Hampshire County Council's Approach to Lifecycle Planning

Steve Spender IEng FIHE
Highway Manager HQ
Hampshire County Council

Hampshire County Council

Today's Presentation

- Brief history - what, when, why
- New Approach to Budget Allocation
- Moving to Route Strategies
- Understanding relationships - LoS, customers, condition, cost

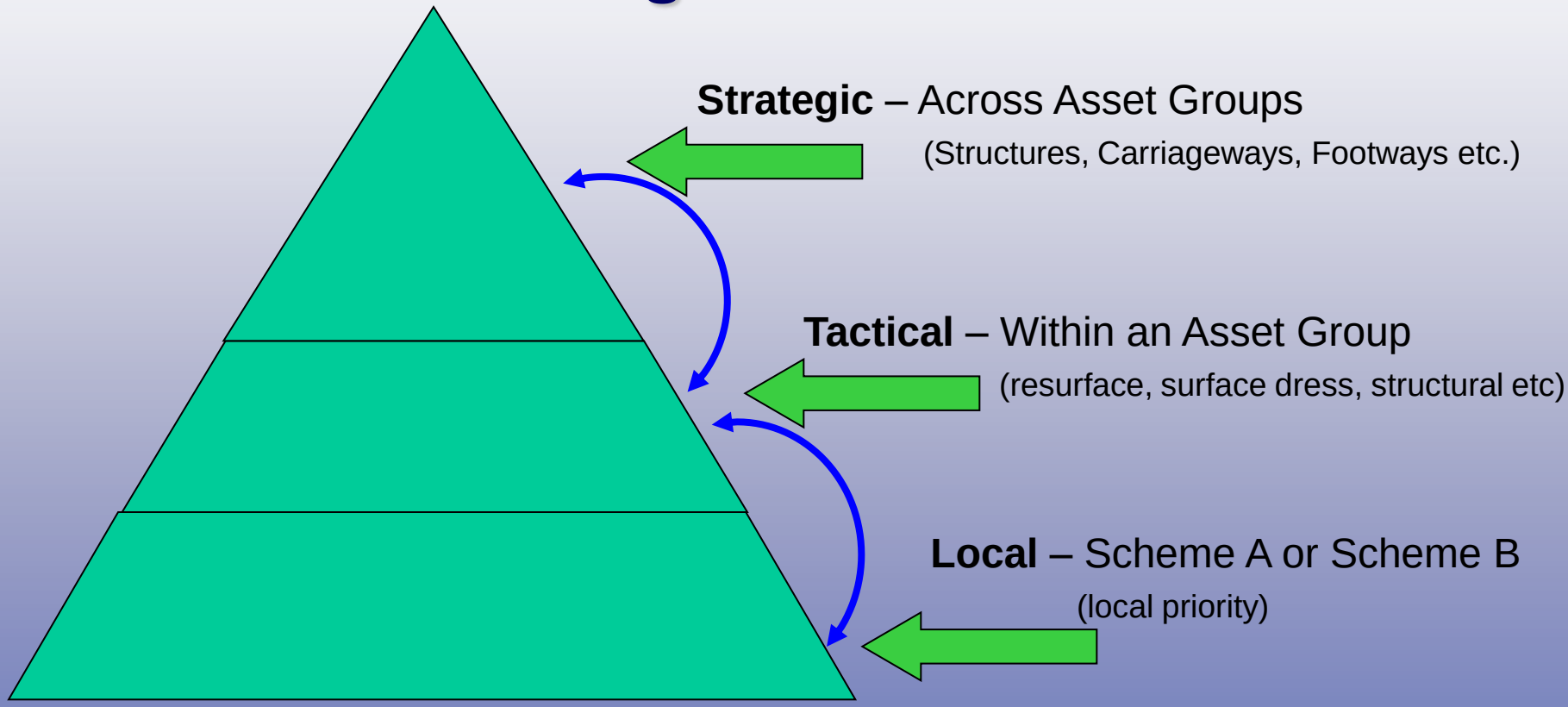
Brief History

Management decision in 2008 to :-

- Improve budget process
- Identify strengths and weaknesses
- Examine our budget allocation processes
- Develop new processes and tools

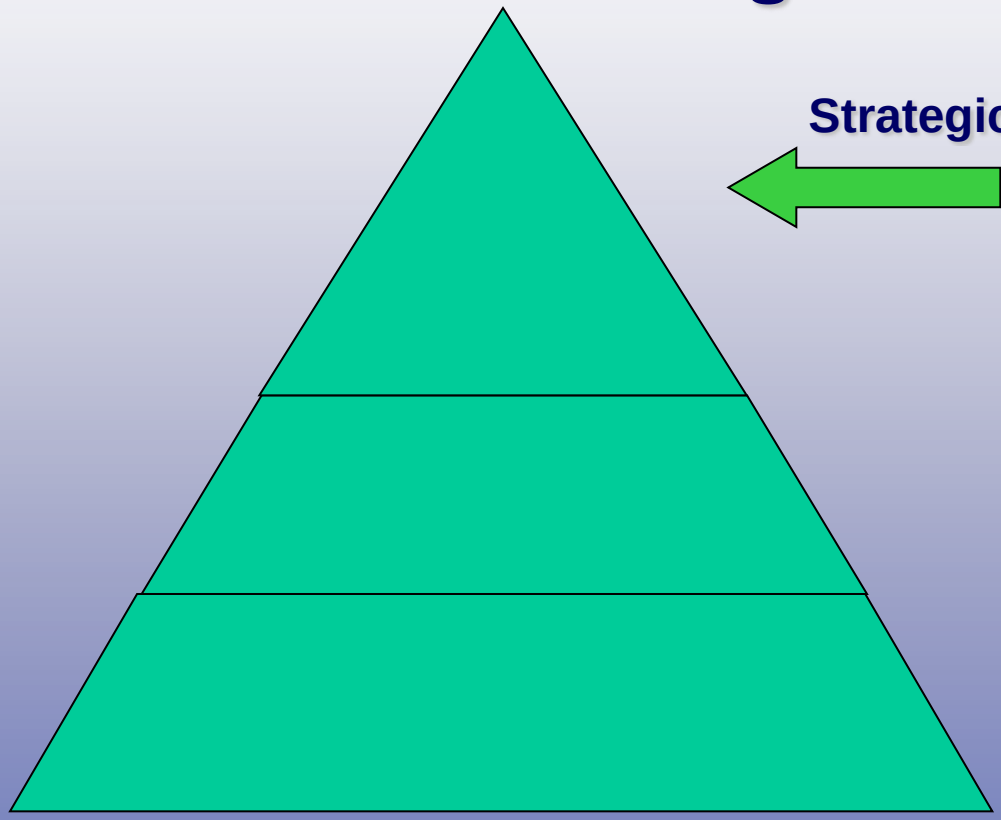
Asset Management

Budget Allocation



Asset Management

Budget Allocation



Strategic – Across Asset Groups

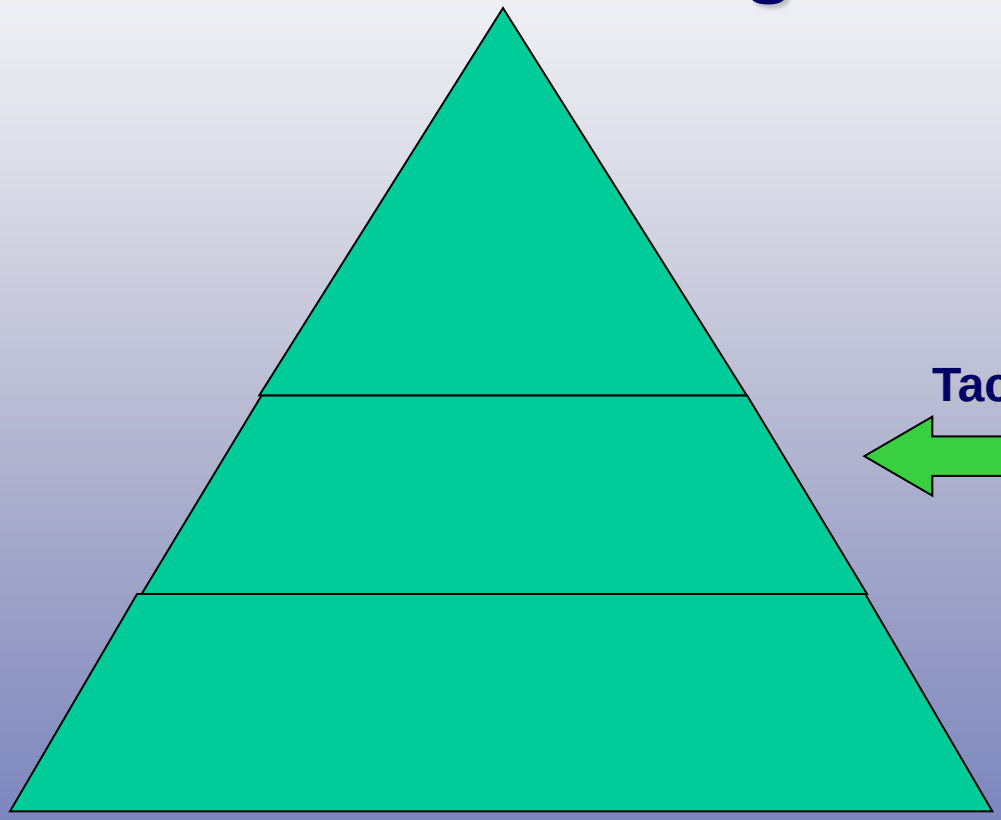
(Structures, Carriageways, Footways etc.)

Initial Review

- **Strategic (across assets)** - historic allocations with limited information on why the money was allocated

Asset Management

Budget Allocation



Tactical – Within an Asset Group

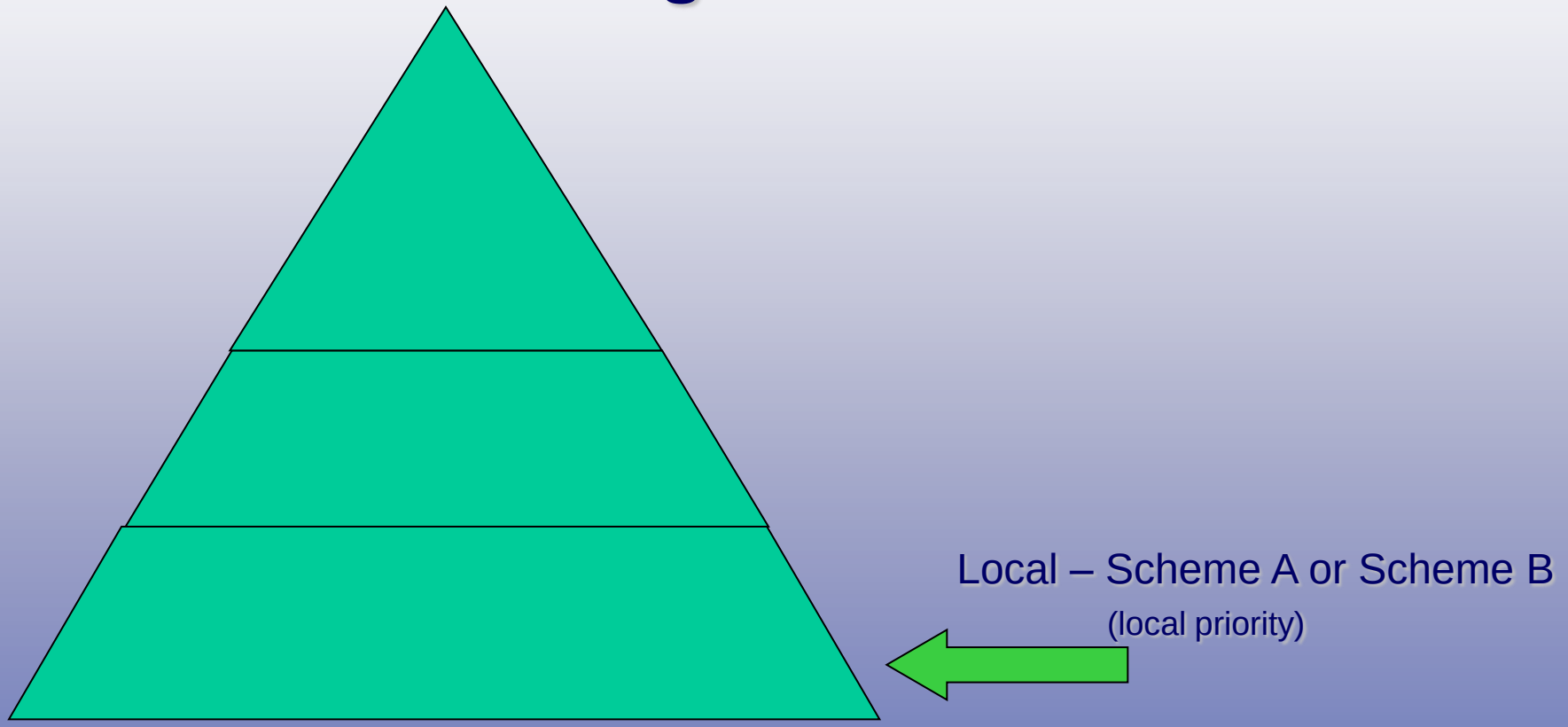
(resurface, surface dress, structural etc)

Initial Review

- **Strategic (across assets)-** historic allocations with limited information on why the money was allocated
- **Tactical (treatment options)** – Some limited lifecycle planning applied, no formal approach or review processes. No budget analysis to support decisions or review of objectives.

Asset Management

Budget Allocation



Local – Scheme A or Scheme B

(local priority)

Hampshire County Council

Initial Review

- **Strategic (across assets)** - historic allocations with limited information on why the money was allocated
- **Tactical (treatment options)** – Some limited lifecycle planning applied, no formal approach or review processes. No budget analysis to support decisions or review of objectives.
- **Local (to do or not to do)** – Reasonably good justification and prioritisation processes, but in the main related only to condition.

Developing the theme

Identified the need to develop tools that

- Relate spend and service provision to corporate values at a strategic level.
- Accommodate lifecycle planning and compare different treatment options.
- Provide transparent and flexible approaches to programming and scheme prioritisation.

The Strategic Tool

- Relates defined corporate aspirations to maintenance activities and spend.

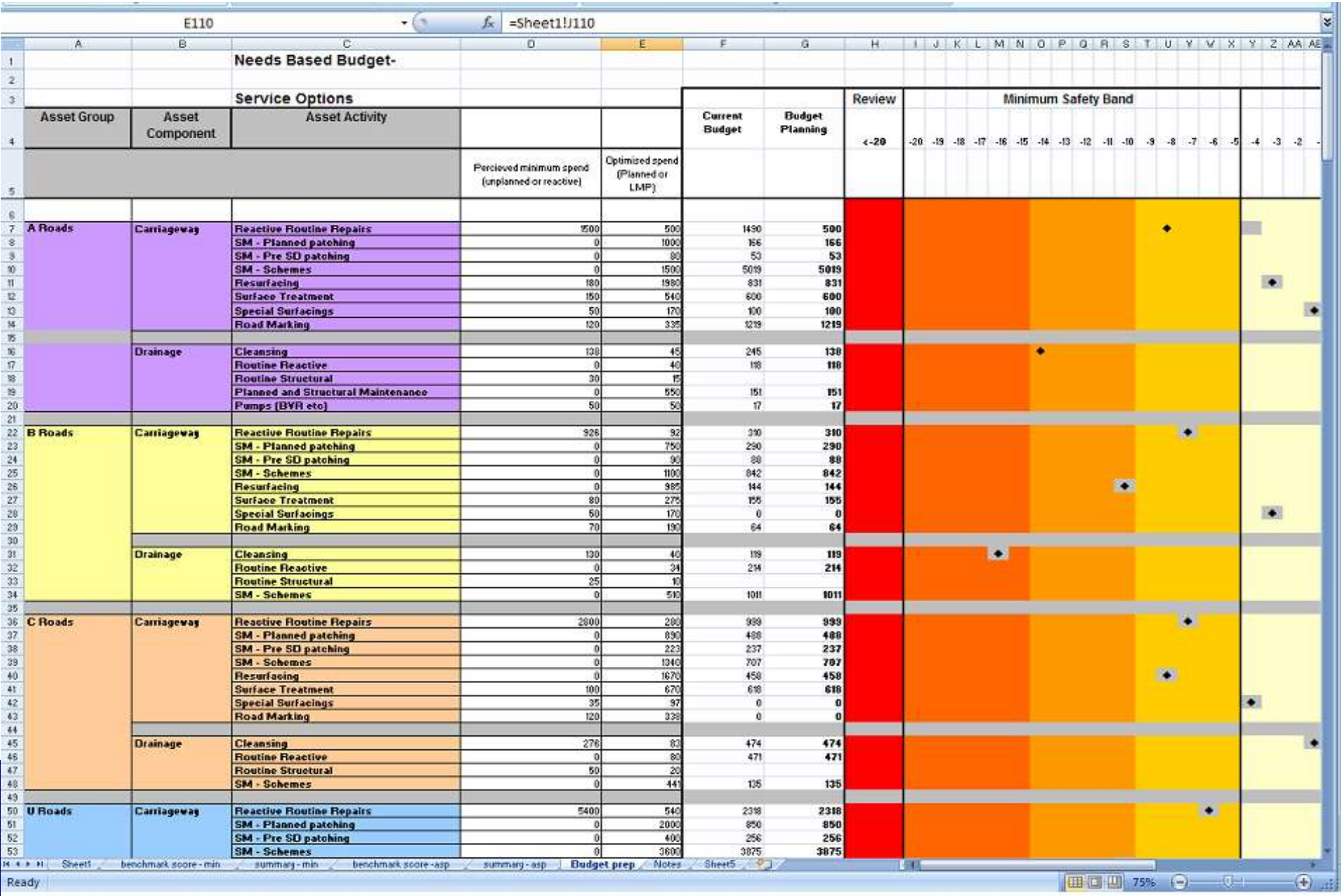
The Strategic Tool

Needs Based Budget-

Risk Assessment of Asset Activities

Asset Group	Asset Component	Asset Activity	Risk Criteria					Total Risk Score	Risk Band
			SAFETY	ENVIRONMENTAL	ECONOMIC	LEGISLATIVE	CUSTOMER FOCUS	TOTAL	
A Roads	Carriageway	Reactive Routine Repairs	3	0	-5	1	-3	-4	min safety
		SM - Planned patching	3	0	1	2	2	8	preservation
		SM - Pre SD patching	1	0	2	2	2	7	preservation
		SM - Schemes	-4	0	-5	-1	-4	-14	min safety
		Resurfacing	-4	0	-5	-2	-4	-15	min safety
		Surface Treatment	2	0	2	2	0	6	preservation
		Special Surfacings	-1	1	2	-1	-3	-2	preservation
		Road Marking	2	0	0	1	1	4	preservation
	Drainage	Cleansing	-2	0	-2	-3	-7	-14	min safety
		Routine Reactive	-3	-1	0	-2	-3	-9	min safety
		Routine Structural	0	0	0	0	0	0	preservation
		Planned and Structural Maintenance	-3	0	0	-1	0	-4	min safety
		Pumps (BVR etc)	0	0	0	0	0	0	preservation
B Roads	Carriageway	Reactive Routine Repairs	3	0	-5	1	-3	-4	min safety
		SM - Planned patching	3	0	1	2	2	8	preservation
		SM - Pre SD patching	0	0	-1	0	0	-1	preservation
		SM - Schemes	-4	0	-5	-1	-4	-14	min safety
		Resurfacing	-4	0	-5	-2	-4	-15	min safety
		Surface Treatment	2	0	2	2	0	6	preservation
		Special Surfacings	-1	1	2	-1	-3	-2	preservation
		Road Marking	2	0	0	1	1	4	preservation
	Drainage	Cleansing	-2	0	-2	-3	-7	-14	min safety
		Routine Reactive	-3	-1	0	-2	-3	-9	min safety
		Routine Structural	0	0	0	0	0	0	preservation

The Strategic Tool



E110 =Sheet1!J110

Needs Based Budget-

Service Options

Asset Group	Asset Component	Asset Activity	Percieved minimum spend (unplanned or reactive)	Optimized spend (Planned or LMP)	Current Budget	Budget Planning	Review <-20	Minimum Safety Band -20 -19 -18 -17 -16 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5 -4 -3 -2 -
A Roads	Carriageway	Reactive Routine Repairs	1500	500	1490	500		
		SM - Planned patching	0	1000	166	166		
		SM - Pre SD patching	0	80	53	53		
		SM - Schemes	0	1500	5019	5019		
		Resurfacing	180	1980	831	831		
		Surface Treatment	150	540	600	600		
		Special Surfacings	50	170	100	100		
		Road Marking	120	335	1219	1219		
	Drainage	Cleansing	138	45	245	138		
		Routine Reactive	0	40	118	118		
		Routine Structural	30	15				
		Planned and Structural Maintenance	0	550	151	151		
		Pumps (BVR etc)	50	50	17	17		
B Roads	Carriageway	Reactive Routine Repairs	926	92	310	310		
		SM - Planned patching	0	750	290	290		
		SM - Pre SD patching	0	90	88	88		
		SM - Schemes	0	1100	842	842		
		Resurfacing	0	985	144	144		
		Surface Treatment	80	275	155	155		
		Special Surfacings	50	170	0	0		
		Road Marking	70	190	64	64		
	Drainage	Cleansing	130	40	119	119		
		Routine Reactive	0	34	214	214		
		Routine Structural	25	10				
		SM - Schemes	0	513	1011	1011		
C Roads	Carriageway	Reactive Routine Repairs	2800	280	999	999		
		SM - Planned patching	0	890	488	488		
		SM - Pre SD patching	0	223	237	237		
		SM - Schemes	0	1349	707	707		
		Resurfacing	0	1670	458	458		
		Surface Treatment	100	670	618	618		
		Special Surfacings	35	97	0	0		
		Road Marking	120	338	0	0		
	Drainage	Cleansing	276	83	474	474		
		Routine Reactive	0	80	471	471		
		Routine Structural	50	20				
		SM - Schemes	0	441	135	135		
U Roads	Carriageway	Reactive Routine Repairs	5400	540	2318	2318		
		SM - Planned patching	0	2000	850	850		
		SM - Pre SD patching	0	400	256	256		
		SM - Schemes	0	3600	3875	3875		

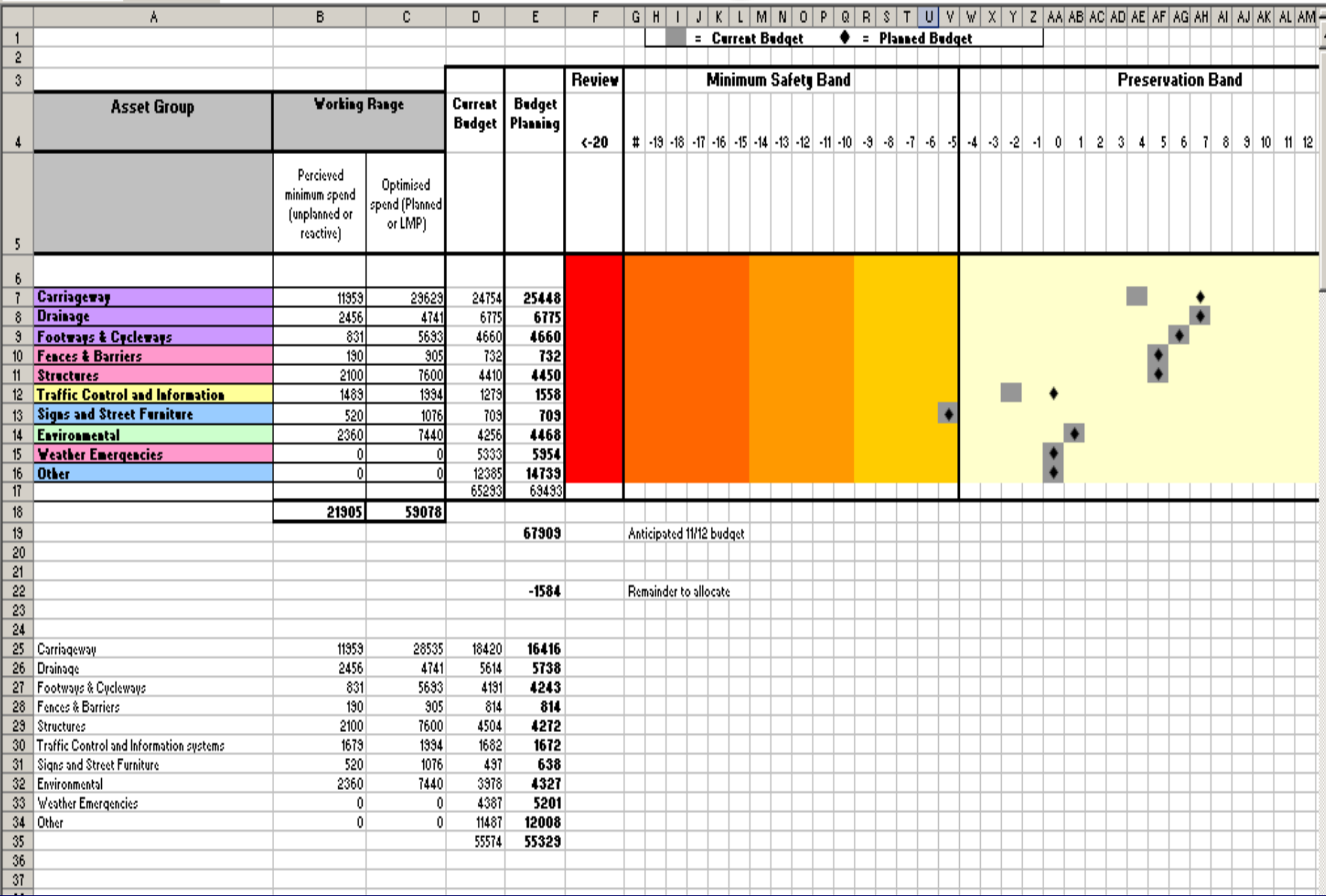
Sheet1 | benchmark score - min | summary - min | benchmark score - asp | summary - asp | Budget prep | Notes | Sheet5

Ready 75%

The Strategic Tool

- Relates defined corporate aspirations to maintenance activities and spend.
- Illustrates the service level for a given spend
- Is used to illustrate and cost budget options

The Strategic Tool



Asset Group	Working Range		Current Budget	Budget Planning
	Percieved minimum spend (unplanned or reactive)	Optimised spend (Planned or LMP)		
Carriageway	11959	29629	24754	**25448**
Drainage	2456	4741	6775	**6775**
Footways & Cycleways	831	5693	4660	**4660**
Fences & Barriers	190	905	732	**732**
Structures	2100	7600	4410	**4450**
Traffic Control and Information	1483	1394	1279	**1558**
Signs and Street Furniture	520	1076	709	**709**
Environmental	2360	7440	4256	**4468**
Weather Emergencies	0	0	5333	**5954**
Other	0	0	12385	**14739**
			65293	69493
	21905	**59078**		
				67909
				-1584
Carriageway	11959	28535	18420	**16416**
Drainage	2456	4741	5614	**5738**
Footways & Cycleways	831	5693	4191	**4243**
Fences & Barriers	190	905	814	**814**
Structures	2100	7600	4504	**4272**
Traffic Control and Information systems	1673	1394	1682	**1672**
Signs and Street Furniture	520	1076	497	**638**
Environmental	2360	7440	3978	**4327**
Weather Emergencies	0	0	4387	**5201**
Other	0	0	11487	**12008**
			55574	**55329**

= Current Budget ♦ = Planned Budget

Review <-20

Minimum Safety Band: # -19 -18 -17 -16 -15 -14 -13 -12 -11 -10 -9 -8 -7 -6 -5

Preservation Band: -4 -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12

Anticipated 11/12 budget

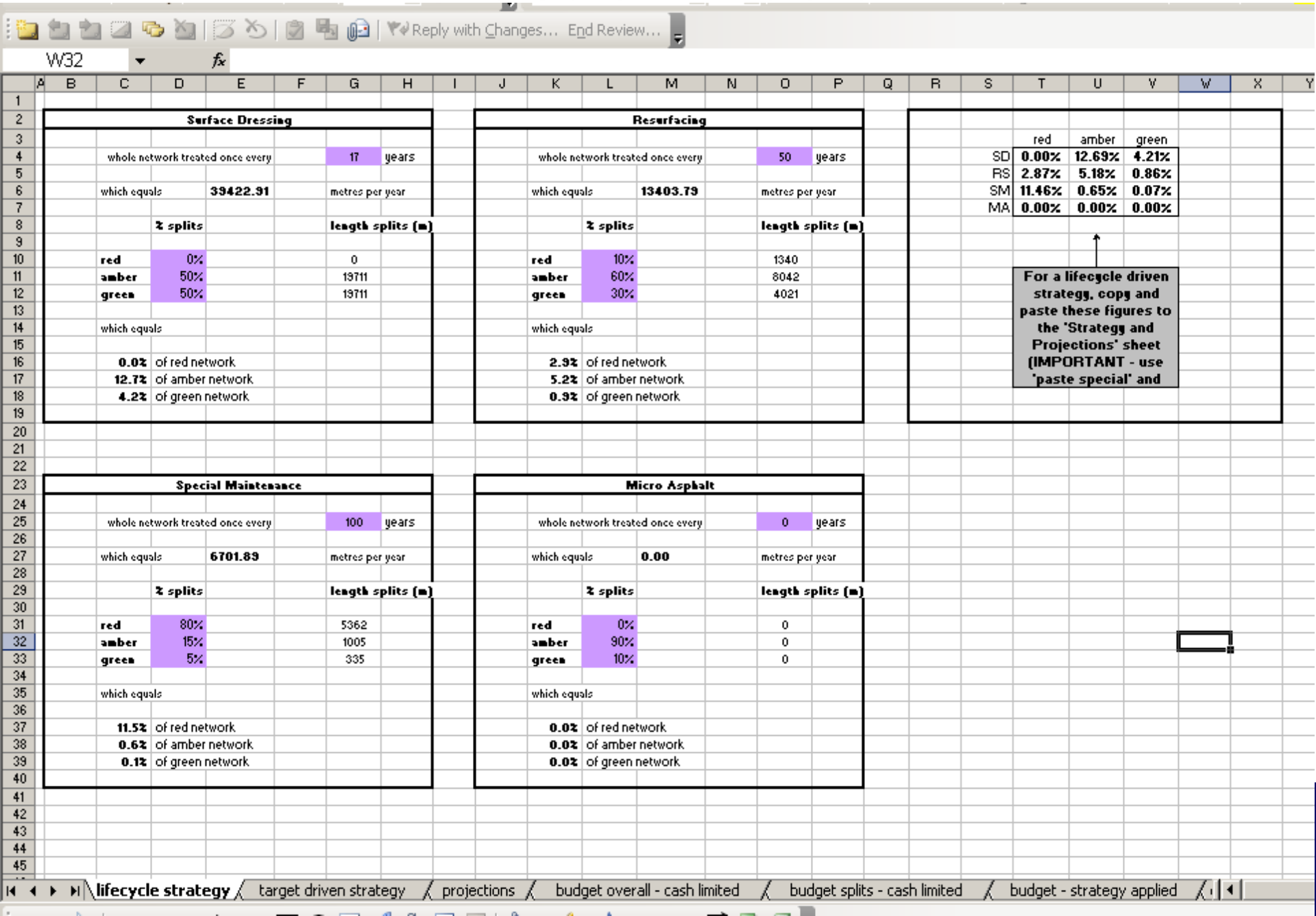
Remainder to allocate

Tactical Tools

Tactical tools have been developed for carriageways

- Optimum lifecycles are have been developed for all road classes.

Tactical Tools



Tactical Tools

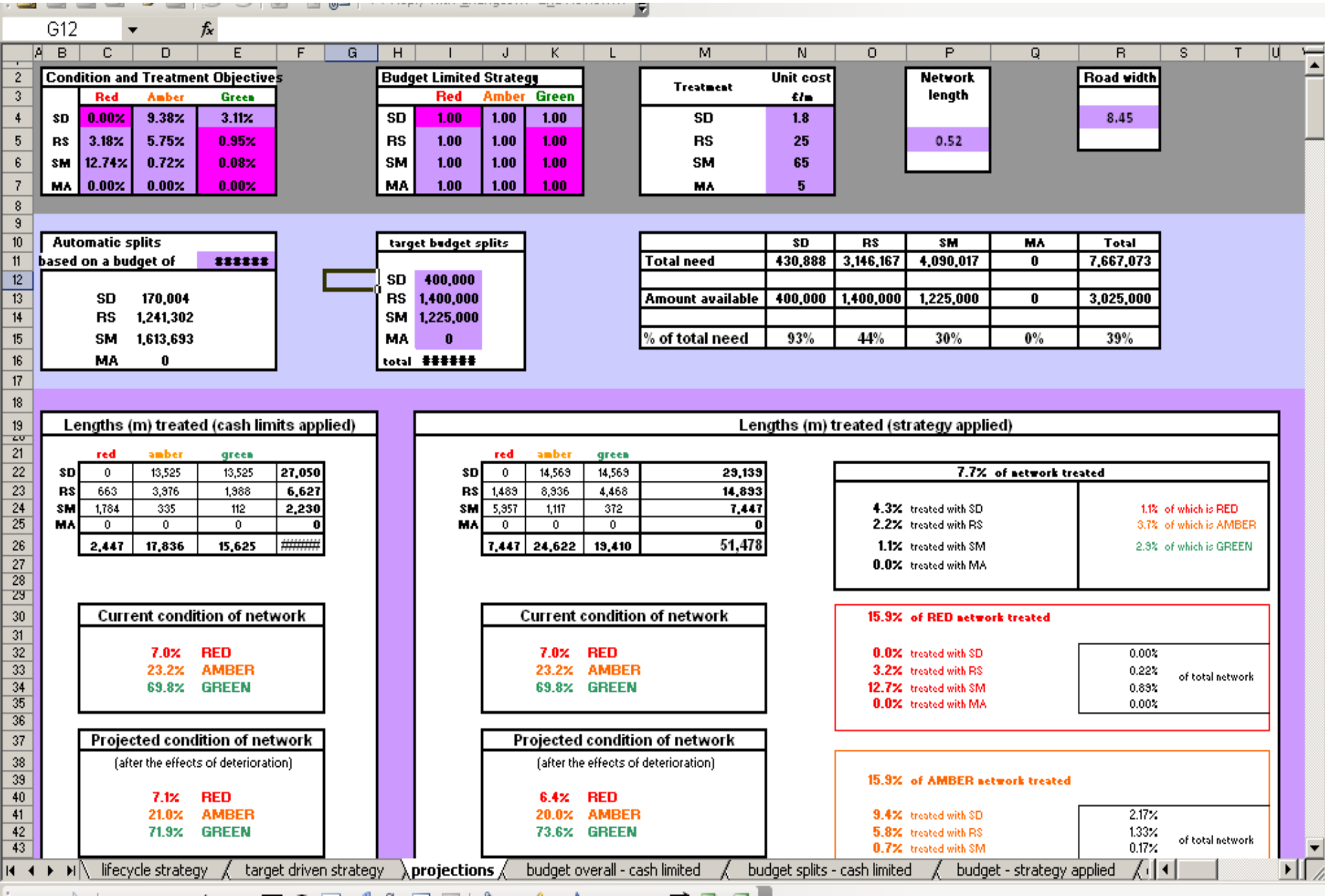
Illustration of an Principal (A) Road Lifecycle

Tactical Tools

Tactical tools have been developed for carriageways

- Optimum lifecycles have been developed for all road classes.
- Budget/treatment options can be adjusted to meet specific outcomes.
- These outcomes can be whole life, condition target, stakeholder or a combination of.....

Tactical Tools



Condition and Treatment Objectives	Red	Amber	Green
SD	0.00%	9.38%	3.11%
RS	3.18%	5.75%	0.95%
SM	12.74%	0.72%	0.08%
MA	0.00%	0.00%	0.00%

Budget Limited Strategy	Red	Amber	Green
SD	1.00	1.00	1.00
RS	1.00	1.00	1.00
SM	1.00	1.00	1.00
MA	1.00	1.00	1.00

Treatment	Unit cost £/m
SD	1.8
RS	25
SM	65
MA	5

Network length
0.52

Road width
8.45

Automatic splits based on a budget of	######
SD	170,004
RS	1,241,302
SM	1,613,693
MA	0

target budget splits	
SD	400,000
RS	1,400,000
SM	1,225,000
MA	0
total	######

	SD	RS	SM	MA	Total
Total need	430,888	3,146,167	4,090,017	0	7,667,073
Amount available	400,000	1,400,000	1,225,000	0	3,025,000
% of total need	93%	44%	30%	0%	39%

Lengths (m) treated (cash limits applied)

	red	amber	green	
SD	0	13,525	13,525	27,050
RS	663	3,976	1,988	6,627
SM	1,784	335	112	2,230
MA	0	0	0	0
	2,447	17,836	15,625	######

Current condition of network

7.0% RED
23.2% AMBER
69.8% GREEN

Projected condition of network

(after the effects of deterioration)

7.1% RED
21.0% AMBER
71.9% GREEN

Lengths (m) treated (strategy applied)

	red	amber	green	
SD	0	14,569	14,569	29,139
RS	1,489	8,936	4,468	14,893
SM	5,957	1,117	372	7,447
MA	0	0	0	0
	7,447	24,622	19,410	51,478

Current condition of network

7.0% RED
23.2% AMBER
69.8% GREEN

Projected condition of network

(after the effects of deterioration)

6.4% RED
20.0% AMBER
73.6% GREEN

7.7% of network treated

4.3% treated with SD	1.1% of which is RED
2.2% treated with RS	3.7% of which is AMBER
1.1% treated with SM	2.9% of which is GREEN
0.0% treated with MA	

15.9% of RED network treated

0.0%	treated with SD	0.00%
3.2%	treated with RS	0.22%
12.7%	treated with SM	0.89%
0.0%	treated with MA	0.00%

of total network

15.9% of AMBER network treated

9.4%	treated with SD	2.17%
5.8%	treated with RS	1.33%
0.7%	treated with SM	0.17%

of total network

lifecycle strategy | target driven strategy | projections | budget overall - cash limited | budget splits - cash limited | budget - strategy applied

Local Programming Tools

Local tools have been developed for carriageways and drainage programmes

- These can be cross-referenced and adjusted to accommodate route strategies and forward planning.
- The programmes use both condition and value engineering criteria to prioritise the programme
- The criteria can be loaded/weighted to accommodate changing objectives.

Local Programming Tools

AD1 — fx Local Engineering Judgement (Planned repairs)

	Y	Z	AA	AB	AC	AD	AE	AF	AG	A
1	Scheme Status	% Red Condition in section	Score	% Amber Condition in section	Score	Local Engineering Judgement (Planned repairs)	Score	Reactive Repairs	Score	KSI s
2	PROVISIONAL	0	0	25	2					0 KSI re
3	PROVISIONAL	10	1	23	2					1 KSI re
4	PROVISIONAL	0	0	26	2					0 KSI re
5	PROVISIONAL	0	0	31	3					0 KSI re
6	PROVISIONAL	7	0	20	2					1 KSI re

Master / Sheet3 / Dropdowns /

Lifecycle Planning - Next steps

Footways –

- Presently collecting condition and inventory information.
- Development of footway lifecycle plans based on hierarchy, condition, material and reactive repair frequencies.
- Develop simple treatment option tool.

Lifecycle Planning - Next steps

Drainage

- Presently developing a data strategy which considers the needs of the asset and the requirement of the FWMA.
- Will be developing lifecycle concepts which will focus on the at risk parts of the network with routine condition surveys, renewal and improvement strategies, whilst maintaining the remaining network in a ‘steady state’.

Lifecycle Planning - Next steps

Other assets

Structures, ITS –

- well documented asset records exist.
- Issues of obsolescence and structural failure are normally funded.
- Further development of lifecycle planning to identify and cost major refurbishment programmes.

General issues

Refinement of initial judgements i.e.

- modelling deterioration
- refine cost coding, improve records
- review condition/depreciation and other outputs to objectives and investment models.
- relate lifecycle objectives to an improvement in customer perception

Thank You.

Email: Steve.spender@hants.gov.uk