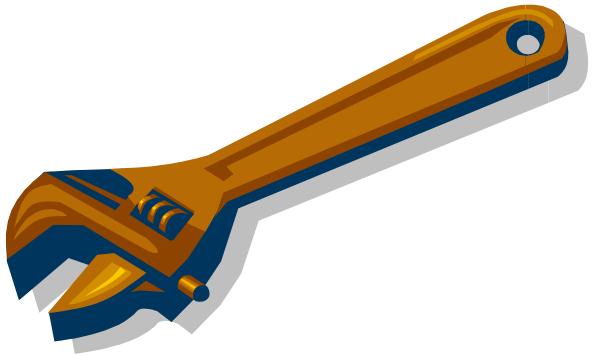
SuDS Tools



Roads, BeST and Simple

- Basic
  - SuDS for Roads Whole Life (and Carbon) Cost Tool
  - Over-run from S4Rds Project
  - 2010'ish
- BeST – Benefits from SuDS Tool
  - CIRIA
  - 2015
- SIA – Simple Index Assessment
  - SEPA
  - 2016

SuDS4ds - Whole Life Cost Tool

- Provides good indicative costs for SuDS
- Easy to learn and apply
- Useful carbon module as integrated benefit
- Not all SuDS – it's for roads, so no green roofs for example!

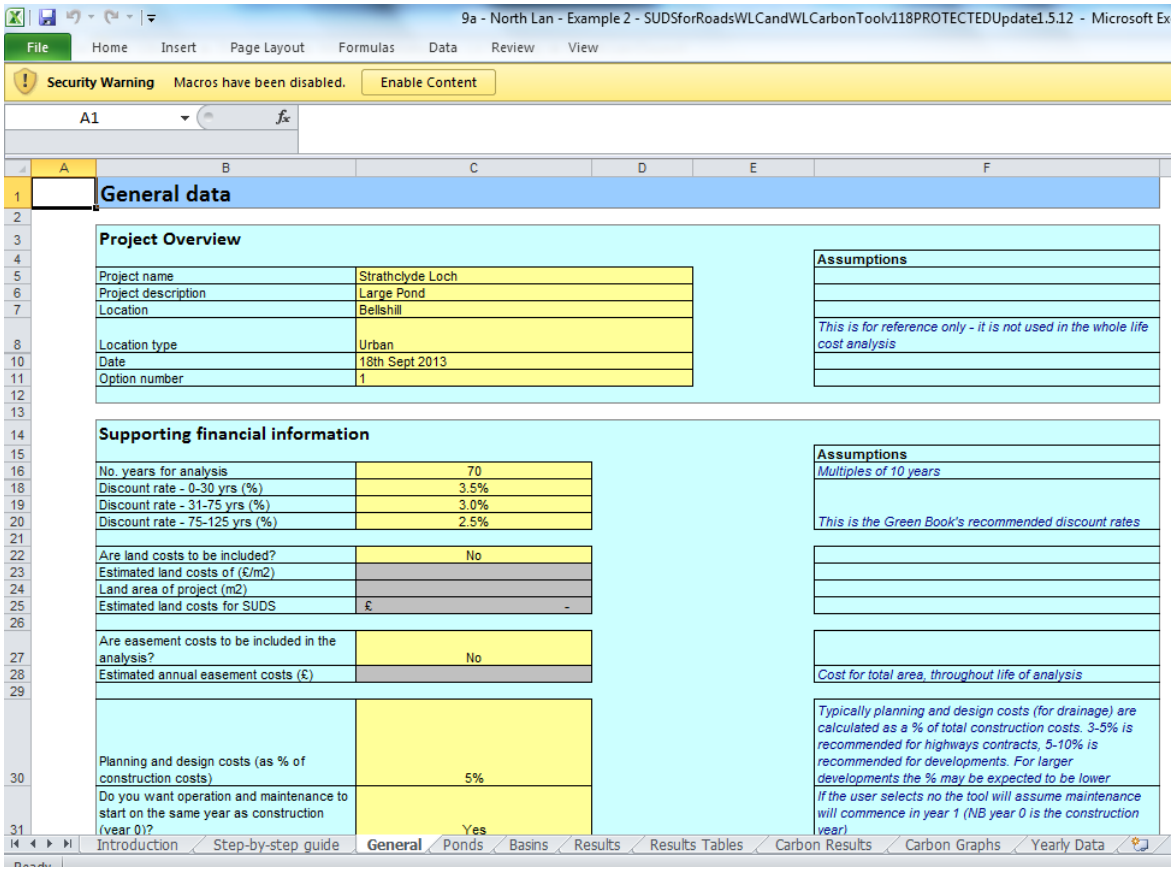
- Available at;

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

SUDS4Rds – WLC

Provides Indicative Costs for Various SuDS throughout life cycle

SuDS4RDs WLC Tool



Simple Index Assessment Tool

For Water Environment Quality & Protection

- SEPA Tool to assess adequate SuDS measures for water quality
- Basic scoring approach for hazard
- Countered by SuDS provisions

- Can be downloaded at;

http://www.susdrain.org/resources/SuDS_Manual.html

Designing for Water Quality - Simple Index Approach

- Land use defines **Pollution Hazard Index**
- Different SUDS have differing potentials to reduce different pollutants
- SuDS provide **Mitigation index**
- CIRIA/HRWallingford has developed an Excel tool to assist with the assessment

Table 26.2 Pollution hazard indices for different land use classifications

Land use	Pollution hazard level	Total suspended solids (TSS)	Metals	Hydro-carbons
Residential roofs	very low	0.2	0.2	0.05
Other roofs (typically commercial/industrial roofs)	low	0.3	0.2 (up to 0.8 where there is potential for metals to leach from the roof)	0.05
Individual property driveways, residential car parks, low traffic roads (eg cul de sacs, homezones and general access roads) and non-residential car parking with infrequent change (eg schools, offices) ie < 300 traffic movements/day	low	0.5	0.4	0.4
Commercial yard and delivery areas, non-residential car parking with frequent change (eg hospitals, retail), all roads except low traffic roads and trunk roads/motorways(1)	medium	0.7	0.6	0.7
Sites with heavy pollution (eg haulage yards, lorry parks, highly frequented lorry approaches to industrial estates, waste sites), sites where chemicals and fuels (other than domestic fuel oil) are to be delivered, handled, stored, used or manufactured; industrial sites; trunk roads and motorways(1)	high	0.8(2)	0.8(2)	0.9(2)

(1) Motorways and trunk roads should follow the guidance and risk assessment process set out in HD45/09 (Highways Agency, 2009)
(2) These should only be used if considered appropriate as part of a detailed risk assessment – required for all these land use types (Table 4.3). When dealing with high hazard sites, the environmental regulator should first be consulted for pre-permitting advice. This will help determine the most appropriate approach to the development of a design solution.

Table 26.3 Indicative SuDS mitigation indices for discharges to surface waters

	Mitigation indices [1]		
Type of SuDS component	**TSS**	**Metals**	**Hydro-carbons**
filter strip	0.4	0.4	0.5
filter trench	0.4 [2]	0.4	0.4
swale	0.5	0.6	0.6
bioretention system	0.8	0.8	0.8
permeable pavement	0.7	0.6	0.7
detention basin	0.5	0.5	0.6
pond [4]	0.7 [3]	0.7	0.5
wetland	0.8 [3]	0.8	0.8
proprietary treatment systems [5, 6]	These must demonstrate that they can address each of the contaminant types to acceptable levels for frequent events up to approximately the 1 in 1 year return period event, for inflow concentrations relevant to the contributing drainage area.		

Total SuDS Mitigation Index (for each contaminant type) ≥ **Pollution Hazard Index** (for each contaminant type)

Total SuDS Mitigation Index = Mitigation Index $_1$ + 0.5 (Mitigation Index $_2$)

Where:

Mitigation Index $_n$ = Mitigation Index for Component 'n'

A factor of 0.5 is used to account for the reduced performance of secondary or tertiary components associated with already reduced inflow concentrations

- Expect source control in addition

Simple Index Approach Tool

Timescales

- RM08 to be changed
- Launched 12 November
- After 31 May – only SIA acceptable

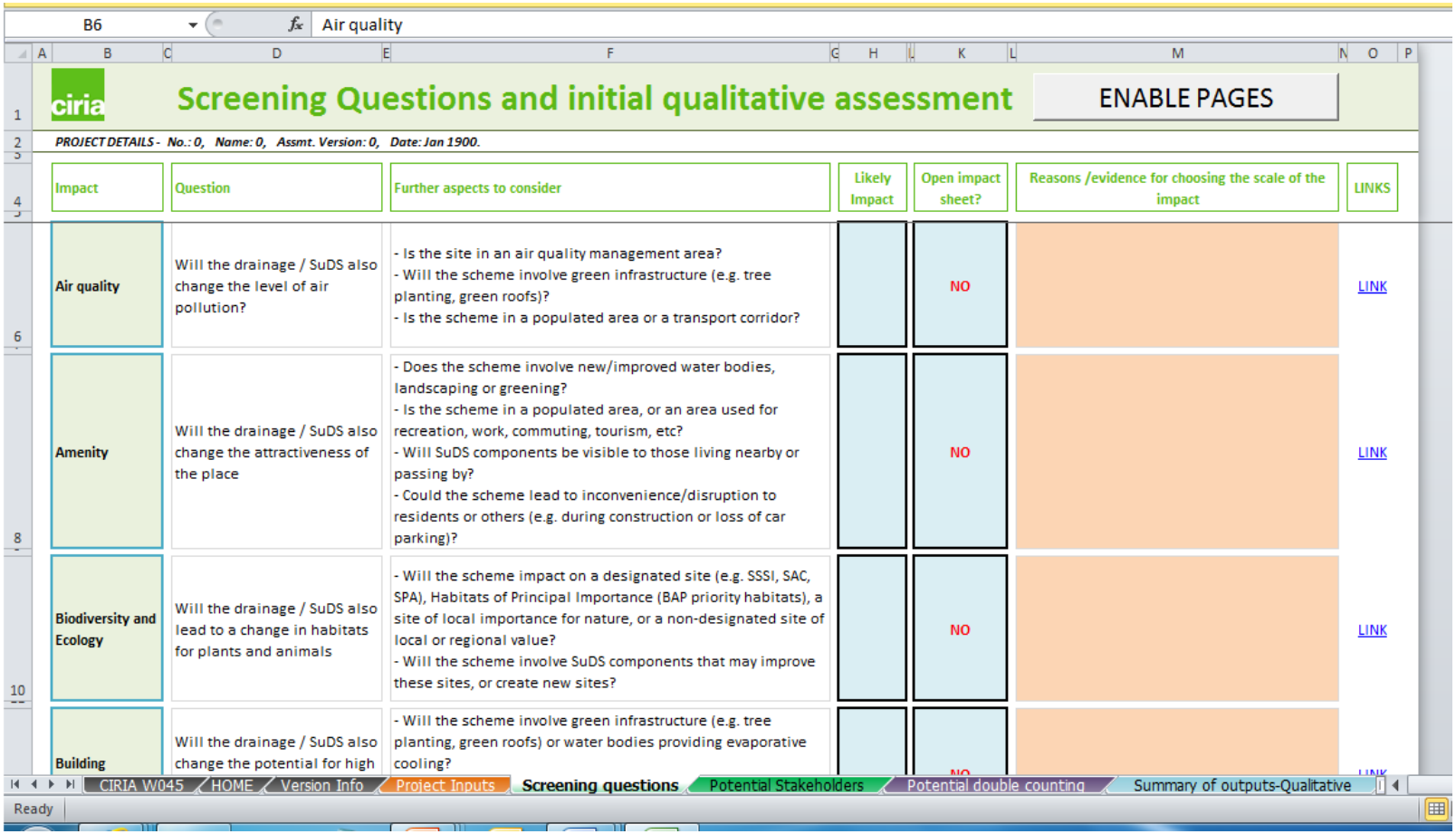
Benefits of SuDS (BeST) Tool

- Very useful tool but takes time to grasp
- Comprehensive spreadsheet
- Better for real developments, i.e. serious proposals
- CIRIA development

BeST Tool

- Available free (but need to register) from;

http://www.susdrain.org/resources/best.html



- Considers 19 possible “Impacts” that SuDS can provide benefits to

Glasgow SWMP Case Study
Available from website at
http://www.susdrain.org/files/resources/BeST/best_case_study_glasgow_swmp.pdf

Table 1: Summary of results

Present Value Assessment Stage	Total PV Benefits	Total PV Costs	Net Present Value	Benefit Cost Ratio
Present Value before confidence applied	£69,858,591	£26,833,659	£43,024,932	2.6
Present Value after confidence applied	£62,707,500	£26,833,659	£35,873,841	2.3
Present Value sensitivity - low				
Present Value sensitivity - high				

BeST Case Study - Glasgow

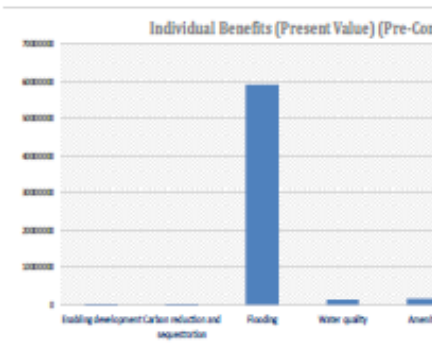


Figure 1: Breakdown of benefits per cate

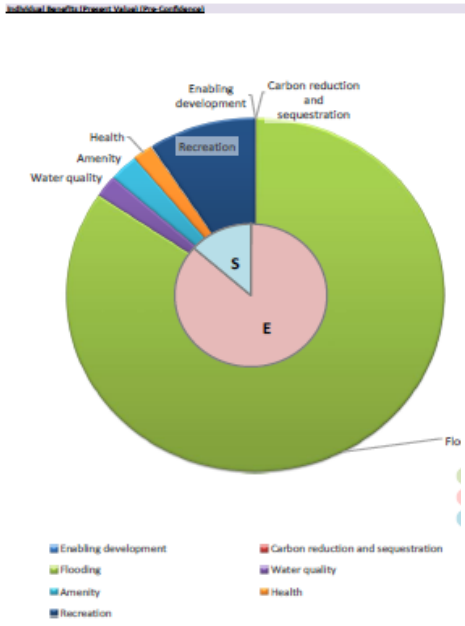
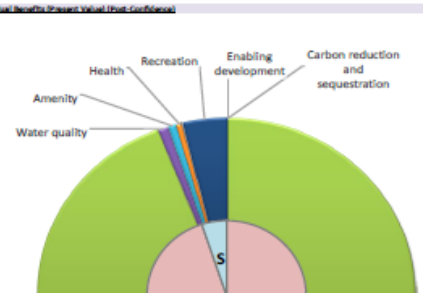
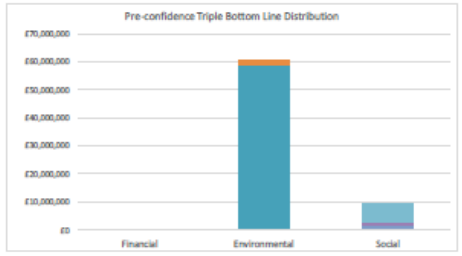


Figure 2: Distribution of benefits pre (left) and post (right)



BeST Case Study - Glasgow



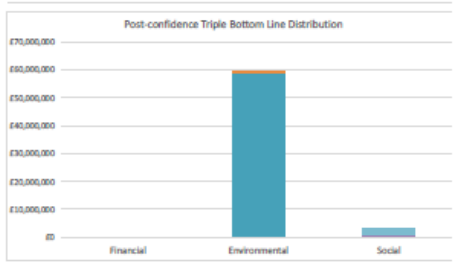
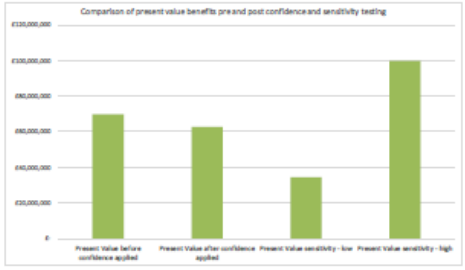


Figure 3: Breakdown of benefits under triple bottom line categories pre (left) and post (right) confidence



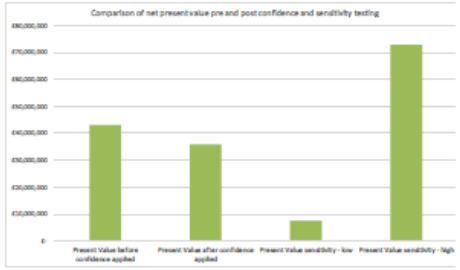


Figure 4: Comparison of benefits present value (left) and net present value (right) for pre and post confidence and sensitivity testing.

Visualisation Tools

Good for Community Engagement and Elected Member Sessions

Questions?

Discussion?

Notes?