



RESEARCH SUMMARY

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Implementation of Source Control SUDS in Scotland

Introduction

The 21st Century witnessed a revolution in drainage practices in Scotland with the implementation of sustainable drainage systems (SUDS). The uptake from traditional drainage to SUDS has happened in a relatively short timescale with Scotland being regarded as frontrunners in the UK. This rapid transition to SUDS has been facilitated by a stakeholder platform entitled the Sustainable Urban Drainage Scottish Working Party (SUDSWP) which has promoted their use since 1997.

One of the key benefits of SUDS is that they are designed to mimic natural drainage processes and this entails managing rainfall in stages as it drains from developed land. Collectively this process is known as the stormwater treatment train. The first stage is source control with stages two and three being site and regional controls. Source control SUDS manage rainfall events as close to the source as possible (where the rain falls). Site and regional control SUDS are larger downstream structures which manage larger rainfall events and provide additional pollutant removal when required. Site and regional control SUDS are now 'business as usual', however the uptake of source control SUDS as part of a stormwater treatment train is less routine than expected with developers favouring site and regional controls.

The Scottish Government identified in the Future Directions for Scottish Water Consultation (2009) that an increase in source control measures will be fundamental to solving diffuse pollution problems in urban areas and to assist in the realisation of the Hydro Nation Agenda. Scottish Water and Local Authorities have also identified that source control measures are required for delivering surface water management plans to support the Flood Risk Management (Scotland) Act 2009. Considering these ministerial and institutional aspirations and the benefits provided by source control, this study has been commissioned by SUDSWP via the Centre of Expertise for Waters (CREW). The study reviews the background to source control and appraises delivery on a global scale. Using these findings the next steps for progressing the SUDS journey in Scotland are defined.

Key Points

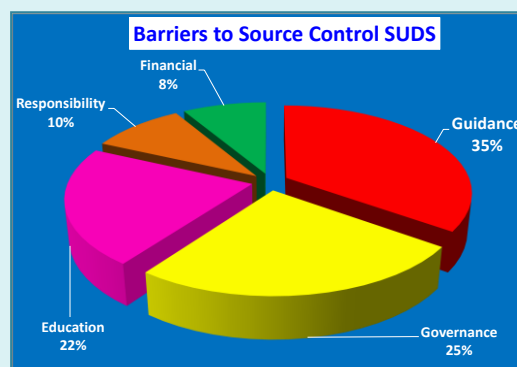
This research established that Scotland has benefitted from a strong legislative and regulatory regime that has assisted SUDSWP in driving the transition agenda from traditional drainage to SUDS. However Scotland has weak enforcement of regulatory requirements and inspection policies. This is resulting in reluctance by practitioners such as developers to implement the systems, particularly emerging techniques such as rain gardens and green roofs which are mainstream in other countries. In the past, Scotland benefitted from research partnerships (Scottish Universities SUDS Monitoring Programme) which validated the source control techniques such as swales and permeable paving, now considered mainstream across the country. This enabled SUDSWP in collaboration with CIRIA to develop national guidance for SUDS in 2000. We have established that there are three key areas of opportunity for encouraging the future implementation of source control and that the source control toolkit is expanding as new knowledge becomes available. We also identified several key barriers or disabling factors.

Key enabling factors and areas of opportunity:

- Multi-functional source control in open areas and margins (local streets).
- Unit plot source control.
- Areas designated for regeneration / retrofit projects.

Key barriers:

- Guidance – clarity on technical issues, terminology and policies.
- Governance – fragmented inter-agency collaboration and funding mechanisms.
- Education – best practice case studies for emerging techniques.
- Responsibility – maintenance and health and safety.
- Financial – land take / use and construction / maintenance costs.



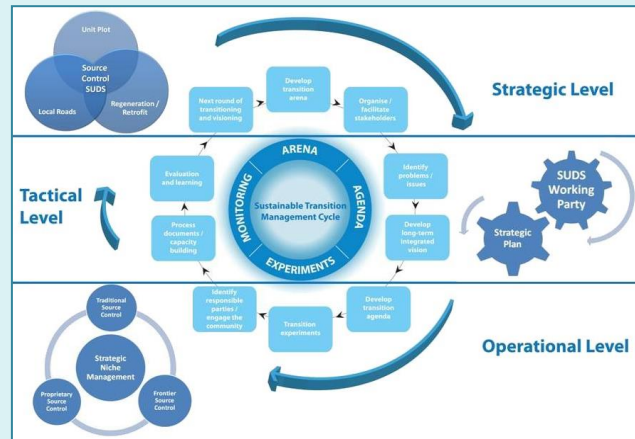
Research Undertaken

The objectives of this research were threefold:

- Review the background to source control including the history, various types and options.
- Appraise how source control is being delivered, within the UK and Worldwide, and comment on the approach of various responsible organisations and professional groups in Scotland.
- Define the next steps including comments on optimal source control and further considerations and recommendations.

Research Activities

- Literature reviews for tracking the evolution of source control SUDS and appraisal of delivery by responsible groups in Scotland and Worldwide. This was supported by application of international experience from the research team and utilising existing networks.
- Development of technical reports and case studies to identify traditional and emerging source control techniques, why and how they were implemented in Scotland and Worldwide. Fifteen source control techniques were identified and seven countries appraised in their delivery of the systems.
- Workshop held for the national SUDS Working Party of stakeholders, supported by additional representatives of key sectors.
- Online and semi-structured interviews held with practitioners in the UK to gain anecdotal information and further identify barriers and potential solutions.
- Based on findings a transition framework was developed for SUDS Working Party to focus, orientate and guide activities for the realisation of the end goal – furthering the uptake of optimal source control SUDS in Scotland.



Policy Implications

Due to the composition and diverse backgrounds of the stakeholders in the SUDS Working Party, the group are in a position to continue to facilitate the development of 'common ground'. This could result in an integrated guiding function to influence change towards increased uptake of optimal source control SUDS. Barriers and potential solutions defined through this study which SUDS Working Party may directly undertake or drive, by collectively influencing policies and practices include:

1. **SUDS Working Party** - develop a shared long-term vision which identifies aspirations (especially statutory requirements) and where drivers and funding can be aligned between institutions and organisations.
2. **SUDS Working Party** - develop a strategic plan with a timeline of 10-15 years to facilitate realisation of the shared long-term vision using the land use opportunities and source control toolkit identified in this study. Shorter term (2-3 year) milestones should also be used to bring policies in line with statutory remits. The longer term goal reflects WFD timetables for catchment scale improvements.
3. **Scottish Government** – National SUDS project in recognition of the new flood prevention and management requirements of local authorities, alongside those of SEPA, (plus other stakeholders including Scottish Water), which add a new impetus to the provision of SUDS. A national inspection programme, with detailed development of asset register databases in example pilot local authority areas, would be a significant step forward and is strongly recommended. A short-term (2-5 yrs) SUDS Inspection Programme would provide the evidence base against which future actions and improvements can be measured.
4. **All public bodies with statutory responsibilities and remits that encompass SUDS** - In parallel with, and informed by a fixed term Scottish Government project above, each organisation with a statutory remit which encompasses SUDS should be encouraged to develop and implement their own inspection and enforcement policies in line with their specific SUDS remits, as follows:
 - **Planning Authorities** – for a sample of approved developments every year, inspect and report on the establishment of features specified in the planning consent. Report also on amenity and compliance with other aspects of SUDS largely out with the remit of the organisations below.
 - **Roads Authorities** – ensure policies require assessment of SUDS in the roads appraisal prior to adoption. Report findings.
 - **Local Authority Building Standards** - ensure policies require assessment of SUDS in the percentage of developments subject to inspection each year. Report findings.
 - **Scottish Water** – continue to undertake pre-adoption inspections and report annually on findings. Report annually on inspections of vested SUDS (all 'public SUDS' as defined in the WEWS Act 2003 in new developments).
 - **SEPA (Environmental Regulation)** – inspect a percentage or target a minimum number of SUDS facilities established for new developments each year. Each SEPA pollution control team should have a target number of inspections, but catchments at risk of ecological status failures associated with planned urbanisation will require a greater degree of inspection of the SUDS measures designed to prevent that (i.e. risk based effort).
 - **All above (Local Authorities, Scottish Water and SEPA)** should report annually on SUDS in relation to their duties

under the Nature Conservation Act 2004.

5. **Scottish Government Building Standards Division** – ensure statutory duties are not ignored. Using the SUDS Inspection Panel findings arising from the Scottish Government project suggested above, further encourage Local Authority Building Standards and other departments to take a more active role in monitoring the design and development phases by following up with sign-off / inspection programmes.
6. **Scottish Government** – the findings of surveys and interviews undertaken for this work indicate a need for source control guidance for planners and developers in Scotland: simple terminology; clarification of levels of treatment; stormwater treatment train and distributed functionality across a development; and different aspirations for combined sewer catchments in comparison with separately sewered ones; exemplification of applications in various types of development; clarity regarding shared source control SUDS features and unit plot measures.
7. **Scottish Government** - establish “unit plot SUDS” as a recognised term in planning guidance.
8. **SUDS Working Party** – based on the SUDS Inspection Panel findings arising from the proposed national SUDS project, consider any need for amendments to statutory requirements (e.g. perhaps Building Standards Regulations or GBRs to prevent damaging changes to source control SUDS at unit plot level), or improvements to vesting standards and guidance to better meet multiple benefits and statutory duties such as the Nature Conservation Act 2004.
9. **SUDS Working Party** – explore opportunities to promote positive messages and disseminate information to stakeholders and developers, for example co-organising conferences and partnering other organisations in their events (e.g. Scottish Hydraulics Study Group, SUDSNet, CIWEM Scottish Branch). Bring international case studies of long-established sites to the attention of members and wider stakeholder audience that way.
10. **SUDS Working Party** – partner with others and/or arrange own site visits for members to see source control examples in Scotland.
11. **Scottish Government / SUDS Working Party** – explore opportunities for a broad sector and public awareness raising campaigns to fit with the need for flood asset registers and provision of source control SUDS. Consider the Melbourne Water “10,000 Raingardens – be a part of protecting your water environment” initiative as a practical option for Scotland.
12. **Scottish Government / CREW / SUDS Working Party** – encourage / re-establish research partnerships to validate the emerging source control techniques which meet the aspirations and needs of dense developments and retrofit situations. Assess a selection of source control systems which are mainstream in other countries but not in Scotland, as they are implemented, as undertaken at the outset of SUDSWP and the parallel Scottish Universities SUDS Monitoring Project.

Scottish Government. (2009a). Implementing the Water Environment and Water Services (Scotland) Act 2003: Scotland's Water: Future Directions: A Consultation. ISBN: 978 0 7559 1911 6.

Scottish Government. (2009b). The Flood Risk Management (Scotland) Act 2009 (asp 6).

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