A GUIDE TO OUR SERVICES

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INTRODUCTION

Traffic Survey Partners (TSP) was established by Siva Nagarajah and Phil Spencer who between them have more than 40 years' experience in transport survey management.

Prior to TSP, Siva was the Analysis Director of Count On Us for over 12 years, and before that a Graduate Statistical Officer at the DfT.

Phil was previously the Regional Director of Nationwide Data Collection (London) Ltd; a Regional Director of Count On Us, and prior to that the Managing Director of City Clickers.

During 2012 both Angie Davis and Jerry Bentall joined the company, Jerry as the Director responsible for Public Transport and Market Research projects and Angle as the Regional Director for Scotland and the North.

Jerry has 35 years' experience in this field including extensive periods with British Rail, Halcrow and for the past 12 years with Count On Us. Angie previously spent 14 years with Count On Us as the company's Principle Analyst and is based in Glasgow, offering a full range of survey facilities.

Since forming Traffic Survey Partners in 2011, we have developed strong relationships with clients in both the public and private sectors. These range from major international consultancies and transport operators,

through to local authorities, private developers and local architects/surveyors.

Our directors are driven by a passion to satisfy clients' needs utilising our extensive survey management experience. Our approach is consistently open and straightforward irrespective of the client.

At TSP we take pride in our flexible and tailored approach to meeting our clients' requirements. Through our years of experience and expertise, we can offer high value services at very competitive rates, taking advantage of our low cost base and network of satellite resources. This business approach enables us to call upon a diverse range of skills and experience the envy of much larger survey companies.

At the same time we are also fully aware of all the latest advances in survey related technology and the advantages these bring both in terms of the quality of output and cost efficiency.

We have therefore invested in innovative technologies including high mast digital cameras that are capable of capturing views from 10m high with our DVRs, which are capable of recording up to 124 hours continuously.

OUR SERVICES

The range of services that we offer includes:

- Automatic Traffic Counts
- Classified Traffic Counts
- Registration Number Plate Surveys (including ANPR)
- Bluetooth Tracking Surveys
- Journey Times Surveys (including Bluetooth Vehicle & GPS)
- Speed Surveys (including ATC and Radar)
- Vehicle Occupancy Surveys (Multi-modal Surveys)
- Queue Length Surveys
- Signal Timing Surveys
- Saturation Flow and Degree of Saturation (DoS) Surveys
- Parking Surveys (including Street Occupancy Surveys, Car Park and Beat Surveys)
- Street Notices display surveys
- Pedestrian or Cycle Crossing Surveys
- Public Transport Surveys (including Bluetooth Vehicle & Pedestrian Tracking)
- Roadside Interview Surveys
- Household Interview Surveys

The range of service and experience offered in key survey areas is shown in more detail below for your information.

AUTOMATIC TRAFFIC COUNTS

This covers the collection of continuous traffic flow data using a wide range of Automatic Traffic Counter equipment (ATC) at our disposal ranging from basic volumetric pneumatic tubes through to a full loop array with PIEZO sensors.

Typically tubes are installed at standard speed and volume sites (less than 60mph) to collect data for 24 hours a day for a continuous period of 7 or 14 days.

Inductive loops are installed at longer term or permanent sites and at standard speed and volume sites (less than 60mph).

ATC's are installed either in isolation or in conjunction with manual or high mast camera data collection, as part of local or wider area volume studies.

We are also well placed to provide long term contract data collection at retail and business premises, which can also be used to determine car parking accumulations through the installation of permanent ATC equipment.



CLASSIFIED TRAFFIC COUNTS

Classified traffic turning or link count data can be collected as:

- Simple Links counts
- T-Junctions
- Crossroads
- Grade Separated Roundabouts (be they small or complex)

Traffic may be classified into a number of categories and we will always be pleased to advise on which is the most appropriate in the context of a particular survey.

Options include:

- Simple two category Lights & Heavies
- Coba 9 (Pcy/Mcy/Cars and Lgv/Ogv1/Ogv2/Psv)
- Coba 10 (Coba 9 plus Taxis)
- DfT approved (13 class) classifications

Time intervals can vary from 30 or 15 to 5 or even 1 minute data blocks as required.

Data collection techniques may include:

- Digital camera with subsequent analysis via either automated or manual observation
- Manual field observation with data recorded onto tally counters or Laptop PC or PDA's
- Automatic Traffic Counters (ATC), typically using pneumatic tubes or loops

Manual collection typically has economic benefits for short duration surveys of say 3 to 4 hours, whilst digital cameras are more cost effective for longer duration surveys. ATC collection is the most suitable for multi-day surveys, with the added capability to record speed profiles.

Manual collection has the added advantage of enabling additional site observations to be recorded simultaneously by the same staff providing enhanced site information that fixed position cameras might not be able to pick up.

Digital cameras with digital recording have the benefit of being able to record an extensive period of footage (i.e. 12/16/24 or 36 hours) at either no, or nominal extra cost, even if core data is only required for an hour or two in peak periods. The additional footage remains available for analysis at a later date if this becomes relevant.



The accuracy of the ATC surveys is dependent on the site characteristics. This method is not suitable for collecting turning count data for example, but is ideal for simple link counts. Data is collected for all passing vehicles, but is then summarised into 15, 30 or typically 60-minute intervals.

REGISTRATION NUMBER PLATE SURVEYS (INCLUDING ANPR)

Vehicle Origin and Destination (O/D) Surveys represent the most complex traffic surveys typically undertaken, but are much in demand given their ability to identify area wide/cordon traffic movements and routings across defined areas.

These surveys typically involve the capture of full vehicle registration plate data at a number of cordon and/or screenline sites, and the tracking of vehicles through an area.

TSP leads the way in the development of digital camera surveying techniques. This technology lends itself perfectly to the conducting of O/D surveys. The advantages of camera applications include:

- Significantly higher accuracy with full Registration Plate recognition
- Data for 95 100% of passing vehicles can be collected
- Accurate journey times (to the nearest second) between sites can be determined
- Capability to undertake continuous 24-hour data collection, using infra red technology

DIGITAL ANPR TECHNOLOGY

We specialise in Origin/Destination (O/D) Surveys via the use of Automatic Number Plate Recognition Systems and subsequent analysis via ANPR readers to provide the detailed analysis required.

BLUETOOTH TRACKING SURVEYS

The application of Bluetooth technology using signals from wireless devices to constantly update the progress of vehicles and pedestrians through time and space has huge potential as a low cost alternative in a range of situations from developing complex vehicle tracking matrices to the simple analysis of queue times at station ticket windows.

The approach is based on identifying the unique addresses of all Bluetooth devices in consumer electronics now carried by increasing numbers of the population either personally or within vehicles. As each emits a unique signal, individuals or vehicles can be tracked through networks of carefully located receivers to provide extensive databases of movements both in terms of route and time.

Data downloading/processing is relatively straightforward but potentially complex in respect of the end product.

Whilst not suitable in all survey situations, TSP recognises the value of this technology through its own experiences and has invested in the most up to date equipment and envisages the application of Bluetooth based surveys as a significant development for the future of many aspects of transport research.

We will be happy to discuss the relevance of this approach in the context of any specific survey requirement.

JOURNEY TIMES SURVEYS

We have undertaken a number of (moving observer) journey time surveys using Portable GPS units, installed in our survey vehicles. This allows for the collection of timing data at pre-determined locations plus information relating to queue times at each feature (signalled junctions for example).

The GPS data is downloaded when the precise OSGR location of the back of the gueue (determined via a significant reduction in speed) and the time of passing the agreed timings point are shown.

A standard Micorsoft[®] Excel[™] spreadsheet is then presented to the client. Additional information on each journey is also provided by the driver via voice activated digital dictaphones with subsequent transcription and presentation as a Word document.

SPEED SURVEYS

Speed surveys are undertaken, typically, for traffic speed control purposes as part of a planning application or a specific road safety issue.

Collection techniques include:

- Radar Speed gun (manually operated)
- Data Logger with pneumatic road tube or other axle sensor, this being the most cost effective method for most long and short term data requirements
- Record Time of vehicles between two predetermined points (see ANPR)
- Video camera and manual or screen analysis via pixilation variation techniques

GPS can also be a useful device for the analysis of speed profiles for certain known vehicles e.g. a bus or tram or ferry, plus the provision of other route-based information and travel times.

VEHICLE OCCUPANCY SURVEYS (MULTI-MODAL SURVEYS)

The recording of the number of occupants within vehicles (private cars or multi-modal) is usually obtained by manual observation.

Vehicles are typically categorised into one or more classifications (car, taxi. bus/coach for example), including hazardous goods or public transport applications. This type of survey is often used as part of the development process of a company's Green Travel Plan.

QUEUE LENGTH SURVEYS

Queue length surveys can require one of several techniques to be applied and thus produce varying data outcomes. The objective of the survey in terms of the key output requirement will dictate what form of data collection is most appropriate.

The most typical approach is the simple observation of recording either how many vehicles are in a queue or the physical extent of the queue just prior to the red signal changing from red to green (or at the minute change for priority sites), with the data being collected per lane and per approach to the feature/junction.

A useful variation is to have preset distance markers set back at intervals from the front of the queue and then to record the times at which the queue meets these markers.

Where queues do not clear in a single green phase, another option is to record the number and or length of queue remaining at the start of the next red phase.

Typically queue length survey data would be collected manually using roadside observers, with one or more staff per junction, depending upon



how many approaches are to be surveyed and the frequency of the observations.

Records may include the extent of the queue on every cycle, or on a maximum observed in a specified time period - 5 or 15 minutes typically.

Given the increasing use of High Mast Camera data collection however, cameras may be positioned at locations on the approach to a junction, such that the length of queues, vehicle delays and often the cause of the queue can be determined without the requirement for any additional manual survey input.

TSP is well placed to advise on the most appropriate technique or combination of techniques for a particular scenario and is committed to the principle of conducting site visits wherever possible as a vital aid to any project proposal submitted to clients.

SIGNAL TIMING SURVEYS

Signal timing data is most often collected by high mast cameras in conjunction with the monitoring of other traffic related observations with the footage subsequently analysed via TV monitors in our specialist data room.

Data that would typically be reported includes all signal change timings within all or a set number of individual phases (usually up to 15) per survey period.

SATURATION FLOW (SAT) AND DEGREE OF SATURATION (DOS) SURVEYS

These observations are also typical components of comprehensive junction surveys and analysis with which TSP are very experienced. Sat and DoS analysis is a critical element of traffic flows and congestion, but is also complex in its execution.

Siva Nagaraiah has unrivalled expertise in this particularly sensitive area of traffic flow analysis and interpretation.

Saturation Flow (Sat Flow) and Degree of Saturation (DoS) data are also typically collected by High Mast Cameras with one camera per approach at each junction being surveyed. Sat Flow and DoS data would be measured for each lane or group of lanes (where the lanes have exactly the same traffic turning and approach profile) and for each period where flow conditions vary.



The minimum length of time when there is saturated discharge across the stop-line for this survey should be 12 seconds. Recordings typically begin at the change from red to amber and then again at the change back to red (recorded to the second) if the approach is fully saturated.

If the saturated discharge finishes part way through the green cycle, the enumerator performing the measurement will be trained to have the experience to recognise the end of saturated discharge and thus end the saturation flow for that cycle.

A maximum of 10 or 15 cycles within the survey period(s) should be surveyed for lanes that are saturated. The cycles selected should be the 10 to 15 most saturated cycles observed within the period and where possible should be evenly spread across the survey period. Where there are less than 10 to 15 observed saturated cycles for any lane, as many cycles as possible should be surveyed, with no data collected where suitable saturated conditions do not exist.

A classified count will be undertaken of all the vehicles that cross the stop line between and including the first vehicle after the lights first turn green and the last vehicle surveyed during the period of saturation. A separate classified count should also be undertaken of all vehicles that cross the stop line after the last vehicle surveyed during the period of saturation and the last vehicle at the end of the green phase.

In addition the exact signal timings (in hours, minutes and seconds) for all signal cycles surveyed will be recorded, including the lights first turning to amber, to green, to amber, to red, and back to amber and then green again (at the start of the next cycle), plus the exact time at which the first vehicle surveyed crossed the stop line, as well as the last vehicle included within the saturation flow measurement and the last vehicle at the end of the green phase.

Example Excel files will be provided for this survey type to help ensure that the client receives the most appropriate output to meet their objectives.

Saturation and subsequently Degree of Saturation surveys are very precise and require a very clear set of parameters to be agreed in advance. Only staff with extensive experience of this type of survey are used to collect this type of data.

PARKING SURVEYS (INCLUDING STREET OCCUPANCY SURVEYS, CAR PARK AND BEAT SURVEYS)

Parking Surveys can entail a variety of techniques and applications. Again this is an area of trafficrelated research where TSP brings an unrivalled level of experience in the planning, execution and analysis of these surveys. Critically we are able to advise on the most appropriate method to meet your needs and which will best achieve the optimum balance between cost and output.

- Parking Accumulation Surveys involve recording the number of vehicles parked within a defined zone or car park at regular, predetermined time intervals. Typically an observer walks a fixed beat counting and recording the number of cars present per zone/section of a car park or street in each time period specified. For closed car park/ cordon locations, the volume of vehicles parked at the beginning and end of the survey and all those that enter and leave the car park/network cordon within the survey period can also be recorded and the variation of in and out movements over time used to calculate a moving accumulation estimate.
- Street Occupancy Surveys involve recording the number of vehicles parked per parking restriction type per road or part of road, either on one or more occasions in a day. Typically this data is collected between 0100 - 0500 on one, two or three midweek days in order to assess the legal and illegal night time/residential demand of the survey area. Survey observation frequency is usually determined by the signed parking time limits within the area being surveyed, e.g. a 1-hour restriction may require observations every hour or every 30 or 15 minutes. Parking zones usually define a specific parking condition or restricted limit, e.g. Disabled Parking, Loading Zone, Taxis Only. An extreme application of this survey would be to have every parking space assigned its own unique identifying number or space code.
- Parking Duration Surveys are undertaken when information is required as to how long vehicles parked in addition to how many are parked. This survey typically involves the recording of a part or the whole of the vehicle registration number plate for all vehicles parked on a predetermined route, as well as the parking space or parking restriction type occupied and the exact location. This data can be collected on an individual space-by-space basis or simply by restriction type per road.

In the majority of cases, the degree of sensitivity contained in the survey output is directly related to the beat frequency e.g. with data typically being collected every 5, 15, 30 minutes or 1, 2, 3 or 4 hours. Again we will ensure that the stated

objectives of the survey are clearly identified prior to survey design and execution/analysis.

The conventional output of such a survey is to depict the demand and duration of stay of vehicles within the sensitivity constraints permitted by the cycle of observations. This may assist to determine a demand profile for a long term car park or the level of misuse of a short stay car park by all day public transport commuters for example. Alternatively it may allow a review of current parking restrictions where for example a one-hour restricted zone may be amended to say a 5-minute parking zone to free up an area outside the front of a newsagent.

The costs associated with undertaking Parking Surveys are proportional to the frequency of the observations/beats and the type of data (counts or registration plates) recorded, so there needs to be a matching of the minimum data need versus budget availability to optimise a survey plan.

Additional information that may be provided as required includes:

- Profile of vehicle accumulation per time interval over the survey period
- Profile of duration demand by time of arrival
- Profile of duration demand by time of departure
- By zone capacity and percentage occupancy with accumulation per cycle time

We can also assist with a combined Origin/ Destination and parking survey, whereby a conventional O/D cordon is established but also includes a parking survey within the cordon, in order to identify travel patterns to and from the parking site whilst also obtaining parking accumulation and duration of stay information.



PEDESTRIAN OR CYCLE CROSSING SURVEYS

Pedestrian/Pedal Cycle Count data is typically collected via digital cameras, with subsequent manual analysis via TV footage. These surveys identify volumes (split by classifications and/or by direction), delay, time taken to cross, obstructions and whether crossing infrastructure is actually used. They can also be used to determine whether or not additional controlled crossing facilities are needed (with the collection of PV2 data) or whether a crossing is actually justified.

They can also be used to determine the level and frequency of conflict between pedestrians/cyclists and traffic at sensitive locations such as outside schools or at high pedestrian volume locations.

PUBLIC TRANSPORT SURVEYS

Typically public transport surveys involve passenger counts and/or interviews.

The passenger counts can include boarding/ alighting counts for buses at bus stops or by observation from the roadside as they pass key locations. These latter observations may be through manual roadside observations, although cameras may also be used in the right circumstances.

At rail/underground/light rail stations these counts may comprise simple station entry/exit counts, board/alight counts on the platforms, or more complex pedestrian circulation surveys across all areas of a major terminus, perhaps requiring teams of 50 or more staff.

In addition to these basic quantitative observations TSP can also carry out a wide range of behavioural observations relating to ticket purchase, retail use and occupancy levels.

At the most sophisticated level of data collection, TSP maintains a team of specially trained interview staff to carry out face-to-face interviews with travellers either at bus/rail stations or on board.

This permits often detailed issues relating to passengers' journeys including origin/destination, trip purpose and frequency, opinions on the guality of service and the availability of alternative modal choice.

Such data may also be collected via the issue/ collection of self-completion questionnaires.

Again the development of a survey strategy may require the right balance of cost/response rate/ quality of response, and TSP is very experienced in explaining the options available and the advantages, or otherwise, of each.



ROADSIDE INTERVIEW SURVEYS (RSI'S)

For wider/larger survey areas, and where trip purpose and frequency information with exact origin and destination postcodes are required, the Roadside Interview Survey (RSI) is often the most effective survey type.

RSI surveys take a great deal of time to plan and organise, are quite labour intensive requiring significant and lengthy liaison with other organisations, including the Police and the Local Authority, both in the selection of sites and the approval of traffic management plans.

The output from this survey type however provides extensive and detailed information on vehicle movements into and out of a survey area, as well as some insights into driver behaviour.

TSP directors have extensive experience in the management of RSI-led projects and will be happy to advise on their suitability in meeting the objectives of a specific project.

HOUSEHOLD INTERVIEW SURVEYS

Where travel and profile/behavioural information is required in greater depth, particularly where the participation of the whole household is required, then the household survey is a useful survey tool. This may involve random face-to-face interviews conducted on the doorstep along a transport corridor for example. Where extensive information is required, including travel diaries for instance, it is preferable to adopt an approach whereby survey forms are left with the household for collection at a later time.

TSP backed by its network of interview trained staff is well versed in a wide range of applications of this survey approach and will be pleased to discuss the pros and cons of a whole range of potential possibilities.

The quality and depth of information that can be achieved by this approach compensates for the time and resources required to set the survey up.

PROJECT MANAGEMENT

Transport data collection and analysis are the main activities of TSP. We are able to demonstrate expertise covering a wide range of transport related surveys.

For every project, large or small, our directors are personally involved from planning to output, thus guaranteeing the quality of your survey from inception to delivery.

High quality traffic data is a vital input to every aspect of the planning process. At TSP, it is our aim to deliver quality data in a comprehensive, economical and efficient way.

Client liaison and subsequent reporting are managed from our regional office in London.

TSP would propose to complete all elements of survey work in-house, and will not outsource any elements of the proposed survey work programme. TSP employs a managed and controlled approach to producing high quality data.

CONTACT US

In order to receive a fixed price quotation, simply e-mail **enquiries@trafficsurveypartners.co.uk**

or call us on **020 7625 2883** with your survey specification together with any supporting maps or photographs where appropriate.

If you only have a general idea of your requirements, we will be pleased to review them and will come back with our suggested survey approach with a range of costs for you to review.

www.trafficsurveypartners.co.uk

