A RISK-BASED APPROACH TO PRINCIPAL INSPECTIONS

Presentation to the Bridge Owners Forum

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INTRODUCTION

- Atkins appointed using WAG Framework
- Past collaboration
- Shared vision for critical evaluation
- Clear 'value-for-money' potential
- Optimise resources

BACKGROUND

- BD 63 allows PI's < 12 years
- Assessment to be *'robust and fully documented'*
- Other sectors spend ££'s, many applications
- Recent development in Highways
- Heavily researched, few working tools

THE OBJECTIVE

Time-based

-Fixed 2-year GI's

-Fixed 6-year PI's

-Rigid-application

-Defensive, zero-risk

-Inefficient resourcing

Risk-based

-Keep 2-year GI's

-Risk assess all PI's

-Evaluate intervals, 6-12

-Prioritise structures

-Targeted resources

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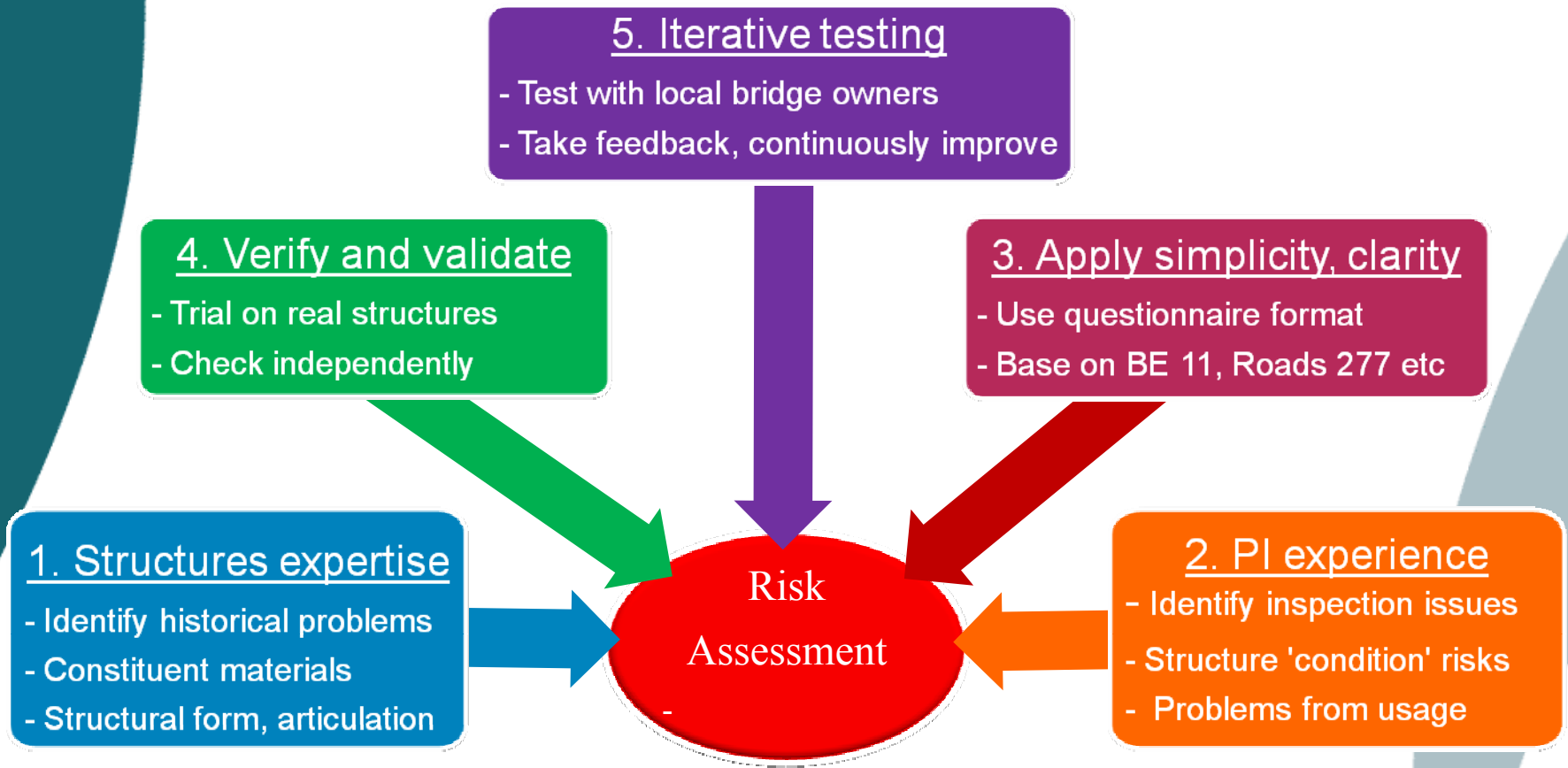
THE BRIEF

- Use available, existing records
- Quick implementation - by March 2010
- Simple to use
- Record engineering judgement
- Understanding programme constraints

METHODOLOGY



ATKINS

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THE RISK ASSESSMENT

- 6 types of Highway Structure:

1. Culverts
2. Single-span bridges
3. Multi-span bridges
4. Gantries and Footbridges
5. Retaining walls
6. Technology structures

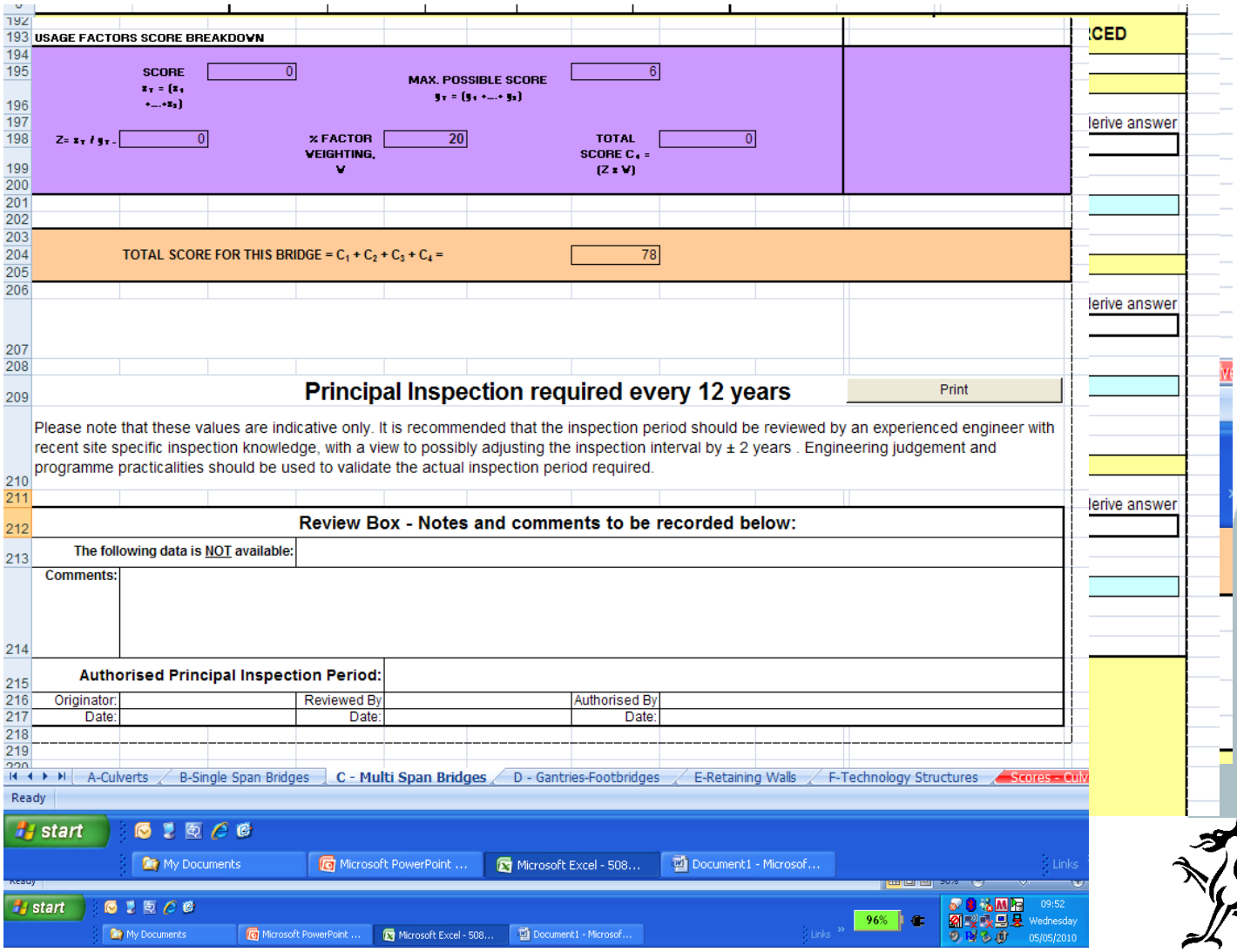
- Each has individual risk 'questionnaire' format

THE RISK ASSESSMENT

- Basis: Risk = f (*likelihood, consequence*)

1.Historical evidence	• e.g. What is the structural form? • e.g. What are the constituent materials?
2.Inspection evidence	• e.g. What is access to the structure like? • e.g. How reliable is the GI BE11 form?
3.Condition evidence	• e.g. What is the existing condition like? • e.g. Is there potential for deterioration?
4.Usage evidence	• e.g. What loads does the structure take? • e.g. How heavily trafficked is it?

THE RISK ASSESSMENT



USAGE FACTORS SCORE BREAKDOWN

SCORE $x_T = (x_1 + \ldots + x_5)$	0	MAX. POSSIBLE SCORE $y_T = (y_1 + \ldots + y_5)$	6		
$Z = x_T / y_T$	0	% FACTOR WEIGHTING, W	20	TOTAL SCORE C_4 = (Z x W)	0

TOTAL SCORE FOR THIS BRIDGE = $C_1 + C_2 + C_3 + C_4$ = 78

Principal Inspection required every 12 years

Print

Please note that these values are indicative only. It is recommended that the inspection period should be reviewed by an experienced engineer with recent site specific inspection knowledge, with a view to possibly adjusting the inspection interval by ± 2 years . Engineering judgement and programme practicalities should be used to validate the actual inspection period required.

Review Box - Notes and comments to be recorded below:

The following data is NOT available:

Comments:

Authorised Principal Inspection Period:

Originator:		Reviewed By		Authorised By	
Date:		Date:		Date:	

A-Culverts | B-Single Span Bridges | C - Multi Span Bridges | D - Gantries-Footbridges | E-Retaining Walls | F-Technology Structures | Scores - CuM

Ready

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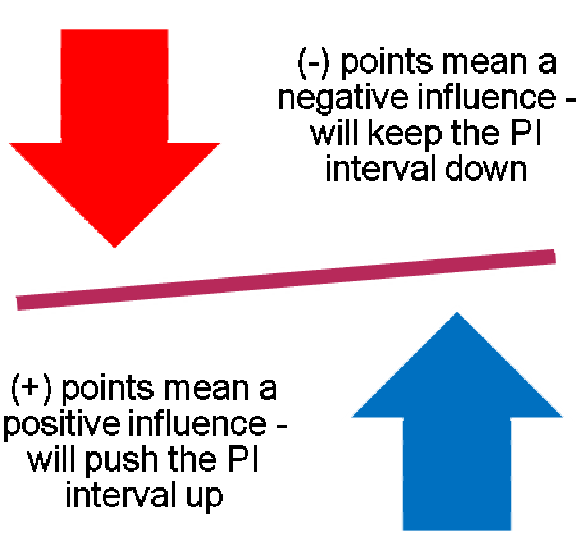
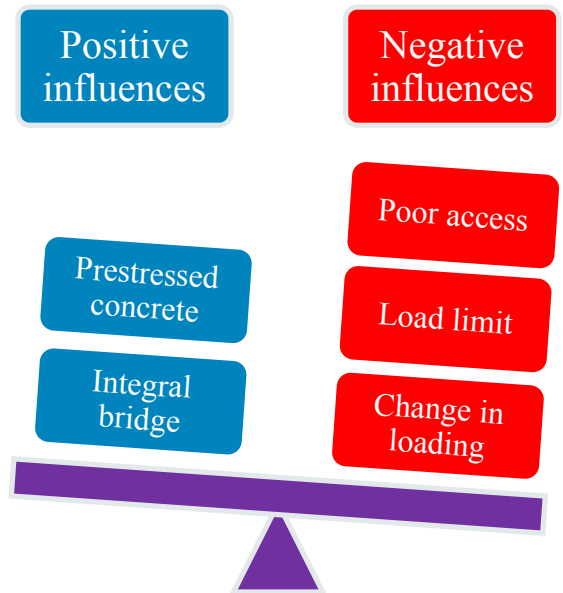
SCORING SYSTEM

(+) points accumulated ∝ PI interval (6< x<12)

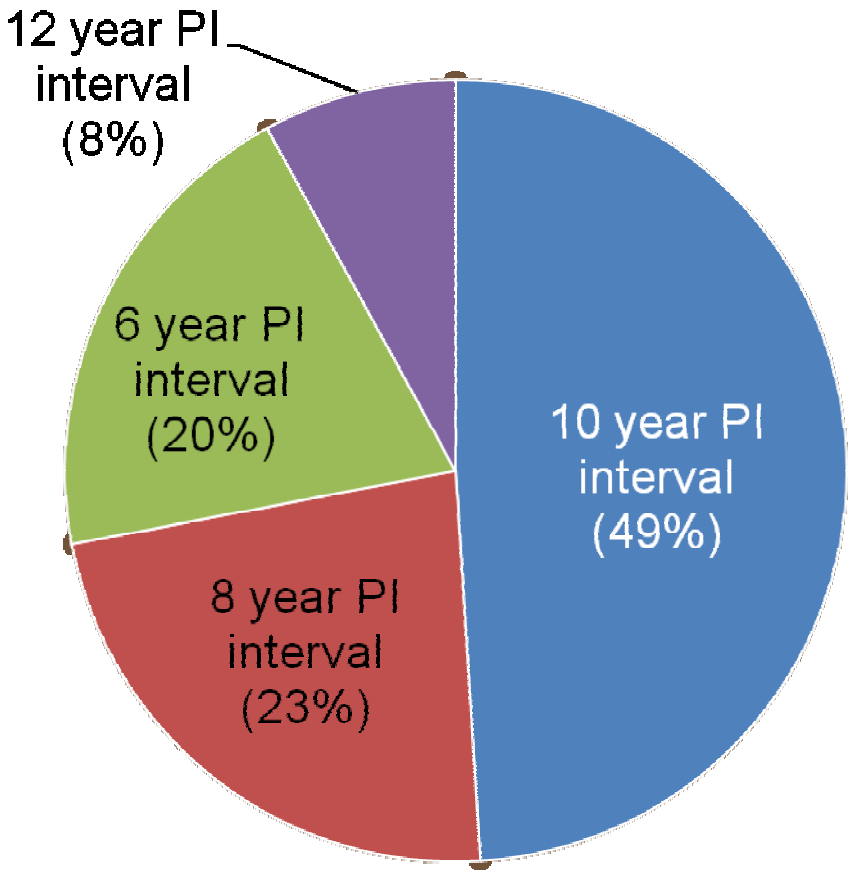




SCORING SYSTEM

- 75 case studies to validate scoring structure

CASE STUDY RESULTS



BENEFITS

- Consistent philosophy - being used across Wales
- Value for money - achieving *'more for less*'
- Flexibility in managing and resourcing PI's
- Reduces unnecessary risks to site operatives
- Fully documented, auditable risk assessment

THANK YOU

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