



Surface Water Management Plans more than just modelling

Martin Osborne

Technical Director – Wastewater Asset Management



Contents

- **Drivers and scope of SWMPs**
- **Methodology**
- **Modelling**
- **Verify model results**

- **Lessons learned**
- **The future**



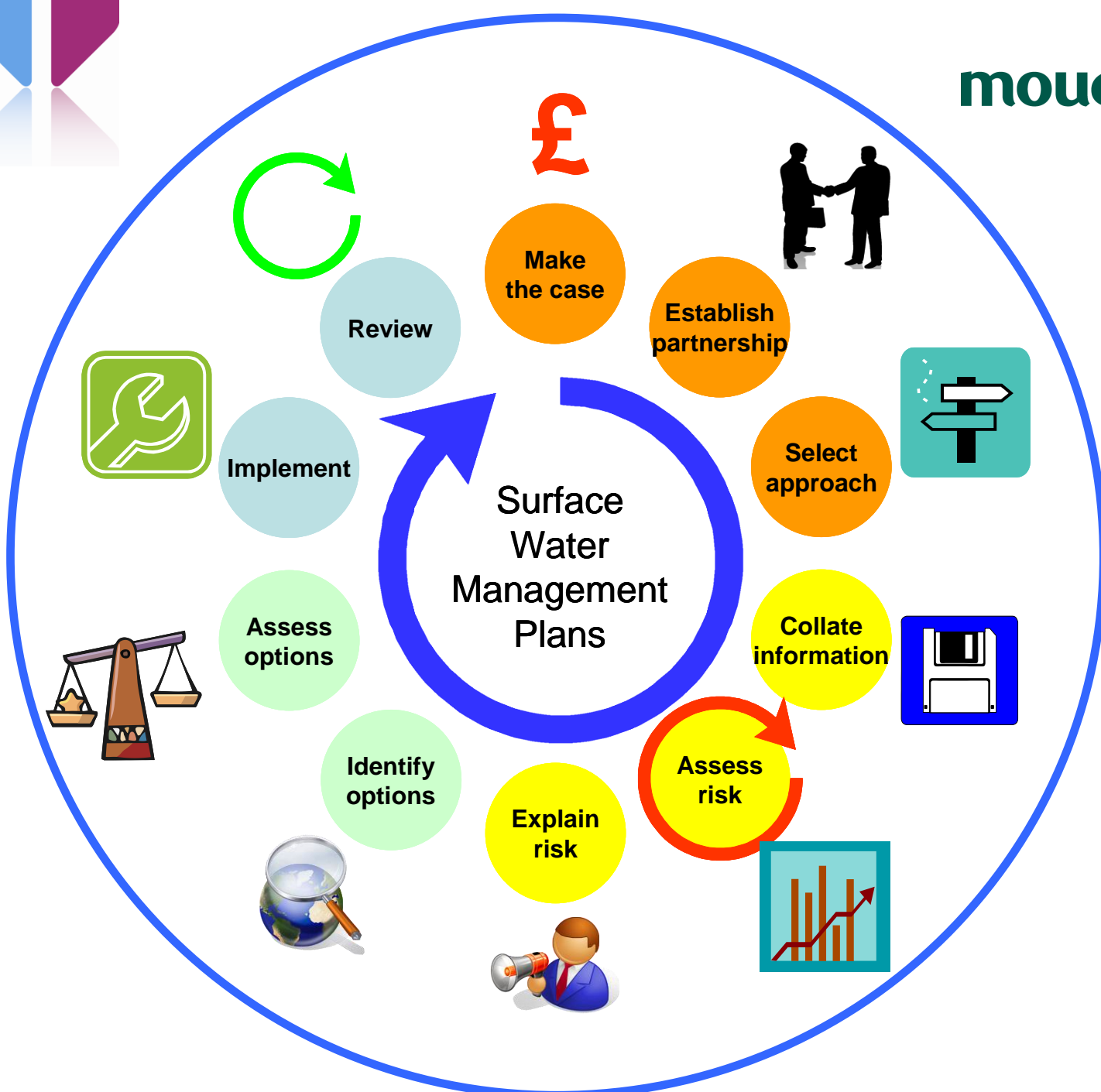
Legislation and other drivers

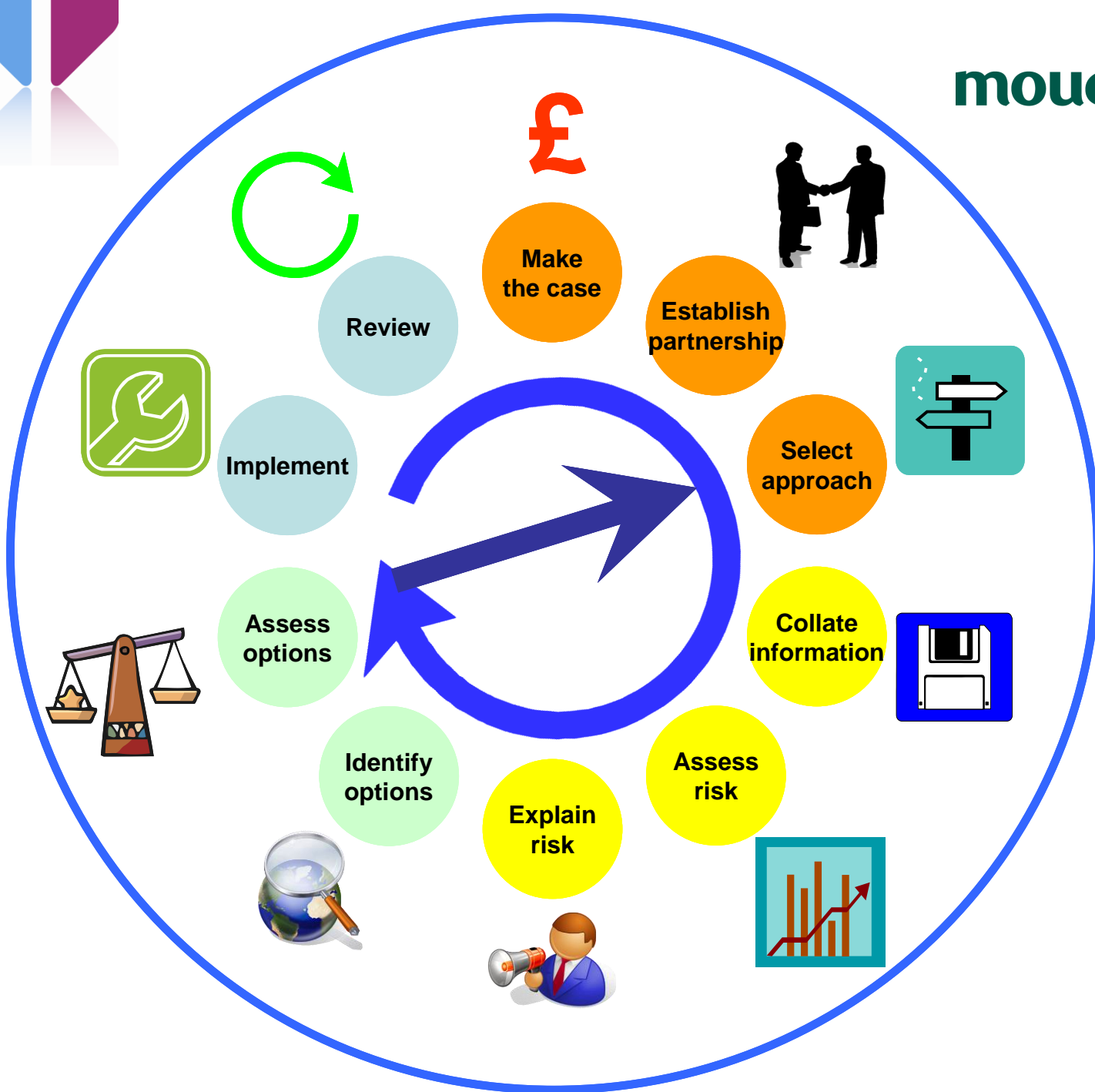
- **Flood Risk Regulations require**
 - Preliminary flood risk assessment - June 2011
 - Flood hazard map - June 2013
 - Flood risk management plan - June 2015
- **Other drivers**
 - ABI commitment to affordable insurance expires - June 2013
 - Water company business plans drafted - April 2014



Scope of Surface Water Management Plans

- **Surface water flooding includes:**
 - Pluvial flooding
 - Ordinary water course flooding
 - Sewer / drainage flooding
 - Overland flow from groundwater
 - Groundwater flooding







Levels of a SWMP

- **Strategic - which areas have a problem?**
 - Based on readily available data
 - No modelling
- **Intermediate – how big is the problem and can anything be done?**
 - Some data collection
 - Simple modelling tools to refine understanding
 - Cover all significant areas
- **Detailed – how will we reduce the problem?**
 - Further data collection
 - Detailed modelling tools
 - Only cover risk areas



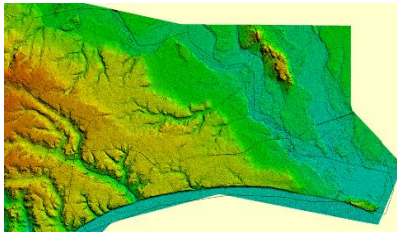
Build 2d model

Ground slope from DTM
Obstruction of buildings and c
Losses to soil infiltration and piped drainage

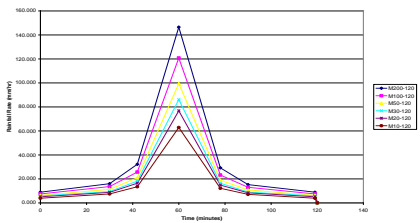
MasterMap



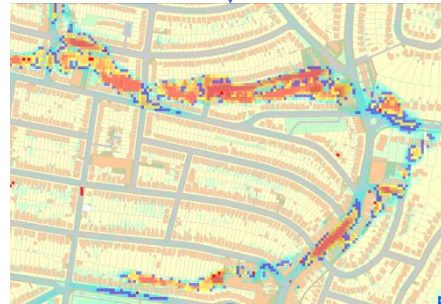
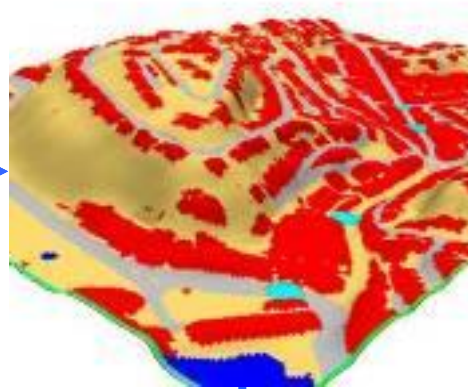
DTM



Rainfall

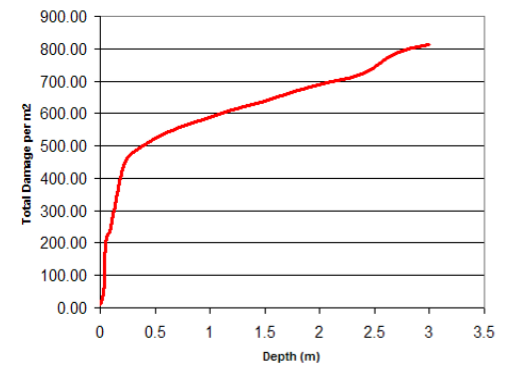
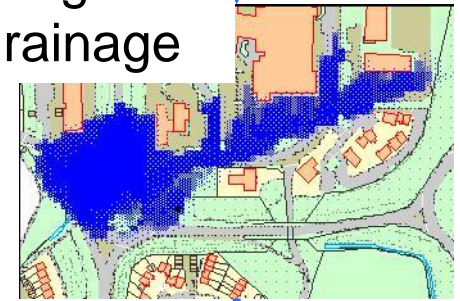


Select rainfall

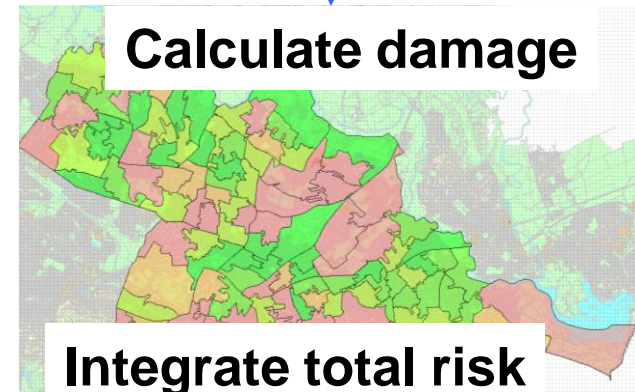


Calculate flow depth

Assess flooded properties



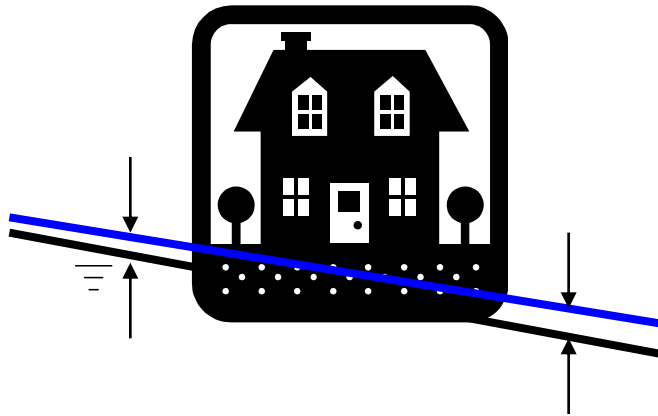
Calculate damage



Integrate total risk



Assess which properties are flooded



- Old concept
- Sheet flow over smooth ground
- Take maximum adjacent depth
- **Too many flooded properties**

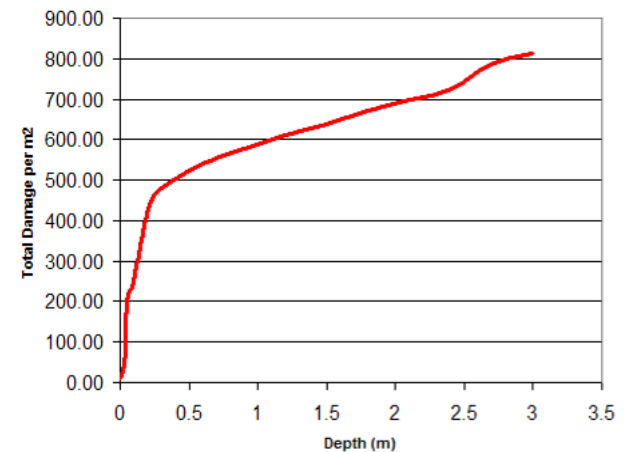


- New concept
- Ponding on undulating ground
- Take maximum adjacent level
- **Fewer flooded properties**



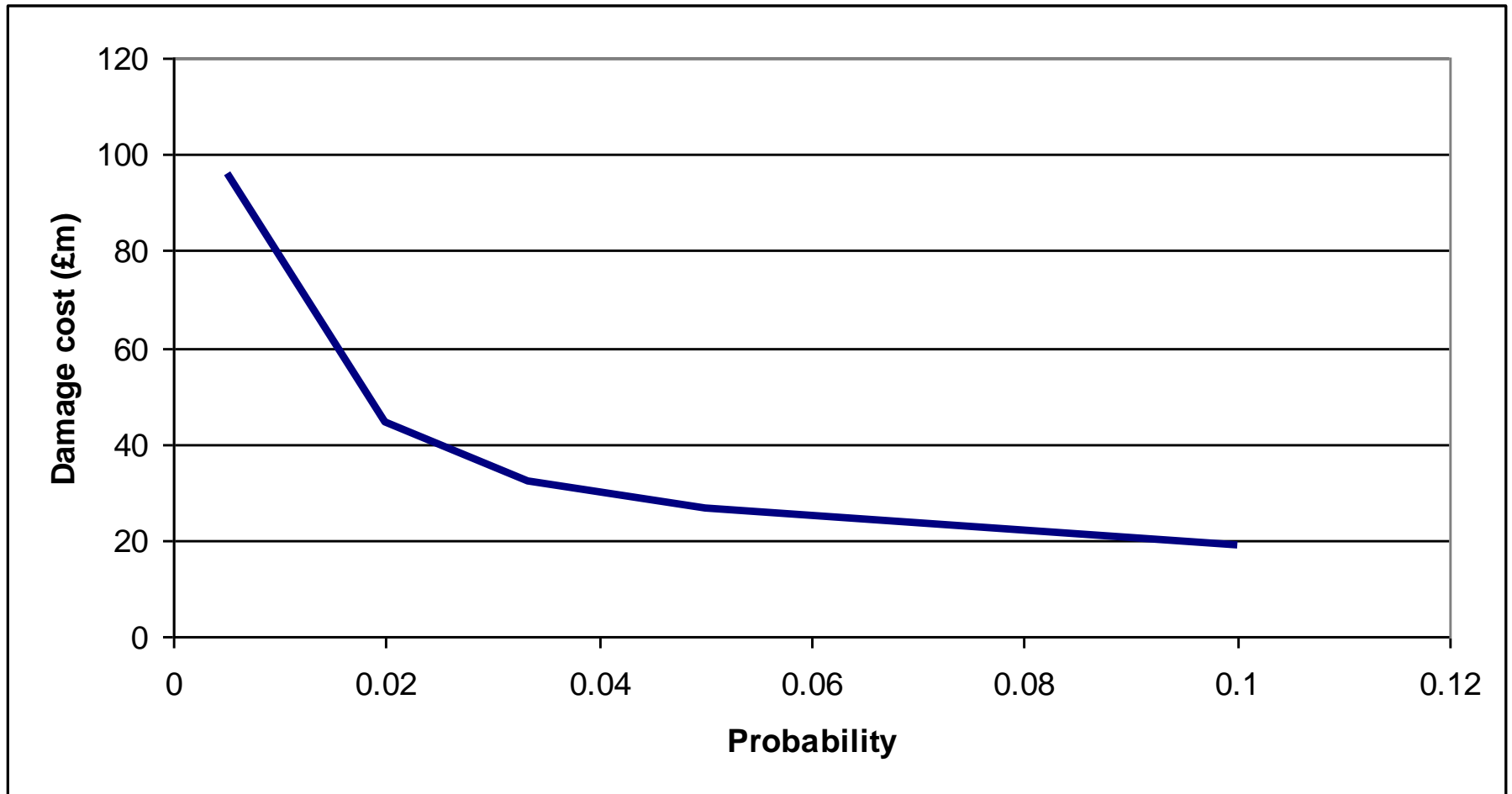
Calculate damage cost – Multi Coloured Manual

- **Residential damage costs**
 - Property age
 - Property type
 - Socio economic group
 - **NEW simple regression model**
- **Intangible costs**
- **Commercial damage costs**
- **Traffic delays**



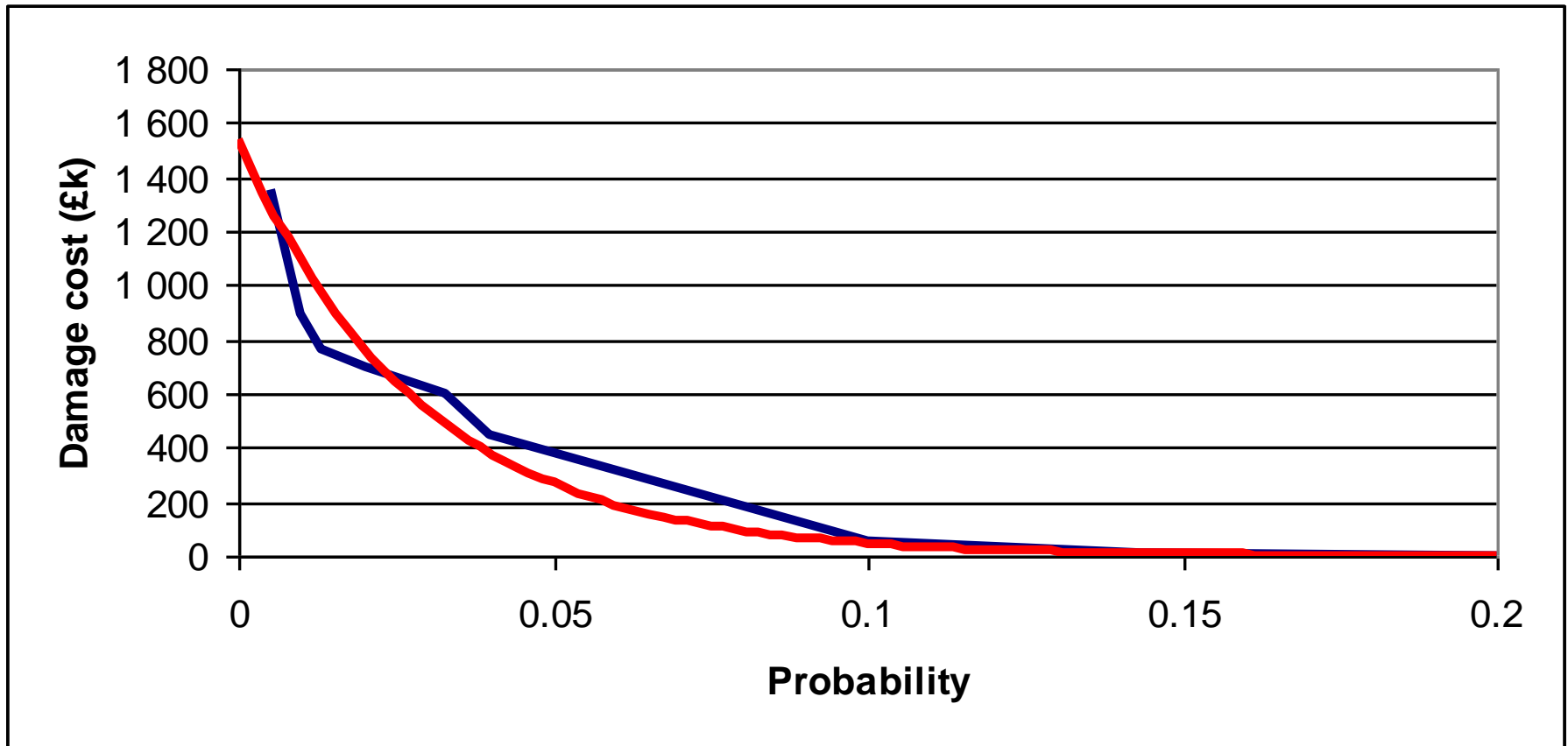


Integrate damage to total risk



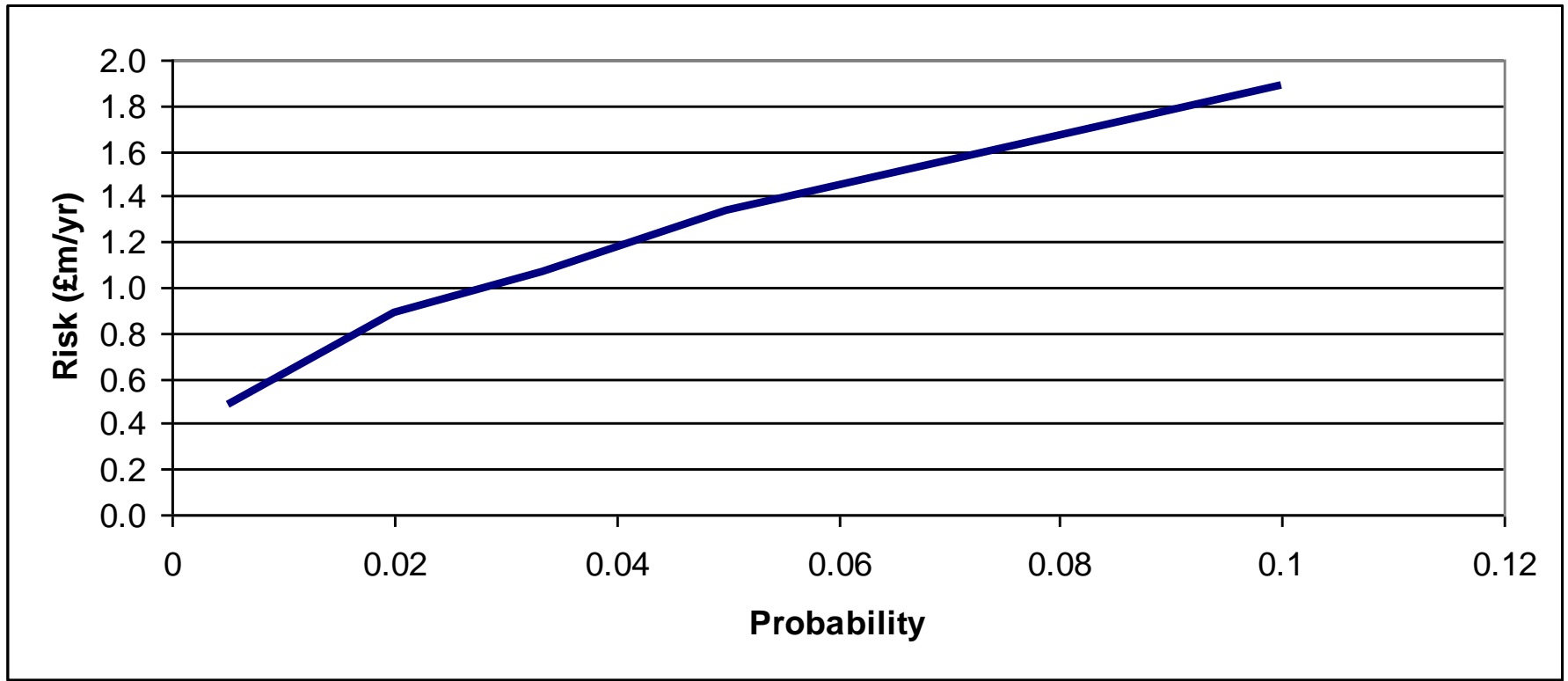


Integrate analytically





Where is the biggest risk?





Verify model results

- **No opportunity for flow survey verification**
- **Verify against historical flood events**
- **Records may be poor as no clear responsibility for records**
- **Site visits are important to understand cause and effect of flooding**



Lessons learned

- **Iterative approach with greater detail in critical areas**
- **Impact of sewerage system in removing flow is significant – especially for small events**
- **Also need to consider sewerage system importing flow – need a sewerage model to address this**

- **Building threshold level is important – consider survey in critical areas**
- **Comparison with historic flooding is important – but much historic flooding is due to blocked gullies!**
- **Low / medium return periods are the issue**
- **So you have identified the risk – now what?**



How do we solve the problems

- Bigger pipes may not be the answer
- Source control - **RE**duce & **RE**use
- Flow paths - **RE**tain and **RE**direct
- Impact - **RE**sist and **RE**-site





The future

- **How will the new responsibilities play out in the future**
- **Local authorities are responsible for local flood management strategy – including sewer flooding**
- **“Total environment” initiative where local authorities control the budget for all local flood risk including Internal Drainage Boards, Environment Agency and Water Companies.**
- **So will local authorities set the sewerage flooding strategy at PR14?**



Questions?

Martin.Osborne@mouchel.com

