

Calculator: SUDS Whole Life Cost and Whole Life Carbon Tool

<http://www.scotsnet.org.uk/best-practice.php>

Summary

Halcrow was commissioned by SCOTS and SUDSWP to develop a whole life costing and whole life carbon tool for Sustainable Urban Drainage Systems (SUDS). The tool will allow designers, developers and local authorities to cost and compare the construction and maintenance costs and carbon emissions of various SUDS schemes.

Developers: Please note that this tool was developed by Halcrow who were acquired by CH2M HILL in 2011. Halcrow is now known as CH2M HILL

Applicable sectors							Themes		
All Infrastructure	Buildings	Roads	Water	Energy	Transport	Construction	Materials	Ecology	Wastewater
							Potable Water	Carbon/GHG	Other
Countries	Worldwide					Access	Free to download		
Compatibility with other tools	Other whole life carbon and costing tools.					Guidance for Users	A user guidelines document is available with the tool, which provides templates on data requirements for the tool and how to use the tool. This tool is a supplement to the SUDS for Roads guidance, produced by SUDS Working Party and SCOTS in 2010, which is a design guide for implementing SUDS in road design.		
Inputs & Outputs	<p>The tool was tested by a number of CH2M HILL engineers and engineers from the key sponsors, with any corrections made to ensure robustness of the tool.</p> <p>A key part of periodic maintenance activities is de-silting of swales, ponds, permeable block paving, basins & wetlands. The tool calculates annual sediment generated from upstream catchment, and sediment deposited in SUDS based on sediment removal efficiency. When % siltation reaches a defined threshold (as a % of volume) de-silting is assumed to take place. The sediment removal model therefore automatically calculates frequency & volume of de-silting. This is a major maintenance cost.</p> <p>Various outputs are available in the tool, including the share of whole life cost and whole life carbon among construction and maintenance activities. This is important for stakeholders, as the property developer is the entity responsible for construction, while the local authority is responsible for maintenance. The preferred decision about which SUDS treatment to select selection decision may vary between the two organisations.</p>					Methodology	<p>The tool is based on engineering first principles using standard industry pricing guides. It calculates capital and maintenance costs and, in turn, the whole-life cost of a SUDS treatment. At the same time, it automatically calculates embodied (capital) carbon emissions and operation and maintenance carbon emissions, thus whole life carbon. Carbon emissions are obtained from CESMM3 and fuel emissions from the Department for Environment, Food and Rural Affairs.</p> <p>The user can, however, enter their own unit costs if they have them available from previous projects.</p>		
						Data intensity & flexibility	<p>The whole-life cost and whole-life carbon toolkit has many benefits. It allows users to develop a SUDS treatment train (up to three levels of treatment) to compare the whole-life cost and whole-life carbon of different SUDS approaches within a development site. Users are able to identify the optimal SUDS features based on capital, operational and carbon costs, and these form part of the SUDS selection criteria for design of SUDS for highway drainage schemes. The toolkit...</p>		

Note: "Free to download" does not necessarily imply that it is free for commercial use.

Database library	<p>The tool contains unit costs and carbon emissions factors for the construction and maintenance of SUDS schemes. Unit costs come from SPONS Pricing Book, while carbon emissions are obtained from CESMM3 (Civil Engineering Standard Method of Measurement) and fuel emissions from the Department for Environment, Food and Rural Affairs.</p>	Data intensity & flexibility (continued)	<p>... provides a detailed breakdown of capital and operational costs and thus provides the evidence base to inform early discussions between developers and adopting authorities (for example, local authorities or Scottish Water) about the trade-off between capital and operational costs of different SUDS approaches.</p> <p>This tool was developed for Scotland, but the same principles can be applied in other countries, using different pricing books.</p>
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