

## **Monitoring Requirements for NW Bicester**

This document sets out the monitoring requirements for the Exemplar or Phase One of NW Bicester, covering construction stage monitoring, post construction assessments and post occupancy monitoring. It includes a more specifically detailed section on monitoring for Travel Plan targets.

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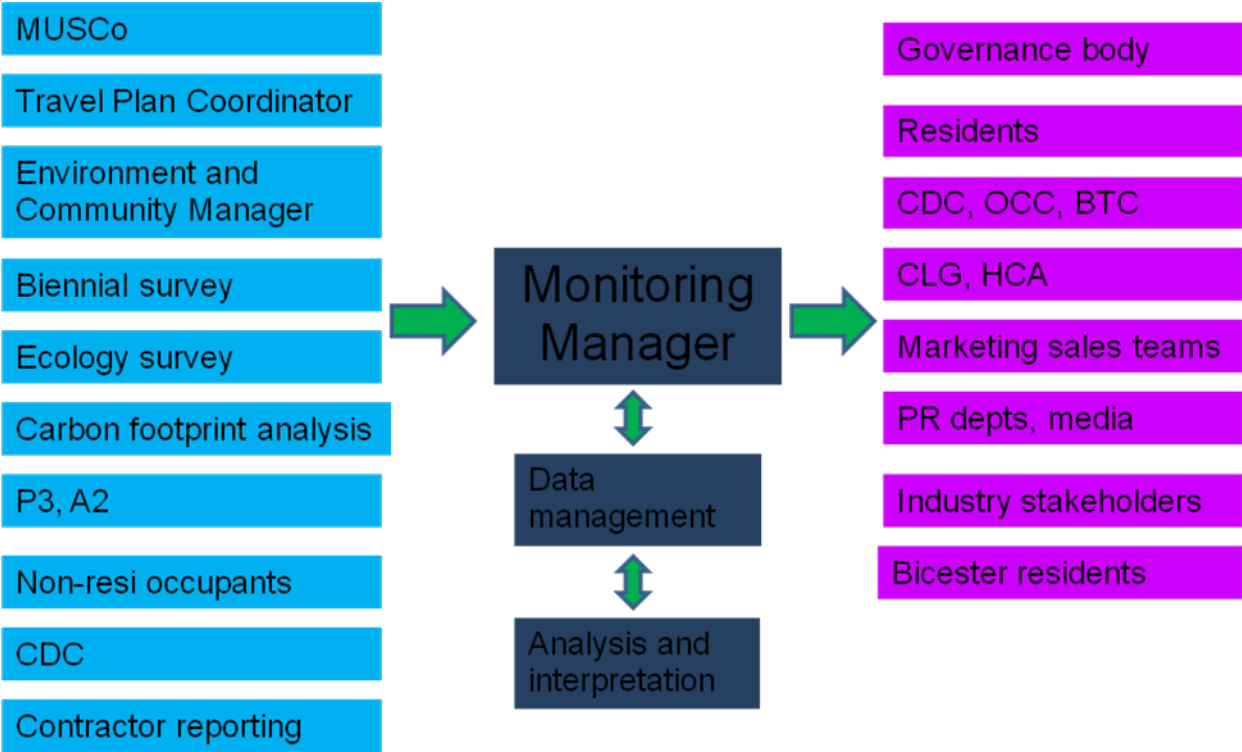
### **1. *Monitoring Objectives***

1. To measure progress against the Eco Towns PPS and the Eco Bicester One Shared Vision
2. To encourage active engagement and commitment to ensuring a successful eco-development in accordance with ambitions for governance and community development
3. To enable good management and governance - by collecting enough qualitative and quantitative information to understand what is happening both technically and behaviourally, in order to manage the eco town responsively and to keep improving
4. To inform residents and occupants of performance (both individual and collective) to enable informed behaviour change and to empower community governance
5. To communicate successes and shortfalls to industry, government and Bicester residents. This enables wider progress and informs policy
6. To satisfy planning requirements

### 2. Reporting Structure

Responsibility for coordinating and delivering the monitoring requirements in this document is held by A2Dominion. There is a widely held aspiration for this responsibility to pass to the Interim Management Board once it is established. This aspiration will be tested as the IMB develops and as NW Bicester residents arrive.

A2Dominion will appoint a Monitoring Manager to coordinate and deliver the monitoring. Monitoring results from a range of sources will be fed to the Monitoring Manager in a pre-agreed format and at pre-agreed times. The Monitoring Manager is responsible for data management, analysis and interpretation. The Monitoring Manager reports the results first to A2Dominion and then to wider stakeholders annually.



**Responding to monitoring results**

A2Dominion is responsible in the first instance for ensuring the Monitoring is carried out, analysing and interpreting the results and then responding to them.

**Scope**

Construction stage monitoring applies to all construction work on the scheme.

Post occupancy monitoring will cover all residential and non residential uses within the site including all residents, businesses and community operations.

**Timing**

Construction stage monitoring will commence on start of works on site and continue until completion.

Post occupancy monitoring will commence as soon as the first residents and non-residential occupants move in.

The monitoring and reporting will be carried out by the A2Dominion who take ownership of delivery of the targets and the aspirations of the eco town. If and when the IMB take over this responsibility, they will also take ownership of the targets and aspirations. A2Dominion will respond to monitoring results through changes in estate management, communication with residents etc.

A2Dominion will provide a monitoring report to CDC after 50dws are occupied; then on a yearly basis containing ongoing data routinely collected along with qualitative analysis. Biennial surveys will inform a full report every 2 years carried out by A2Dominion and presented to CDC and other stakeholders.

**Coordinated approach to monitoring**

Monitoring approaches to residents and non-residential organisations will be coordinated and managed so that people are not contacted too many times per year and are not made to feel they are living in an experiment. If appropriate, A2Dominion will combine their standard annual surveys and eco-town monitoring surveys into one resident interaction.

**Presentation of monitoring results**

Presentation format for results is yet to be agreed. Results can be presented in many ways:

- Site wide data giving results collectively for all residents and non-resi occupants
- Individual household or business data (for analysis but feedback only to individuals or businesses)
- Distribution charts showing the range of results for all individual homes (made anonymous for data protection)

Results will be fed back to occupants in a colourful, user friendly way so they are easily understood.

Information can show how the results compare with UK averages and with other eco developments.

Advice on how to contribute towards even better results in future will be presented and people can be offered the opportunity to contact A2Dominion if they are interested in finding out more.

The community intranet (or Shimmy service) will offer a forum for discussing the results.

The results can also be presented so as to link in with school projects and the curriculum.

### 3. Post Occupancy Monitoring Schedule

Government Objective 7 – Carbon footprint		Who	When	Monitoring method	Units	Notes / comments
GO-1	Average carbon footprint of eco town residents	Carbon footprint analyst – A2D to appoint appropriate analyst	Biennial	Analysis combining site wide data, and individual surveys	tCO2 /person /year	<p>The Government Objective for Eco Towns includes ... “to reduce the carbon footprint of development by ensuring that households and individuals in eco-towns are able to reduce their carbon footprint to a low level and achieve a more sustainable way of living<sup>1</sup>.”</p> <p>Combine and cross check data from:</p> <ul style="list-style-type: none"> <li>• site wide data on home energy consumption supplied by EScO and water supplier</li> <li>• transport carbon data – output from biannual travel surveys,</li> <li>• site wide data on household waste supplied by district council</li> <li>• biennial survey questionnaires on consumption of food, goods and services</li> <li>• results from personal carbon footprint calculators</li> <li>• national and local average data for carbon footprints</li> </ul> <p>Methodology to be agreed with BioRegional.</p>
ET7 Zero Carbon		Who	When	Monitoring method	Units	Notes / comments
ET7-1	Carbon emissions	A2D	Annual	Calculated from data below	tCO2 /year	Site wide emissions from building energy use. Target of zero to meet Eco Town definition.
ET7-2	Site wide electricity consumption	SSE	Annual	Metering	kWh /year	Total annual electricity consumption for building energy use
ET7-3	Electricity generated on site	A2D/SSE	Annual	Metering	kWh	Annual output for each of the on site generating

<sup>1</sup> p2 PPS on eco towns

					/year	technologies – PV arrays and gas CHP
ET7-4	Net import / export of grid electricity	SSE	Annual	Metering	kWh /year	Total annual electricity exported to and imported from the national grid
ET7-5	Import / export profile	SSE	Annual	Metering	kWh against time over each year	Time related profile of import/export patterns will help with development of a smart grid for NW Bicester
ET7-6	Output profile for each on site generating technology	A2D/SSE	Annual	Metering	kWh against time	To compliment import/export profile and to facilitate smart grid
ET7-8	Site wide hot water consumption	SSE	Annual	Metering	kWh/year	Annual hot water demand for the whole site
ET7-9	Hot water output from each on site generator	SSE	Annual	Metering	kWh/year	Annual hot water production from each generator technology, including system heat losses and heat dumped.
ET7-10	Site wide gas consumption	SSE	Annual	Metering	m3/year	
ET7-12	Electricity consumption by property	SSE	Annual	Metering	kWh/year	This data can be made anonymous for data protection reasons. Distribution graphs will show the range of household consumption levels and allow individual residents to compare themselves with their neighbours and with the national average.
ET7-13	Hot water consumption by property	SSE	Annual	Metering	kWh/year	As above
ET7-14	Detailed electricity data	A2D/SSE	Annual	Metering	kWh/year	Potential research project to look in detail at electricity consumption habits and ways to reduce it. Detailed time related profiles will be provided however funding will be sought for more detailed breakdown of consumption for lighting, appliances, cooking, cooling etc. Time related profiles show when peak and low demands occur. With further funding, remote meters can be installed on each circuit for participating sample homes.
<b>ET8 Climate change adaptation</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
-	Building related carbon emissions	-				See ET7-1

-	Transport related carbon emissions	-				See ET11-2
-	Temperature and humidity	-				See ET12-5
-	Mains water consumption	-				See ET17-2
<b>ET9 Homes</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
-	N/A					
<b>ET10 Employment</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET10-1	Employment space delivered on site	A2D	Annual	Reporting	m2	Floor area of employment space completed on site
ET10-2	Jobs on site	A2D	Biennial	Survey	Numbers FTE	On site non-resi occupants report employee numbers to governance body.
ET10-3	Home working	A2D	Biennial	Survey	Numbers	Home working is defined in Section 5 - the Travel Monitoring Section later in this Monitoring Plan under Part 2 M4.
ET10-4	Jobs in Bicester	CDC/Bicester Vision	Biennial	Assessment from available data	Estimated numbers FTE	It is difficult to attribute specific Bicester jobs to NW Bicester or Eco Bicester. CDC will use economic development data to monitor total jobs in Bicester over time and make a judgement as to when jobs growth can be associated with Eco Bicester. Compare with SQL baseline
ET10-5	Jobs profile	CDC/Bicester Vision	Biennial	Assessment from available data	Descriptive assessment	If possible, it will be useful to get some measure of the increase in jobs in certain sectors. CDC Economic Development to confirm what is currently measured. Compare with SQW baseline although it is recognised that not all data is available at town level.
<b>ET11 Transport</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
						For definitions and methodology under ET11 Transport, refer to Section 5 of this Monitoring

						Plan
ET11-1	Modal journey breakdown	TPC	Annual	Assessment using data below	%	Modal breakdown to be estimated from a combination of counter data and travel surveys. Modal shift targets are set out in the Travel Plan.
ET11-2	Resident transport related carbon emissions	TPC	Biennial	Assessment using data below	tCO2 /person /year	Average personal transport related carbon emissions to be estimated from travel surveys and travel diaries.
ET11-3	Number of car journeys	TPC	Annual	Counters	Trip numbers (AADT)	Counters at each site exit and in site link road collect detailed data and AADT.
ET11-4	Number of cycle/pedestrian journeys	TPC	Annual	Counters		Counters in link road and in pedestrian / cycle route to town
	Bus patronage and other bus related monitoring	TPC	Biennial	Bus company reporting to TPC		Bus company reporting requirements established at start
	Illegal/inappropriate parking	TPC	Biennial	A2D, Just Ask, TPC or residents reporting		Need some way of monitoring and recording whether parking supply at residential and non-resi locations is appropriate.
ET11-5	Journey breakdowns for all residents	TPC	Biennial	Survey with travel diaries		Travel diaries showing destinations, purpose and mode. Use these results to establish how many people use local facilities, including the town centre.
ET11-6	Car, bicycle, moped etc ownership levels	TPC	Biennial	Survey	numbers /household	Resident travel surveys
ET11-7	Personal car mileages	TPC	Biennial	Survey	miles/year + modal	Resident travel surveys.
ET11-8	Car model	TPC	Biennial	Survey		Collect information on the range of vehicle types and their associated CO2 emissions, noting any low emissions vehicles, electric cars or hybrids, LPG vehicles etc. This information can be used to tailor the information programme and incentives for encouraging lower emission vehicles.
ET11-9	Carbon intensity for each car model	TPC	Biennial	DOT data	kgCO2 /mile	To calculate CO2 emissions from personal car mileages and compare with Travel Plan target
ET11-11	Frequency of bicycle usage	TPC	Biennial	Survey with travel diaries	Journeys /month	Resident travel surveys



ET11-12	Annual bicycle miles	TPC	Biennial	Survey	Miles /year	Resident travel surveys
ET11-13	Car club membership	TPC	Biennial	Car club reporting to TPC	Membership numbers	Data supplied by car club
ET11-14	Car club mileages	TPC	Biennial	Car club reporting to TPC	miles/year	Data supplied by car club
ET11-15	Carbon intensity of car club vehicles	TPC	Biennial	Car club reporting to TPC	kgCO2/mile	Data supplied by car club
ET11-16	Modal breakdown of journey types e.g. work, school, etc	TPC	Biennial	Survey		Resident travel surveys
ET11-17	Home working					See ET10-3
ET11-18	Commuting distances for incoming workers	TPC	Biennial	Survey	miles/year	Site business travel surveys - collect postcodes for all employees and modes of transport
ET11-19	Travel modes for non-residential occupants	TPC	Biennial	Survey	miles/year	Site business travel surveys
ET11-20	Air travel miles, recreational and professional	TPC	Biennial	Survey	miles/year	Resident travel surveys
ET11-21	Mode breakdown for school children	TPC	Biennial	Survey	%	Hands up survey
ET11-22	Non residential deliveries	TPC	Biennial	Survey	Number /year	Annual delivery vehicle movements associated with each non-resi use: biomass deliveries, Coop deliveries, school deliveries, eco-pub deliveries, cafe, nursery etc
ET11-23	Qualitative feedback	TPC	Biennial	Survey		Feedback from all site users on transport related facilities, what measures have worked for them and what measures would help them to further reduce their car use and carbon emissions
<b>ET12 Healthy lifestyles</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET12-1	Exercise frequency	A2D	Biennial	Survey	%	How many people have exercised in the last week/month?
ET12-2	Perceived health	A2D	Biennial	Survey	Score from 1 – 10?	How healthy do you feel?
ET12-3	Perceived wellbeing	A2D	Biennial	Survey	Score from 1 – 10?	Is life good here?
ET12-4	Health indices such as obesity levels, incidence of mental health, smoking	A2D	Biennial	GB to ask NHS/PCT for data	People numbers, percentage	Anonymous data from GP's according to postcode? Best practice in health surveys to be researched and agreed.

ET12-5	Comfort levels: temperature, humidity levels throughout the year	Specialist	Ongoing measurement. Annual reporting	Data loggers installed, collected and interpreted	degrees C over time, % humidity over time	The success of the overheating strategy will be monitored using temperature data loggers in critical rooms. Further monitoring in a sample number of homes will hopefully be funded through BEPIT and/or other additional post occupancy monitoring funding.
ET12-6	Perceived comfort levels: temperature, humidity	A2D	Biennial	Survey		Are people warm enough, cool enough? Does their home feel fresh and well ventilated?
ET12-7	Noise levels	Specialist	Ongoing measurement. Annual reporting	Physical monitoring	decibels over time?	Sample homes monitored. Details to be agreed
ET12-8	Indoor air quality / healthy homes indicators	Specialist	Ongoing measurement. Annual reporting	Physical monitoring		Sample homes monitored. Details to be agreed.
<b>ET13 Local services</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET13-1	Delivery of services against timetable	A2D	Annual	Report		See ET21 below
ET13-2	Walkability Index	TPC / specialist	Biennial	Assessment	Score from 1 - 100	To what degree are all the most commonly needed services provided on site or within walking and cycling distance? Calculate the walkability score <a href="http://www.walkscore.com/">http://www.walkscore.com/</a> or similar Can we improve our score year on year?
ET13-3	Qualitative report	A2D	Annual	Report		Describing services available on site, success rates, attendance, events programmes, participation rates. ET13.1 looks for "leisure, health and social care, education, retail, arts and culture, library services, sport and play facilities and community and voluntary facilities."
<b>ET14 Green infrastructure</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET14-1	Active users	A2D	Biennial	Survey	Numbers and scores	Collect data on how many residents and non-resi users make use of and appreciate the green infrastructure.

						Gather information on which elements of the GI are most used and appreciated.
ET14-2	Take up of allotments	A2D	Annual	Report	%	% plots taken and actively used. Reported by allotment association or similar
<b>ET15 Landscape &amp; historic environment</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
	N/A					
<b>ET16 Biodiversity</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET16-1	Numbers of key indicator species	Ecologist	Annual	Specialist contractor	numbers	Key indicator species to be defined in the Landscape and Ecology Conservation Management Plan (ELMP) and agreed by the Biodiversity Working Group. ELMP monitoring schedule also to be agreed. Can make use of and encourage coordinated volunteer monitoring surveys
ET16-2	Area of key indicator habitats	Ecologist	Annual	Specialist contractor	m2, hectares	Key indicator habitats to be defined in the ELMP and agreed by the Biodiversity Working Group. ELMP and specific monitoring programme also to be agreed.
ET16-3	Report against delivery of the L&ECMP	Ecologist	Annual	Specialist contractor		To be agreed by the Biodiversity Working Group.
ET16-4	Some measure of community involvement in conservation	A2D	Annual	Report	numbers	Numbers of events and numbers of participants. Numbers of residents actively enjoying, taking part in, observing wildlife or conservation work
<b>ET17 Water</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET17-1	Site wide mains water consumption	TW	Annual	TW metering	litres / year	
ET17-2	Metered household usage	TW/A2D	Annual	TW metering	litres / day	Residential water use to be <80l/person/day to meet CSH
ET17-3	Metered non-residential water usage	TW	Annual	TW metering	litres / day	Meet BREEAM Excellent in all non-resi buildings
ET17-4	Site wide communal water	TW	Annual	TW metering	litres / day	

	usage					
ET17-5	Site wide recycled water	A2D	Annual	Estimate	litres / day	Estimate based on occupancy and typical appliance water consumption, subtracting any mains water top up to rainwater tanks.
<b>ET18 Flood risk management</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
	N/A					
<b>ET19 Waste</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET19-1	Domestic total waste (including recycling)	CDC	Annual	On board weighing	kg /household /year	On board weighing technology on collection vehicles Results reported monthly by Council
ET19-2	Recycling rates	CDC	Annual	On board weighing	%	On board weighing technology on collection vehicles Results reported monthly by Council
ET19-3	Total waste (including recycling) from each non-resi organisations	Non-resi organisations	Annual	Waste contractor receipts	kg/year	Each non-resi organisation to set waste targets and design a monitoring strategy in their individual waste plans
ET19-4	Recycling rates for non-resi organisation	Non-resi organisations	Annual	Waste contractor receipts	%	Each non-resi organisation to set waste targets and design a monitoring strategy in their individual waste plans
ET19-5	Community composting	A2D/Just Ask	Annual	Estimate	tonnes /yr	These will be rough estimates
ET19-6	Individual composting	A2D	Biennial	Survey	tonnes/yr	These will be rough estimates from surveys
<b>ET20 Master planning</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
-	N/A					
<b>ET21 Transition</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET21-1	Delivery against timetable: neighbourhoods, employment, community facilities and services, governance handover	A2D	Annual	Report		Reporting against agreed timetable
ET21-2	Qualitative report on community development	A2D	Annual	Report		Reporting against community development aspirations set out in the planning application documents and in the

	plans					Governance Strategy
ET21-3	Qualitative report on programme of encouraging environmentally responsible behaviour	A2D	Annual	Report		Reporting against the aspirations set out in the PPS, the Eco Bicester – One Shared Vision, the planning application and the Governance Strategy. “enabling residents to live within managed environmental limits” “enabling residents to reduce their carbon footprint to a low level”
ET21-4	Delivery of monitoring programme as set out in this document	A2D	Annual	Report		
<b>ET22 Community &amp; governance</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET22-1	Establishment of roles and responsibilities as set out in the S106 on governance	A2D	Annual	Report		
ET22-2	Number of community events	A2D	Annual	Report	Events per year	
ET22-3	Participation rates in all community initiatives	A2D	Annual	Report	People numbers, percentage	
ET22-4	Take up rates of green services and facilities on site	A2D	Annual	Report	People numbers, percentage	Data from facility organisers and also from residents or intranet surveys
ET22-5	Satisfaction rating	A2D	Biennial	Survey		How happy are people with their homes, their neighbourhood, the services in their neighbourhood and the governance of their neighbourhood
ET22-6	Average number of names of neighbours that residents know	A2D	Biennial	Survey	People numbers	This provides a measure of how well the community is working and a measure of social capital. It is an adaptation of an old LA21 indicator and there are data to compare with.
ET22-7	Resident involvement	A2D	Biennial	Survey	%	What % of residents are involved in some aspect of the governance of the neighbourhood. This could be a role in the governance organisation, in the school or community centre, it could be organising events or volunteering in the

						conservation group, writing content for the intranet, helping with monitoring or green lifestyle promotions etc
<b>General data</b>		<b>Who</b>	<b>When</b>	<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
GD-1	Occupancy level for each property (residents, workers, visitors)	A2D	Biennial	Survey	people numbers	This information is helpful in interpreting data such as electrical consumption, water consumption and waste

#### 4. Construction Stage Monitoring

Construction stage monitoring will include the following. It will tie in with and compliment the Construction Environmental Management Plan (CEMP) and the Sustainable Waste Management Plan (SWMP).

ET9 Homes		Monitoring method	Units	Notes / comments
ET9-1	Post construction Code assessment	Contractor reporting		
ET9-2	Post construction air tightness testing meet specified standard	Contractor reporting	Air changes per hour	
ET9-3	Post construction co-heating tests deliver satisfactory results	Contractor reporting		Funded through BEPIT. Details tbc
ET10 Employment		Monitoring method	Units	Notes / comments
ET10-1	Construction related jobs	Contractor reporting	FTE each year	Report against the Economic Strategy. Need to define construction related jobs.
ET10-2	Construction skills strategy implemented	Contractor reporting		Report against the Economic Strategy
ET10-3	Number of apprenticeships and training placements	Contractor reporting		Report against the Economic Strategy
ET10-4	Number of local businesses benefitting from construction process	Contractor reporting		
ET10-5	Other local jobs due to construction process eg. Product suppliers, catering services etc	Contractor reporting		Qualitative description mentioning names of local companies
ET11 Transport		Monitoring method	Units	Notes / comments
ET11-1	Construction site travel plan in place and delivered	Contractor reporting		

ET11-2	Modal share of construction work force	Contractor reporting		
ET11-3	Average commuting distance for construction workers	Contractor reporting	Km	Calculated from post codes
ET11-4	Average sourcing distance of construction materials	Contractor reporting	Km	Weighted for different materials by tonnes
<b>ET16 Biodiversity</b>		<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET16-1	Construction Environmental Management Plan delivered	Contractor reporting		
ET16-2	Out of bounds areas enforced	Contractor reporting		
ET16-3	Trans location measures successful	Contractor reporting		
ET16-4	Key species and habitats successfully protected	Contractor reporting		
<b>ET17 Water</b>		<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET17-1	Construction related water consumption	Contractor reporting	litres / year	
ET17-7	Water quality in run off streams	Contractor reporting		Standards and monitoring requirements to be agreed with the Environment Agency
<b>ET19 Waste</b>		<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET19-1	Assessment of waste management practice	Assessed on basis of indices below		
ET19-2	SWMP in place and delivered	Contractor reporting		
ET19-3	Total construction waste (including recycling) as a % of total construction materials bought	Contractor reporting	%	



ET19-4	Total construction waste (including recycling)	Contractor reporting	Tonnes / month	
ET19-5	Total construction waste to landfill	Contractor reporting	Tonnes / month	
ET19-6	Total hazardous waste	Contractor reporting	Tonnes / month	
ET19-7	Breakdown of construction waste recycled	Contractor reporting	Tonnes / month	
ET19-8	Construction materials reused	Contractor reporting	Tonnes / month	
ET19-9	Earth / fill movements on or off site	Contractor reporting	Tonnes / month	
<b>ET21 Transition</b>		<b>Monitoring method</b>	<b>Units</b>	<b>Notes / comments</b>
ET21-1	CEEQUAL Award achieved	Contractor reporting		Target Excellent
ET21-2	BREEAM ratings achieved	Contractor reporting		Target Excellent
ET21-3	Code for Sustainable Homes assessments achieved	Contractor reporting		Target Code 5
ET21-4	Carbon emissions from construction activities	Contractor reporting	tCO2 /month	Site energy consumption – electricity, diesel consumption
ET21-5	Considerate Contractors standard met	Contractor reporting		
ET21-6	Environmental reporting (ref CEMP)	Contractor reporting		Noise, dust, water runoff, toxic emissions or waste
ET21-7	Embodied carbon impacts of construction	Contractor reporting	tCO2	Track embodied CO2 and compare with original embodied CO2 targets
ET21-8	% Timber products sustainably sourced	Contractor reporting	%	Could be FSC, European PEFC, local or reclaimed
ET21-9	Sustainable materials sourcing policy met	Contractor reporting	%	

## 5. Methodology for Travel Plan Monitoring

### Monitoring the Modal Shift and Low Carbon Targets

There are two types of survey to be undertaken – (a) automatic counters and (b) household and employee questionnaires.

- Who will undertake the surveys – the Travel Plan Co-ordinator will be responsible for data collection and analysis, reporting to the Monitoring Manager.
- When

Surveys (a) permanent loop counters and pedestrian/cycle counters will be placed in the highway and street furniture so that data can be collected at any point and provided for any time period over the year. The reporting period will need to be agreed and repeated each year, which will need to link in with first occupation so that the targets can be checked.

Surveys (b) to be collected in the same neutral month, during school term time in 'monitoring year 5' (from 4<sup>th</sup> – 5<sup>th</sup> anniversary of first occupation) and then biannually until 10 years after final occupation

- Methodology

Surveys (a) automatic vehicle counters, automatic pedestrian and cyclist counters, bus passenger boarding numbers for the bus stops in the development to be collected from the operator if ticketing enables this or via a manual survey if not.

Surveys (b) a travel diary to be completed by residents and an employee travel plan questionnaire at the non-residential units. The household questionnaires will require residents to complete a travel diary for every trip made over a period of a week, detailing the mode they used, the number of people in any car used and whether they were the driver or passenger, the purpose of the trip and the destination (by street / car park name if within the Bicester area or by village/town name if outside the study area). In addition they will be asked to supply household information, namely number of people in the household, age profiles, number of cars owned, whether they ever work from home and if so how many times a week, the type, age and engine size and annual mileage (tick against a mileage band + supply a reading from their milometer). The employee questionnaires will ask where the person travels from on a typical day and their mode of transport (on all legs of the journey).

- Duration

Surveys (a) permanent data collected, with analysis carried out in the agreed month with presentation of a detailed week of data to match the week of the household diaries + monthly and year on year comparisons;

Surveys (b) 1 week's worth of data collected over a 4 week period

- Where

Surveys (a) – vehicle counters at the northern and southern accesses of the site; pedestrian and cyclist counters on the bus-only route and the off-road footway/cycleway connecting the northern and southern parts of the site and on the cycle route along the Banbury Road; bus boarding data for all bus stops in the site.

Surveys (b) all residents and all employees surveyed, with 50% household response rate acceptable, as long as all residents within those households are captured within the survey.

- What are surveys to measure?

Surveys (a) - calculate total site traffic generations over both accesses, split into arrivals and departures in the a.m. and p.m. peaks and compare against tables 8.7 and 8.8 in the TA. Average 12 hour flows over a 5-day and 7-day week should also be measured to provide a year on year comparison. Calculate average 12 hour, a.m. peak, lunchtime peak and p.m. peak pedestrian and cyclist flows along the bus-only link, off-road route and Banbury Road cycle link. Provide information on the number of bus passengers boarding at bus stops in the exemplar site and fare stage information as gathered by the operator. Both these sets of data would serve as baseline information against which to monitor annual changes.

Surveys (b) – to measure the number of trips originating from the site that are by non-car modes, the number of people working from home on a typical work day, the average vehicle emissions for cars owned by residents of the exemplar site, and the average annual vehicle kilometres travelled by private cars owned by residents and establish whether the targets have been met. Car modes defined as car drivers, car passengers and light goods vehicles. Non-car defined as pedestrians, cyclists, bus passengers, rail passengers, motor cycles, taxi, school coach, community transport. Where more than one mode is used information needs to be provided on all legs of the journey, e.g. car to the train station and then train to work. When it comes to analysing the mode by purpose and more than one mode has been used, the stated mode should be the one used on the longest leg of the journey. Purpose choices should be work, on employer's business, educational attendance, escorting (e.g. to school, doctor's, etc), shopping, recreation/leisure, visiting friends and relatives, personal business.

- Relevant peak hour movements – in the modelling and TA work the peaks have been assessed as a.m. peak = 8-9 o'clock and p.m. peak = 5-6 o'clock. However, the traffic data and diary surveys should be used to monitor whether this is the actual peak and the analysis methodology amended if necessary.
- Survey data (a) should be passed to Oxfordshire County Council 4 weeks after collection. The final form for surveys (b) will need to be agreed with Oxfordshire County Council staff prior to the monitoring period and after the survey the analysed results should be passed over within 12 weeks. County Council staff will have the right to ask to look at the raw data if there are any discrepancies. The agreed results will be past to local councillors, the GB and made available to the wider public on web sites.

**MONITORING AND INCENTIVES****PART 1****1. Definitions**

In this schedule the following words and phrases shall have the following meanings unless the context otherwise requires (and for the avoidance of doubt any definition which does not appear below shall be given the meaning allocated to it in the main body of this Deed):

<b>“Car”</b>	means any mechanically propelled vehicle but excluding electric or hybrid vehicles (being vehicles which use one or more electric motors for propulsion or vehicles that use an on-board rechargeable energy storage system and a fuel based power source for vehicle propulsion respectively) motor- cycles taxis, school coaches and any community transport vehicle (e.g. a dial a ride vehicle) and accordingly “Car Mode” means travel by Car
<b>“Car Trip”</b>	means a trip by a person travelling (for the whole or part of the journey) in a Car (being either the driver or a passenger) but excluding a Car Trip undertaken using a Car Club Car –( <i>this will be defined by reference in another Schedule</i> )
<b>“Follow Up Week”</b>	means each week selected as the follow-up

week for the purposes of paragraph 2.3.4 which shall be a week during school term time in September or October (excluding half term).

**“Measurements”**

means the transport mode measurements and the low carbon measurements as set out in Part

2 of this schedule and M2, M3, M4, M5 and M6 shall be construed accordingly

*Refer to Monitoring Schedule*

**[“Monitoring Manager”] -****“Monitoring Year”**

means a calendar year commencing on the Start Date and each subsequent year commencing on the anniversary of that date so that Monitoring Year 1 is the calendar year commencing on the Start Date and ending on the day before the first anniversary of the Start Date and

Monitoring Year 2 means the calendar year commencing on the first anniversary of the Start Date and ending on the day before the second anniversary of the Start Date and so on.

**“Monitoring Years (Selected)”**

means Monitoring Year 5, Monitoring Year 7, Monitoring Year 9, Monitoring Year 11, Monitoring Year 13, Monitoring Year 15 and

	<p>in the event that by the end of Monitoring Year 15 10 years has not elapsed from the date of Occupation of the final Dwelling at the Site every second Monitoring Year subsequent to Monitoring Year 15 until 10 years have elapsed from the date of occupation of the final Dwelling at the Site.</p>
<b>“Non-Car Mode”</b>	<p>means travel by any mode other than by Car.</p>
<b>“Resident”</b>	<p>means a person whose primary place of residence is at a Dwelling at the Site.</p>
<b>“School Survey”</b>	<p>means a School Survey as detailed in part 4 of this schedule.</p>
<b>“Site Survey”</b>	<p>means a Site Survey as detailed in part 4 of this schedule and which comprises a residential survey and a non residential survey</p>
<b>“Specified Week”</b>	<p>means each week selected for a Site Survey which shall be a week during school term time in September or October excluding half term)</p>
<b>“Start Date”</b>	<p>means the date of occupation of the 50<sup>th</sup> Dwelling at the Site.</p>
<b>“Targets”</b>	<p>means the targets for each Measurement as set out in part 3 of this schedule.</p>

**“Travel Plan Co-ordinator”**

*defined by reference to another Schedule*

**“Travel Plan Group”**

*defined by reference to another Schedule*

**“Trip”**

means a journey which satisfies the following criteria:

- the journey is by a person who is either a Resident or who works at the Site but excluding a journey by a child accompanied by an adult when the final destination of both the adult and the child is the same; and
- the journey commences at premises at the Site; and
- the destination of the journey may be either at the Site or beyond the Site but excluding any journey whose destination is less than 400 metres from its start.

**2. Surveys**

The Owner and the Developer covenant with the County Council that they will ensure that:

2.1 during Monitoring Year 4 the Travel Plan Co-ordinator<sup>2</sup> submits to the County Council for its approval

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<sup>2</sup> Use definition in an other Schedule



- a form of questionnaire for the residential survey and form of questionnaire for the non-residential survey to be undertaken for the purposes of the Site Survey during Monitoring Year 5;
- the proposed week during Monitoring Year 5 when the Site Survey will be undertaken and the related Follow Up Week; and
- the methodology for analysing the information supplied by the Site Survey and the proposed format in which such analysis will be presented.

And the Travel Plan Co-ordinator will adjust the forms of questionnaire, the timing of the Specified Week and Follow Up Week in Monitoring Year 5 and the methodology and format of the analysis in accordance with the County Council's requirements.

- 2.2 the Travel Plan Co-ordinator reviews with the County Council in each Monitoring Year prior to each of the other Monitoring Years (Selected) the forms of questionnaire for the Site Survey, the proposed Specified Week and Follow Up Week in the following Monitoring Year and the methodology and format of the analysis of the Site Survey and adjusts them in accordance with the County Council's requirements.
- 2.3 a Site Survey and a School Survey are undertaken during each Monitoring Year (Selected) in accordance with the following provisions
- 2.3.1 Each Site Survey will be undertaken by the Travel Plan Co-ordinator or by a reputable firm or company which is independent of the County Council, the Owner, the First Developer and the Second Developer
  - 2.3.2 The Travel Plan Co-ordinator will distribute a questionnaire as approved by the County Council pursuant to paragraph 2.1 or as applicable paragraph 2.2 to each Dwelling at the Site in readiness for it to be completed in respect of the Specified Week as approved by the County Council.
  - 2.3.3 The Travel Plan Co-ordinator will distribute a questionnaire as approved by the County Council pursuant to paragraph 2.1 or as applicable paragraph 2.2 to each non-residential premises at the Site (excluding the school) in readiness for completion in respect of the Specified Week as approved by the County Council.
  - 2.3.4 the Travel Plan Co-ordinator will use all reasonable endeavours to secure that a questionnaire is fully completed by the household at each Dwelling and for this purpose will arrange a prize draw or other reasonable incentive and will collect all such questionnaires within 1 week of the Specified Week and in the event that there is not secured from 50% or more of the Dwellings at the Site completed questionnaires with full information relating to all the Residents at the relevant Dwelling the Travel Plan Co-ordinator will contact and encourage Residents at those Dwellings who have not completed questionnaires to

complete such questionnaires with reference to the Follow Up Week (as approved by the County Council) and will collect those questionnaires.

- 2.3.5 the Travel Plan Co-ordinator will use all reasonable endeavours to ensure that there is completed by a senior member of staff at each non-residential premise at the Site (excluding the school) a questionnaire in a form approved by the County Council for the non-residential survey for a week day (that is Monday to Friday inclusive excluding bank holidays or any other public holiday) during the Specified Week and that it is returned to him and for this purpose will arrange a prize draw or other reasonable incentive.
- 2.3.6 the Travel Plan Co-ordinator will use all reasonable endeavours to ensure that there is undertaken by staff employed at the school at the Site a survey in accordance with Part 4 of this Schedule on a typical school day during September or October (as agreed with the school and the County Council) during each of the Monitoring Years (Selected) and the results of such survey provided to the Travel Plan Co-ordinator within 1 week of the survey
- 2.3.7 the Travel Plan Co-ordinator will supply to the County Council within 12 weeks of the Specified Week or if later within 4 weeks of the day on which the School Survey is undertaken in each Monitoring Year (Selected) a report on the information provided by the Site Survey and the School Survey and an analysis of such information all in accordance with the methodology and format approved by the County Council further to paragraph 2.1 or as applicable paragraph 2.2. The report shall also address such other matters as agreed between the County Council and the Travel Plan Co-ordinator
- 2.3.8 the Travel Plan Co-ordinator will co-operate with the County Council in such manner and on such occasions as the County Council reasonably require in the verification of the accuracy of any data used in compiling the report and without prejudice to the generality of the foregoing the Travel Plan Co-ordinator will ensure that the originals of the completed residential survey questionnaires the non-residential survey questionnaires as completed and of the School Survey are retained by the Travel Plan Co-ordinator for no less than 12 months and that representatives of the County Council will be permitted to study such original questionnaires as completed at all reasonable times following request and that copies of them will be provided promptly to the County Council if so required.

**3 Measurements**

The Measurements set out in column 2 below shall be ascertained from information comprised in the Site Survey and as applicable School Survey undertaken during the Monitoring Year (Selected) as listed in column 1 below and for this purpose the notes set out in Schedule 2 apply.

<b>Monitoring Year (Selected)</b>	<b>Measurements</b>
Year 5	M2, M3 and M4
Year 7	M2 and M3
Year 9	M2, M3, M4, M5 and M6
Year 11	M3, M3, M4, M5 and M6
Year 13	M3, M3, M4, M5 and M6
Year 15	M3, M3, M4, M5 and M6
All other Monitoring Years (Selected)	M3, M3, M4, M5 and M6

**4. Payments**

In the event that any of the Measurements for a Monitoring Year (Selected) as set out in column 1 below fails to attain the Target for that Monitoring Year (Selected) the Developer and the Owner covenant to pay to the County Council within 14 days of the submission of the report further to paragraph 2.3.7 (or if earlier within 14 days of the due date for submission of that report) the sum set out in column 2 below subject to reduction as set out in paragraphs 5 and 6.

<b>Monitoring Year (Selected)</b>	<b>Payment</b>
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Year 5	£10,000 Index Linked
Year 7	£20,000 Index Linked
Year 9	£30,000 Index Linked
Year 11	£40,000 Index Linked
Year 13	£50,000 Index Linked
Year 15	£100,000 Index Linked
All other Monitoring Years (Selected)	£100,000 Index Linked

5. In the event that for a Monitoring Year (Selected) both of the travel mode targets are attained but one of the low carbon targets is not attained (and the other two low carbon targets are attained) payment pursuant to paragraph 4 shall be reduced by 50%.
  
6. In the event that the low carbon targets for a Monitoring Year (Selected) are attained but one of the travel mode Measurements fails to attain its target (and the other travel mode Measurement does attain its target) payment pursuant to paragraph 4 shall be reduced as follows:
  - 6.1. If the travel mode Measurement that fails to attain its target is within 2% of its target the payment shall be reduced by 90%.
  - 6.2. If the travel mode Measurement that fails to attain its target is within 4% of its Target the payment shall be reduced by 70%.
  - 6.3. If the travel mode Measurement that fails to attain its target is within 6% of its Target the payment shall be reduced by 50%.
  - 6.4. If the travel mode Measurement that fails to attain its target is within 8% of its Target the payment shall be reduced by 30%.
  - 6.5. If the travel mode Measurement that fails to attain its target is within 10% of its Target the payment shall be reduced by 10%.
  
7. The County Council covenants with the Owner, the First Developer and the Second Developer that it shall not use any payment made further to paragraph 4 for any purpose other than one or more of the following at such times and in such form as the County Council in its discretion may decide (but subject always to prior consultation with the Travel Plan Co-ordinator):

- 7.1. Where payment is made because of failure to attain a Target for a travel mode Measurement: measures to encourage the use of Non-Car Modes of travel to or from premises at the Site which may include one or more of the following: enhancements to the bus service bus stop improvements at any stop on the Bus Route, [to be defined] promotional activities to encourage new users of Non-Car Modes of travel, promotion of walking and cycling including provision of vouchers, cycle loans to businesses operating in the Site and other incentives and improvements to off-site routes used by the Residents.
- 7.2. Where payment is made because of failure to attain a Target for a low carbon Measurement; infrastructure and support mechanisms which may provide for one or more of the following; measurements to enable Residents to work from home effectively, publicity events and individual discussions to promote opportunities, publicity for and events to advertise the benefit of low vehicle emissions additional electric charging points, offers for Residents who buy a car with reduced carbon emissions and/or personal travel planning and other actions to incentivise Residents to reduce their use of Cars.

#### 8. General

8.1 Without prejudice to the above provisions if any report indicates that any of the objectives of the Travel Plan have not been achieved then the Owner the First Developer the Second Developer and the County Council shall seek to agree amendments to the Travel Plan in order to remedy this.

8.2 The Owner, the First Developer and the Second Developer covenant to pay to the County Council *[travel plan monitoring costs]*

**MEASUREMENTS**

**PART 2**

<b>The Travel Mode Measurements</b>		
	<b>Measurements - Core Provisions</b>	<b>Supplemental Notes for Establishing Measurements further to Site Survey/School Survey</b>
M2	The percentage of Trips undertaken by Non-Car Mode.	The total number of Trips and the number undertaken by Non-Car Mode are to be the total number of Trips as recorded by the relevant Site Survey.
M3	The percentage of all the pupils attending the school at the Site on a typical school day who arrive at the school by Car on that day.	The typical school day signifies the school day selected for the relevant School Survey.
<b>The Low Carbon Measurements</b>		
M4	The percentage of all adult Residents who are in employment that work from home.	A resident who works for part of a day from home and part of that day elsewhere shall not be treated as working from home on that day and a Resident who works part time (or full time) who works for less than less than 3 hours on a day shall not be

		treated as working from home on that day.
M5	The average vehicle emissions (Carbon dioxide emitted per kilometre – CO <sub>2</sub> /Km) according to the manufacturer's specification for all Cars owned by Residents	<p>A Car is treated as owned by a Resident where:</p> <ul style="list-style-type: none"> <li>(a) the Resident is designated as the owner in the vehicle registration document of the vehicle (and the vehicle is registered at the Driver and Vehicle Licensing Agency in his name); or</li> <li>(b) the Resident has the permanent use of the Car and the Resident's employer who is designated as the owner in the vehicle registration document of the vehicle (and the vehicle is registered at the Driver and Vehicle Licensing Agency in the name of the employer); or</li> <li>(c) the Resident has an arrangement with a vehicle leasing business for the lease of the Car for a minimum period of 12 months and the vehicle leasing business is designated the owner in the vehicle registration document of the vehicle (and the vehicle is registered at the Driver and Vehicle Licensing Agency in the name of the vehicle leasing business); or</li> <li>(d) the Resident has the permanent use of the Car and his employer has an arrangement with a vehicle leasing business for the lease of the Car and the vehicle leasing company is designated the owner in the vehicle</li> </ul>

		<p>registration document of the vehicle (and the vehicle is registered at the Driver and Vehicle Licensing Agency in the name of the vehicle leasing business).</p>
M6	<p>The average annual mileage (in kilometres) travelled by each Car owned by a Resident during the whole or any part of the year ending at the end of the Specified Week</p>	<p>Annual mileage per Car (owned by a Resident) is to be established from information in the questionnaire for each Dwelling.</p> <p>The average annual mileage is then established by means of averaging the annual mileage per Car.</p>



**TARGETS**

**PART 3**

The target for each Measurement as set out in column 2 – 6 below applies for the corresponding Monitoring Year (Selected) as listed in column 1 below:

<b>Monitoring Year (selected)</b>	<b>M2 Travel Mode Target</b>	<b>M3 Travel Mode Target</b>	<b>M4 Low Carbon Target</b>	<b>M5 Low Carbon Target</b>	<b>M6 Low Carbon Target</b>
Year 5	45% or more	20% or less	16% or more	-	-
Year 7	46% or more	20% or less	-	-	-
Year 9	47% or more	20% or less	16% or more	Less than 110G	13,250km or less
Year 11	48% or more	20% or less	16% or more	Less than 110G	13,250km or less
Year 13	49% or more	20% or less	16% or more	Less than 110G	13,250km or less
Year 15	50% or more	20% or less	16% or more	Less than 110G	13,250km or less
All other monitoring Years	50% or more	20% or less	16% or more	Less than 110G	13,250km or less

**SCHOOL SURVEY****PART 4**

**School Survey** – This will comprise –

1. A staff travel survey in the form of a questionnaire; and
2. A pupil survey undertaken by means of the “hands up” methodology with each class teacher asking his pupils at registration to put up their hands according to mode or mode(s) of travel used on their journey to school that day. The teacher will check this against information supplied in the previous survey and if there is any change in the travel mode will confirm by conversation with the relevant pupils.

The information to be recorded shall include:

- the number of pupils attending the school on the survey date;
- the mode/modes of transport used by each pupil attending the school on the survey date on his journey to school;
- the number of those pupils attending the school on the survey date whose journey to school in whole or in part was by Car
- the mode of transport used by each member of staff working at the school at the survey date

**Site Survey – Non Residential Survey**

This will comprise a questionnaire to be completed by a senior member of staff at each non-residential premise (excluding the School).

The information to be recorded shall include:

- For each person working at the premises on the survey day where they have travelled from to reach the premises and the mode or modes of transport used on that journey. If by Car the number of passengers in the Car
- The aggregate number of Trips undertaken by all persons working at the premises on the survey day
- The mode of transport used on each Trip
- The number of Trips undertaken by Car
- The number of passengers in the Car on each such Trip and whether the person employed at the premises was the driver or a passenger.

**Site Survey – Residential Survey**

This will comprise of a questionnaire for each Dwelling at the Site and will entail the Residents at each Dwelling completing a travel diary for the Specified Week or as applicable Follow Up Week. All references below to Specified Week shall where applicable signify Specified Week or as appropriate Follow Up Week.

**Notes**

1. The questionnaire shall explain what constitutes a Car, a Car owned by a Resident, a Resident and a Trip.
2. “relevant year” means the year ending at the end of the Specified Week.

The information to be recorded in each travel diary shall include

- A record of all Trips undertaken by each Resident residing at the Dwelling during the Specified Week detailing:-
  - Mode of travel used on each Trip and identifying whether it was by Car/partly by Car;
  - If more than one mode of travel was used details of each mode and the length of each limb of the journey (according to the mode of travel used); the mode used when leaving his Dwelling and the mode used when arriving at his destination
  - If by Car or partly by Car whether the Resident was the driver or a passenger and the number of passengers;
  - The purpose of each Trip (purpose choices to be work, on employers business, education attendance, escorting (e.g. to school), shopping, recreation/leisure, visiting friends and relatives, personal business, other);
  - The final destination of each Trip.
- The number of Residents at the Dwelling during the Specified Week and their age profiles (by banding).
- The number of Cars owned by Residents at the Dwelling during the Specified Week.
- The number of adult Residents at the Dwelling during the Specified Week who are in employment.
- For each such Resident the number of ‘work days’ on which he worked from home. A work day excludes a day when all the work undertaken is in excess of the Resident’s contracted hours (or for any person who is self employed a day when all the work undertaken is outside standard hours)

- The type, age and engine size of each Car owned by each Resident at the Dwelling during the Specified Week and when it was acquired during the relevant year. The same information for any Car owned by the Resident at any time during the relevant year and the period of time during that year when he owned that Car.
- There is to be supplied a reading from the milometer of each Car owned by each Resident during the Specified Week . If the Resident has changed Car since the last survey there is to be supplied an estimate of annual mileage (according to mileage banding agreed with the County Council and provided in the questionnaire) travelled by each Car owned by that Resident during the relevant year. This estimate of annual mileage is to include all travel undertaken by the relevant Car irrespective of whether the Resident was travelling in it.

The survey shall also be designed to ascertain measures that will assist in encouraging Trips by Non-Car Mode