Annex W - Full Methodology

Introduction

This document should be read in conjunction with the full consultation document.

The purpose of this analysis is to establish which subsidised bus services are best value for money, and which are worst value. The fundamental metric used to establish “value for money” is “cost per address served uniquely by subsidised bus”.

Bus services can be ranked based on this metric. This ranking will determine which services should be prioritised with the limited budget available, and for which the subsidy should be removed. The number of services affected will be based on the savings required under the new bus subsidy budget.

Assumptions

Some assumptions were made as part of this analysis:

- The need for transport is uniformly distributed across population (more specifically, uniformly across addresses)
- Different customer needs can be satisfied by bus services at different times of day
- In general, the population will remain relatively static over the next five years. Where necessary, Section 106 and Community Infrastructure Levy agreements will ensure additional transport is provided to growth areas.
- Subsidy Contract Value is perfectly spread across all 52 weeks of the year.
- Where a contract contains multiple services, subsidy contract value is evenly spread across these services (and across all stops served by these services).

Exclusions

Where observed, certain attributes were ignored or excluded from the analysis.

These were:

- External funding sources such as Section 106, Community Infrastructure Levy, and Department for Transport funding. These are not candidates for cost reductions. The expectation is that when these funding agreements expire, the services will be run commercially.
- Community Transport services were left intact, in line with wider Oxfordshire County Council policy direction.
- Dial-a-ride and other similar schemes were not included in this part of the analysis.
- Bus service timetables are never entirely static. Any services not listed in the master timetables were factored in wherever possible, but any subsequent changes to timetables will not be reflected.

How many addresses are served uniquely by each subsidised bus stop?

To arrive at the index for ranking subsidised bus services, two key datasets were used within Tableau and MapInfo software.

The first data set contains timetable data for all bus services operating solely, or partly, within Oxfordshire County. This data is owned by Oxfordshire County Council (OCC) and made publicly available via Traveline. The *Public Transport Info & Infrastructure Team* own this data within OCC. On top of this data subsidy contract information was layered, owned and provided by the *Subsidised Bus Service Team*.

The second data set contains every address in Oxfordshire. The data was obtained from Ordnance Survey (their *Address Point* data set). An address is defined as a postal address (a set of geographic coordinates, from a list of every postal address by Royal Mail).

Bus timetables are never static, and subsidies undergo routine reviews. The bus subsidy and timetable data analysed was the most up-to-date version available at the time of the analysis.

With this data, the first step was to calculate whether the addresses are served by commercial bus services. To do this, the address point data was plotted on a map. A 400 metre zone (straight-line distance) was created around all bus stops served by at least one commercial bus service.

Historically Oxfordshire County Council has used 400 metres as a “reasonable” walking distance. It was decided that this distance fit well with our analysis for three reasons:

1) It is a tried and tested distance applicable to Oxfordshire
2) It fits more appropriately than any alternative further distance for serving “vulnerable” customers as it is a shorter distance to walk.
3) This analysis uses “crow flies” distance and so walking distance may be slightly further than 400 metres in some cases.

The alternative considered was 640 metres (approximately an 8 minute walk at 80 metres per minute), used by Transport for London throughout their Public Transport Accessibility Level analysis (PTAL).

If an address falls within this zone, it is treated as being *served by Commercial Services*.

These addresses are then removed from the analysis.

Addresses that are not served by a commercial service remain. The process is repeated for stops served by subsidised bus services. This is to calculate how many addresses are served by each subsidised service (that are not already served by commercial services).

For each subsidised bus service stopping point, the number of addresses served is counted. Each subsidised bus stop now has a number associated with it, called the **Address Score**.

In cases where an address falls into multiple overlapping circles, its count is allocated to the nearest bus stop.

Time Bands

Due to the nature of the needs of the customer, as well as the variability of bus timetables, this entire process was carried out three times for different times of day and week. These were termed **Time Bands**.

To prioritise a time band, all services stopping within the times are assessed and scored, but any service or stop outside is not included. This provides a separate ranking table for each.

The time band categories are:

- **Weekday Daytime**: 09:30-16:00 Monday-Friday
- **Weekday Peak Times**: 06:30-09:30, and 16:00-19:00 Monday-Friday

- **Weekday Evening/Night, and Weekend**: 19:00-06:30 Monday-Friday, and all times on Saturday, Sunday, and Bank Holidays

If a bus stops at a location within any given time band, then all addresses within 400m from that stop are considered to be served by that bus. This means that addresses can be served or not served depending on the time band. For example, addresses often have no services available at the weekend or at night, but they do during the day. Every time band is assessed independently of one another.

This means that if a commercial bus service stops at a location within a specific time band, then any subsidised services that stop at the same location within the same time band will effectively be given a zero for their address score for this stop. This is because the subsidy is not serving the addresses uniquely within that time of day. In other words, the addresses have a commercial alternative.

The time bands are based on two core principles:

- The first is that they align with customer needs. Different types of people travel at different times of day and week. As part of the analysis we aimed to provide options based on different customer types and assess the impacts associated with them. People who might be considered as "commuters", for example, tend to travel at peak times. "Vulnerable" or elderly people tend to travel during the day to access services and go shopping, and people travelling for "leisure" often travel at the weekend or in the evening.

- The second is that they coincide with time brackets used for bus and rail travel by Transport for London (see http://www.oyster-rail.org.uk/peak-or-off-peak/ for more information). The time definitions are therefore supported more widely across the industry.

Arriving at the Ranking: Cost Index

As a result of the above steps, every subsidised bus stop has a count of uniquely served addresses for each time band. This is called the **Address Score.** From this we wish to rank the bus services, by creating a **Cost Index**.

As mentioned in the introduction, we want to rank the services based on "cost per address served uniquely by subsidised bus". It is therefore necessary to next assign cost to services based on current subsidy contract costs.

The first step is finding **Cost per Stop Visit**. This value is calculated by totalling the number of stops a service has per year and dividing the annual contract cost by this. The number represents a cost for every time a subsidised bus visits a stop.

For each subsidised service the **Address Score** is summed for the time band. This is because each service will visit many stops, each of which can have a different address score.

The service **Cost per Stop Visit** is then divided by service **Address Score** to give the **Cost Index**, which represents the ranking of cost per address per stop. In other words, it shows whether a service is “value for money” in terms of how many unique addresses it serves compared to the cost required to serve them.

This should be considered an index and not an actual cost because of the way costs have been uniformly distributed across contracts (as outlined in the *Assumptions* section above).

Once the process is completed, every subsidised bus service has a **Cost Index** associated with it, from which they can be ranked.

Determining Service Risk Level

With a ranking of services generated for each of the proposed options, the next step is to sort the list by the **Cost Index** so that the best value services are at the top and worst are at the bottom. By working down the list, it is possible to define which subsidised services should be prioritised for any future funding.

The Risk level is allocated to each service to indicate how services will be prioritised. Very Low risk is given to services that are exempt from the ranking (as described above). Low, Medium, and High risk are given to services that serve addresses with no commercial alternative during the specified time band. These three categories are evenly divided between these services. Very High risk is given to services that have a zero Address Score during the specified time band.