

**UNCOMPLICATED
LESS TEDIOUS
MORE EFFICIENT
SMART TOOLS**



OPUS

SMART TOOLS

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Smart Tools

- Application, User interface, Excel Spreadsheet
- Automation
- Understanding
- Visualisation



Smart Tools

- More informed, better decisions
- Efficient
- No more tedious tasks
- Simplify hard problems



Case Study - dTIMS

- Deighton Total Infrastructure Management System
- Tool used for asset deterioration modelling
- Functions
 - remaining service life
 - forecast condition
 - calculate benefits
 - determine optimum maintenance
 - repair strategy and forecast risk levels



dTIMS





Variable	Initialisation	initialisation Expression	Progression Expression
AVnCND_OBJ_Rut	OBJ_CND_nAE_Rut	IF((100.0-(100.0/(1.0+EXP(SVnCAL_OBJ_Rut-AVnCND_Rut))))>50.0,(100.0-(100.0/(1.0+EXP(SVnCAL_OBJ_Rut-AVnCND_Rut))))*100.0/(100.0-(100.0/(1.0+EXP(SVnCAL_OBJ_Rut-Gen_CON_nSE_0))))),100.0-(100.0/(1.0+EXP(SVnCAL_OBJ_Rut-AVnCND_Rut))))	
Gen_CON_nSE_0		0	
SVnCAL_OBJ_Rut	OBJ_INI_nSE_Rut	Cal	>fgroup,99.0)
AVnCND_Rut	Rut_INI_nSE_Convert	DVnCND_Pave_Depth<150.0,0.6,0.3))	AE
RutAccelProb_CND_bAF_GT_Thresh	AVnCND_RutAccelProb	>SVnCAL_RutAccelProb_Thresh	
AVnCND_RutAccelProb	RutAccelProb_CND_nAE		100.0 / (1.0 + EXP(-7.568/1000000.0 * AVnCND_Traffic_ESA * 365.0 + 2.434 * AVnCND_SNP - IF(DVnCND_Pave_Depth < 150.0 And AVnCND_SNP < 2.5,4.426,0.4744)))
SVnCAL_RutAccelProb_Thresh	RutAccelProb_INI_nSE_Thresh		XTAB(FGroup_Parameters,'FThresh_RutAccelProb',dTAG_TL->fgroup,99.0)
		MIN(AVnCND_Rut,XTAB(FGroup_Parameters,'FRes_Rut',dTAG_TL->fgroup,99.0))	
Pave_INI_nSE_Age	_Convert		Pave_CND_nA AVnCND_E_Age
dTAG_TL->pave_avgthickness			
Rut_INI_nSE_KRP_Cal			



R Studio and Shiny

- Powerful
- Free online tutorial
- Open Source
- Online documents



Purpose of Tool

- Help aid understanding
- Better customise model
- Visually see changes



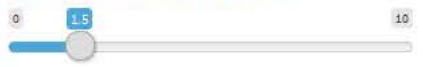
Controls

Clear Plot Plot

Carriageway Surfacing Objectives Rating

High Speed Data Calibration

Rut Progression Calibration (KRut)



Roughness Calibration (Critical Age):



Threshold at which cracking will start:



Crack Progression Calibration (KCP):



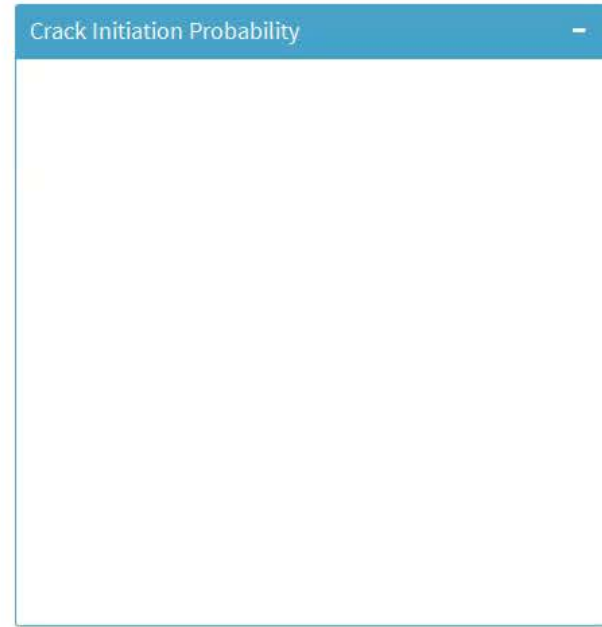
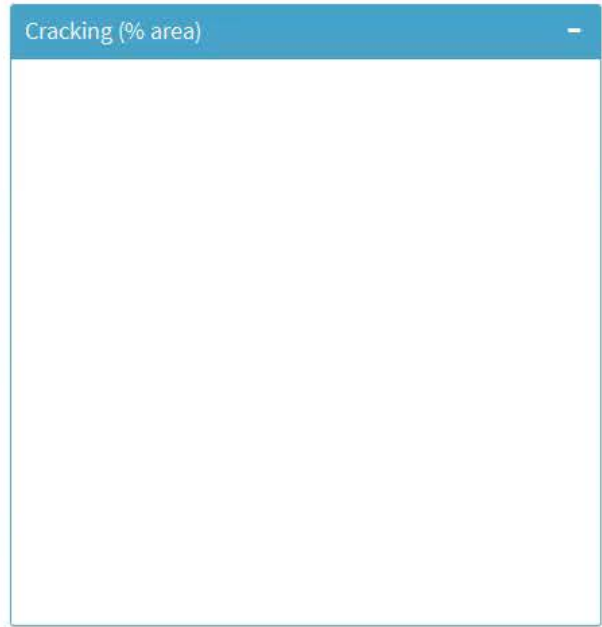
Crack Initiation Probability Calibration (KPI):



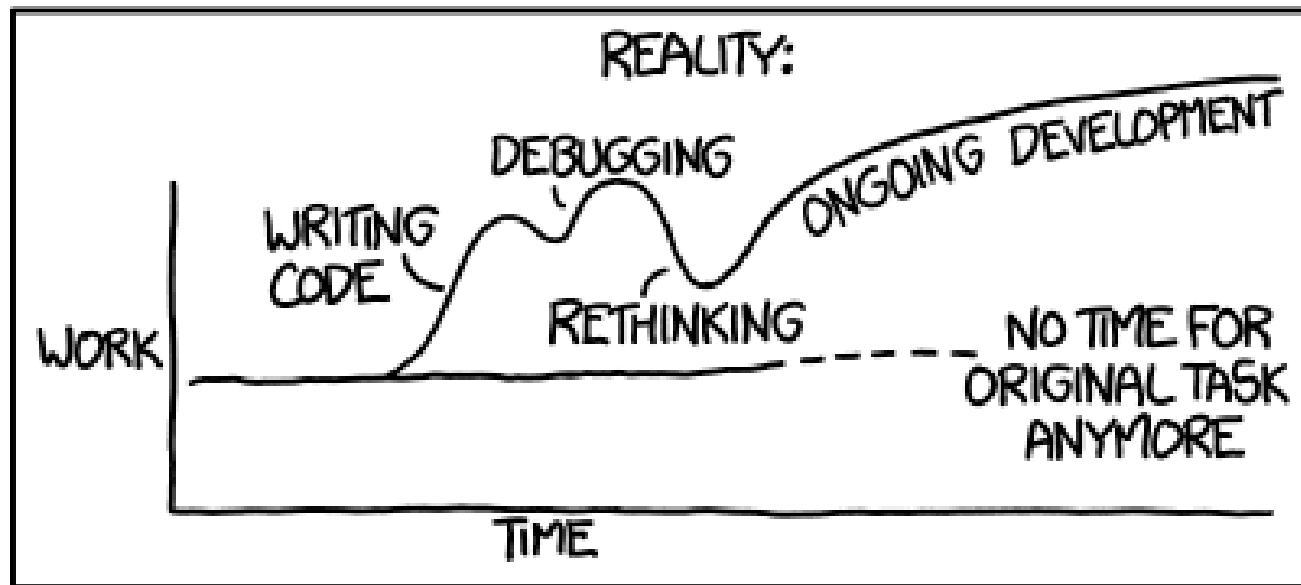
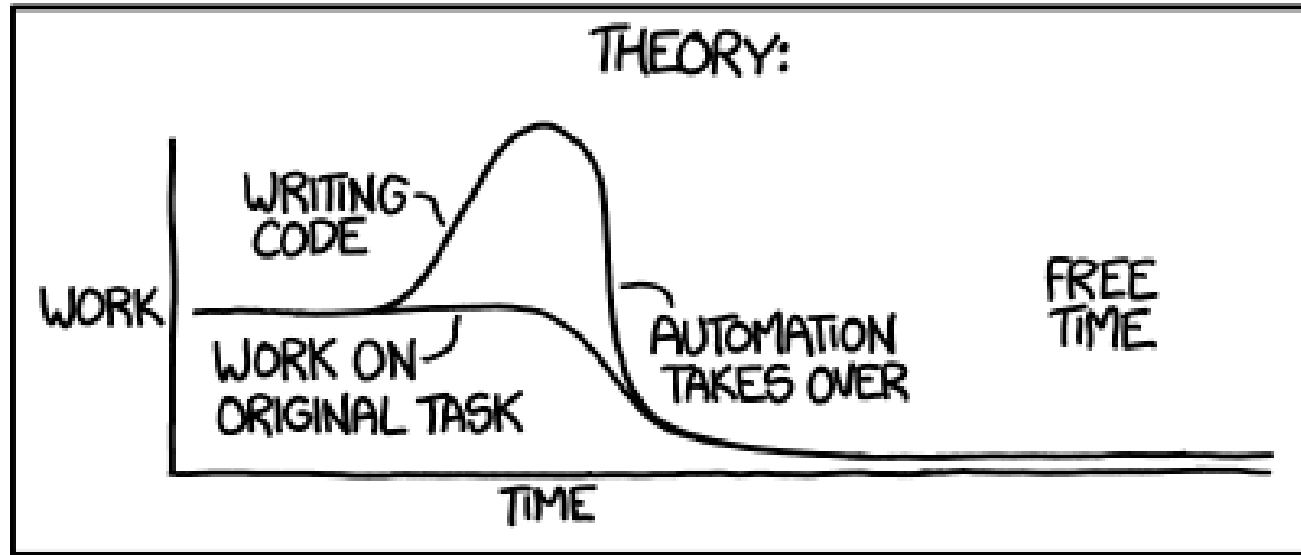
Surface Life Factor:



Variables Objectives



"I SPEND A LOT OF TIME ON THIS TASK.
I SHOULD WRITE A PROGRAM AUTOMATING IT!"



Thank You

Any Questions?