Overview

- 3.1.1 The 2018/19 student travel survey received a total of 545 responses. On the survey, a response rate of 68% is specified.
- 3.1.2 As of May 2019, there were 8149 students based at the University in Worcester and therefore survey responses equate to 7% of the student population.
- 3.1.3 The main mode of travel used by students to access the University has been identified from the travel survey and is summarised in Table 8.

Table 8: Main Mode of Travel to Work – Student

Mode of Travel	Year						
	2010	2011	2012	2013	2015	2017	2018/19
Bus	2%	3%	6%	6%	4%	7%	5%
Bicycle	7%	8%	6%	4%	4%	4%	5%
On Foot	38%	43%	45%	48%	47%	55%	48%
Train	7%	8%	10%	11%	7%	8%	9%
Motorbike	1%	1%	1%	1%	0%	0%	1%
Single Occupancy Vehicle (SOV)	30%	28%	24%	24%	30%	29%	41%
Car with others	9%	7%	6%	5%	4%	9%	9%
Other (including combination)	2%	3%	2%	1%	4%	-	-

- 3.1.4 Table 8 shows:
- The number of students travelling in single occupancy vehicles has fluctuated between 24% and 30% between 2010 and 2017 but has seen a sharp increase to 41% in 2018/19.
 - The number of students travelling by bicycle has remained relatively constant over the last 5 years, as has the number of students travelling on-foot, apart from a spike of 55% in 2017.
 - The number of students travelling by train or by bus has remained fairly constant over the study period with some fluctuations.
- 3.1.5 The distance travelled by students in singular occupancy vehicles is summarised in Table 9.

Table 9: Distance Travelled in Single Occupancy Vehicles – Student

Distance Travelled	2013	2015	2017	2018/19
Up to 1 mile	0%	2%	0%	2%
1 – 2 miles	2%	4%	4%	3%
2 – 4 miles	5%	9%	11%	7%
4 – 10 miles	19%	11%	14%	15%
10 – 20 miles	23%	23%	26%	34%
20 – 50 miles	48%	44%	42%	35%
Over 50 miles	3%	8%	4%	4%

3.1.6 Table 9 shows:

- The percentage of students travelling between 10-20 miles has seen an increase from 23% in the 2015 Travel Plan update to a high of 34% in the most recent travel survey.
- There has been a decrease in students travelling between 20 and 50 miles, from 44% in 2015 to 35% in 2018/19.
- Overall, the table demonstrates that the majority of students who travel to university in a single occupancy vehicle live a considerable distance from either campus. In fact, Table 9 demonstrates that 88% of students live further than four miles from campus.

Table 10: Reasons for Undertaking Journeys to University by Car – Student

Reason	Previous update	Current
Time saving	17%	19%
Cost saving	5%	6%
Personal responsibilities	12%	15%
Convenience	15%	18%
Health reasons	1%	2%
Personal security	0%	3%
Public transport not available	4%	5%
Distance from home	35%	26%
Other	10%	7%

3.1.7 Table 10 shows:

- The number of students undertaking journeys by car due to distance from home has decreased by 9% since the last Travel Plan update.
- All of the other reasons in the survey saw small increases.

3.1.8 The surveys also sought to ascertain what measures would encourage greater use of public transport to and from the university. The results of this question are detailed in Table 11.

Table 11: Measures to Encourage Travel to University by Sustainable Modes - Student

Reason	Previous Update (2015)
Better connection from home to the station	10%
Better connection to university from the station	13%
Public Transport information	8%
Discount tickets/passes	33%
Better provision of bus shelters	3%
More frequent bus service	15%
More direct bus routes	15%
Other	3%

Reason	Current Update (2018/19)
Closer train station to home	17%
Closer train station to campus	20%
More flexible tickets	19%
Discount/cheaper tickets/passes	49%
Safer cycle routes	19%
Refresher/proficiency cycle training	6%
More frequent bus service	24%
More direct bus routes	23%
I am happy with the way I travel to campus	43%

3.1.9 The results indicate that:

- The provision of discounted tickets and passes remains the most popular measure to encourage an increase in journeys by public transport.
- Improvement of bus services in directness and frequency also remain popular measures.

3.1.10 Table 12 details responses to how different measures would encourage students to car share.

Table 12: Measures to Encourage Car Sharing – Student

Reason	Previous update	Current
Not interested in car sharing	29%	-
Help in finding car share partners with similar work patterns	28%	26%
Reserved parking for car sharers	14%	19%
Reduced car parking charges for car sharers	26%	20%
None of these	-	31%
Other	3%	4%

- Although the “not interested in car sharing” response has been omitted from the most recent survey, it could be assumed that the “none of the above” respondents represent those who are not interested. If this is the case, there has been a small increase in students not interested in car sharing.
- Measures to encourage car sharing all saw a decrease in students who would be persuaded by these, apart from “reserved parking for car sharers”, which saw a 5% increase from the previous update.
- Further results of the survey indicate that the number of students fully aware of the university's car sharing scheme has decreased from 45% in 2015 to 13% very aware and 33% somewhat aware in 2018/19.
- The proportion of students with no knowledge of the scheme increased from 16% to 25% during the same time period.

3.2 Home to University Travel

- 3.2.1 Students were also asked to identify their usual mode of travel between their 'home address' and their 'term time' address and also how often they make the journey. The results of this questions are detailed in Table 13.

Table 13: Mode and Frequency of Travel Between Home and Term Time Address

Mode of Travel	Every Weekend		At least once a month		At least 2 3 times a semester		Once during the semester		Not at all		No Answer		Totals	
	2015	2018	2015	2018	2015	2018	2015	2018	2015	2018	2015	2018	2015	2018
Aeroplane	0%	0%	0%	0%	0%	1%	3%	7%	2%	1%	0%	0%	6%	10%
Train	2%	4%	4%	3%	5%	5%	3%	5%	1%	1%	3%	1%	18%	19%
Coach	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%
Own car	6%	7%	3%	3%	3%	2%	3%	2%	2%	1%	4%	4%	19%	20%
Car with students at the university	0%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	0%	2%	0%
Driven by a family member	1%	1%	1%	2%	2%	2%	4%	2%	0%	0%	0%	0%	9%	7%
N/A	5%	4%	0%	0%	0%	0%	0%	0%	9%	6%	28%	16%	43%	25%
Other	1%	0%	0%	0%	0%	0%	0%	0%	0%	0%	1%	1%	2%	2%
Total	15%	16%	9%	8%	11%	12%	13%	17%	15%	10%	37%	38%	100%	100%

3.2.2 The results in Table 13 indicate that:

- The number of students travelling in their own car has remained at similar levels to 2015, with an increase of 1% to 20%;
- The number travelling by aeroplane has risen from 6% to 10%; and
- Overall, mode of travel and frequency of travelling home has remained fairly consistent to 2015, with a 5% increase in students who do not travel home at all during the semester. This could perhaps explain the 4% increase in air travel shown above.

Parking Permit Holders

3.2.3 Parking permit data has been collected by the University which provides an accurate record of those who have paid for parking at the university. This data indicates that there are currently 1158 students who own a parking permit.

3.2.4 There are many who do not own a permit and Table 14 summarises the parking locations of these students:

Table 14: Parking Locations - Non-Permit Holders

Location	Percentage (2018/19)
Campus short stay car park	8%
Campus long stay car park	38%
Free parking on nearby street	42%
Public pay & display car park (non-University)	12%

3.2.5 Table 14 indicates that the majority of students without a permit choose to park in the long stay car park or on nearby streets.

3.2.6 GIS analysis has been undertaken on the postcodes given in the parking permit data. This analysis was done to determine the percentage of parking permit holders who live with walking and cycling distance of a university campus. It should be noted that permit holders who have to drive for their course (i.e. students on courses which involve placements) have been excluded from the analysis.

3.2.7 An acceptable walking distance of 2km was used in the analysis (equivalent to a walk time of 24 minutes). This is based on guidance provided by the Institution of Highways and Transportation (IHT) in their publication 'Guidelines for Providing for Journeys on Foot' (2000), which suggests that in terms of commuting, walking to school and recreational journeys walk distances of up to 2,000 metres can be considered as a preferred maximum. A cycling distance of 8km was used in the analysis (equivalent to a cycle time of 30 minutes). This is based on guidance set out for Local Cycling and Walking Infrastructure Plans (LCWIPs) from the Department for Transport (DfT), which states that it is possible for cycling to replace trips made by other modes of transport, typically up to 10km.

3.2.8 Permit holder postcodes have been converted to coordinates so that staff locations can be plotted in QGIS.

Table 15: Parking Permit GIS Analysis – Results

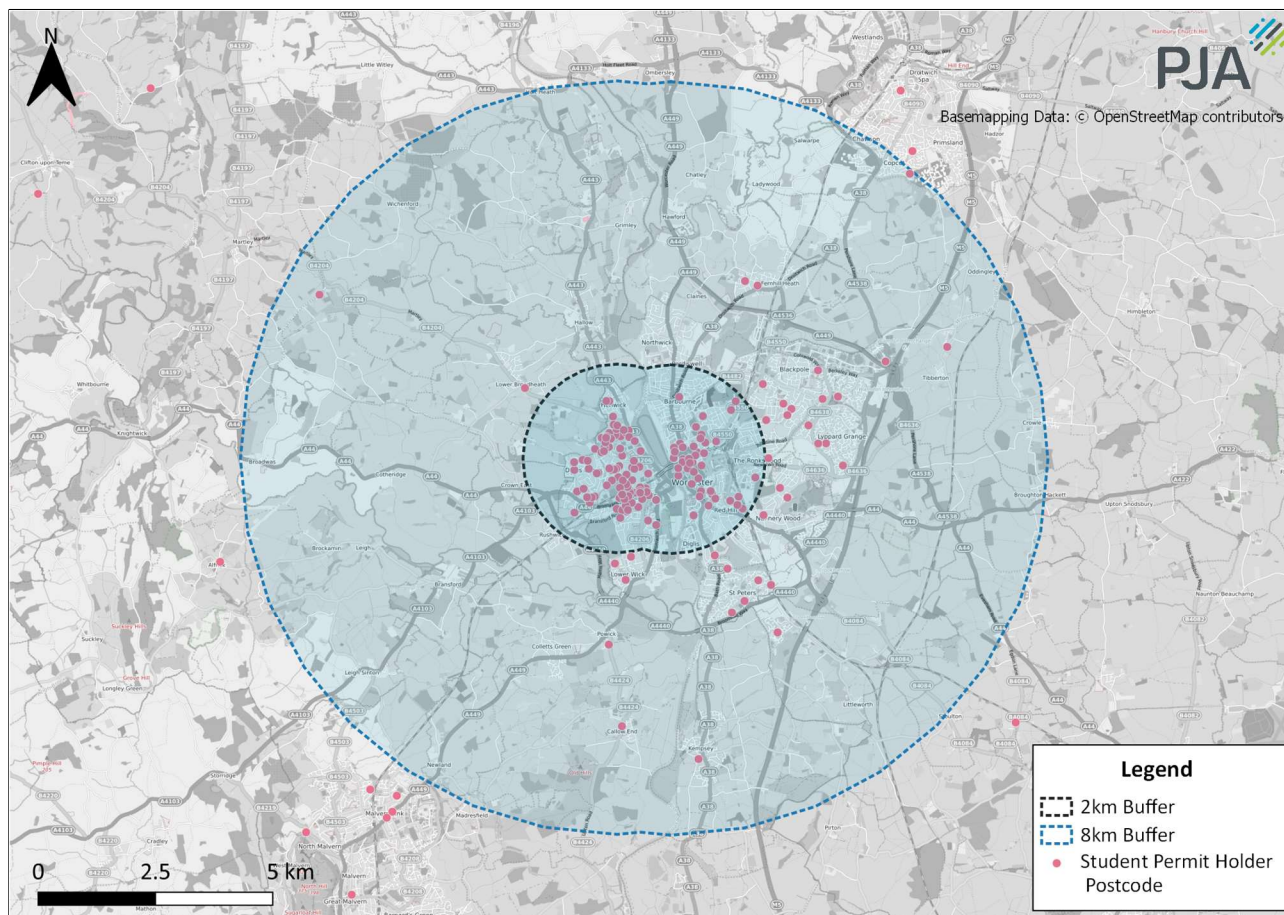
Distance	Percentage of students
Within Walking Distance (2km)	14%
Within Cycling Distance (8km)	29%

3.2.9 The GIS analysis shows that:

- There are 14% of parking permit holders within walking distance of a campus site
- There are 29% that are within cycling distance of the site.

- This equates to a total of 151 student permit holders who could walk instead and a total of 311 students who live within cycling distance.

Figure 5: Student Permit Holder Locations



Student Postcode Analysis

3.2.10 As with staff, the term-time postcode locations of all students have been examined to identify where they are travelling to the University from. Figures 4 and 5 illustrate the home locations of students across a wider regional area and also at more detailed level within Worcester.

Figure 6: Student Home Locations – Worcestershire (SOURCE: University of Worcester Geography Department)

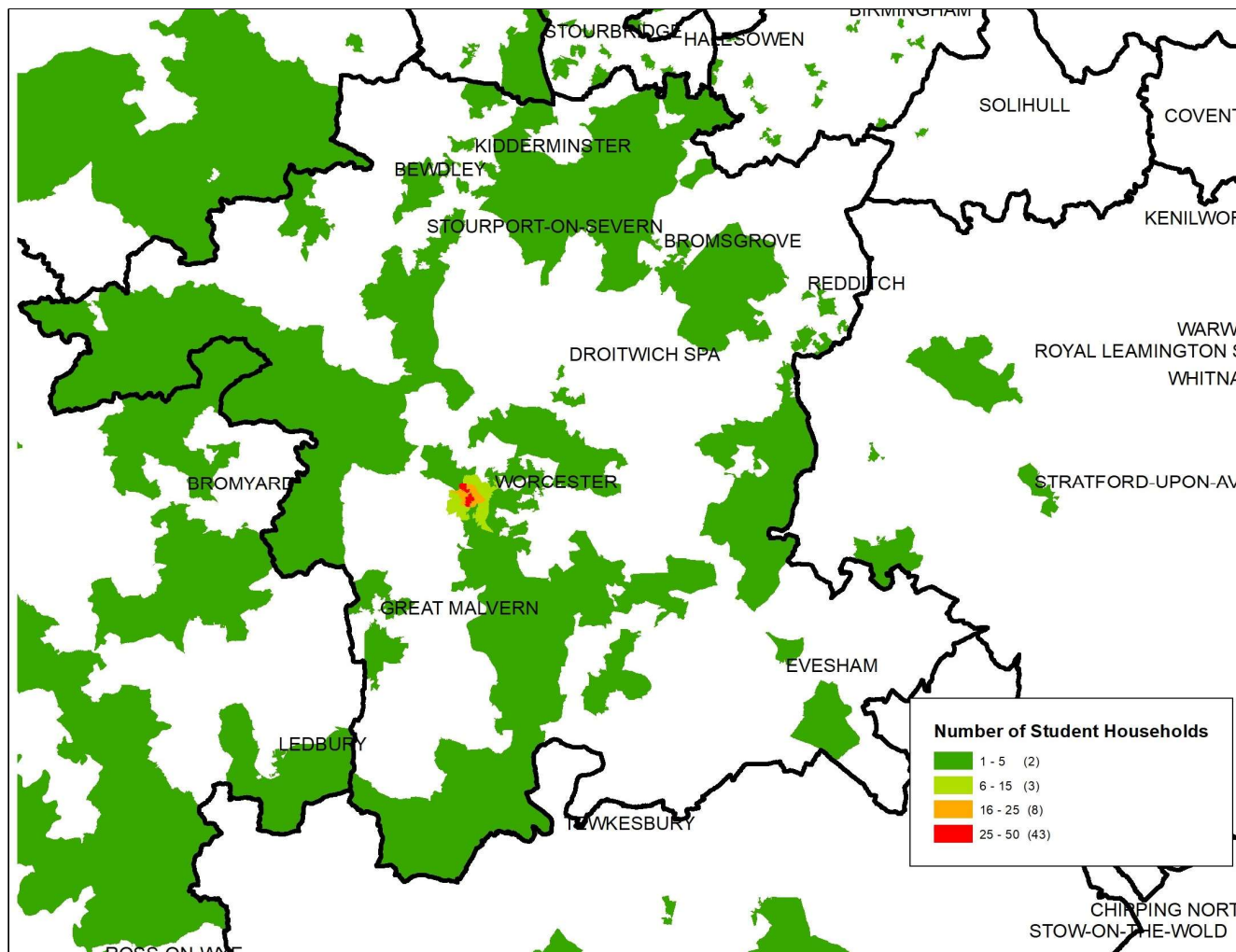
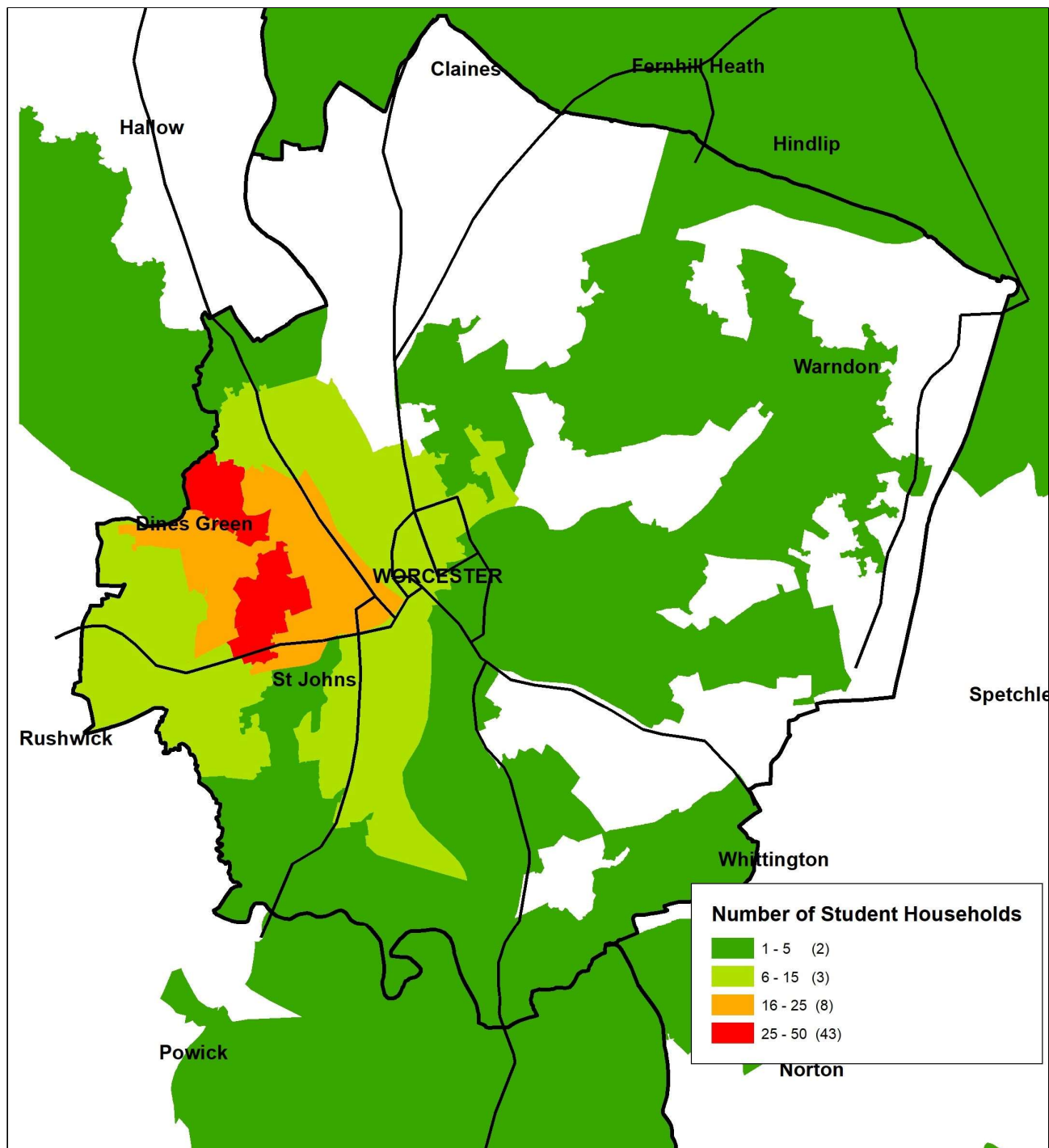


Figure 7: Student Home Locations – Worcester (SOURCE: University of Worcester Geography Department)

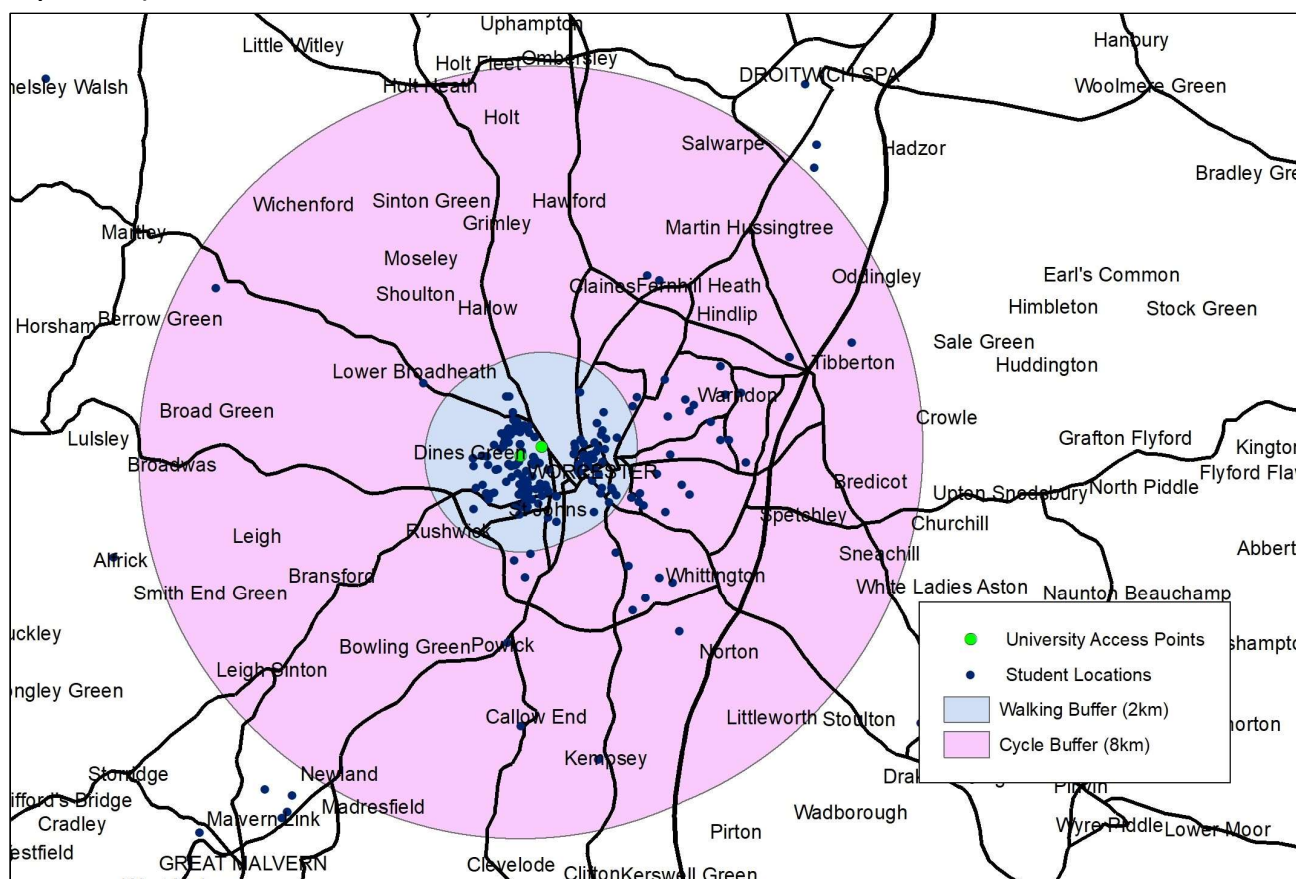


3.2.11 As would be expected, Figures 4 and 5 demonstrate that students are primarily concentrated within Worcester, in locations nearby to University of Worcester campuses.

3.2.12 Figure 6 shows a 2km and 8km buffer from the site. GIS analysis has been undertaken on the postcode locations and shows that:

- 49% of students live within 2km walking distance (4% more than 2015) from the site; and
- 56% of students live within 8km cycling distance (4% more than 2015) from the site.

Figure 8: Student Postcode Locations and Walking/Cycling Buffer (SOURCE: University of Worcester Geography Department)



4 Inter-Site Travel

4.1.1 As a result of the layout of the University over several campuses, many staff and students are required to travel between site during the day to attend lectures and access university facilities. The mode of travel used by staff and students for inter-site travel is summarised in Table 16.

Table 16: Mode of Travel Used for Inter-Site Trips

Mode of Travel	Staff		Students	
	2015	2018/19	2015	2018/19
Bus	2%	-	-	-
Car	21%	35%	16%	26%
Walk	65%	77%	66%	79%
Cycle	7%	10%	7%	6%
University Vehicle	3%	-	-	-
Other	2%	7%	11% ¹	6%

4.1.2 Table 16 indicates that:

- The proportion of both staff and students walking between sites has increased;
- The proportion of both staff and students driving between sites has also increased; and
- Levels of cycling between sites has increased slightly for staff and dropped by 1% for students.

4.1.3 Members of staff were also asked to identify what additional facilities could be provided by the university to assist with inter-site travel. The resultant suggestions are summarised in Table 17 and 18.

Table 17: Facilities to Assist with Inter-Site Travel

Facility	Staff			
	2011	2013	2015	2018/19
University loan bikes	15%	8%	9%	-
Upgraded footpaths/crossings	15%	11%	13%	-
University car parking closer to City Campus	14%	17%	11%	-
More frequent bus services	13%	11%	10%	-
Upgraded cycle paths	13%	12%	12%	-
New bus route along Hylton Road	11%	n/a	n/a	-
More frequent Unishuttle bus route along Hylton Road	n/a	24%	25%	-
University pool vehicles	10%	10%	9%	-
Secure cycle parking	8%	8%	7%	-
Other	-	-	5%	-

¹ Option for bus travel not included within student survey therefore assumed to be included within 'Other'

4.1.4 The survey response options have changed since the previous update and the responses to the 2018/19 survey are summarised below:

Table 18: Facilities to Assist with Inter-Site Travel 2018/19

Facility	Staff
	2018/19
Bikes that you don't need to book	14%
Electric bikes so its easy up hills	20%
More frequent buses (currently 6/hr)	11%
Nothing I just like using my vehicle	27%
Other, please state	30%

- The 2018/19 responses indicate that a large proportion of staff (20%) indicated that electric bikes would encourage them to change the way they travel between sites.
- In 2018 the university introduced 50 new electric bikes to their bike loan scheme.
- Following the publication of the 2013 Travel Plan, a Unishuttle Bus (31B) has been provided, with approximately a quarter of respondents in 2013 and 2015 desiring a more frequent service.

5 Carbon Emissions

5.1.1 Information regarding carbon emissions for commuting trips to and from the University has been provided by the University of Worcester. The change in carbon emissions over the previous five years is detailed in Table 19.

Table 19: Total Carbon Emissions from Commuting Travel (Staff and Students)

Mode of Travel	Carbon Emissions (tCO ₂ e)						
	2011 12	2012 13	2013 14	2014 15	2015 16	2016 17	2017 18
Annual	6315.0	6142.4	5823.0	5683.3	5978.6	7817.0	5747.6

5.1.2 The results of the survey are positive, showing a 26% decrease in carbon emissions produced by commuter travel since 2016-17. It should be noted that the reduction in carbon is likely due to commuters driving fewer polluting vehicles rather than a reduction in the number of journeys.

6 University of Worcester Mobility Plan

6.1 Overview

6.1.1 The Mobility Plan sets out the University of Worcester's objectives and actions for various Strategic Lines to do with sustainability. The Strategic Lines are split into the following categories:

- STRATEGIC LINE I: University management and governance
- STRATEGIC LINE II: Promotion of pedestrian mobility
- STRATEGIC LINE III: Promotion of cycling mobility
- STRATEGIC LINE IV: Promotion of public transport
- STRATEGIC LINE V: Promotion of more efficient car use
- STRATEGIC LINE VI: Awareness and participation
- STRATEGIC LINE VII: Urban planning and sustainability

6.1.2 This section summarises the key actions given in the Mobility Plan which will assist in reducing single occupancy car use.

Walking and Cycling

6.1.3 Strategic Line II sets out measures that will promote and improve pedestrian infrastructure. This includes continued investment in pedestrian facilities such as seating on campus and leisure facilities. It is also proposed to implement new pedestrian areas and review car parking provision at Severn Campus, while continuing to invest in pedestrian areas at St Johns Campus.

6.1.4 A range of measures to improve cycling mobility are also given in Strategic Line III. A key improvement will be the proposed upgrade of cycle lanes between Worcester City campuses and the provision of a proposed pedestrian bridge to Ghelevelt Park - scheduled for Q5. This key measure will help to reduce the proportion of inter-site trips that are currently undertaken by single-occupancy vehicle (26%).

6.1.5 The University will also continue to carry out awareness and participation schemes to promote use of bikes as a mode of travel. These initiatives include the Woo Bikes Cycle campaign, which has been undertaken and promoted by students. The student Woo Bikes Coordinator will also continue to support the implementation of a city-wide bike share program in Worcester, as detailed in Strategic Line VII.1.

- 6.1.6 A new Rail2Ride pilot for last mile travel is also underway for the 2019/2020 academic year. This is in partnership with West Midlands Railway and allows users to pre-book a bicycle up to 10 days in advance via an app.

Public Transport

- 6.1.7 The mobility actions for public transport align with the Travel Plan actions given in Table 20. Key measures include the continued negotiation of discounts for staff and students on public transport and investigating the feasibility of a subsidy for travel by public transport.
- 6.1.8 A new initiative for the university is the piloting of a new night bus service, which commenced in September 2019 until mid-December and is due to continue with changes in Semester 2. It is hoped that this measure will create a habit of using public transport for students and reduce the need to use taxis when public transport services might otherwise be unavailable.

More Efficient Car Use

- 6.1.9 The Mobility Plan details a range of measures that will promote efficient car use and therefore reduce trips made to, from and between campuses in single occupancy vehicles. One key action is to introduce fully synchronised parking policies for student and staff. It is recognised that this is perhaps the most effective method of reducing single occupancy vehicular trips and therefore further recommendations to support this mobility action are made in the remedial measures given in Section 8.

7 Progress to Targets

7.1 Actions

- 7.1.1 A number of actions were detailed in the previous iteration of the Travel Plan, covering a range of categories. The actions, as well as the current progress towards completion, is summarised in Table 20, with a key provided below.

Symbol	Explanation
✓	Action complete
✓	Action partially complete / ongoing
✗	Action not complete / abandoned

Table 20: Summary of Travel Plan Actions

Action	Progress	Complete?
Travel Plan Awareness		
Prepare Travel Plan materials to a clear and consistent design	All sustainability messaging using consistent style	✓
Develop a Travel Plan section on the University website	Complete on both sustainability pages and main university find us pages	✓
Prepare travel option information	Walk, cycle and sustainable travel option promoted. Individual advice given if students or staff ask, many promotional events take place, primarily at the start of the semester and February 'Go Green Week	✓
Collate web links to facilitate personalised journey planning advice	Net Nav app promoted instead	✗
Erect Travel Plan information boards	New style of maps now in place, and production of first board to go in St John's in progress	✓
Maintain awareness of the Travel Plan	As above	✓
Parking		
Coordinate a car parking working group to review how parking is managed	Reviewed parking to develop new mechanisms for encouraging fewer journeys to campus	✓
Regularly assess car parking provision across the University Campuses	As above	✓
Introduce a system of flexible permits	Under review, number plate recognition systems are being investigated – project postponed for now	✓
Public Transport		
Provide bus maps and timetabling information	Bespoke maps designed, poster and fold out versions created	✓
Promote existing discounts available to staff and students	New bus promotions agreed, and further work scheduled for next academic year	✓
Liaise with public transport operators to identify potential for further discounts and route improvements	New bus promotions agreed, and further work scheduled for next academic year	✓
Investigate the potential for providing season ticket loans to staff	Not achieved	✗
Improve the bus stop waiting area on the St John's Campus	A new shelter has been installed	✓
Walking and Cycling		
Promote existing walking and cycling facilities and initiatives	Maps produced and on-street signage installed	✓
Review the use of existing facilities to identify areas for future investment	Bike loan has been extended, City Council currently considering joining	✓

Action	Progress	Complete?
Promote uptake of loan bike scheme	Bikes have been replaced, and number of bikes increased. System has been more automated. 3 rd tender for service about to commence Bike loan scheme now includes 50 electric bikes	✓
Development department pool bike pilot scheme, whereby departments have access to bikes for inter-site travel	Scheme piloted and proposals for longer trail under discussion. Paper accepted to Netherlands conference on this project – Stack Rack.	✓
Set up facility to allow walkers and cyclists to find 'buddies' to accompany them	Never happened due to lack of demand	✗
Set up walking and cycling groups subject to demand	"	✗
Further investigate the potential introduction of tax-free cycle purchase	Cycle to work scheme for staff	✓
Continue to liaise with local authorities with regard to improving signage of routes	Achieved	✓
Implement NUS Love to Ride UniCycle behaviour change program and get 5% staff and 3% students signed up.	Great take up successful project. Featured in EAUC conference at Keele	✓
Car Share		
Promote existing web-based car share database	Achieved	✓
Consider implications of an emergency ride home scheme	No Demand	✗
Review demand for priority spaces for car sharers and identify suitable locations for additional provision	Under review. Was agreed however due to pressure parking revoked at the last minute	✗
Reducing the Need to Travel		
Promote awareness of video conferencing	All students and staff are to have access to Skype from their own PC	✓
Ensure video conferencing equipment is Accessible	As above	✓
Ensure all new computer equipment facilitates video conferencing	Achieved	✓
Investigate location independent working	Staff have been offered this, with one member taking it up	✓
Investigate potential for increased use of the Virtual Learning Environment	VLE regularly used by academic staff	✓
Collect data on frequency and volume of Location Independent Working	Not applicable – only one staff has taken it up so far	✓

Action	Progress	Complete?
Review use of fleet vehicles and consider investment in low emission vehicles	Two electric vehicles purchased by facilities for use by Campus Services and Estates	✓
Collect data in relation to delivery and contractor vehicle movements	Never implemented	✗
Liaise with suppliers regarding potential use of low emission vehicles	Work on flexible framework underway, with good liaison with key suppliers	✓
Provide sustainable travel advice to contractors	Never implemented	✗
University Business Travel		
Coordinate a travel policy group which examines various options for business travel and sets parameters for business travel decisions	Not achieved	✗
Discourage the use of grey fleet vehicles	A new expenses system is currently being rolled out that will capture data	✓
Consider introduction of pool cars for staff use	Some work was undertaken with travel management company, however further work on pool cars required. This is being carried forward to next year	✓
Collect and disseminate data on use of hire cars and grey fleet	Achieved	✓
Encourage use of trains to replace air travel	New travel contract has been implemented	✓
Student Home to Term Time Residence Travel		
Investigate potential for discounted public transport fares over longer distances	Investigated, only one university has managed to set up this and then only for staff	✗
Establish an informal car sharing service	Car share scheme implemented for staff and students	✓
Liaise with national car/van hire firms to identify the potential for discounted one-way hire	Never implemented	✗
Investigate whether good quality Skype facilities in halls would reduce the need for students to travel home during term time	Skype provided for all students	✓

7.2 Quantitative Targets

7.2.1 The original Travel Plan produced by PJA outlined a number of quantitative Travel Plan targets relating to the travel patterns of both staff and students. Table 21 details these targets and the current progress towards these targets:

Table 21: Progress Towards Targets

Target	Current Progress	On Track?
"A 20% reduction in the percentage of staff travelling by car alone to work by 2018 - i.e. a reduction from 55% in 2012 to 44% by 2018";	Percentage of staff traveling by car alone increased 16% against 2016-17 levels	✗
"A 20% reduction in the percentage of students travelling by car alone to the University by 2018 – i.e. a reduction from 24% in 2012 to 19% by 2018"	Percentage of students travelling by car alone increased 41% against 2016-17 levels	✗
"A 10% reduction in the percentage of students travelling between their home address to term time address by car alone by 2018"	Percentage of students travelling alone by car between their home address to term time address decreased 4.5% against 2016-17 levels but is up 5% from 2015 levels	✓
"Maintain the ratio of business air travel emissions to international student FTE at the baseline of 68.5 tonnes CO ₂ "	Air travel reduced 10% from last year but from the base year it is still 78% higher.	✗
"A 5% reduction in the carbon emissions form fleet vehicles by 2018 from a baseline of 36.9 tonnes CO ₂ "	Fleet emissions decreased 9.5% last year and are up 39% from baseline year. This is due to University growth and increased requirement for more vehicles. Fleet is slowly converting to be fully electric.	✓
"A 5% reduction in the carbon emissions from car hire by 2018 from a baseline of 41.1 tonnes CO ₂ "	Decreased by 29.78% from 2016-17 and by 44% from baseline of 41.1 tonnes CO ₂	✓
"A 20% reduction in the total business undertaken in 'Grey Fleet' vehicles from the 2011/12 baseline level"	Decreased by 8.95% from 2016-17. Has risen by approx. 1% from 77.6 tonnes CO ₂ baseline	✓

7.2.2 The original Travel Plan acknowledged the requirement for absolute reductions in carbon emissions associated with transport at the university, while balancing the importance of future growth at the university. Recent survey data indicates that:

- Progress towards these targets has been positive, with decreases for all targets when compared to 2016/17 emissions.
- Emissions have generally risen since the baseline year; however, it is worth noting in that period the university has grown from 5868 full-time equivalent students and staff to 9541.

8 Remedial Measures – Parking Management

8.1 The Need for Remedial Measures

- 8.1.1 The original travel plan (2013) outlined quantitative targets relating to reducing travel by car alone, stating that by 2018 there should be a 20% reduction in staff and students travelling to university by car alone. This target has not been met for staff or students and there has instead been an increase in the percentage of staff and students travelling alone.
- 8.1.2 Survey results for students suggest that journeys to university on foot have fallen in recent years, whilst travel by public transport and by bike has fluctuated since the baseline year.
- 8.1.3 Survey results for staff suggest that journeys to foot have also fallen, as well as journeys by bus. Journeys to university by bike have risen slightly since 2013 however are still lower than historical surveys.
- 8.1.4 It is evident therefore that the measures implemented to date are having a limited impact on the travel behaviour of staff and students. In order to see a meaningful reduction of single-occupancy vehicle use in line with the University's policies and aspirations a more comprehensive package of remedial measures is required.
- 8.1.5 The University mobility plan sets out a strategy to implement a fully synchronised parking policies for student and staff. The GIS analysis contained in this report shows that 31% of staff and 49% of students live within 2km of a University of Worcester campus². Analysis of parking permit holder data shows that 20% of staff parking permit holders live within 2km of a University of Worcester Campus and 14% of student parking permit holders live within 2km of a University of Worcester Campus. Therefore, there is a clear potential to influence mode share through changing parking policy.
- 8.1.6 We understand that currently parking demand is higher than parking supply and that this situation is likely to worsen over the next few years. A key factor in car parking demand is travel behaviour. The analysis provided in the annual travel surveys gives insight into trends in travel behaviour. Therefore, it is important to address travel behaviour to contain parking demand as the University continues to grow.
- 8.1.7 There are a number of approaches to manage car parking demand, and best practice indicates that this can be achieved by combining 'Pull' measures (incentives/carrots) and 'Push' measures (disincentive/sticks) to single occupancy vehicle (SOV) use. Pull measures include investment in

² Based on postcode data from survey responses

sustainable transport modes, and promotion in terms of increasing awareness and incentivising sustainable transport use. Push measures include modifying parking pricing, introducing eligibility criteria for parking permits, and initiatives to prioritise space for car sharers.

8.1.8 This therefore requires that both a Car Park Management Plan and the University's travel plan work in tandem to address both push and pull measures.

8.1.9 It is recognised that staff retention and the student experience is central to the University's offering and with that comes the offer of car parking for those students who need to drive to the University. However, it should also be noted that there are notable examples of Universities that restrict or do not allow students to have access to University car parks and those that limit staff parking to those that need it. These issues are examined further in this section.

8.2 Managing Demand - Incentives

8.2.1 Parking incentives could be offered alone or in combination with measures which disincentivise parking. A meaningful financial incentive could be offered to staff or students who chose to travel to the university by a sustainable mode of travel. Financial incentives could include shopping vouchers, vouchers to spend on campus (for instance lunch vouchers) or bonuses (for staff).

8.2.2 Accompanying this measure should be a programme of marketing, designed to highlight the potential benefits of choosing a different mode of transport. This marketing scheme would be targeted to specific locations where staff and students reside and would include statistics and infographics detailing the potential time savings, money savings and health benefits of choosing an alternative mode of transport. In tandem with the financial incentives detailed above, it is hoped that a meaningful mode shift away from single occupancy vehicles could be achieved.

8.2.3 Post implementation, the university should continue to monitor mode share through travel surveys to assess the effectiveness of this measure.

8.3 Managing Demand – Permits

8.3.1 Whilst the University have a permit system for staff and students, the allocation of the permits is not based on any needs-based criteria.

8.3.2 The objectives of a permit allocation system should be to prioritise usage on the basis of specific functions or requirements, such as parking for mobility-impaired employees, visitor parking, specific car sharing spaces and other essential users.

- 8.3.3 Reviewing the allocation of permits, priority parking provision and the overall availability of parking spaces can help to achieve the objectives of the University's travel plan.
- 8.3.4 Parking permits allow staff and students access to car parks and may or may not be linked to a pricing policy.
- 8.3.5 The allocation of permits can be based on set criteria, including:
- Impaired mobility or disability;
 - Car Sharing;
 - Essential Users;
 - Users that can demonstrate they have no viable alternatives to single occupancy vehicle (SOV) travel;
 - Home distance from the site; and
 - Ultra-Low Emission Vehicles (ULEV) usage.
- 8.3.6 Best practice considers that criteria for permit allocation should also be transparent and equitable. It should not be done on a hierarchical basis (i.e. senior managers should not be given priority for allocation). This avoids the impression that an organisation favours some car users over others.

Parking Permit Examples

- 8.3.7 A number of examples of organisations that use parking permit systems have been gathered and are summarised below.

Queen Elizabeth Hospital Birmingham

- 8.3.8 After an extensive and effective travel plan implementation which facilitated significant mode shift away from SOV, organic growth within the hospital meant that demand was outstripping supply. In response to this, the Queen Elizabeth Hospital Birmingham established a permit system which precludes staff who live within 2 miles of the site from obtaining a parking permit. This was extended to cover staff who have access to the site by bus or rail. This has exclusions on a needs-basis and was introduced gradually to allow staff to adjust their travel mode over time.
- 8.3.9 Parking permits are charged on a staggered rate basis by grade i.e. the lowest grades pay proportionally less than higher grade staff.

- 8.3.10 However, it was found that staff who have paid for a permit are less likely to change mode, as they are still effectively paying for a parking space even when they are not using it. This system needs to be developed to offer flexibility to those who might choose to travel by alternative modes.

University of Bristol

- 8.3.11 The University has implemented an ‘as-the-crow-flies’ permit system which precludes most³ staff living within 2 miles of the campus from receiving a parking permit. Their key messages for effective implementation are:

- Obtain senior level buy in;
- Keep the criteria simple; and
- Review the impact and adjust in order to maintain outcomes in line with policy.

Keele University

- 8.3.12 The University has a needs-based parking permit for staff and students. Applications for permits can be made under three categories and appeals against decisions are managed via a Car Park Management Panel:

- Category A – blue badge holders
- Category B – work/course-based needs (travel for work, early/late shifts/starts etc.)
- Category C – social need (distance, childcare etc.)

University of Birmingham

- 8.3.13 The University grants parking permits to all staff who apply although this does not guarantee them a space on campus where parking is normally at capacity by c8.30/9am during term time. It costs £1 per day, via monthly direct salary deduction based on the number of days worked per week, or as a pay and display permit.
- 8.3.14 Students can apply for a permit on a needs basis (disability, term-time address is > 10 miles away, a registered carer or children under the age of 16) and it costs £1 per day.
- 8.3.15 Blue badge holders (both staff and students) are entitled to free parking.

³ Exceptions are made for those with a disability or essential users

8.4 Managing Demand – Charging

8.4.1 Parking charges can provide a valuable revenue stream and help to encourage people to choose alternative ways to travel, however, they must be handled sensitively. If possible, any increase in parking charges should be accompanied by improvements to parking and/or the promotion of viable alternatives to car use which emphasises the need to link activities under the CPMP with the travel plan.

8.4.2 It is noted that the University currently increase parking permit prices for students who live within one mile of a campus. For instance, a parking permit for a student who lives within 1 mile of campus is £325 per semester whereas a parking permit for a student who lives outside of 1 mile is £97 per semester. For staff members, pricing is instead based on salary, with the most expensive permit costing £181 for an annual permit or £99 for a semester. The GIS analysis shows that 20% of staff permit holders live within 2km of the University. Therefore, there is a clear potential to introduce a similar higher permit price for staff members who live within a mile of campus.

Charging methods

8.4.3 Employers can set up a salary sacrifice scheme for regularly paid employees whereby an employee can exchange an amount of gross salary that is equivalent to their parking charges. The result of this is that employees pay less National Insurance, thereby reducing the cost of car park charges. This means that the actual cost to a lower rate payer will be at least 12% lower and at least 2% less for higher rate tax payers.

8.4.4 However, best practice also indicates that any permit system should remain on a pay/discount as you go basis as this is understood to encourage people to consider their travel options each time they travel. Those who have already paid for a permit are less likely to travel by alternative modes or car share.

8.4.5 Additionally, car parking tariffs can be calculated according to pay grade/annual gross salary. For example, a tier 1 staff member with a lower annual gross salary at an organisation could pay £100 per annum, whilst a tier 4 staff with a higher annual gross salary at an organisation could pay £400 per annum. This would result in parking charges being less onerous on staff paid a lower salary and could be perceived as being more equitable and fair.

8.4.6 Parking payments could also be automated via the use of software and apps to alleviate any administrative burden. These could be managed in-house or outsourced. An automated

approach would also allow flexible parking charges to be incorporated in the future, as well as static charges which could be implemented immediately.

8.5 Flexible parking strategy

8.5.1 PJA are currently producing a flexible parking strategy for the Urban Growth Company for the UK Central area encompassing the airport, railway station, NEC, Jaguar Land Rover, Birmingham Business Park and future demand at HS2 and Arden Cross.

8.5.2 This approach takes a holistic view of parking demand and supply across multiple land owners/estates to produce a pricing model that balances supply and demand. It is underpinned using economic principles, microsimulation modelling to simulate the effects of the scheme on different transport users and utilises software developed by Fluid7, a Coventry based software provider.

8.5.3 Pricing is varied across the site but set depending on the convenience and quality of the car park. However, parking charges can be varied on an hour by hour/day by day basis to: discourage travel in the peak periods; discourage parking on peak days; and, respond to reserve capacity in the car parking. In this way, demand for parking can be directed towards specific car parks (demand assignment).

8.5.4 This approach can be analysed and implemented incrementally with basic variable pricing introduced and evaluated before progressing onto more sophisticated pricing models.

8.5.5 As the strategy develops, additional functionality in terms of mobile phone apps to direct traffic can be combined with digital signage for wayfinding, displaying available spaces and pricing can be implemented.

8.6 Smart Parking

8.6.1 Smart Parking offers a range of tools and techniques to influence parking behaviour and generate additional revenues. Examples of tools which can be implemented include red/green lights above parking spaces and wayfinding within car parks to direct drivers to free spaces and apps which allow you to pre-book a parking space, potentially for a higher price than the turn up price choose from a range of parking prices and allows you to extend your booking slot if necessary.

8.6.2 Smart parking tools and techniques can also be combined with a flexible parking strategy to offer differing parking costs for differing locations; however, it can also be implemented standalone without the need for a flexible strategy to quickly and easily manage demand and generate

revenues. The use of such tools can be used to enhance the student parking experience whilst generating additional revenues.

9 Summary and Conclusions

9.1 Summary

9.1.1 The key points to note from this 2019 Travel Plan update are:

Staff Travel

- The 2018/19 staff travel survey received a total of 374 responses from staff, with a specified response rate of 74%;
- The proportion of staff travelling by single occupancy vehicle has increased (currently 66%), with the current level the highest since 2009;
- The proportion of staff travelling on foot has been decreasing since 2015 to a low of 17% in 2018/19;
- 31% of staff live within 2km of a campus site;
- 20% of staff parking permit holders (194 staff) live within walking distance (2km) of a campus site and 37% (360 staff) are within a cycling distance (8km) of a campus site;
- The number of staff who travel by bus is currently at 4% from a high of 10% in 2013.

Student Travel

- The 2018/19 student travel survey received a total of 545 responses, with a specified response rate of 68%. As of May 2019, there were 8149 students based at the University in Worcester and therefore survey responses equate to 7% of the student population;
- The proportion of students travelling by single occupancy vehicle has increased sharply (currently 41%), with the current level the highest since the 2010 survey;
- The proportion of students travelling on foot has been fluctuating since 2015 to a level of 48% in 2018/19, with a high of 55% in 2017;
- 49% of students live within 2km of a campus site;
- 20% of student parking permit holders (232 students) live within walking distance (2km) of a campus site and 28% (324 students) are within a cycling distance (8km) of a campus site;
- The number of students who travel by public transport has fluctuated year on year; and

- The proportion of students travelling by airplane between their home-time and term-time address has risen from 6% in 2015 to 10% in 2018/19.

9.2 Conclusion

- 9.2.1 Based on the survey results, it is clear the University is not currently meeting their sustainable travel targets.
- 9.2.2 GIS analysis of postcode data, undertaken by PJA, shows there is definite potential for mode share shift, as a considerable proportion of staff and students live within walking or cycling distance of a University campus.
- 9.2.3 Therefore, a package of recommendations has been set out, which focus on the implementation of a car parking management plan.
- 9.2.4 It is recommended that these remedial measures are investigated further by the university to ensure that better progress is made towards sustainable targets in the coming years.