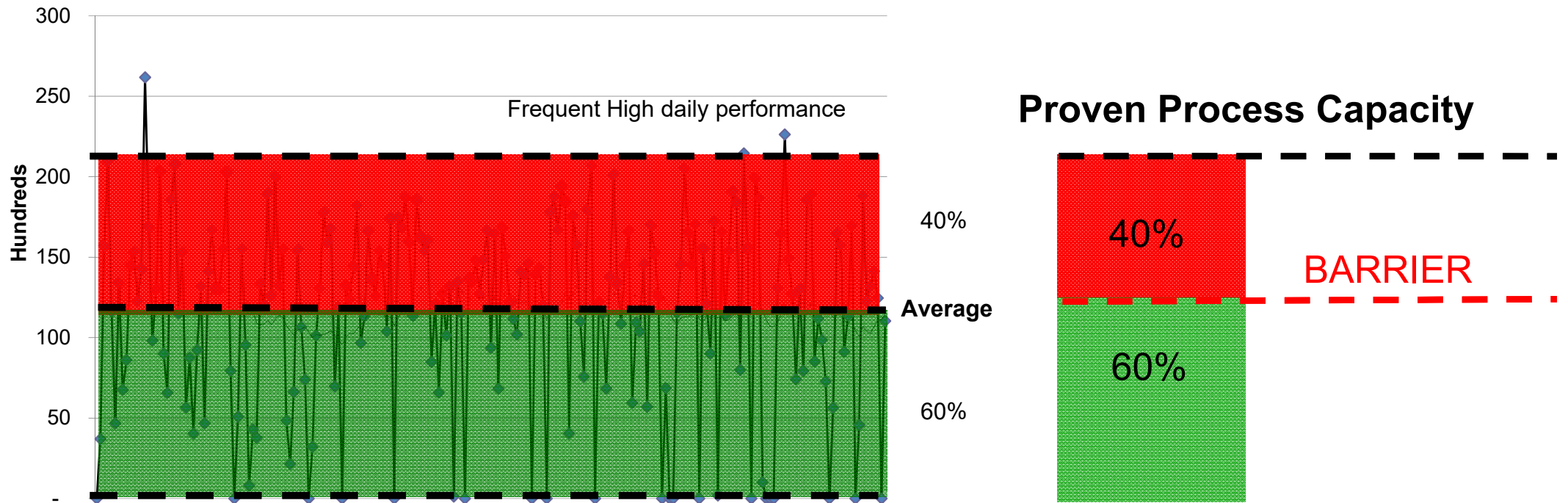


Applying FLOW Engineering Principles (TOC) for a step improvement in Safe Production

The Problem & the Root Cause

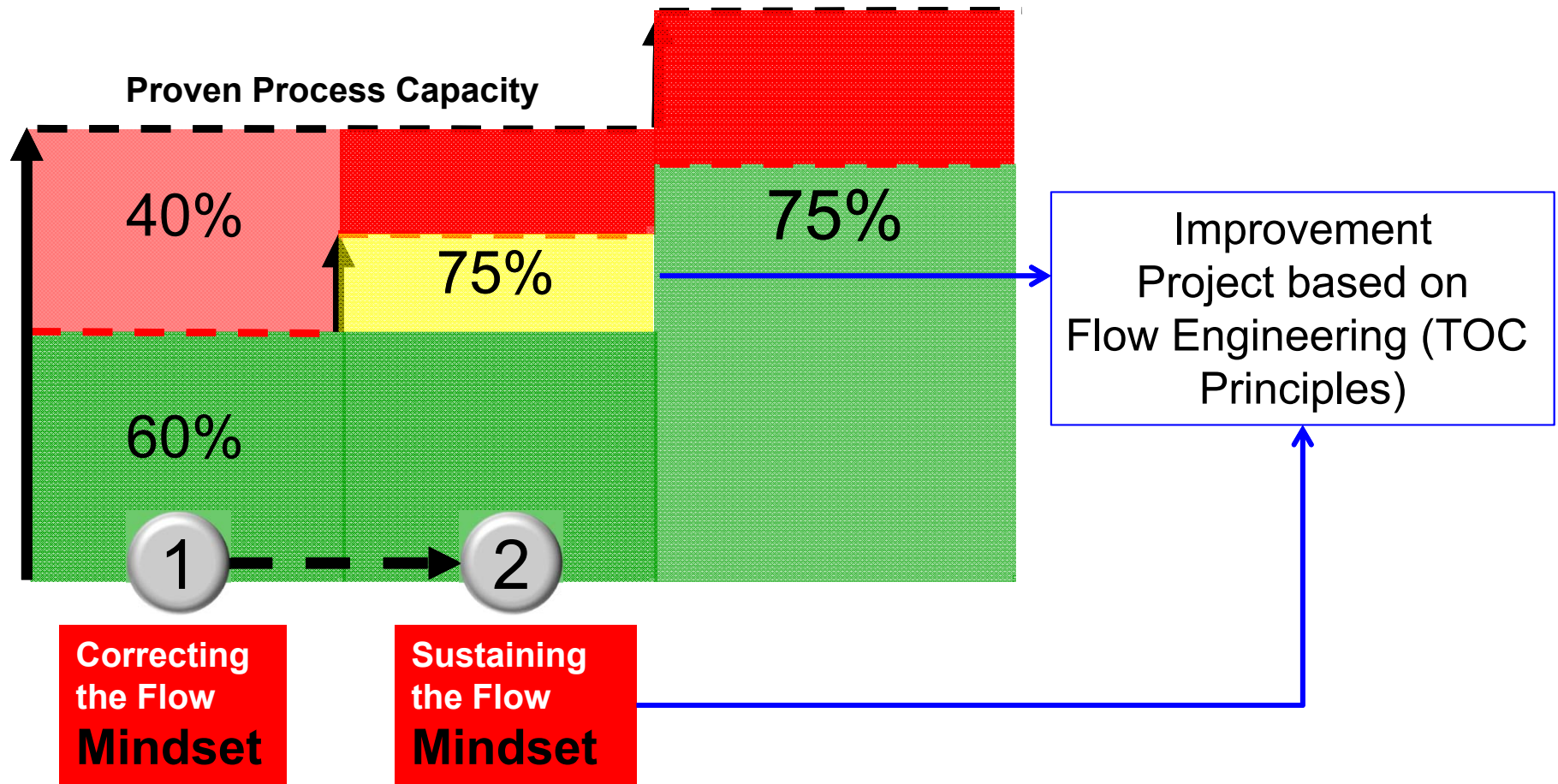
Daily Production



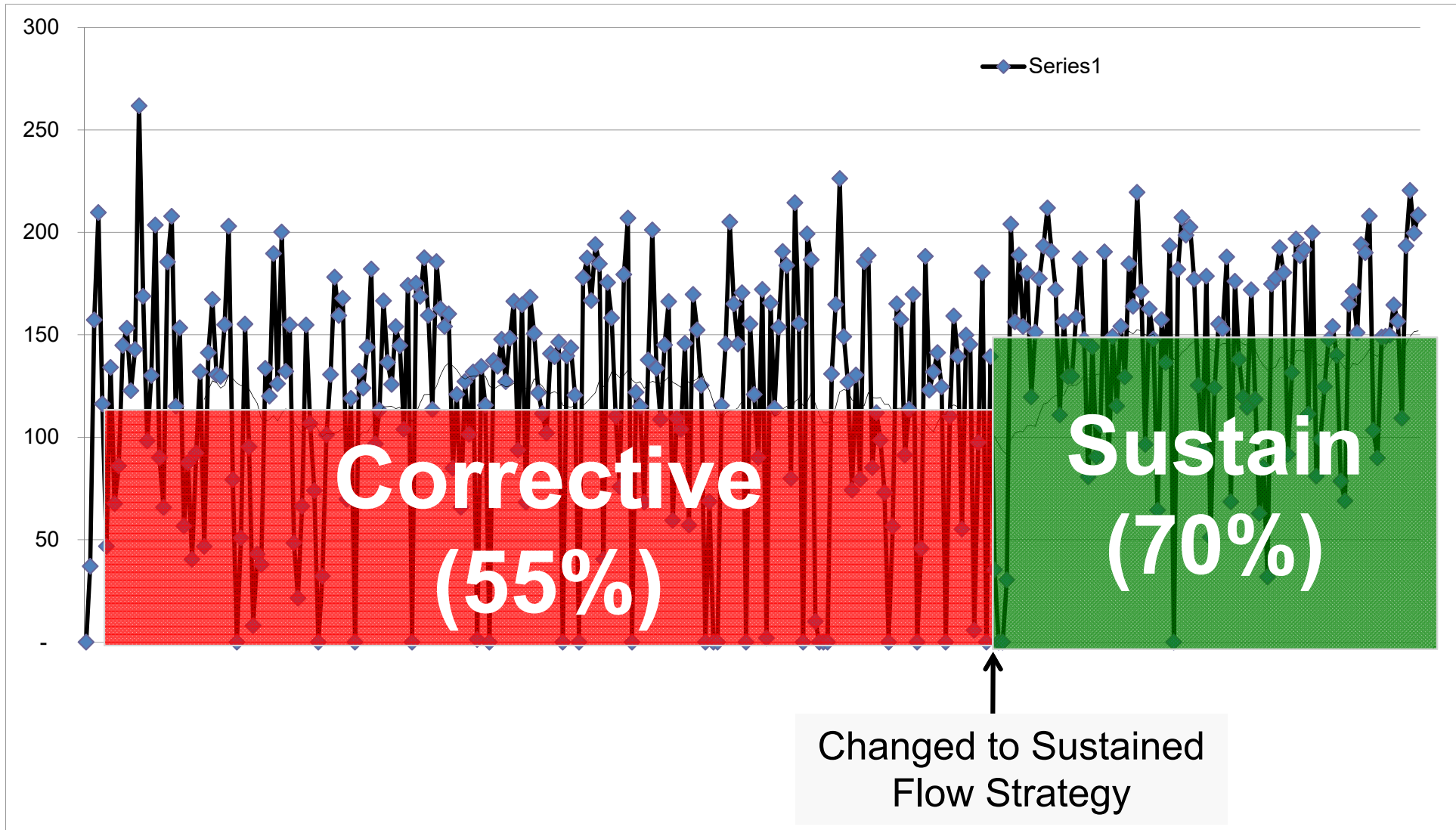
Root Cause for the Productivity barrier:

Management responding to flow disruptions (moving bottlenecks) through constant allocation of resources, required to deal with unforeseen problems

The 75% Change Required



Sustained high performance

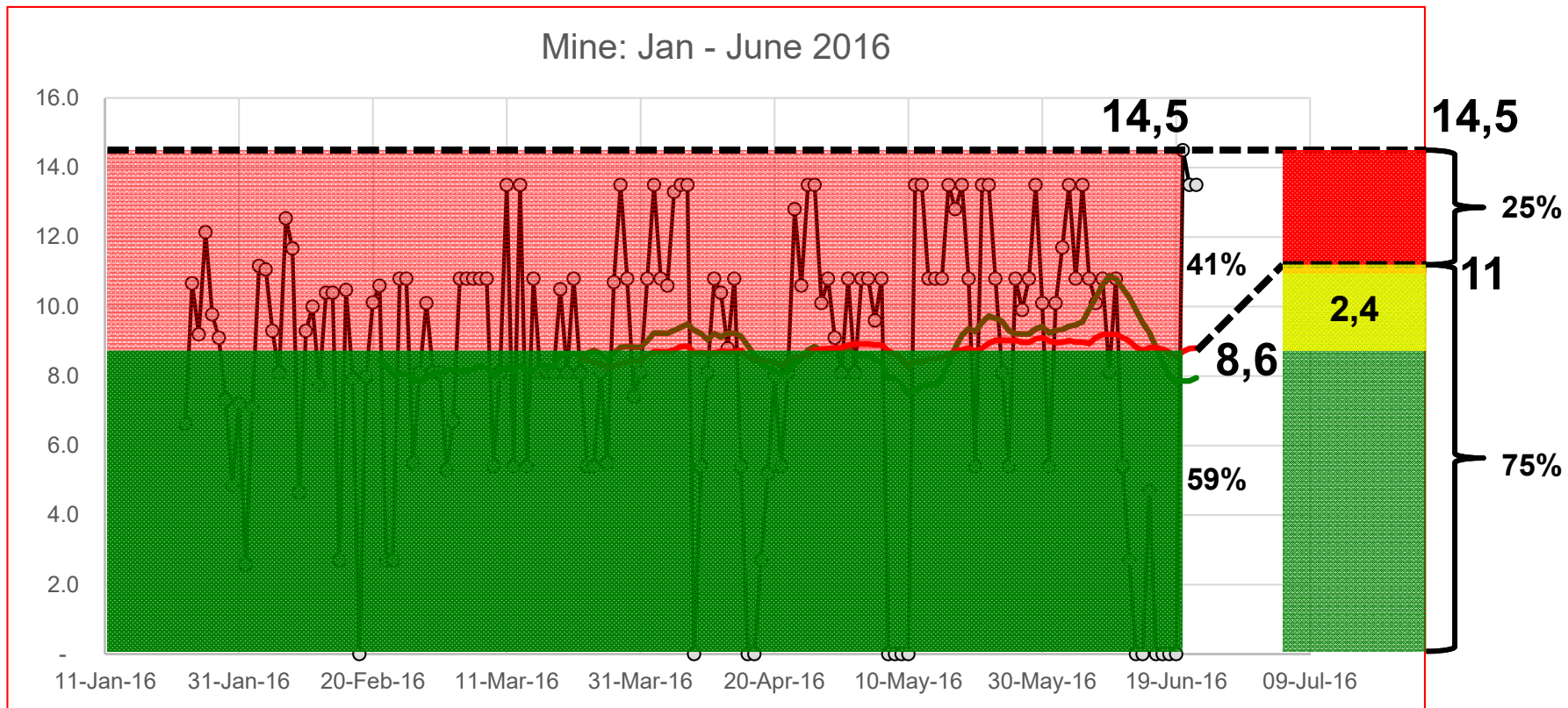


Sustaining Flow Engineering Steps

1. Stop allocation of resources to deal with **moving bottlenecks**
2. Decide where the **FLOW bottleneck** resource should be
3. **Buffer the upstream** flow from impacting the bottleneck (starvation)
4. **Buffer the downstream** flow from impacting the bottleneck (blockage)
5. Adopt the new **Flow measurements** and make the flow visible
6. **Review** daily and monthly

Sustaining Flow Engineering Steps

75% Target



Monthly meters income at 59% = \$619 200

Monthly meters income at 75% = \$792 000

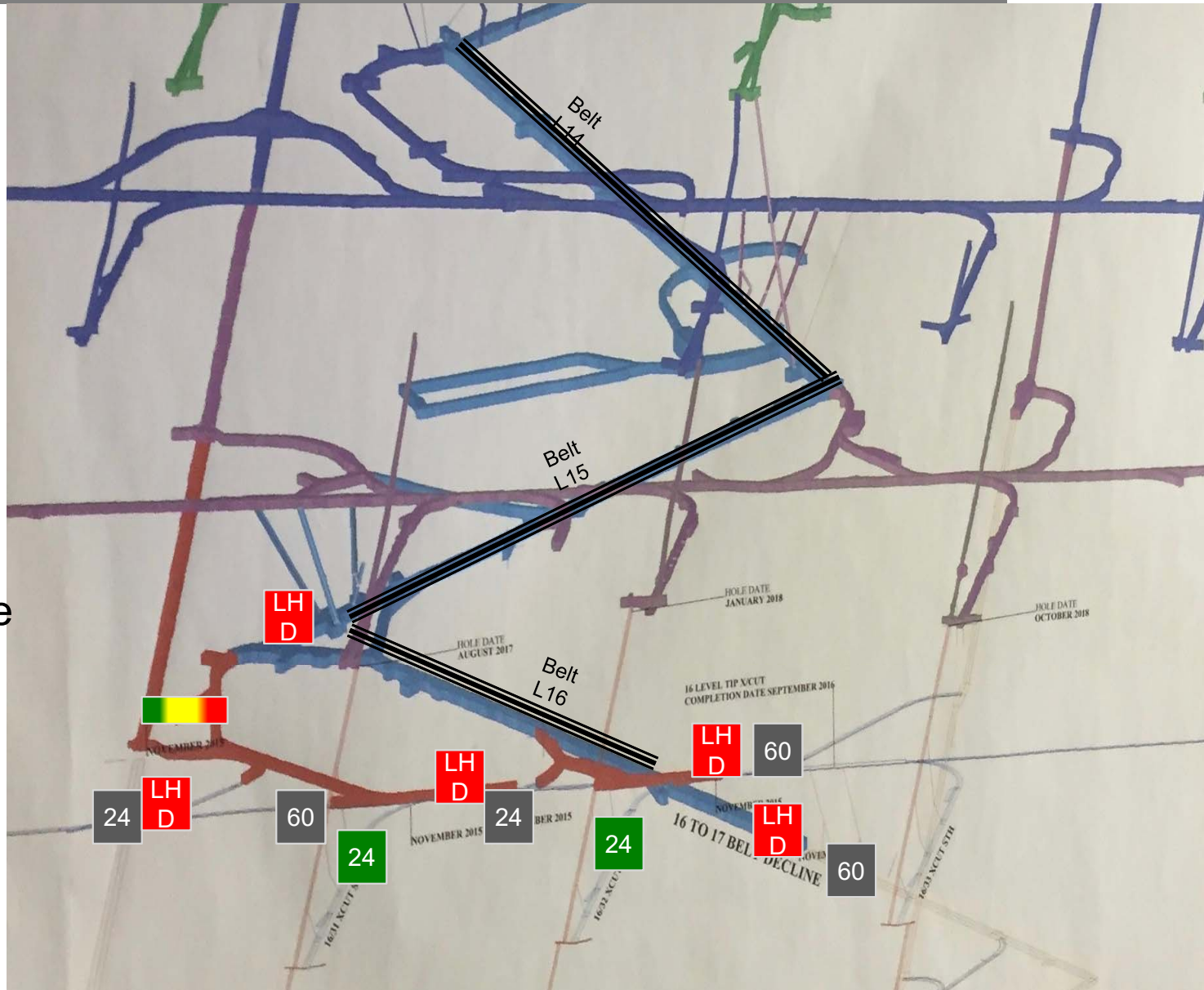
Variance = +\$ 172 800

Flow Engineering Model

**Many
Moving
Bottleneck**

Blast

Belts
People Skills
Breakdowns
Consumables
Diesel
Travel distance
Cleaning up
Ramps
Face time
Operators
Visits
etc



**One
Bottleneck**

LHD

Space Buffer
Work Buffer
Skill Buffer
People Buffer
Diesel Buffer

Flow Engineering Model

Morning shift

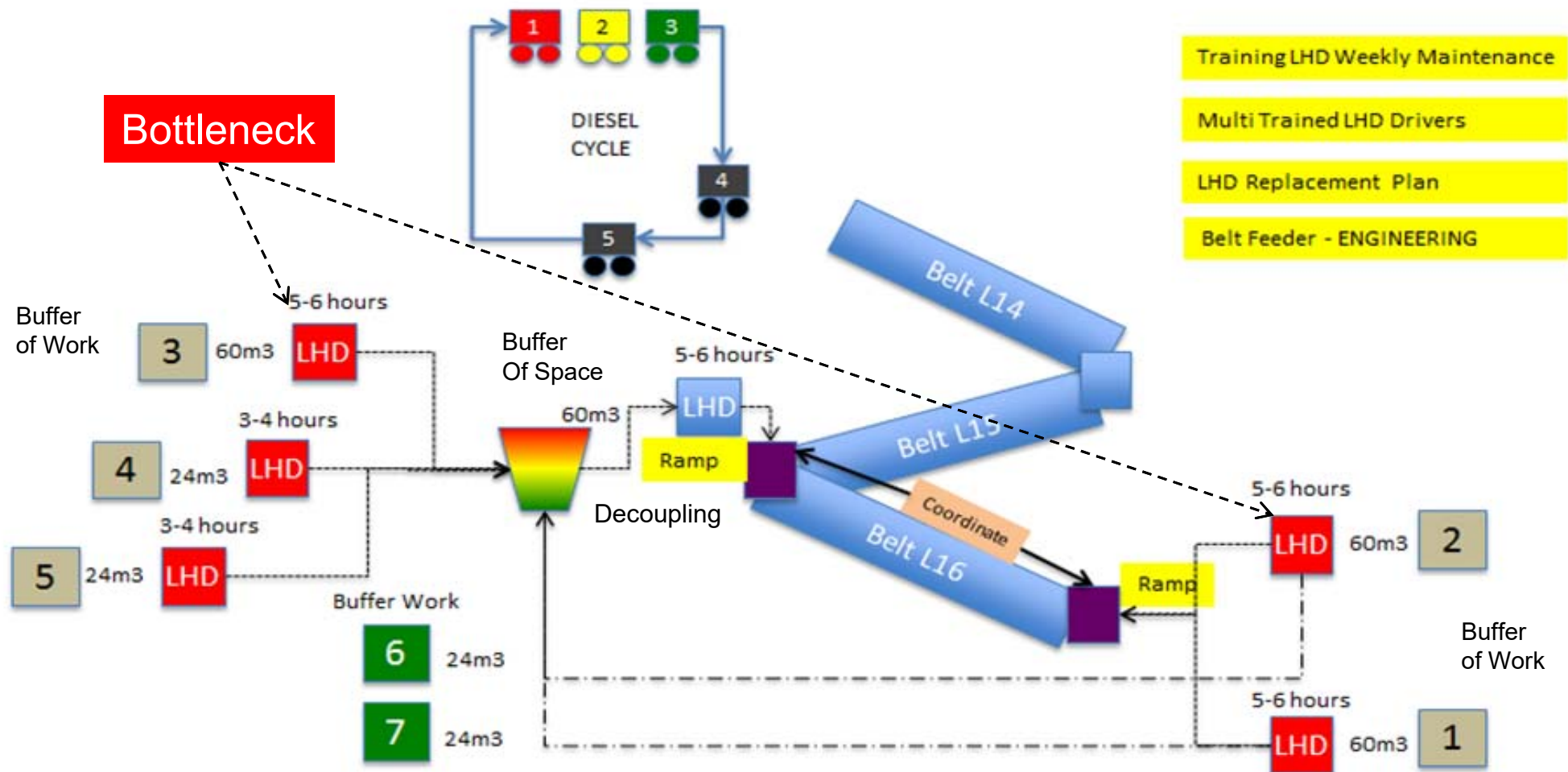
LHD Rule= Fitter, UV & 3xLHD drivers go down 1 hour earlier

Afternoon shift

LHD Rule= Fill till Full

Night shift

LHD Rule= Should run till morning shift



Flow Engineering Metrics



A Theory of Constraints Application

Measurement	RP	Reference	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	1	2	3	4	5	6	7	8	
LHD Production for the day M ³		+100	75-																														
Space Buffer (Before Blast) 60M ³		-1/3	2/3 +																														
Work Buffer (Just After Blast) - Blasted M ³		+100	75-																														
Stopped LHDs - Operator		0	1																														
- Diesel		0	1																														
LHDs Available (shifts)		3	2	1																													
No 1																																	
No 2																																	
No 3																																	
No 4																																	
No 5																																	
No 6																																	
No 7																																	
Breakdown (more than 1 hour) time on LHD fleet		0	1																														
Diesel Cycle		3	2	1																													

Blue = Service
Black = Major Repair



OPS Room Visibility



Sustainable (Safe) 75% Productive Performance

Contact Nicholas@tocsa.co.za
Or 0861102161 for more information