

## Workshop 3: Resources and Techniques for Connected Area Surveys

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### Introduction

The workshop endeavoured to identify all sources of data which could enable connected areas to be assessed. Each data source was discussed to determine its accuracy and reliability; time and cost required to obtain the data; difficulties encountered; applicability to different types of model and catchment; and effects on the verification process.

### Source of Data

The following sources of data were identified:

1. O.S. maps and sewer records.
2. Local knowledge (e.g. sewer gangs, property owners).
3. Local Authority Archives (planning, building, highways).
4. Historical Data.
5. Flow Surveys.
6. CCTV Surveys
7. Local topography and geology
8. Aerial photography (colour and b/w).
9. Aerial imaging (multi-spectral scanner).
10. Field Surveys.

### Discussion

It was considered that none of the first eight of these sources could, in isolation, provide all the data required.

Good quality up-to-date O.S. maps are clearly essential for accurate measurement but do not identify actual impermeable areas. Aerial photography can assist in updating maps.

Local knowledge and archive data can provide a basic understanding of the system but cannot necessarily be relied upon as accurate.

CCTV surveys can provide detailed information on connections.

Flow survey data can provide an indication of which areas are totally separately sewered.

Aerial multi-spectral scanning provides an accurate picture of the total impermeable area within a catchment but does not identify, for partially separately sewered areas, those areas which connect to the system being modelled. Final measurement of areas can be fully automated using this technique.

Field surveys are regarded as an essential part of the data gathering process.

### Conclusions

Overall it was concluded that the most economic method of obtaining this data is to use all available sources to provide a preliminary assessment of which areas are separate/partly separate/combined and to concentrate the field survey resources on the most significant subcatchments.

It is not economic to carry out a complete survey of all roads and buildings. An overall average of 10% was considered to be sufficient with the percentage varying according to the area (low in separately sewered catchments, higher for combined and partly separate areas).

It was noted that the field survey work relied on skilled and experienced personnel, but was often tedious and problematic, particularly in view of public relations difficulties.

The use of contractors was discussed, and it was generally accepted that quality control was difficult to achieve in the absence of a standard specification, and an agreed method of backchecking results.

Typically between half a day and two days are required to survey each 1:1250 map at a cost varying between £10 and £25 per hectare.