



Infrastructure management

***Presentation to Practitioners Workshop
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England and Wales

- Annual expenditure on maintenance / improvement approx. £450m
- £20 billion of sunk investment

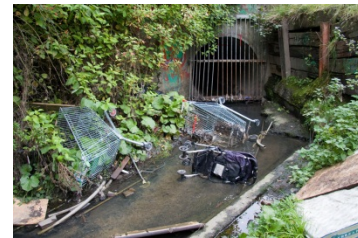
USA

- US Corp of Engineers estimate \$2.2 trillion to maintain levees at a “desirable” standard (Steve Stockton)





Where has the science in FRMRC been focused – and can it help practice?





Some difficult questions....

A range of spatial and temporal scales of interest



All (national) Systems



One Flood Risk Management System



One Asset

What are the national...

How will the system...

How will an asset...

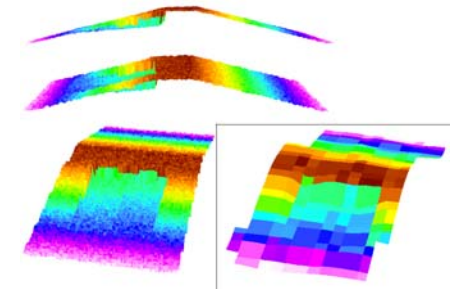
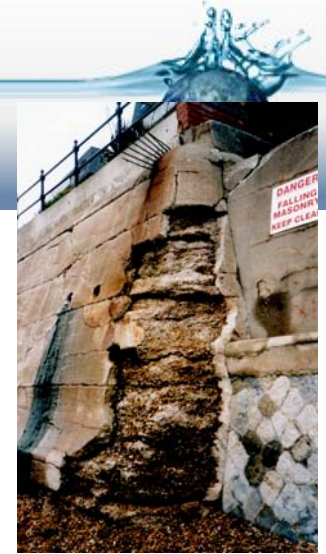
Hot spots?
Investment need?
How might these change ?

Perform now and in the future?
Which assets contribute most to risk?

Perform under load or on demand?
Improve or deteriorate with/without action?

Areas of research within FRMRC....

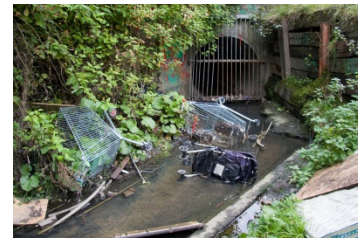
1. **Inspection** - Develop new approaches to integrate visual inspection and remote sensed data in the condition assessment process
2. **Individual asset performance** - Improve system risk analysis (RASP/MDSF2) through an improved breach and blockage representation
3. **Asset system performance** - Extend the current system risk analysis models to include coastal assets
4. **Decision support** - Develop new approaches to optimising asset intervention strategies





The uptake challenge

Promoting linkage between researchers and practitioners to help promote practicality and aid future take-up



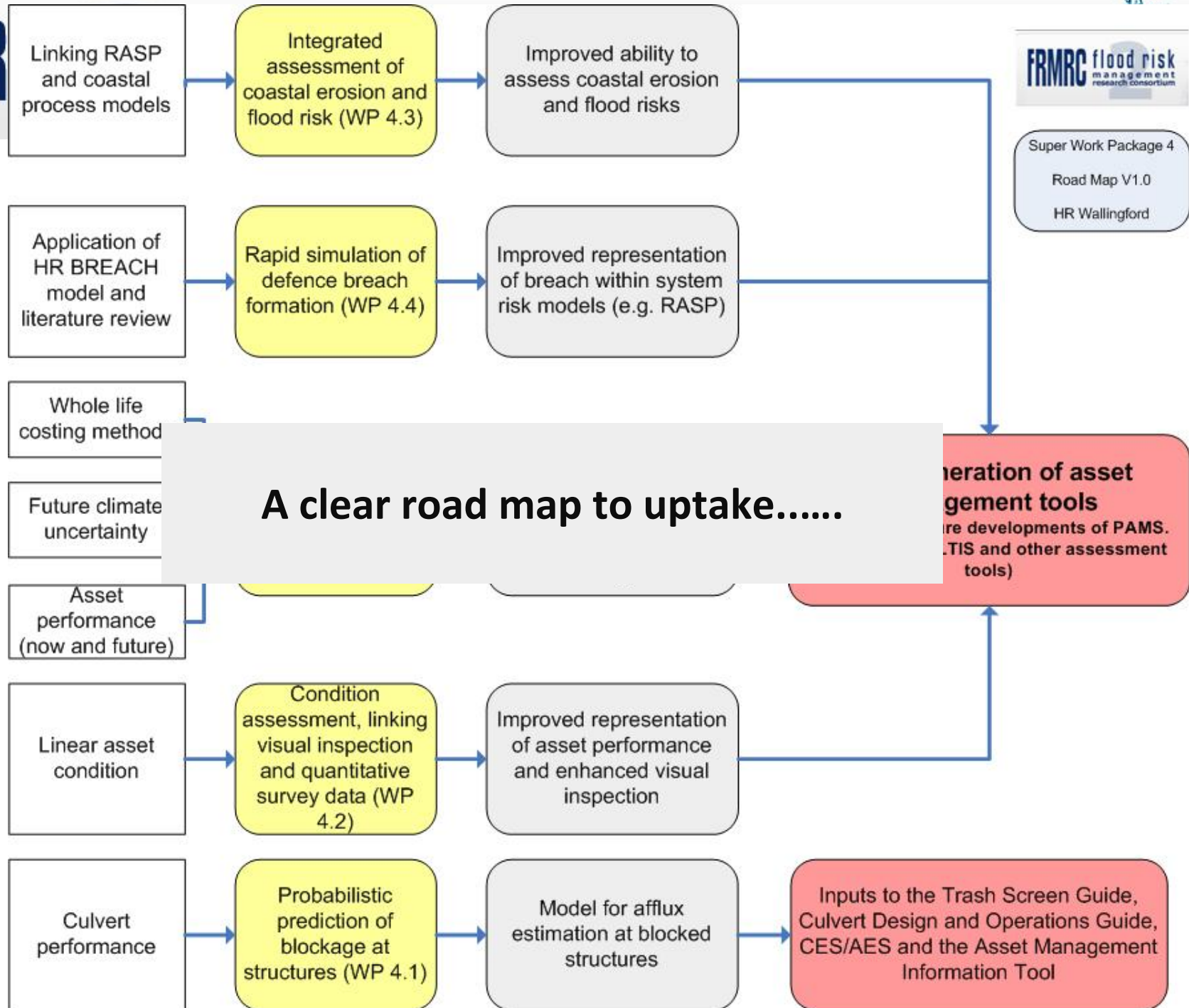


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A range of outputs.....

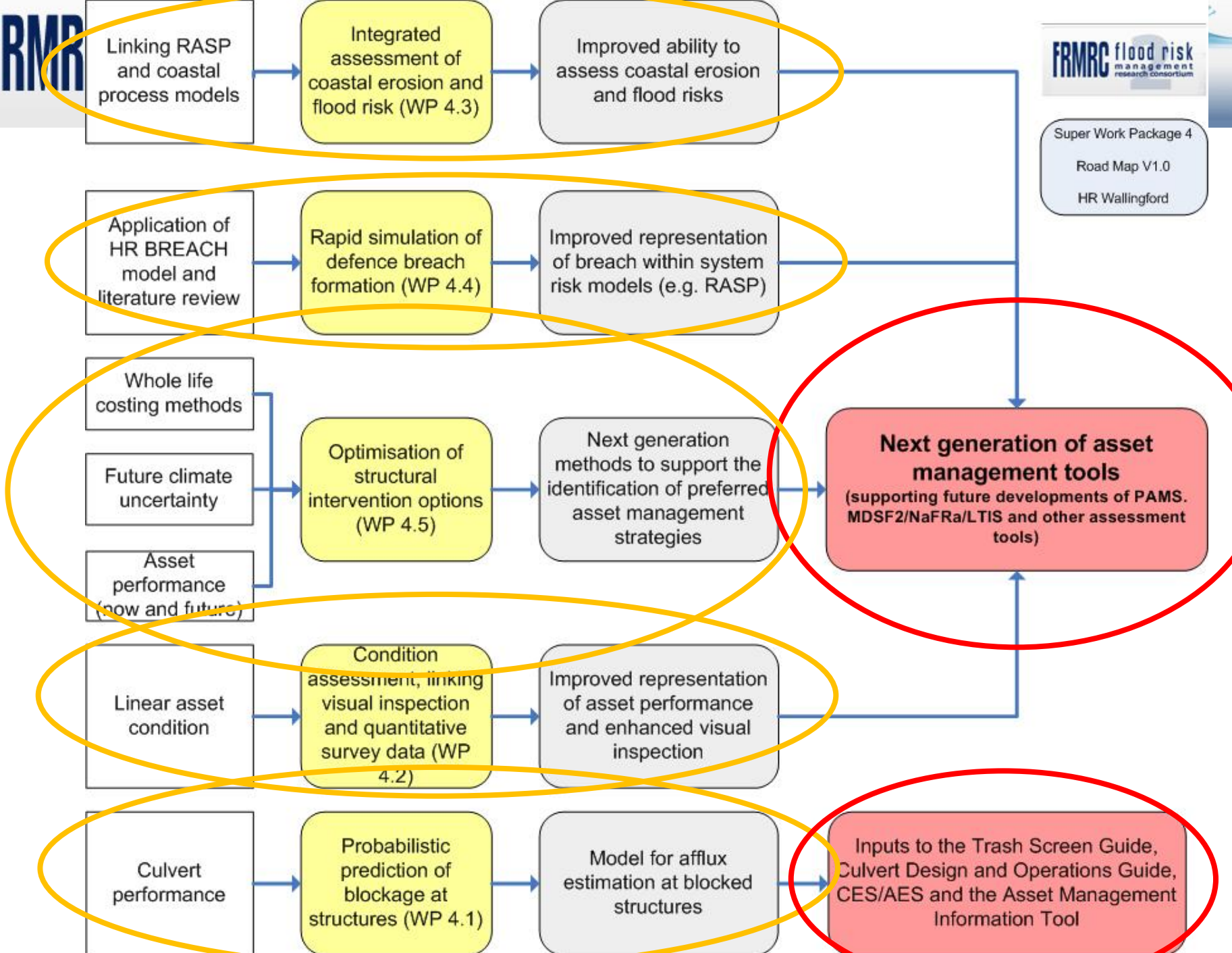
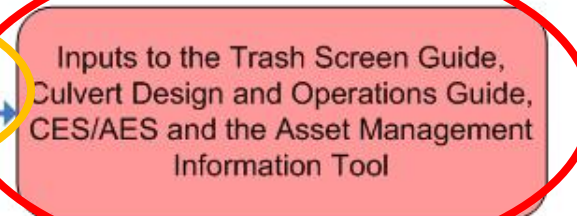
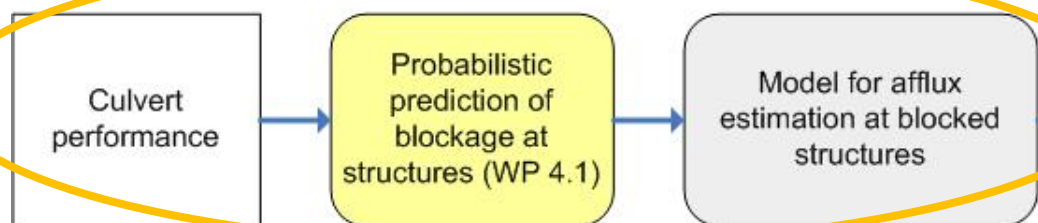
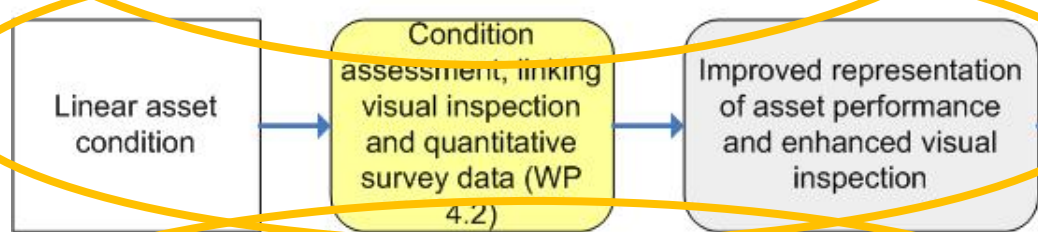
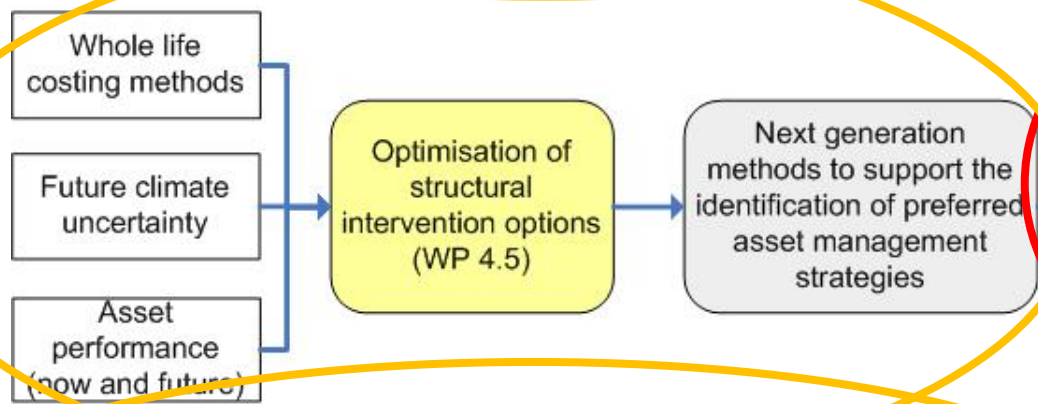
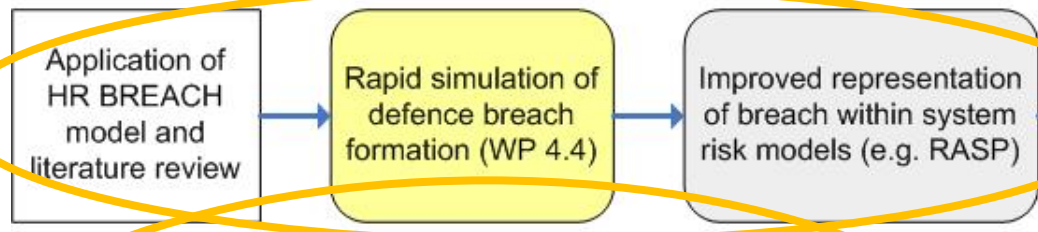
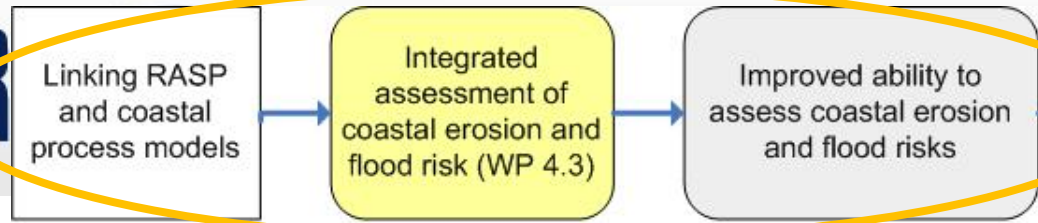
1. **Innovative science** – providing underlying advances (e.g. blockage processes)
2. **Enabling technologies** – extending system analysis frameworks (building RASP to promote take-up into MDSF2 /NaFRA)
3. **Pilot** – proving the utility of the science and technology through prototype pilot application (Dodder, Thames, Holderness)
4. **Guidance** – providing user relevant guidance (two CIRIA technical notes – (i) inspection, and (ii) blockage)
5. **Linkage** – nationally and international projects and data:
 - CDOG (Heriot Watt)
 - FACET tools scoping (Haskoning / Sayers)
 - Floodprobe/UrbanFlood (HRW)
 - ILH (CIRIA/HRW)
 - DSIG data (Oxford/Morris)
 - Workshops Australia (Sayers/HW), China (SWP leaders), Practitioner (today) and Science (9th Dec) workshops in the UK)



A clear road map to uptake.....

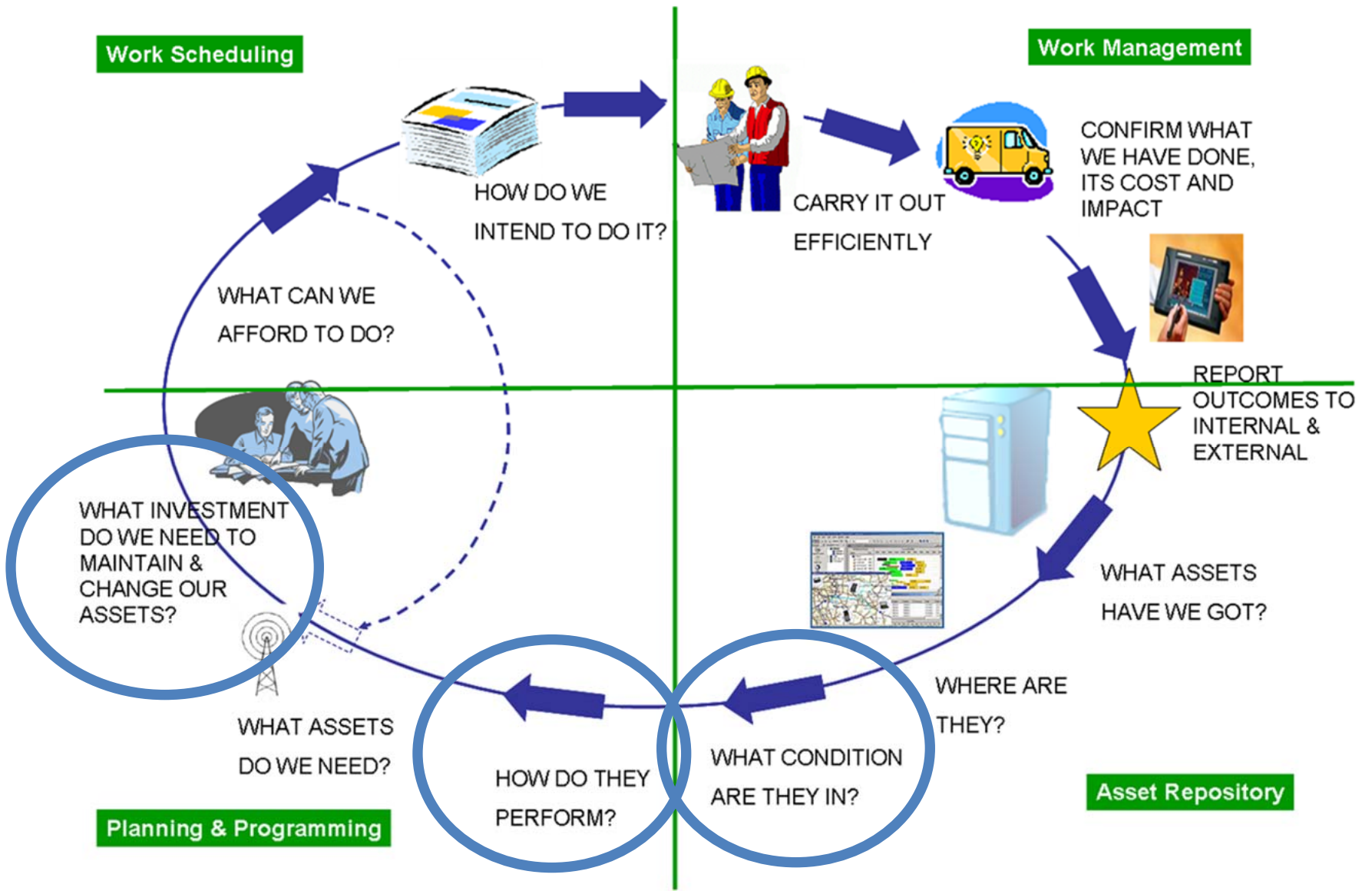
Generation of asset management tools
(future developments of PAMS, .TIS and other assessment tools)

Inputs to the Trash Screen Guide, Culvert Design and Operations Guide, CES/AES and the Asset Management Information Tool





A clear role in practice.....





Look to use the outputs....

Papers

Many journal papers and conference papers

Books

In press - Thomas Telford Book – Infrastructure management and design
(edited Sayers)

CIRIA TN

Notes on inspection and blockage in press

Tools

Breach codes, compiled tools (now as much open source as ideal)

Data

Base datasets in blockage (plus various model runs).



Some key outputs

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