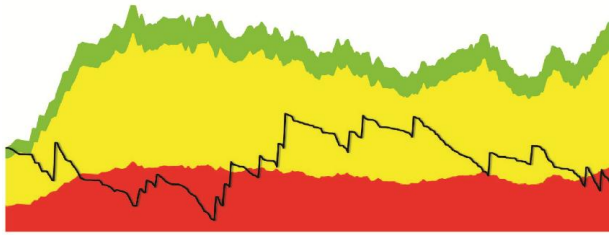
DDMRP

Demand Driven
Material Requirements Planning



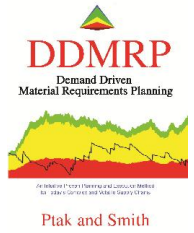
An Intuitive Proven Planning and Execution Method
for Today's Complex and Volatile Supply Chains

Ptak and Smith

Presented by:

Demand Driven™ INSTITUTE

Figure and Graphics Download Pack (Chapters 1-8)



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This download pack is intended as a supplement to the book Demand Driven Material Requirements Planning (Ptak and Smith, Industrial Press, 2016).

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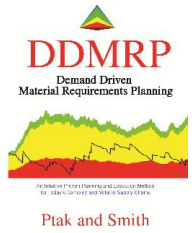
The book is available at Amazon.

The Kindle version of *Demand Driven Material Requirements Planning* is FULL COLOR! Kindle version available here.

Attend the Demand Driven Planner Program

Demand Driven Material Requirements Planning is the official text book of the Demand Driven Planner (DDP) Program.

The Demand Driven Planner (DDP) program is designed for planning, purchasing and supply chain personnel responsible for implementing and maintaining a DDMRP implementation. Designed by the leading authorities on DDMRP at the Demand Driven Institute, the Demand Driven Planner program is comprised of 13 modules of in-depth DDMRP education. The DDP Program is THE official preparatory course for DDI's Demand Driven Planner Professional (DDPP)™ exam.

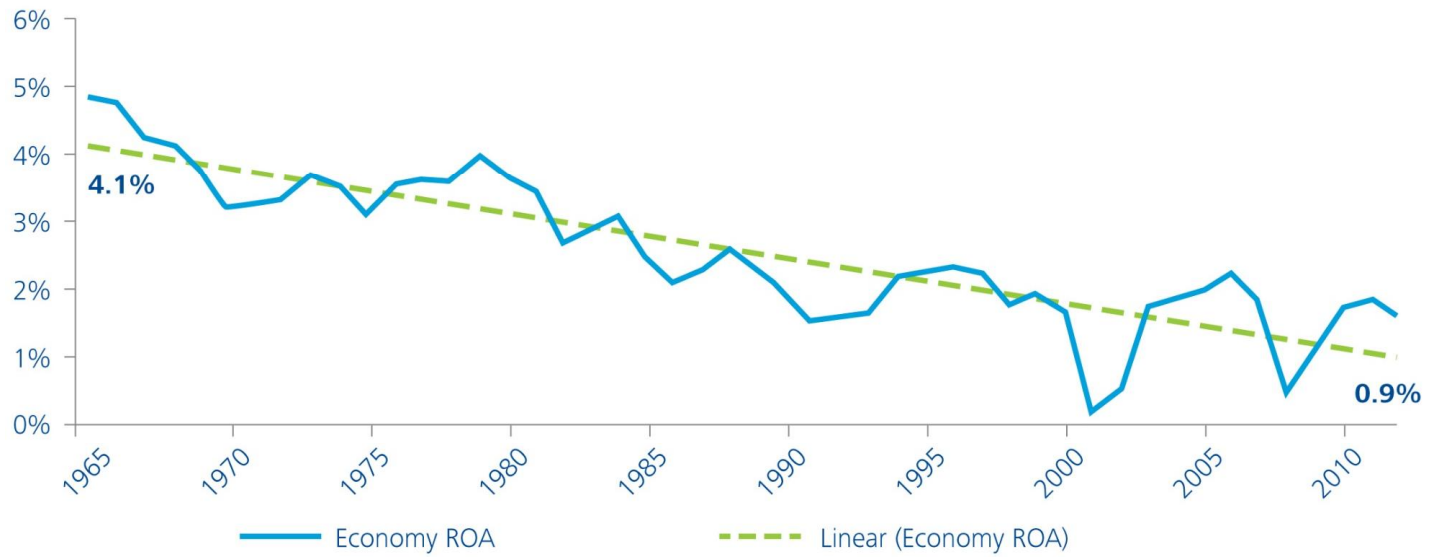


Chapter 1

Planning in the New Normal

Figure 1-1

Figure 1. Return on assets for the US economy (1965–2012)



US firms' ROA fell to a quarter of its 1965 levels in 2012. To increase, or even maintain, asset profitability, firms must find new ways to create value from their assets.

Graphic: Deloitte University Press | DUPress.com

Source: Compustat, Deloitte analysis

Figure 1-2

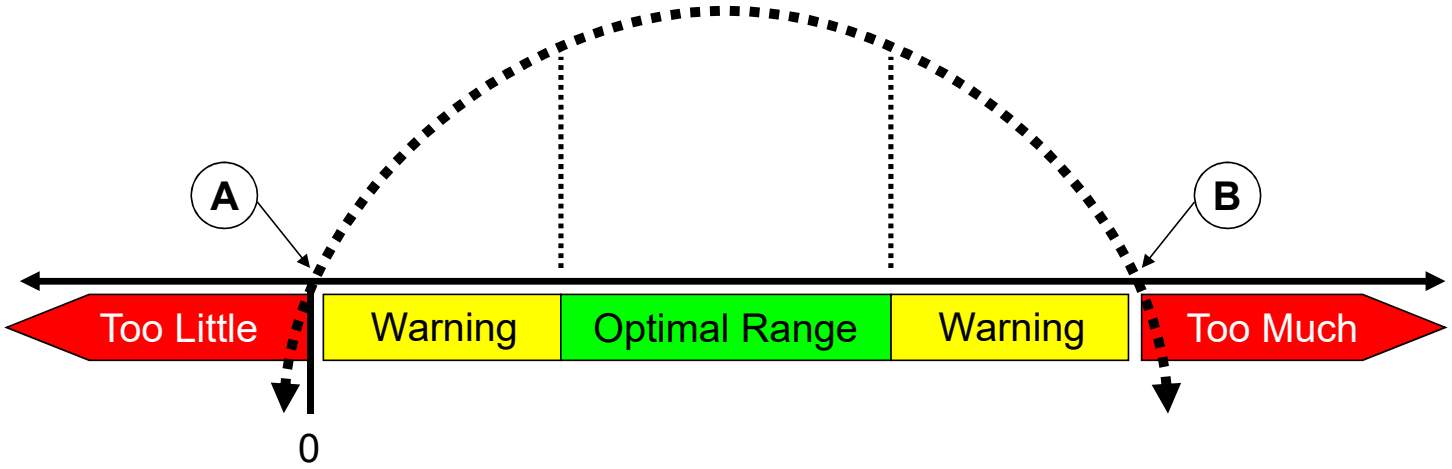


Figure 1-3

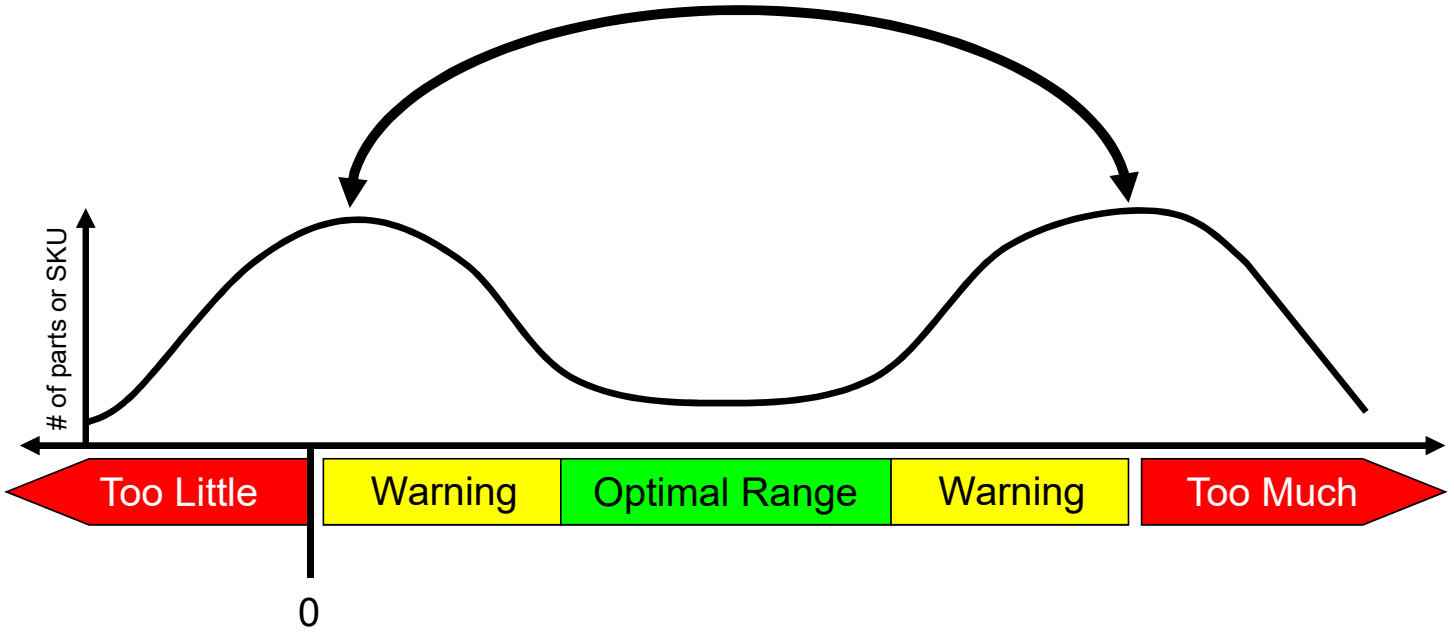
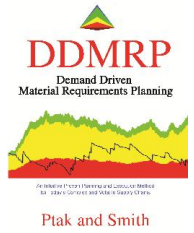


Figure 1-4

Circumstance	1965	2015
Supply Chain Complexity	Low. Supply chains looked like chains – they were more linear. Vertically integrated and domestic supply chains dominated the landscape	High. Supply chains look more like "supply webs" and are fragmented and extended across the globe.
Product Life Cycles	Long. Often measured in years and or decades (e.g. rotary phones)	Short. Often measured in months (particularly in technology)
Customer Tolerance Times	Long. Often measured in weeks and months	Short. Often measured in days with many situations dictating less than 24 hour turns
Product Complexity	Low.	High. Most products now have relatively complex mechanical and electrical systems and micro-systems. Can you even work on a modern car anymore?
Product Customization	Low. Few options or custom feature available.	High. Lots of configuration and customization to a particular customer or customer type.
Product Variety	Low. Example – toothpaste. In 1965 Colgate and Crest each made one type of toothpaste.	High – in 2012 Colgate made 17 types of toothpaste and Crest made 42!
Long Lead Time Parts	Few. Here the word "long" is in relation to the time the market is willing to wait. By default if customer tolerance times were longer it stands to reason that there were less long lead time parts. More so, however, is that fact that supply chains looked different. Most parts were domestically sourced and thus often much "closer" in time.	Many. Today's extended and fragmented supply chains have resulted in not only more purchased items but more purchased items coming from more remote locations.
Forecast Accuracy	High. With less variety, longer life cycles and high customer tolerance times forecast accuracy was almost a non-issue. "If you build it, they will buy it."	Low. The combined complexity of the above items is making the idea of improving forecast accuracy a losing battle.
Pressure for Leaner Inventories	Low. With less variety and longer cycles the penalties of building inventory positions was minimized.	High. At the same time operations is asked to support a much more complex demand and supply scenario (as defined above) they are required to do so with less working capital!
Transactional Friction	High. Finding suppliers and customers took exhaustive and expensive efforts. Choices were limited. People's first experience with a manufacturer was often through a sales person sitting in front of them.	Low. Information is readily available at the click of the mouse. Choices are almost overwhelming. People's first experience with a manufacturer is often through a screen sitting in front of them.



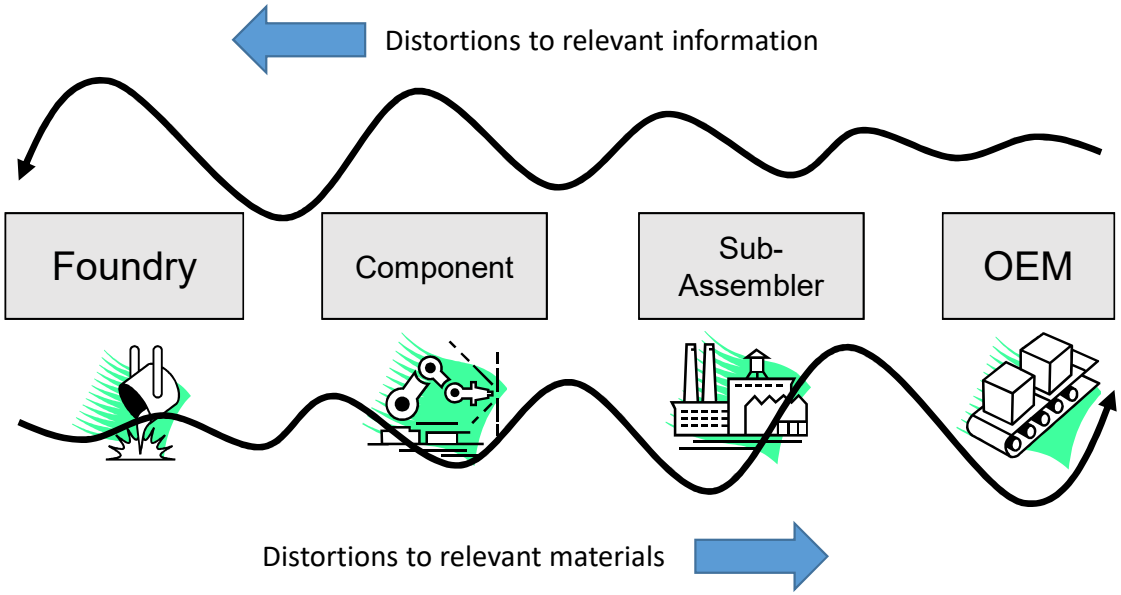
Chapter 2

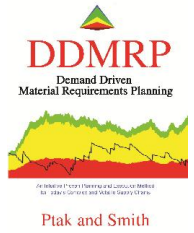
The Importance of Flow

Figure 2-1

Organizational Function	Primary Objective	Example Metric
Planning	Synchronize supply and demand	Shortages and Excess Inventory
Finance	Drive shareholder equity	Return on Average Capital
Sales	Capture demand	Order book
Marketing	Create brand awareness and demand	Market share
Operations	Asset utilization	Overall Equipment Effectiveness (OEE)
Quality	Meet specification	Warranty claims

Figure 2-2


Distortions to relevant information
Foundry
Component
Sub-
Assembler
OEM
Distortions to relevant materials



Chapter 3

Material Requirements Planning in the New Normal

Figure 3-1

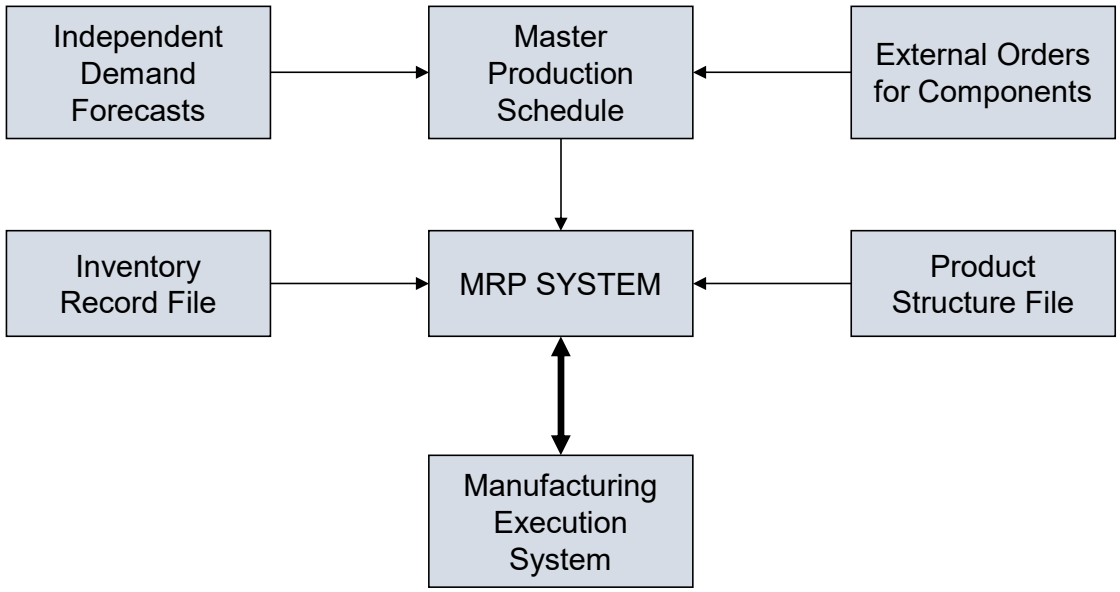

Independent Demand Forecasts
Master Production Schedule
External Orders for Components
Inventory Record File
MRP SYSTEM
Product Structure File
Manufacturing Execution System

Figure 3-2

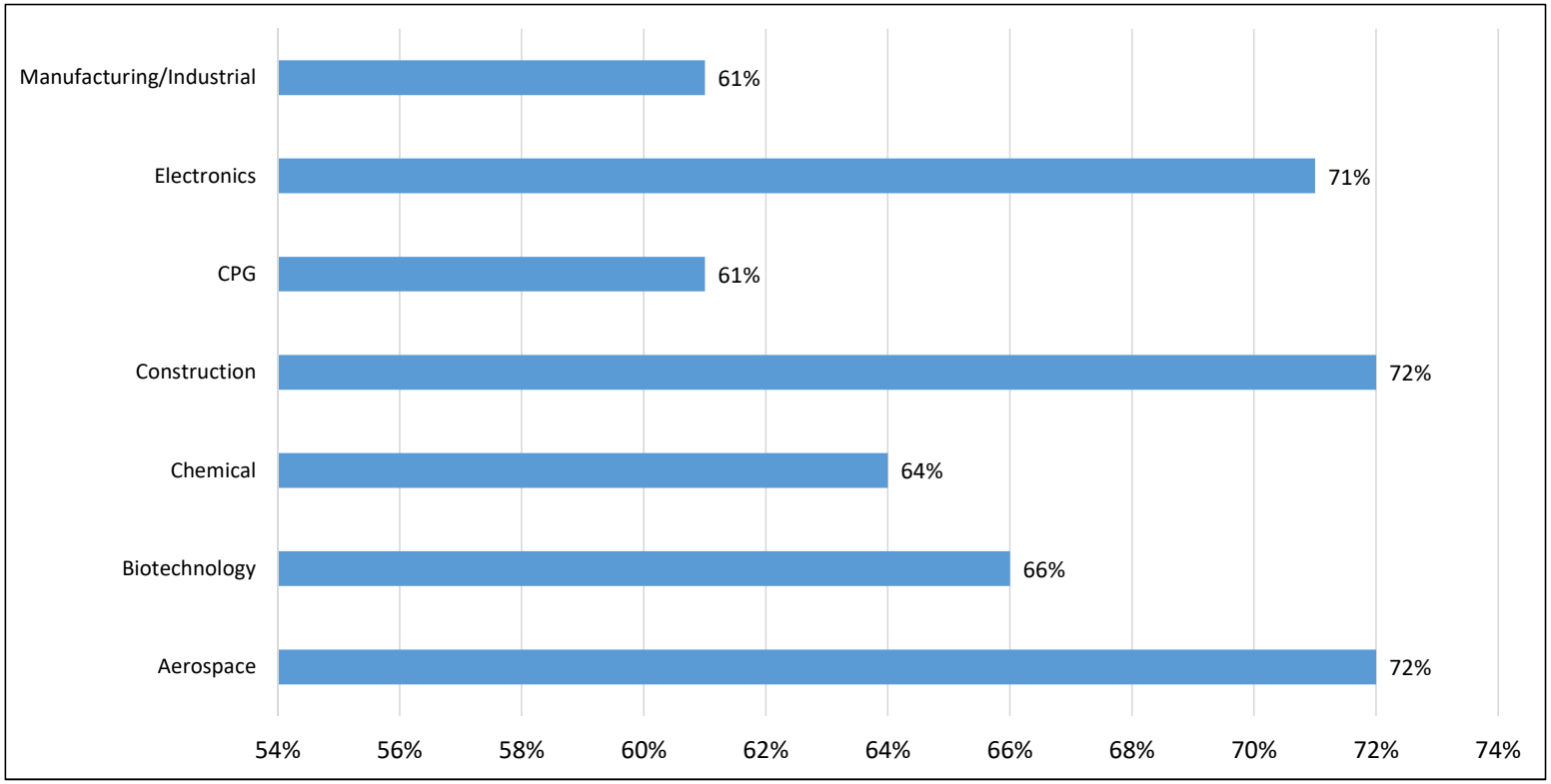

Manufacturing/Industrial
61%
Electronics
71%
CPG
61%
Construction
72%
Chemical
64%
Biotechnology
66%
Aerospace
72%
54%
56%
58%
60%
62%
64%
66%
68%
70%
72%
74%

Figure 3-3

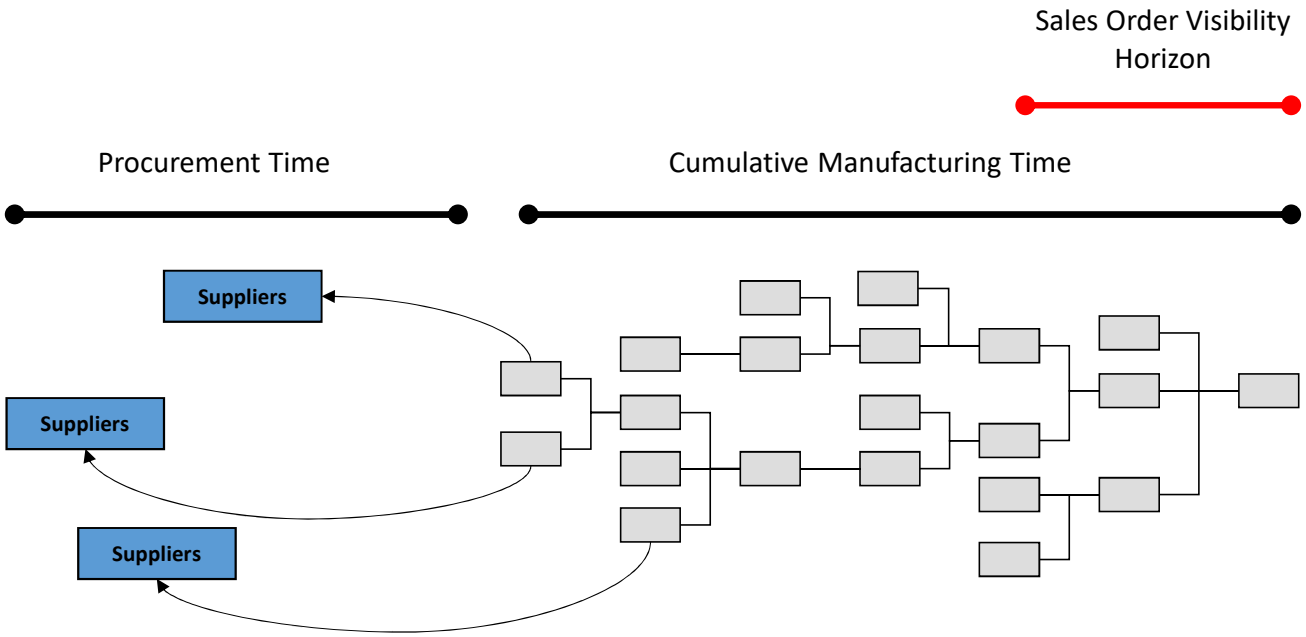

Sales Order Visibility Horizon
Procurement Time
Cumulative Manufacturing Time
Suppliers
Suppliers
Suppliers

Figure 3-4

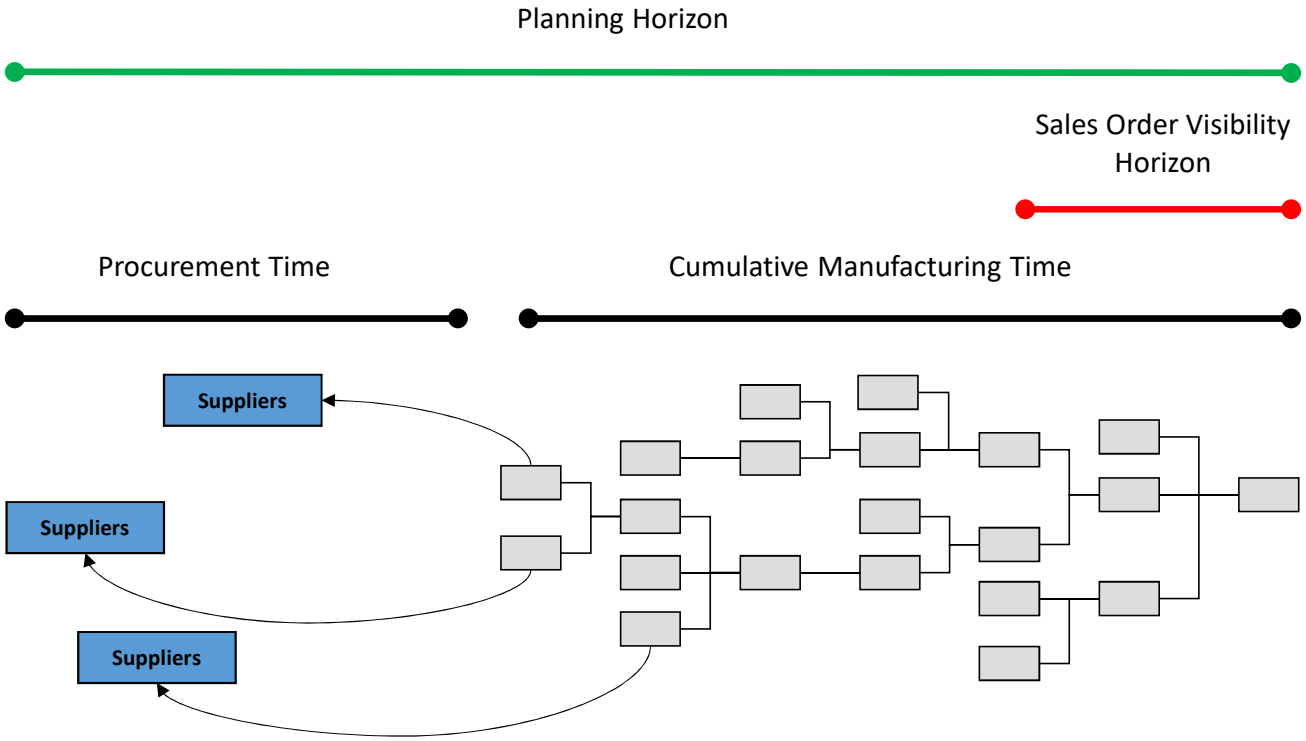

Planning Horizon
Sales Order Visibility Horizon
Procurement Time
Cumulative Manufacturing Time
Suppliers
Suppliers
Suppliers

Figure 3-5

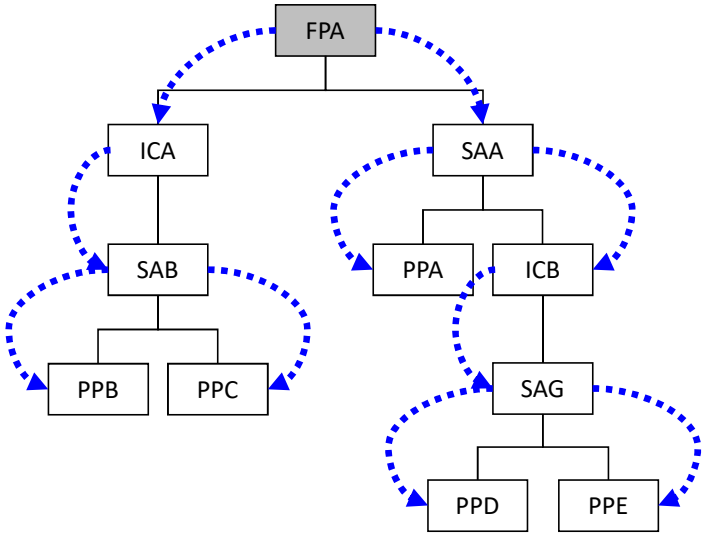


Figure 3-6

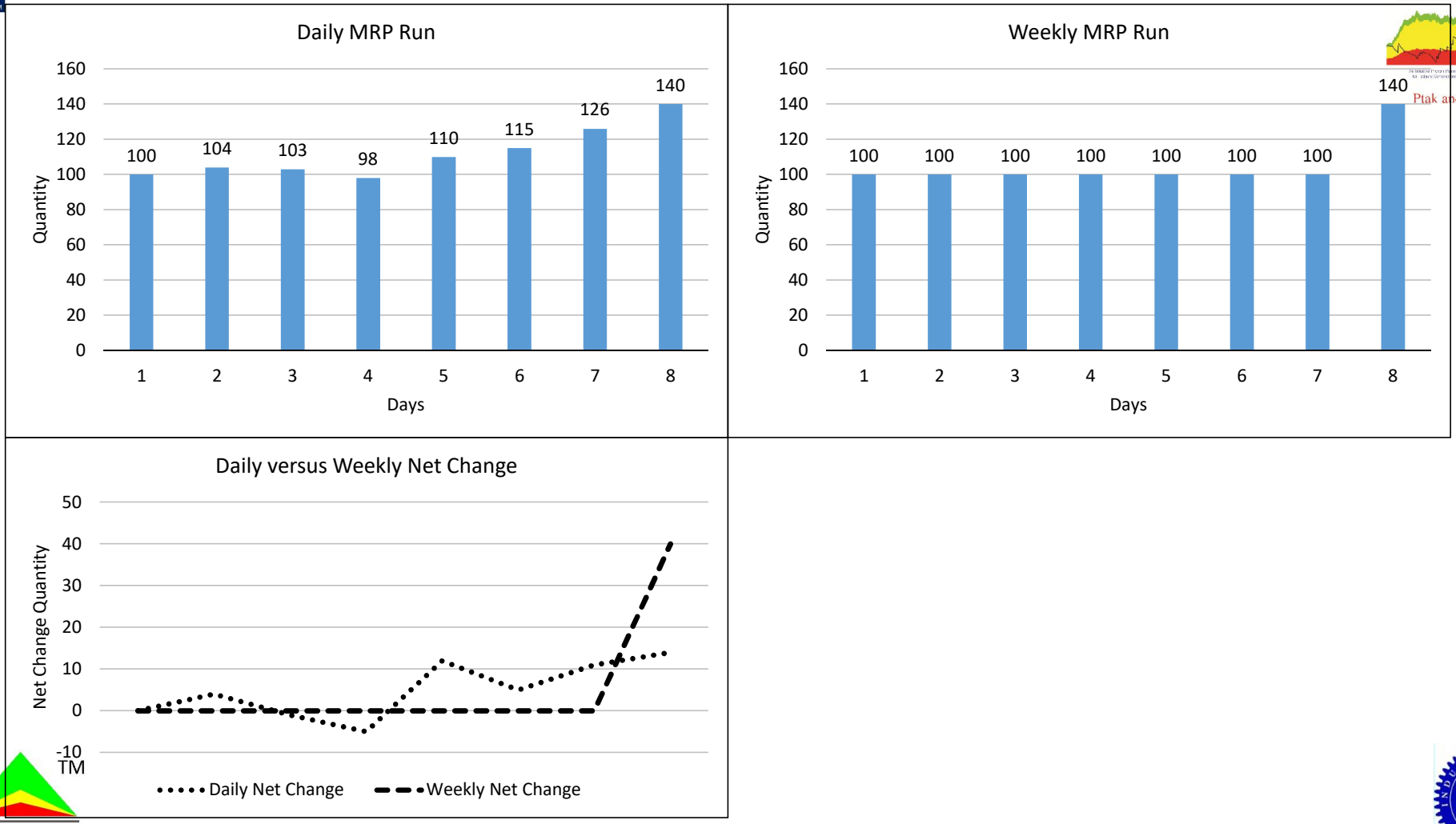

Daily MRP Run
Quantity
160
140
120
100
80
60
40
20
0
100
104
103
98
110
115
126
140
1
2
3
4
5
6
7
8
Days
Weekly MRP Run
Quantity
160
140
120
100
80
60
40
20
0
100
100
100
100
100
100
100
140
1
2
3
4
5
6
7
8
Days
Daily versus Weekly Net Change
Net Change Quantity
50
40
30
20
10
0
-10
Daily Net Change
Weekly Net Change

Figure 3-7

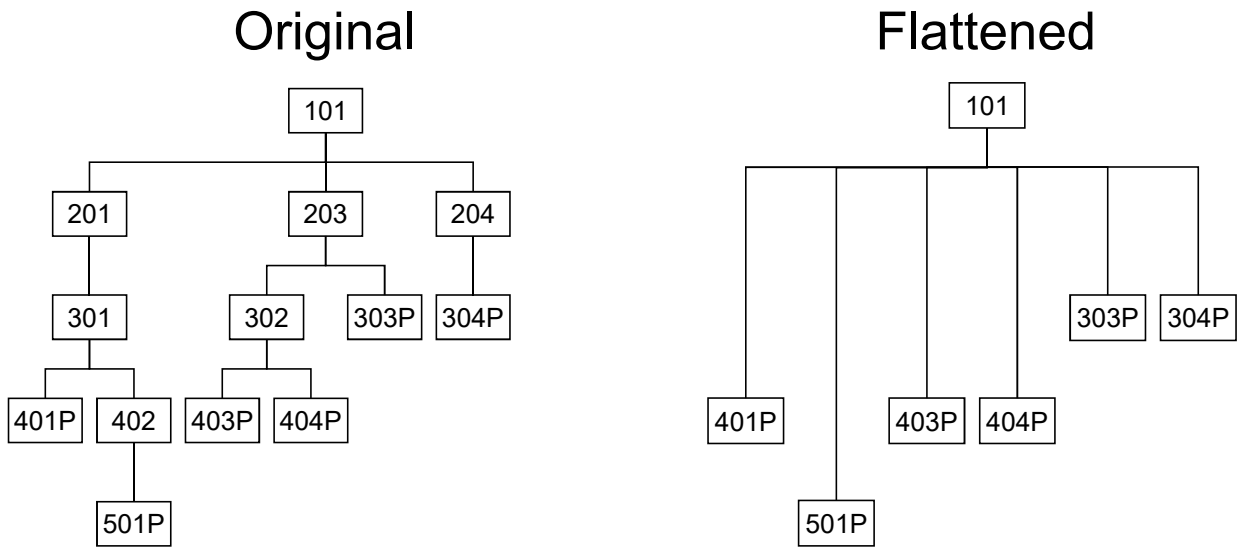

Original
101
201
203
204
301
302
303P
304P
401P
402
403P
404P
501P
Flattened
101
401P
501P
403P
404P
303P
304P

Figure 3-8

Number of Components	Availability Level	
	90%	95%
1	90.0%	95.0%
2	81.0%	90.3%
3	72.9%	85.7%
4	65.6%	81.5%
5	59.0%	77.4%
6	53.1%	73.5%
7	47.8%	69.8%
8	43.0%	66.3%
9	38.7%	63.0%
10	34.9%	59.9%
11	31.4%	56.9%
12	28.2%	54.0%
13	25.4%	51.3%
14	22.9%	48.8%
15	20.6%	46.3%
16	18.5%	44.0%
17	16.7%	41.8%
18	15.0%	39.7%
19	13.5%	37.7%
20	12.2%	35.8%
21	10.9%	34.1%
22	9.8%	32.4%
23	8.9%	30.7%
24	8.0%	29.2%
25	7.2%	27.7%

Figure 3-9

Component Number	Availability Level	Probability of Simultaneous Availability
1	95.0%	95.0%
2	72.0%	68.4%
3	98.0%	67.0%
4	97.0%	65.0%
5	99.0%	64.4%

Figure 3-10

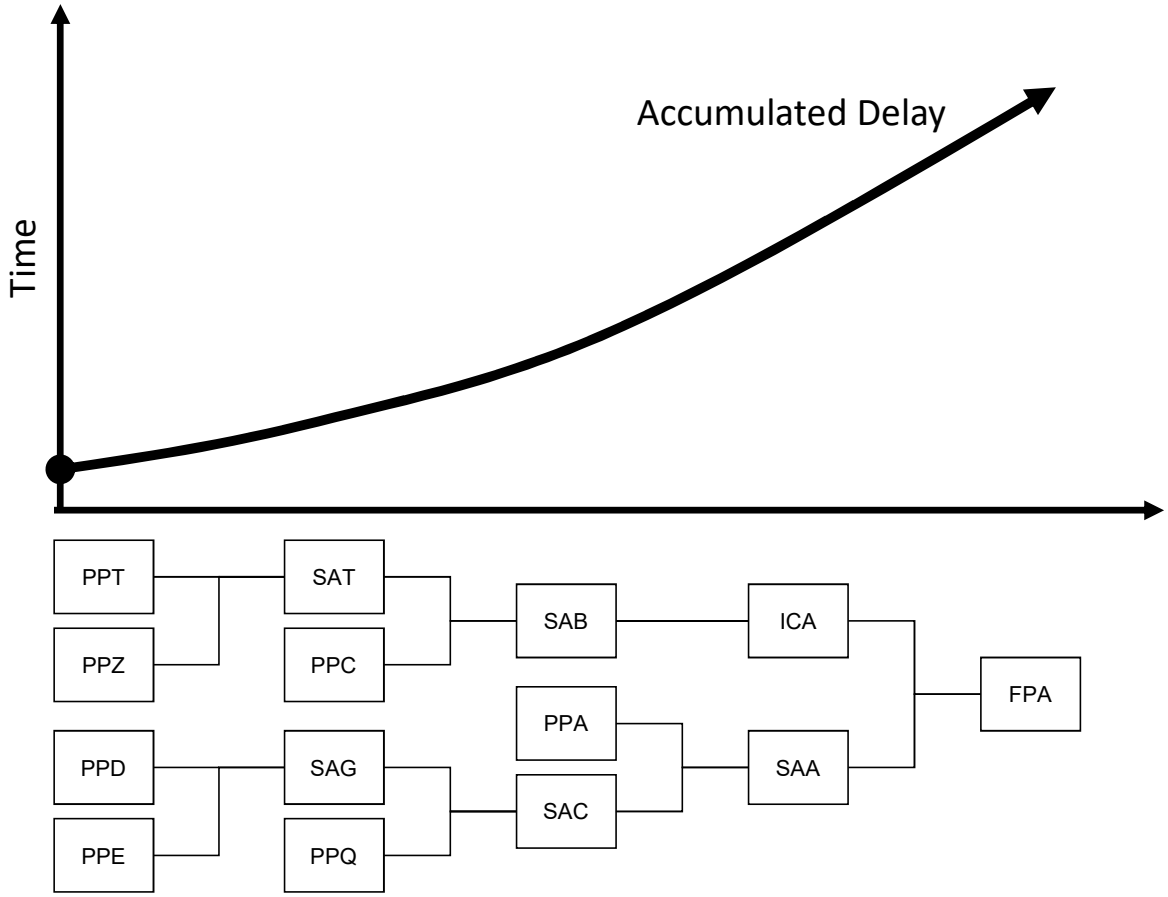
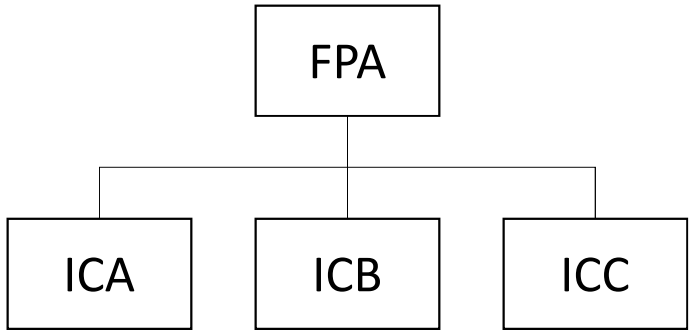

Accumulated Delay
Time
PPT
PPZ
PPD
PPE
SAT
PPC
SAG
PPQ
SAB
PPA
SAC
ICA
SAA
FPA

Figure 3-11

FPA Demand = 115
ICA Min = 100, Multiple = 50
ICB Min = 250, Multiple = 50
ICC Min = 100, Multiple = 100



Chapter 4

Unlocking a Solution – The Power of Decoupling

Figure 4-1

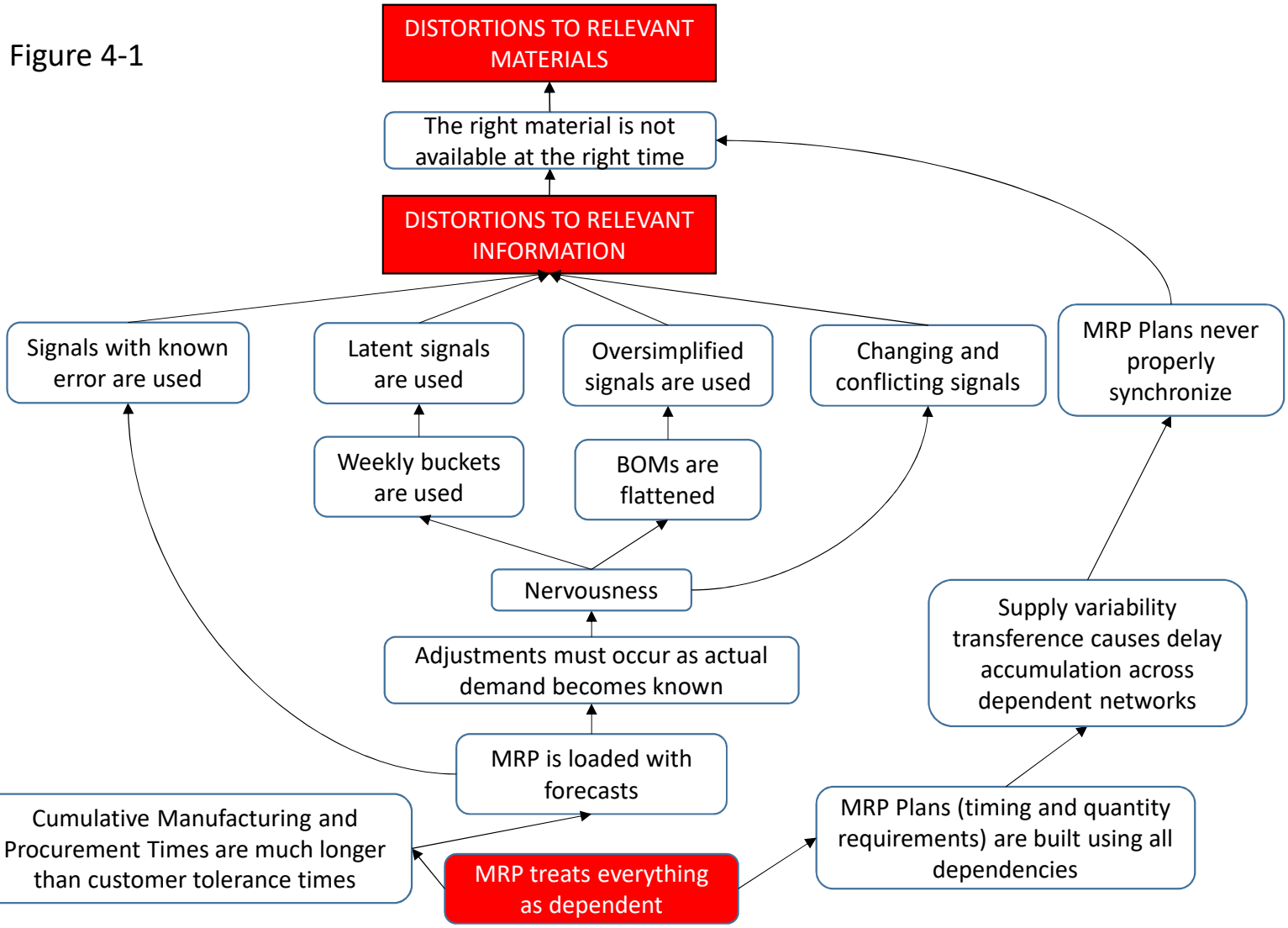

DISTORTIONS TO RELEVANT MATERIALS
The right material is not available at the right time
DISTORTIONS TO RELEVANT INFORMATION
Signals with known error are used
Latent signals are used
Oversimplified signals are used
Changing and conflicting signals
MRP Plans never properly synchronize
Weekly buckets are used
BOMs are flattened
Nervousness
Adjustments must occur as actual demand becomes known
Supply variability transference causes delay accumulation across dependent networks
MRP is loaded with forecasts
Cumulative Manufacturing and Procurement Times are much longer than customer tolerance times
MRP treats everything as dependent
MRP Plans (timing and quantity requirements) are built using all dependencies

Figure 4-2

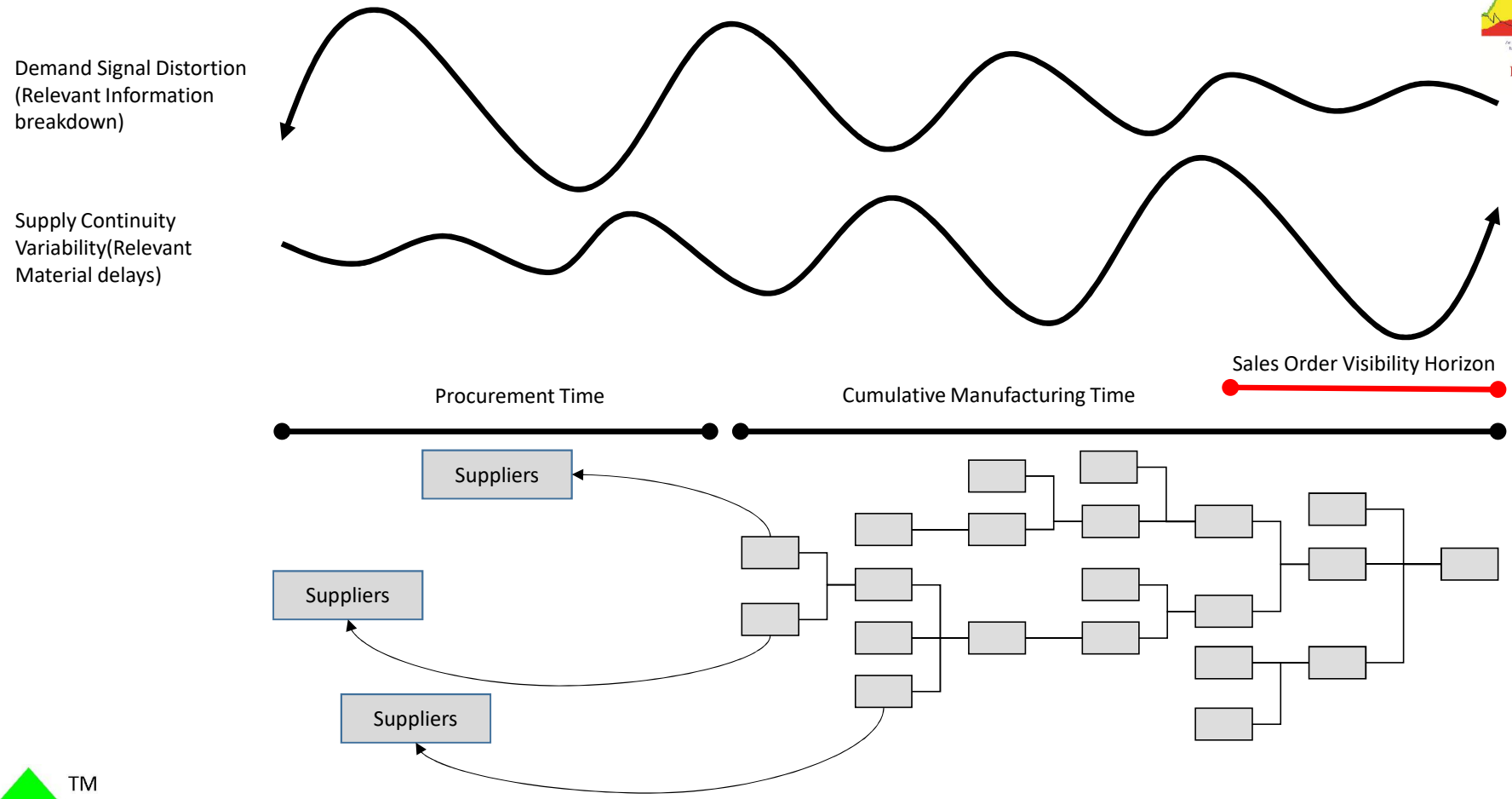
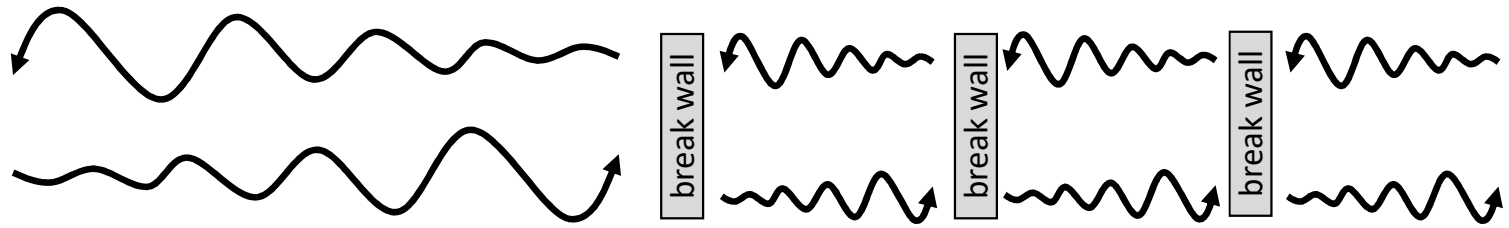
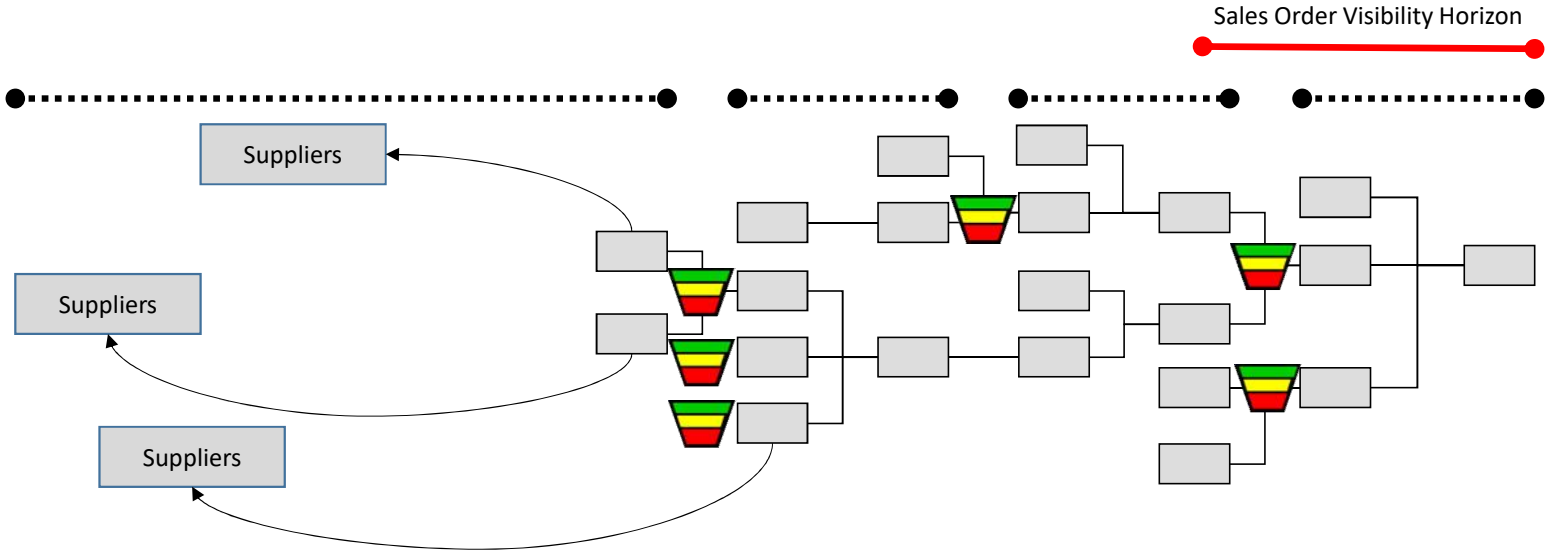

Demand Signal Distortion
(Relevant Information
breakdown)
Supply Continuity
Variability(Relevant
Material delays)
Sales Order Visibility Horizon
Procurement Time
Cumulative Manufacturing Time
Suppliers
Suppliers
Suppliers

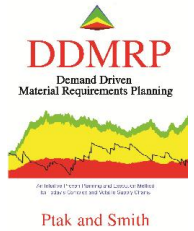
Figure 4-3

Demand Signal Distortion (Relevant Information breakdown)

Supply Continuity Variability(Relevant Material delays)







Chapter 5

Supply Order Generation and Execution for the New Normal

Figure 5-1

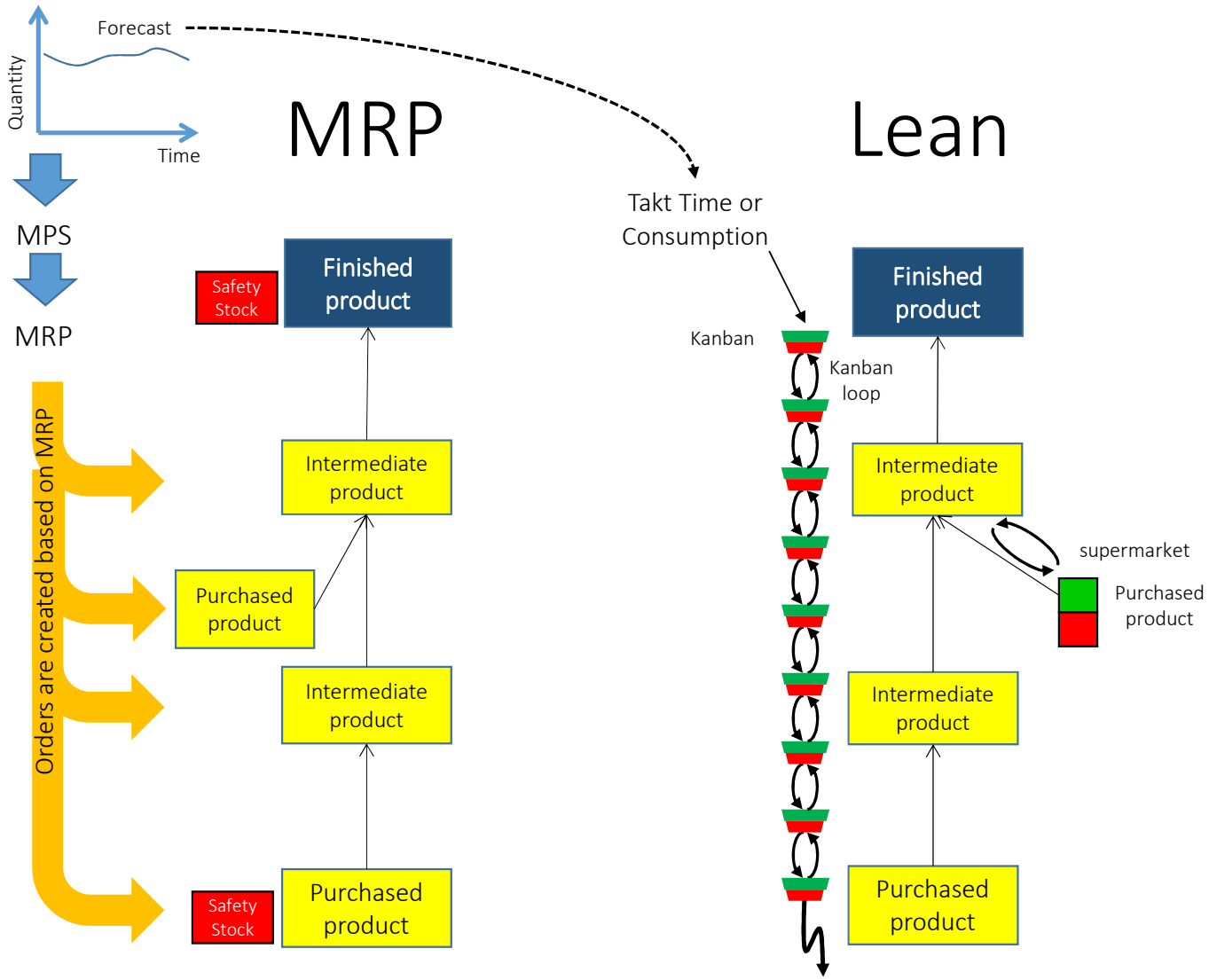

Forecast
Quantity
Time
MPS
MRP
MRP
Lean
Takt Time or
Consumption
Safety
Stock
Finished
product
Intermediate
product
Purchased
product
Intermediate
product
Safety
Stock
Purchased
product
Orders are created based on MRP
Kanban
Kanban
loop
Finished
product
Intermediate
product
supermarket
Purchased
product
Intermediate
product
Purchased
product

Figure 5-2

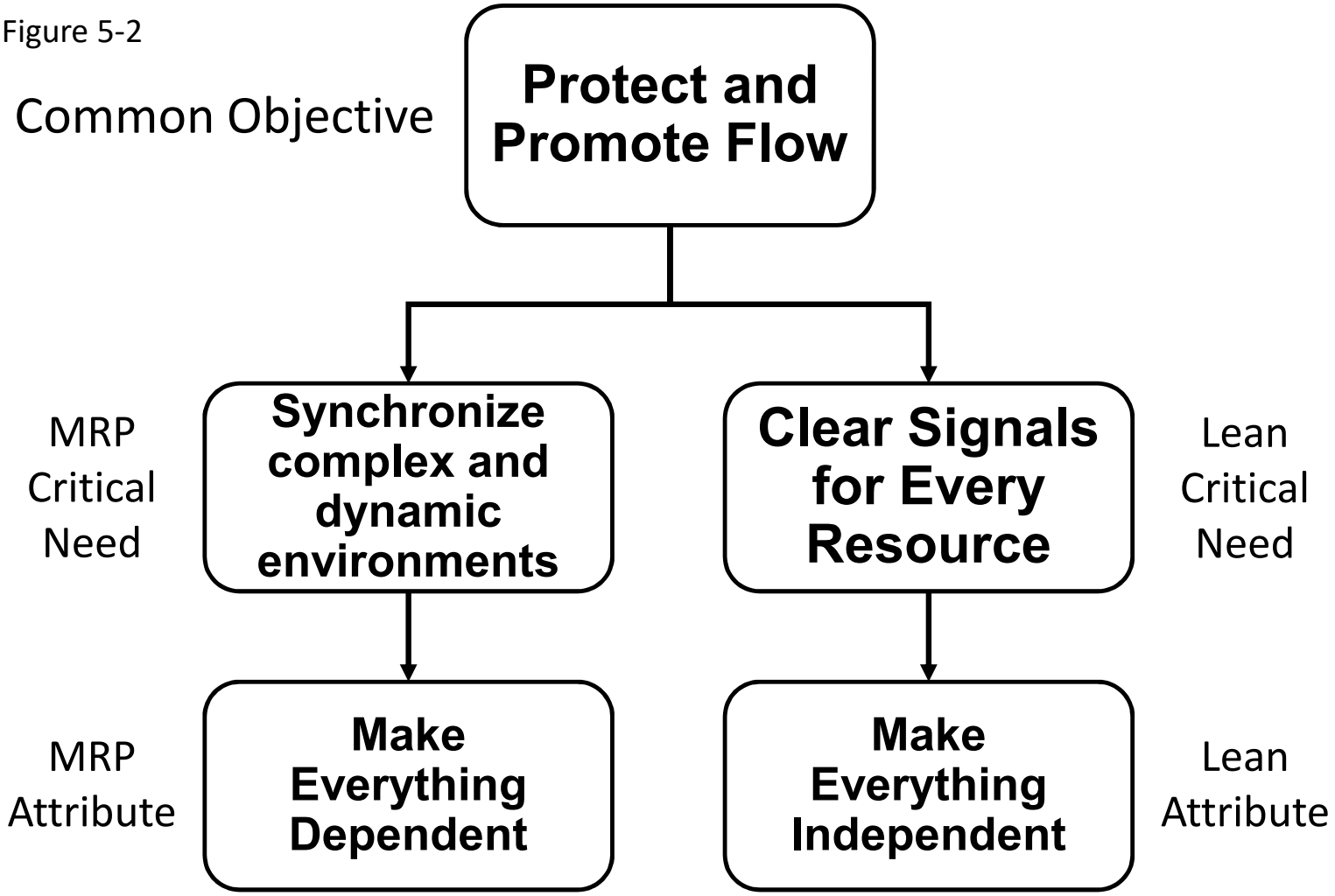

Common Objective
Protect and Promote Flow
MRP Critical Need
Synchronize complex and dynamic environments
Clear Signals for Every Resource
Lean Critical Need
MRP Attribute
Make Everything Dependent
Make Everything Independent
Lean Attribute

Figure 5-3

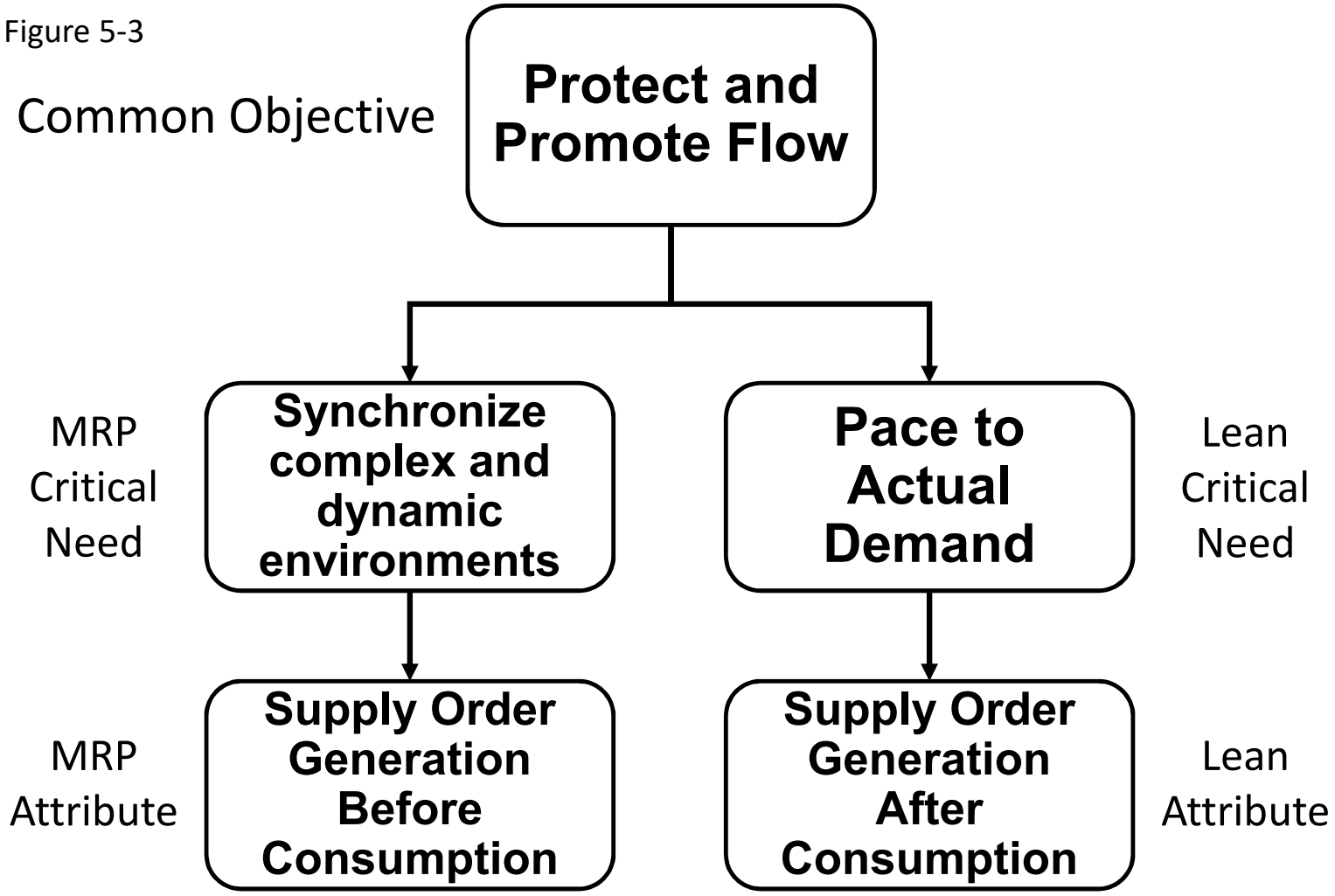
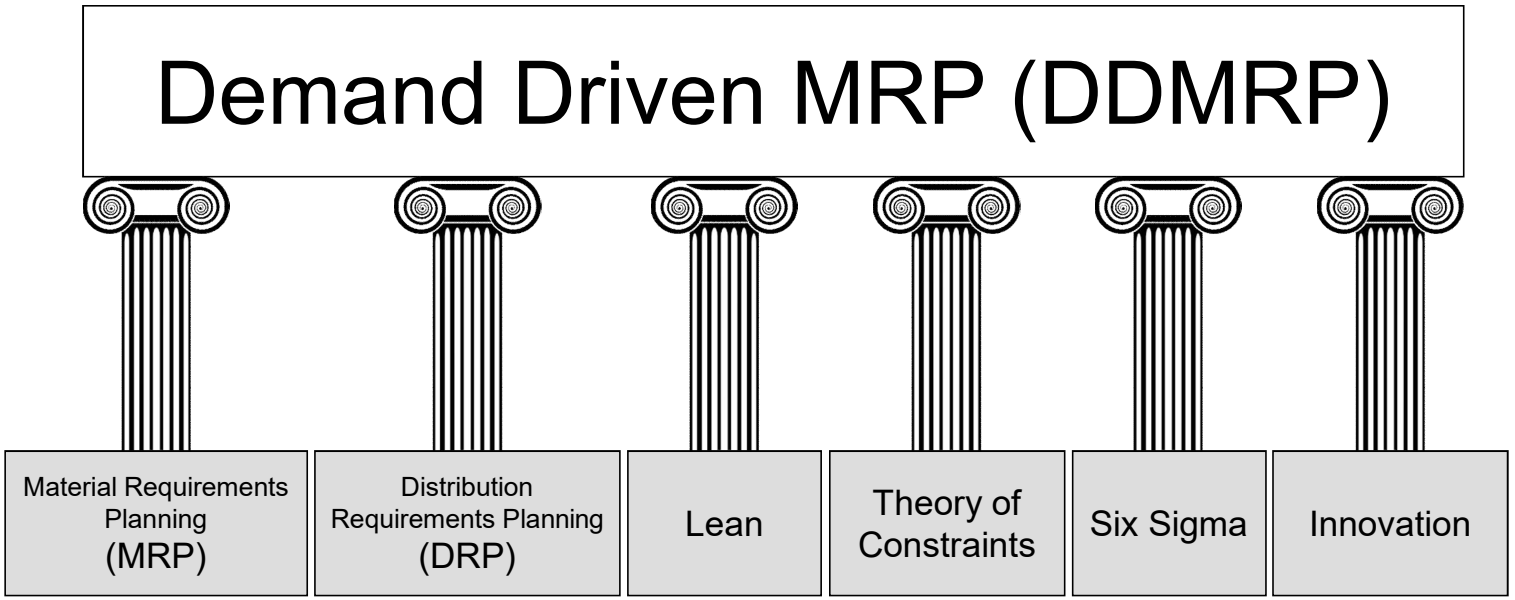

Common Objective
Protect and Promote Flow
MRP Critical Need
Synchronize complex and dynamic environments
Pace to Actual Demand
Lean Critical Need
MRP Attribute
Supply Order Generation Before Consumption
Supply Order Generation After Consumption
Lean Attribute

Figure 5-4



Ptak and Smith

Figure 5-5

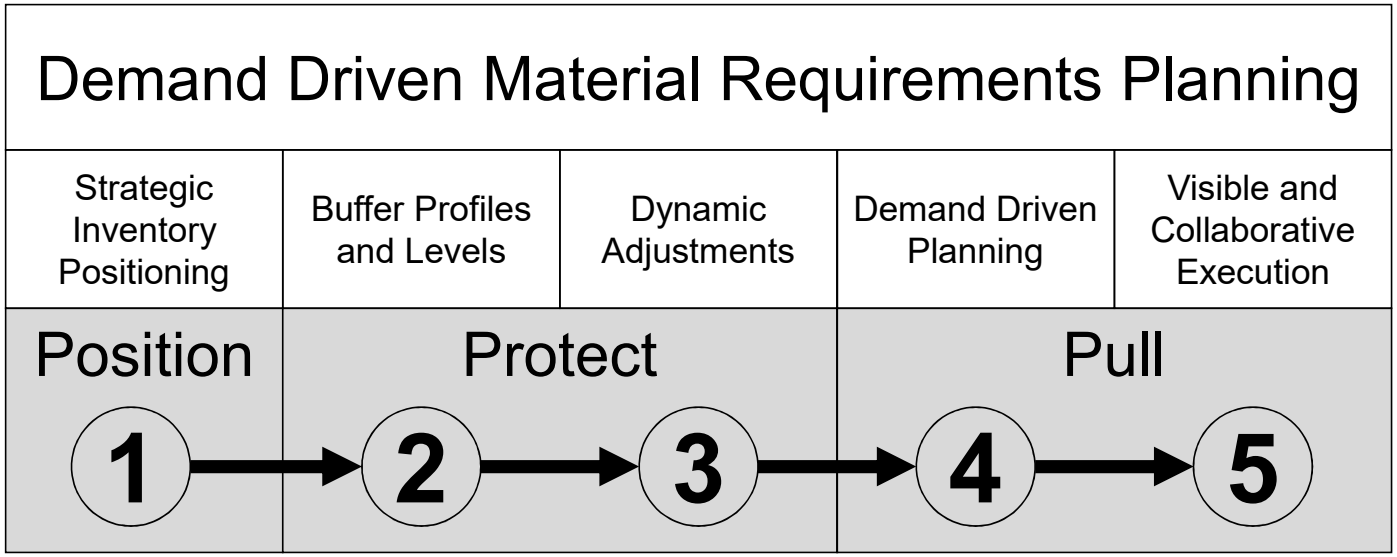

Demand Driven Material Requirements Planning
Strategic Inventory Positioning
Buffer Profiles and Levels
Dynamic Adjustments
Demand Driven Planning
Visible and Collaborative Execution
Position
Protect
Pull
1
2
3
4
5

Figure 5-6

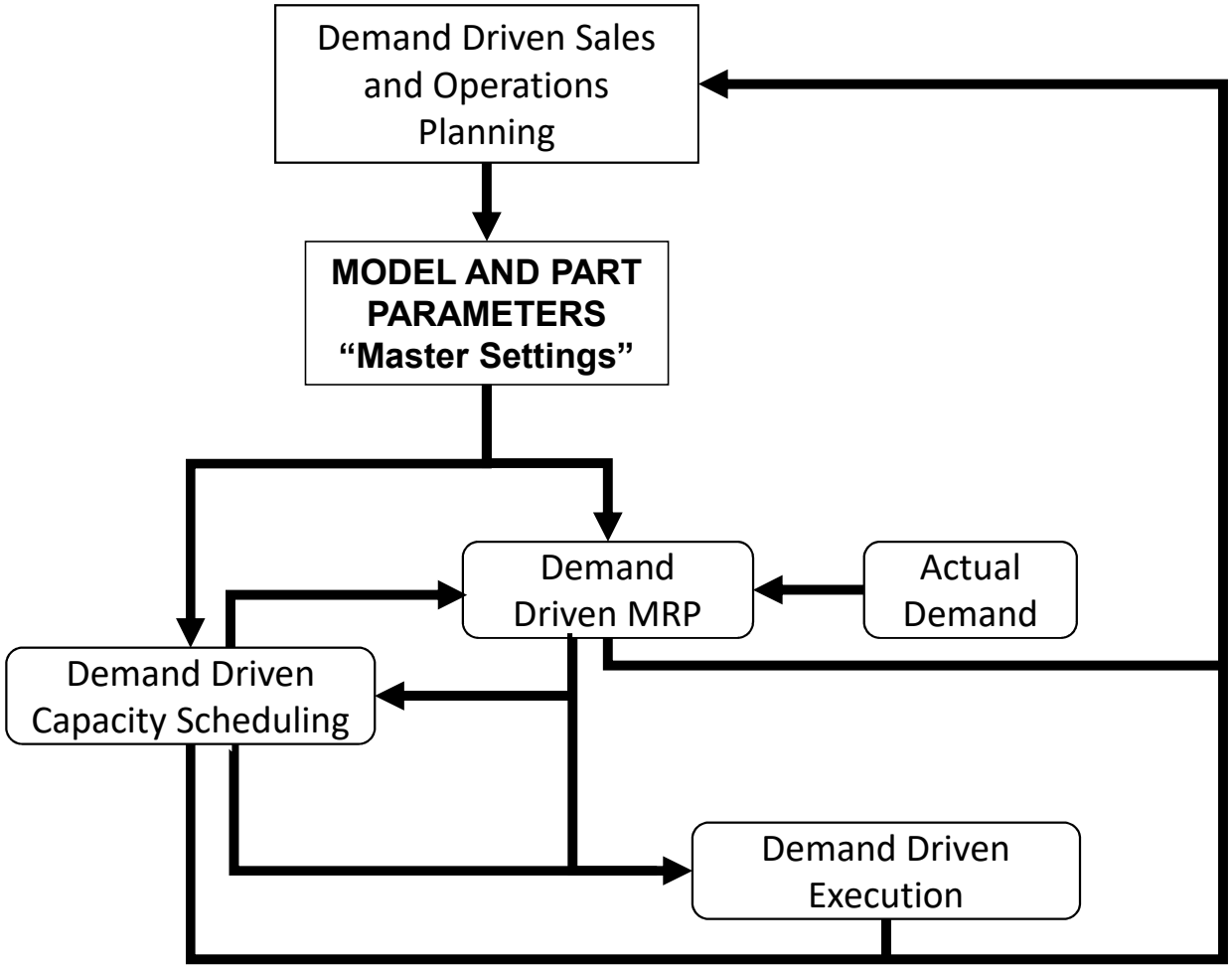
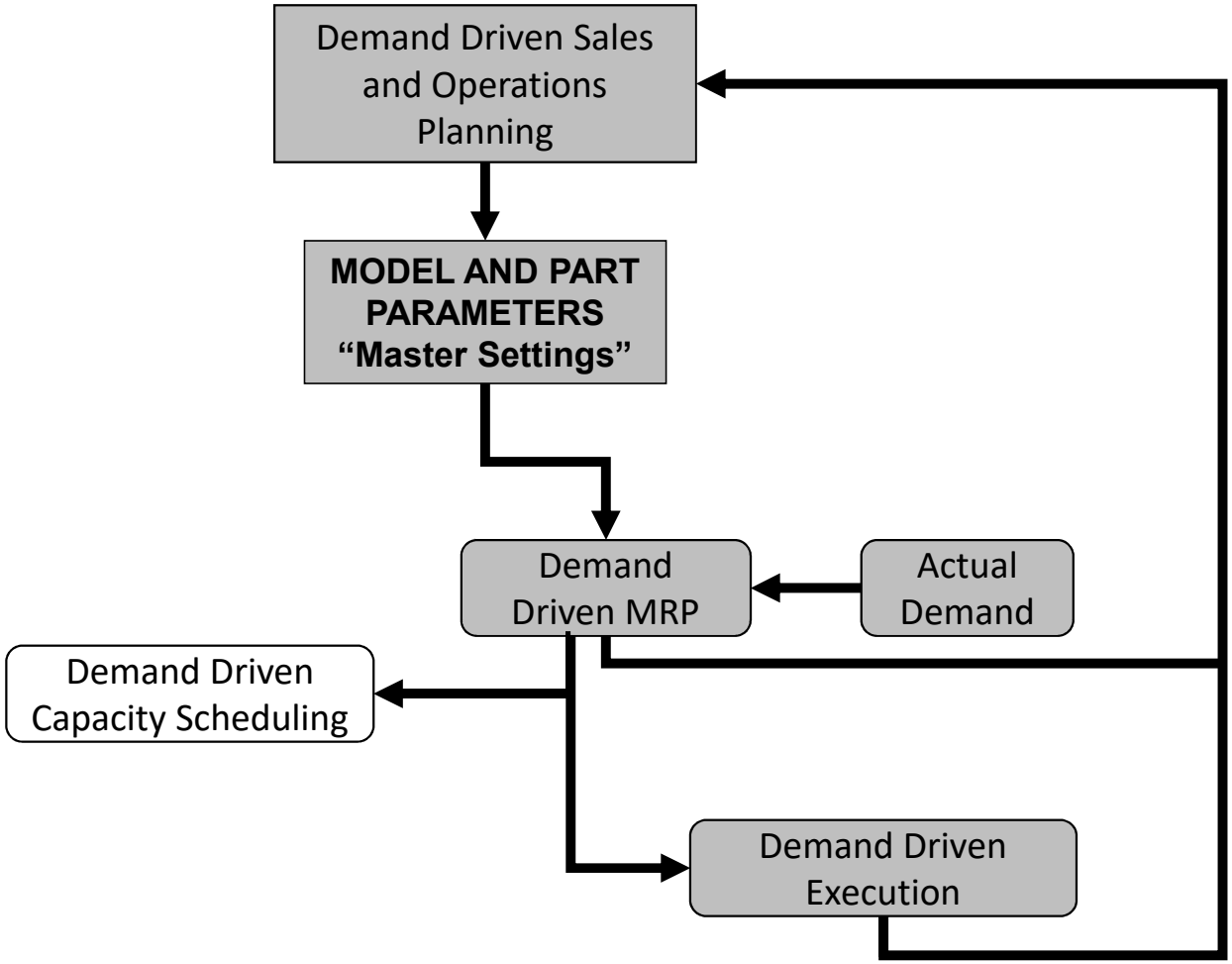
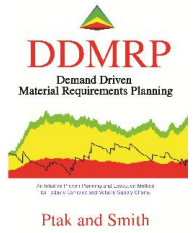

Demand Driven Sales and Operations Planning
MODEL AND PART PARAMETERS "Master Settings"
Demand Driven MRP
Actual Demand
Demand Driven Capacity Scheduling
Demand Driven Execution

Figure 5-7


Demand Driven Sales and Operations Planning
MODEL AND PART PARAMETERS "Master Settings"
Demand Driven MRP
Actual Demand
Demand Driven Capacity Scheduling
Demand Driven Execution



Chapter 6

Strategic Inventory Positioning

Figure 6-1

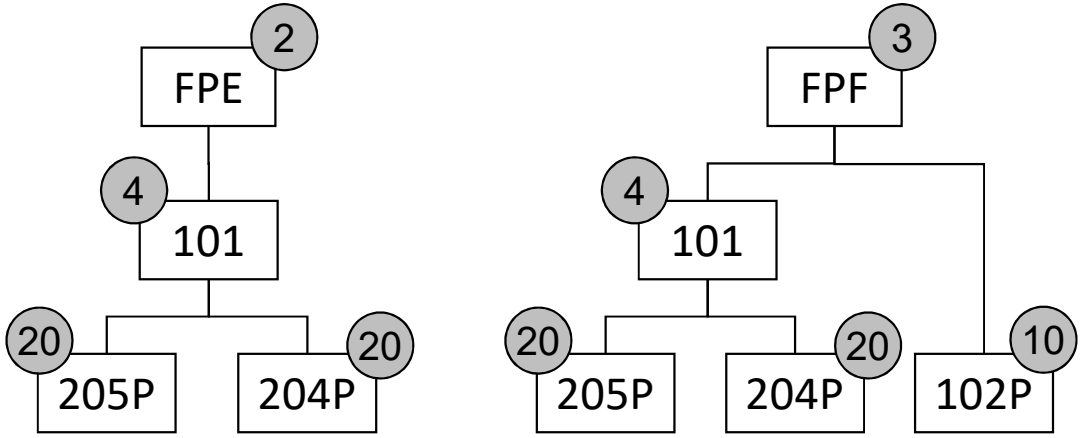


Figure 6-2

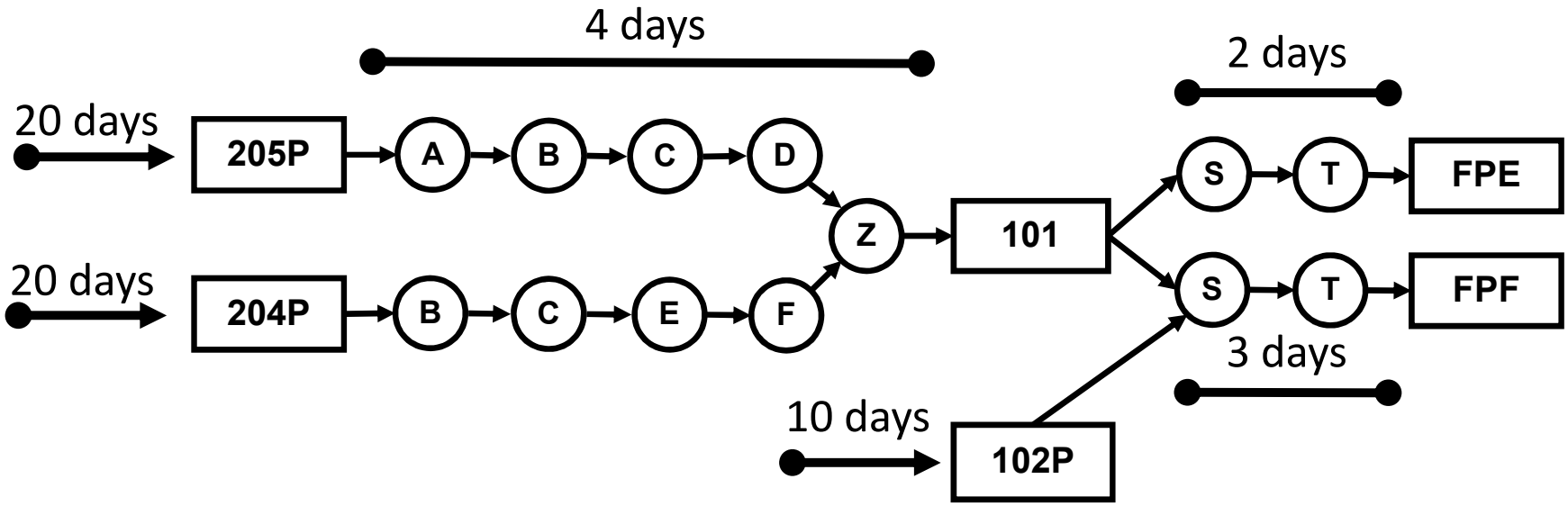

4 days
2 days
20 days
205P
A
B
C
D
Z
101
S
T
FPE
20 days
204P
B
C
E
F
S
T
FPF
3 days
10 days
102P

Figure 6-3

Decoupling Point Placement Criteria	Example Answers
Customer Tolerance Time	3 days for both FPE and FPF
Market Potential Lead Time	FPE has quick turn (1 day) business available
Sales Order Visibility Horizon	3+ days for most orders
External Variability	Demand: Large orders are typically known well in advance. Supply: 204P and 205P have decent reliability. 102P supplier is notorious for poor delivery and quality performance.
Inventory Leverage and Flexibility	101 is a common component for both FPE and FPF
Critical Operation Protection	Resource Z is an assembly operation that requires both routing paths to be complete before it begin its operation

Figure 6-4

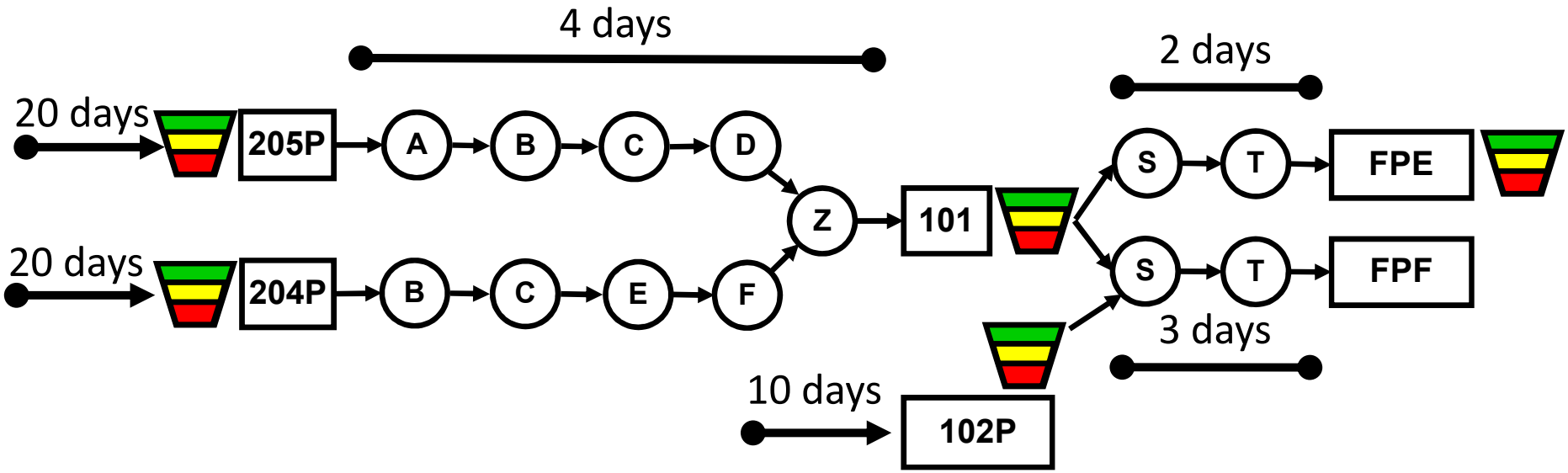

4 days
20 days
205P
A
B
C
D
20 days
204P
B
C
E
F
Z
101
2 days
S
T
FPE
S
T
FPF
3 days
10 days
102P

Figure 6-5

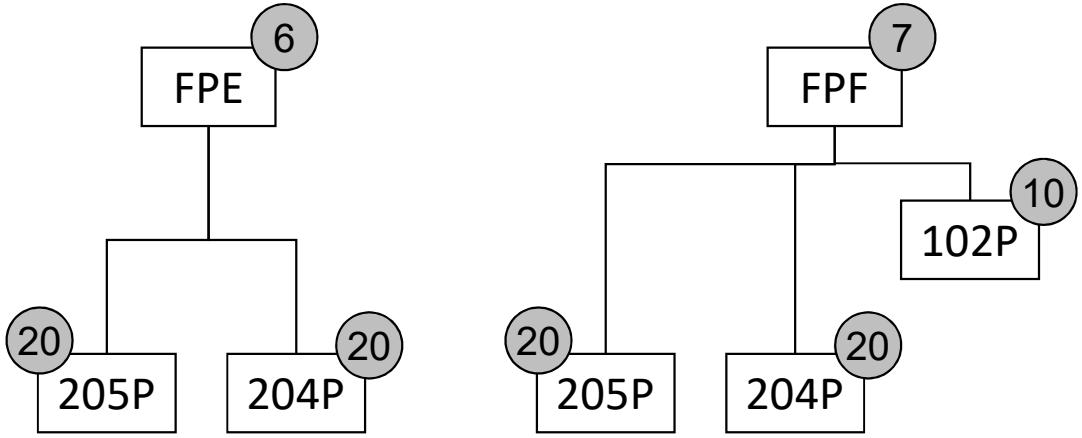


Figure 6-6

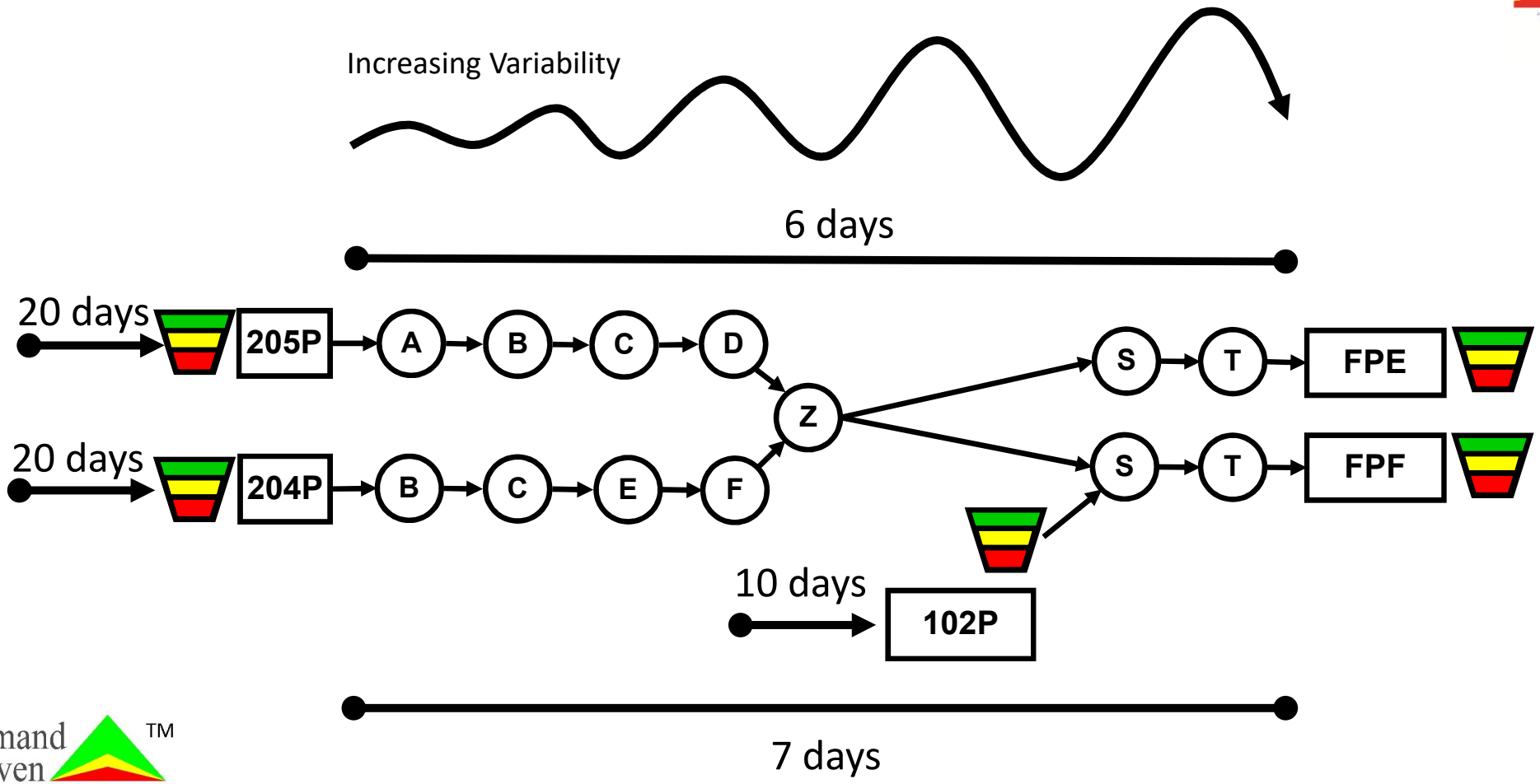

Increasing Variability
6 days
20 days
205P
A
B
C
D
20 days
204P
B
C
E
F
Z
S
T
FPE
S
T
FPF
10 days
102P
7 days

Figure 6-7

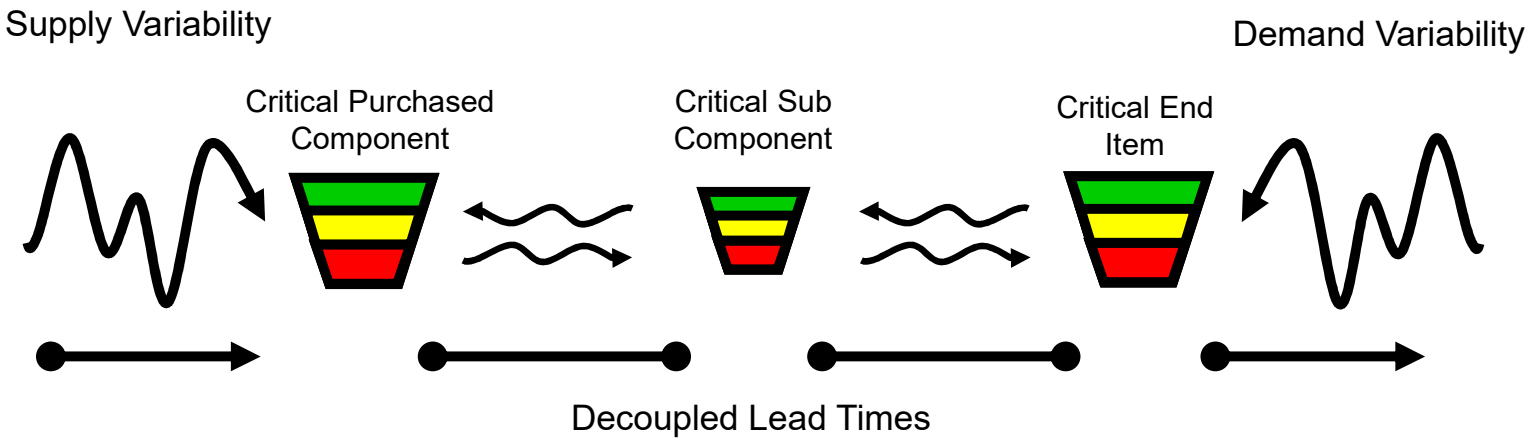

Supply Variability
Demand Variability
Critical Purchased Component
Critical Sub Component
Critical End Item
Decoupled Lead Times

Figure 6-8

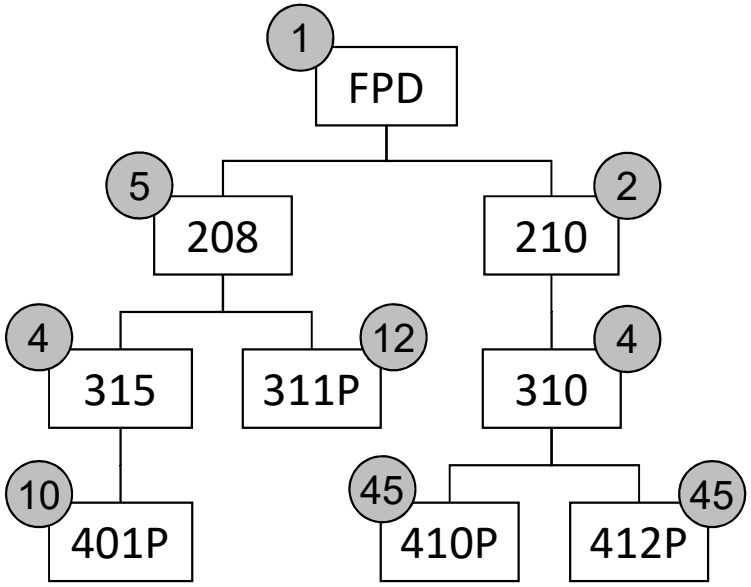


Figure 6-9

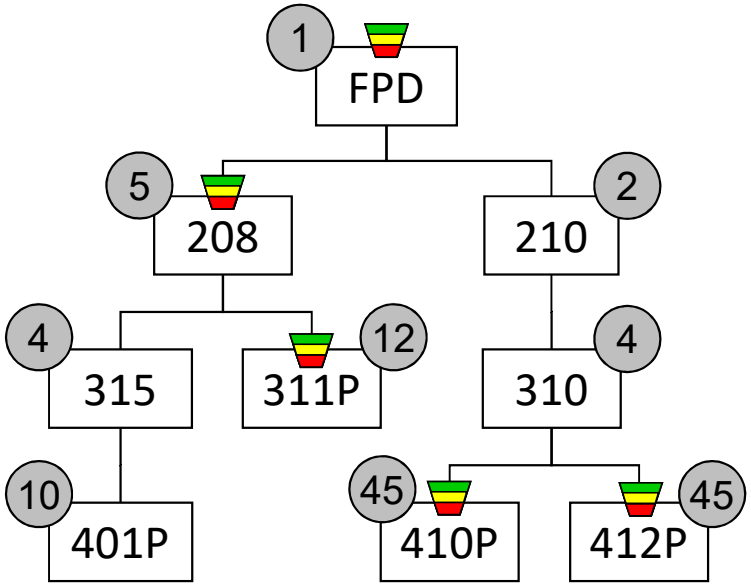


Figure 6-10

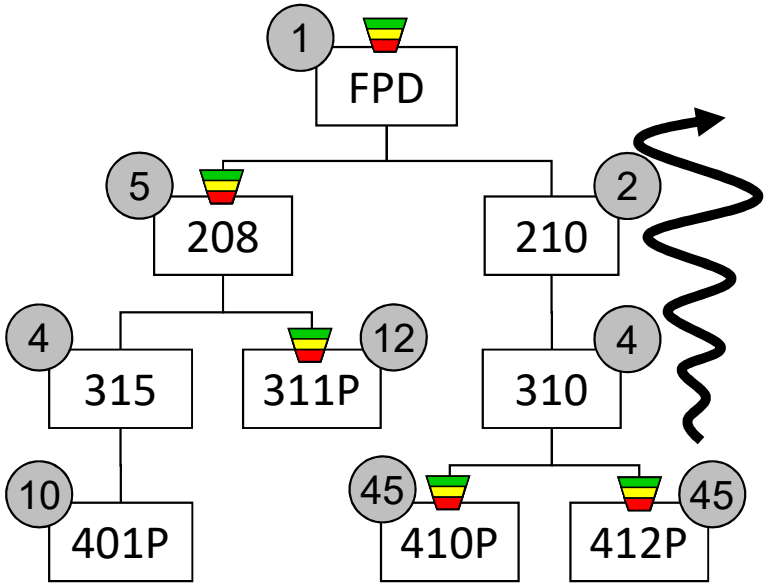


Figure 6-11

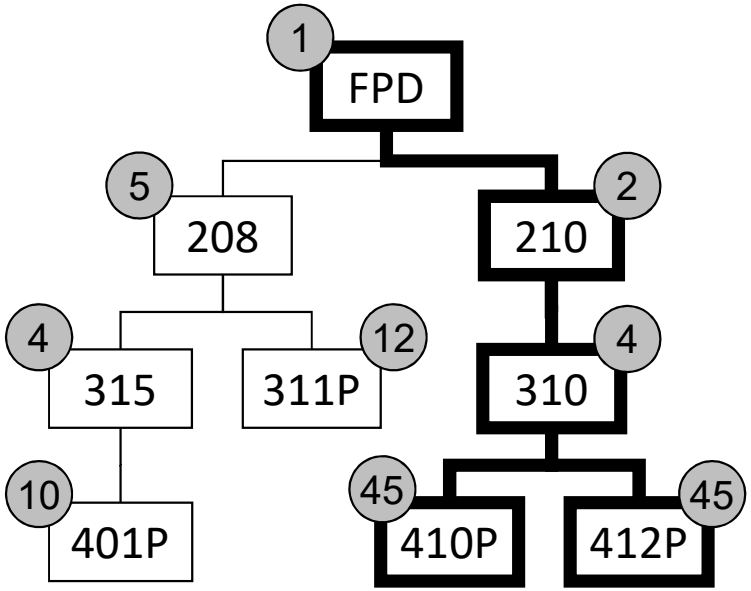


Figure 6-12

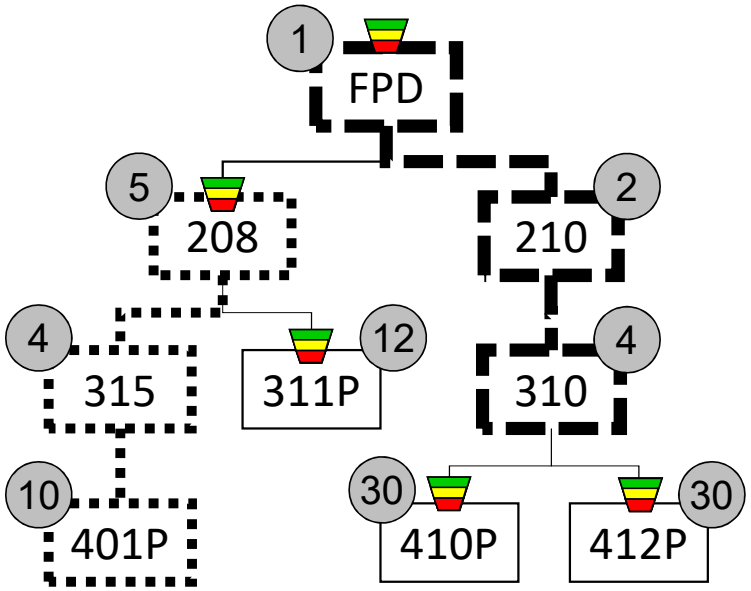


Figure 6-13

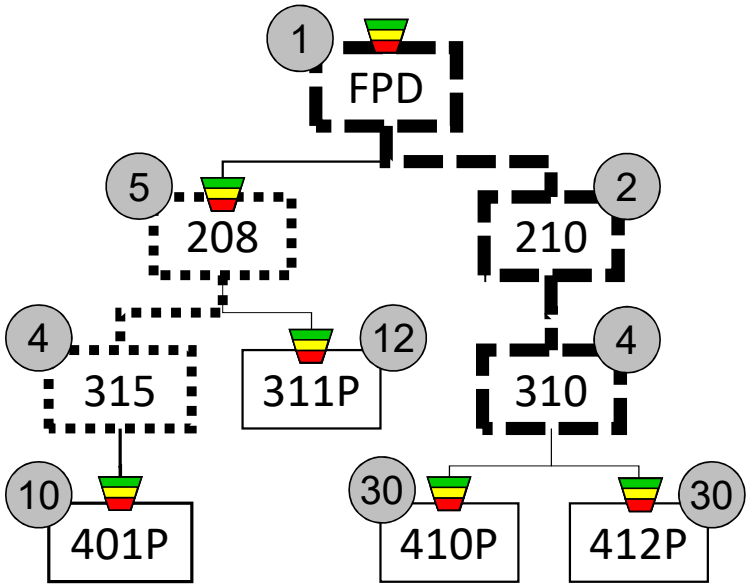


Figure 6-14

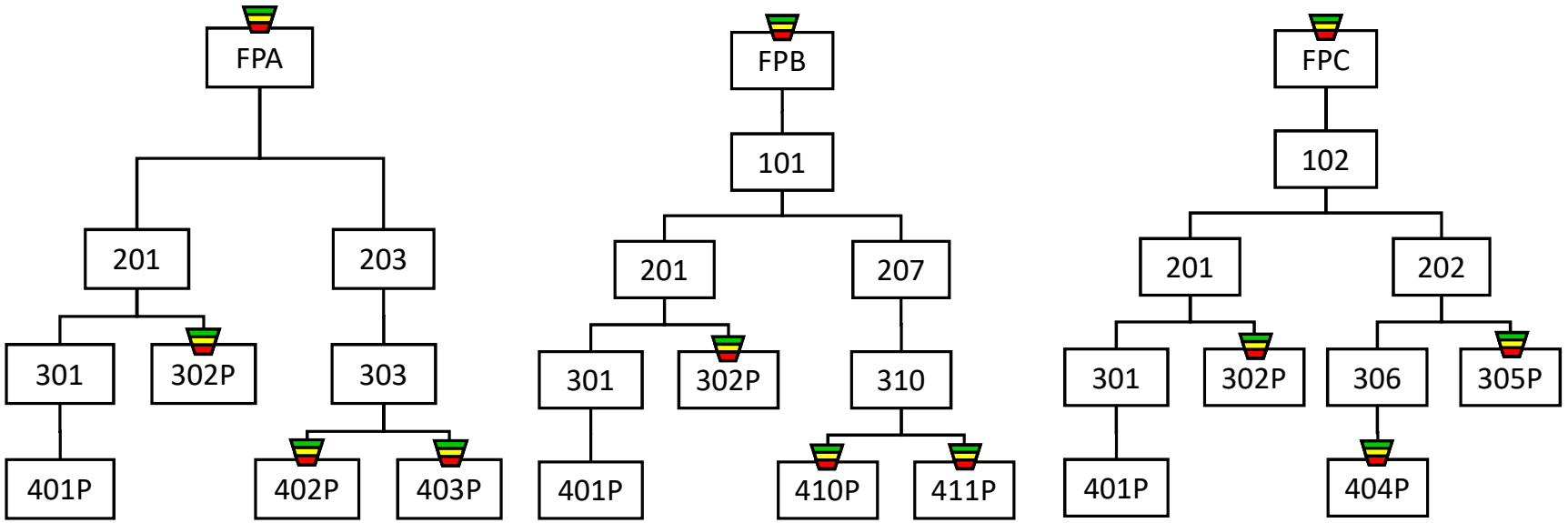

FPA
201
203
301
302P
303
401P
402P
403P
FPB
101
201
207
301
302P
310
401P
410P
411P
FPC
102
201
202
301
302P
306
305P
401P
404P

Figure 6-15

Initial Matrix BOM

		Parent items												
		FPA	FPB	FPC	101	102	201	203	207	202	301	303	310	306
Component items	101		1											
	102			1										
	201	1			1	1								
	203	1												
	207				1									
	202					1								
	301						3							
	302P						3							
	303							1						
	310								1					
	306									1				
	305P									1				
	401P										3			
	402P											1		
	403P											1		
	410P												1	
	411P												1	
	404P													1

Figure 6-16

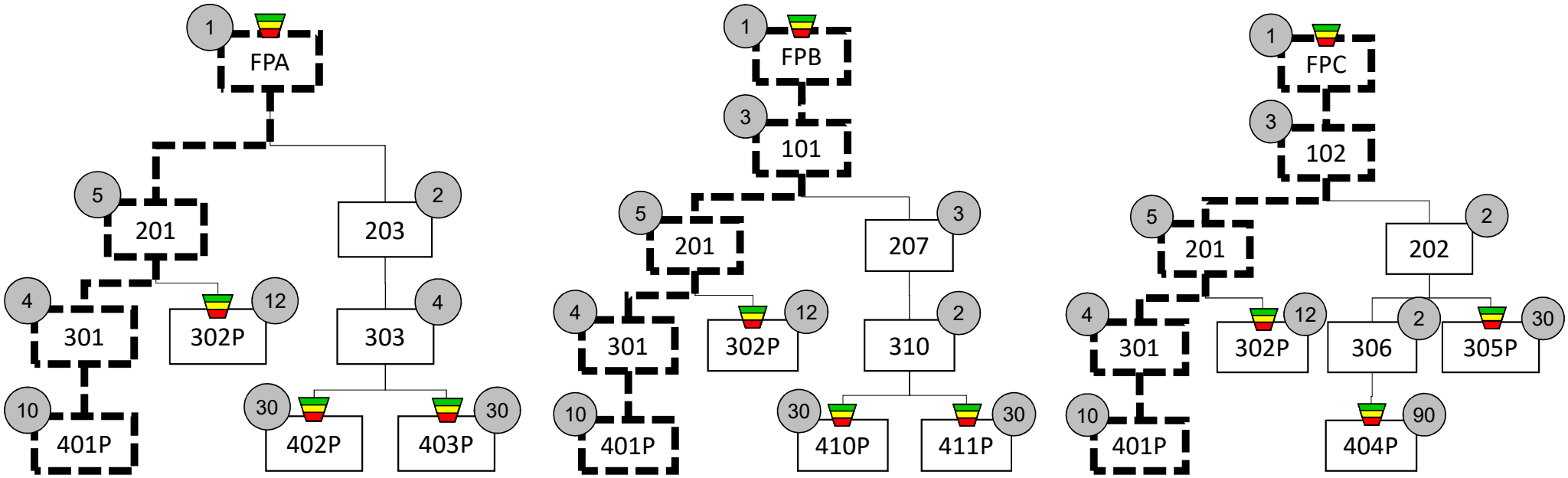

1
FPA
5
201
2
203
4
301
12
302P
4
303
10
401P
30
402P
30
403P
1
FPB
3
101
5
201
3
207
4
301
12
302P
2
310
10
401P
30
410P
30
411P
1
FPC
3
102
5
201
2
202
4
301
12
302P
2
306
30
305P
10
401P
90
404P

Figure 6-17

Initial Matrix BOM With DLT Chains Highlighted

		Parent items												
		FPA	FPB	FPC	101	102	201	203	207	202	301	303	310	306
Component items	101		1											
	102			1										
	201	1			1	1								
	203	1												
	207				1									
	202					1								
	301						3							
	302P						3							
	303							1						
	310								1					
	306									1				
	305P									1				
	401P										3			
	402P											1		
	403P											1		
	410P												1	
	411P												1	
	404P													1

Note: three places to attack. 201, 301 or 401P

Figure 6-18

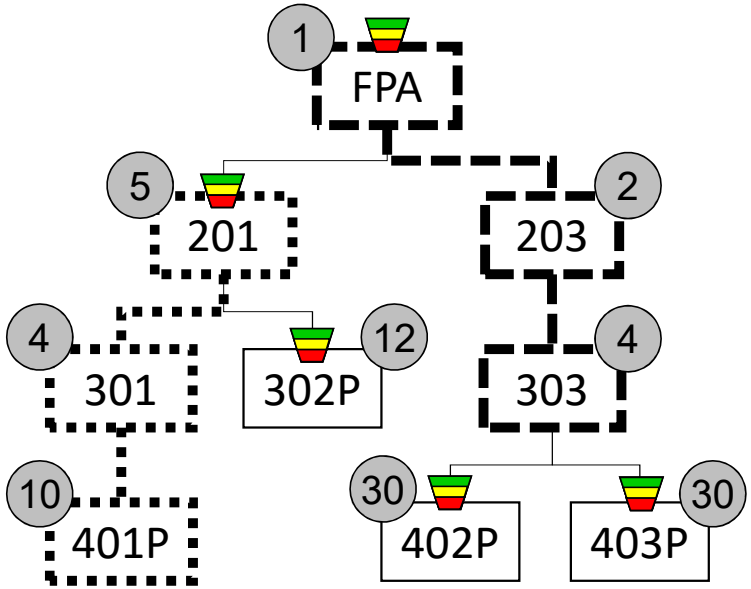


Figure 6-19

Matrix BOM with DLT and 201 Buffered (showing all parts on all DLT chains)

		Parent items												
		FPA	FPB	FPC	101	102	201	203	207	202	301	303	310	306
Component items	101		1											
	102			1										
	201	1			1	1								
	203	1												
	207				1									
	202					1								
	301						3							
	302P						3							
	303							1						
	310								1					
	306									1				
	305P									1				
	401P										3			
	402P											1		
	403P											1		
	410P												1	
	411P												1	
	404P													1

Figure 6-20

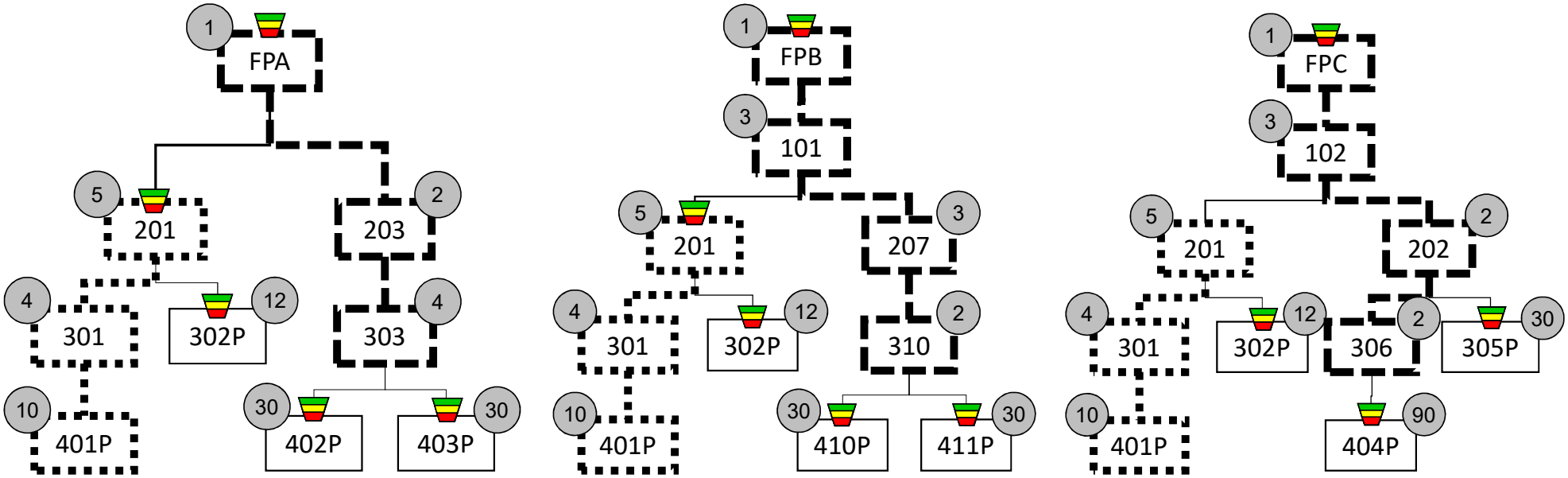

1
FPA
5
201
2
203
4
301
12
302P
4
303
10
401P
30
402P
30
403P
1
FPB
3
101
5
201
3
207
4
301
12
302P
2
310
10
401P
30
410P
30
411P
1
FPC
3
102
5
201
2
202
4
301
12
302P
2
306
30
305P
10
401P
90
404P

Figure 6-21

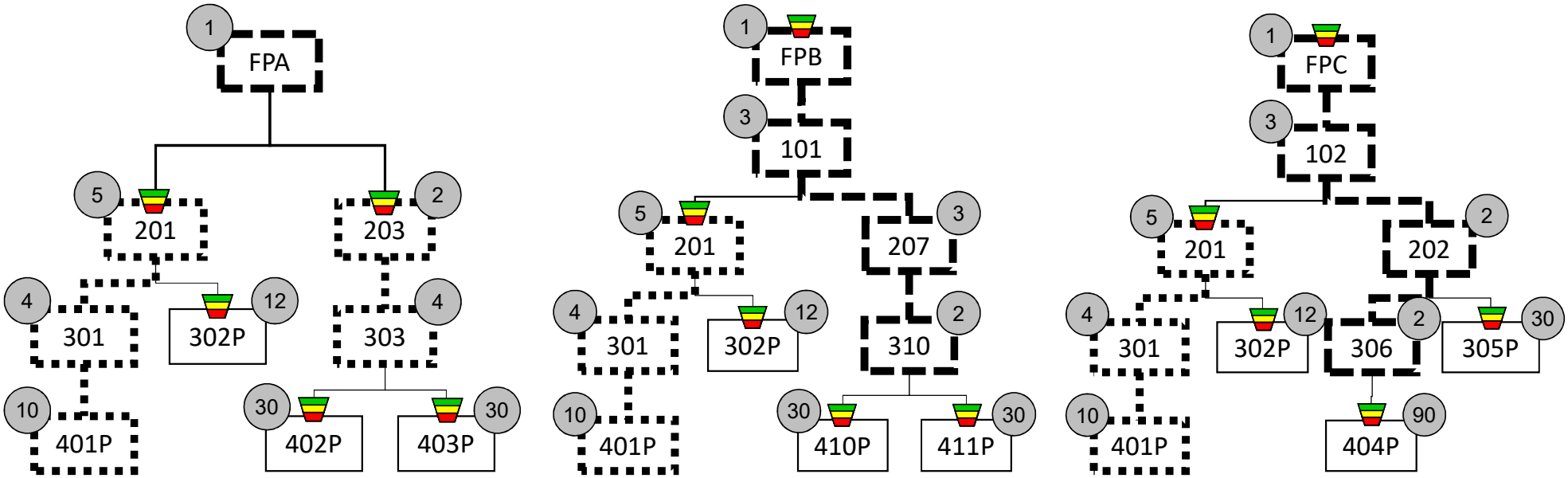

1
FPA
5
201
2
203
4
301
12
302P
4
303
10
401P
30
402P
30
403P
1
FPB
3
101
5
201
3
207
4
301
12
302P
2
310
10
401P
30
410P
30
411P
1
FPC
3
102
5
201
2
202
4
301
12
302P
2
306
30
305P
10
401P
90
404P

Figure 6-22

Matrix BOM with DLT and 201 and 203 Buffered (showing all parts on all DLT chains)

		Parent items												
		FPA	FPB	FPC	101	102	201	203	207	202	301	303	310	306
Component items	101		1											
	102			1										
	201	1			1	1								
	203	1												
	207				1									
	202					1								
	301						3							
	302P						3							
	303							1						
	310								1					
	306									1				
	305P									1				
	401P										3			
	402P											1		
	403P											1		
	410P												1	
	411P												1	
	404P													1

Figure 6-23

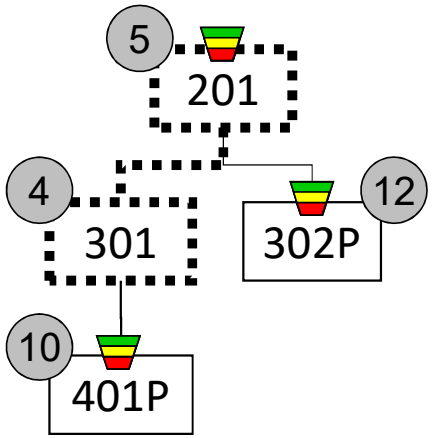


Figure 6-24

Matrix BOM with DLT and 201 and 203 and 401P Buffered (showing all parts on DLT chain)

		Parent items												
		FPA	FPB	FPC	101	102	201	203	207	202	301	303	310	306
Component items	101		1											
	102			1										
	201	1			1	1								
	203	1												
	207				1									
	202					1								
	301						3							
	302P						3							
	303							1						
	310								1					
	306									1				
	305P									1				
	401P										3			
	402P											1		
	403P											1		
	410P												1	
	411P												1	
	404P													1

Figure 6-25

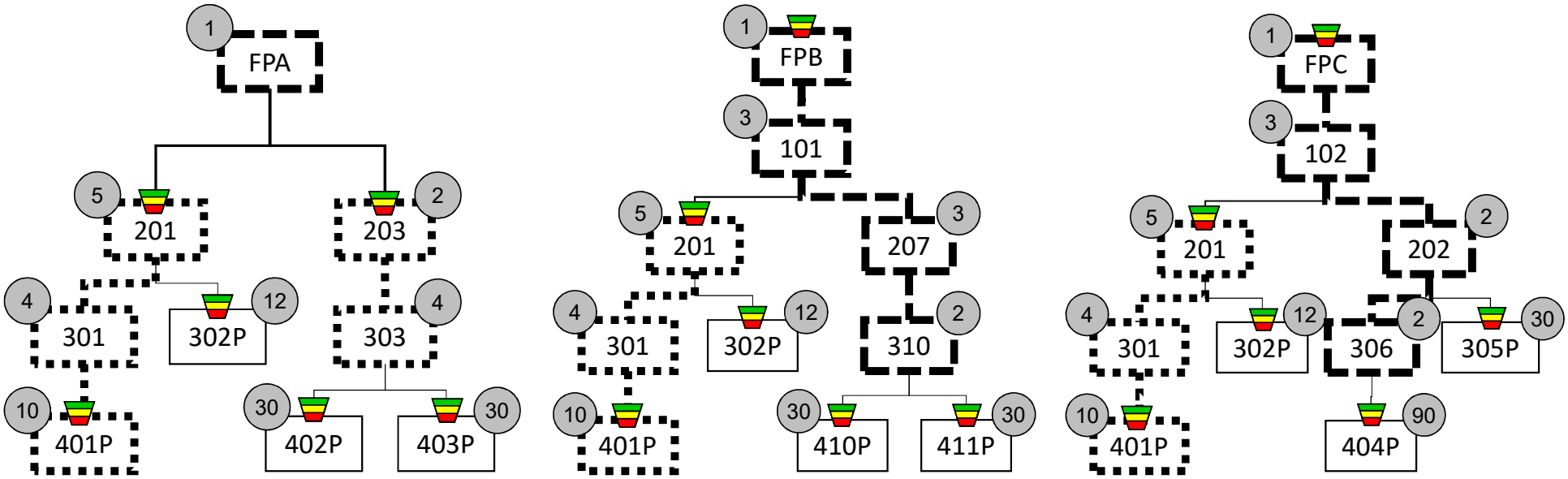

1
FPA
5
201
2
203
4
301
12
302P
4
303
10
401P
30
402P
30
403P
1
FPB
3
101
5
201
3
207
4
301
12
302P
2
310
10
401P
30
410P
30
411P
1
FPC
3
102
5
201
2
202
4
301
12
302P
2
306
30
305P
10
401P
90
404P

Figure 6-26

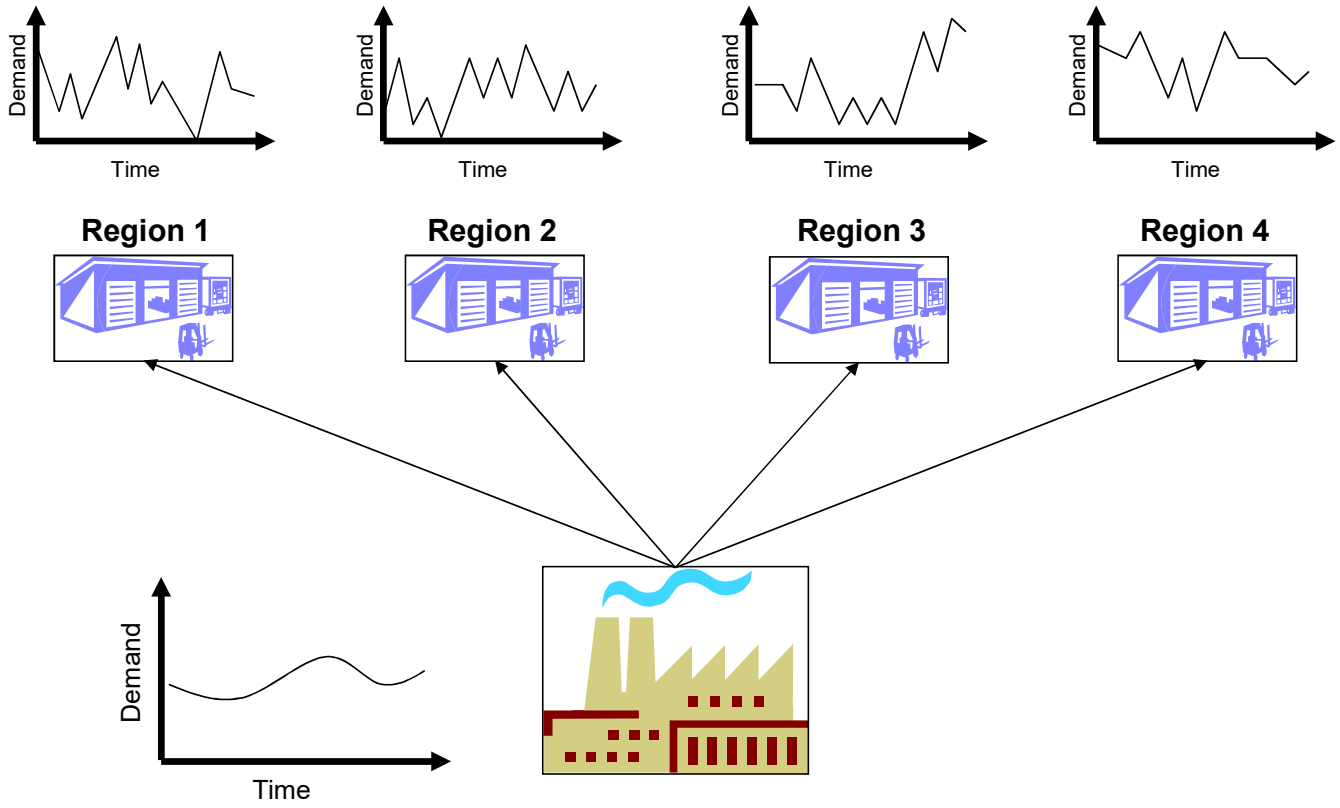
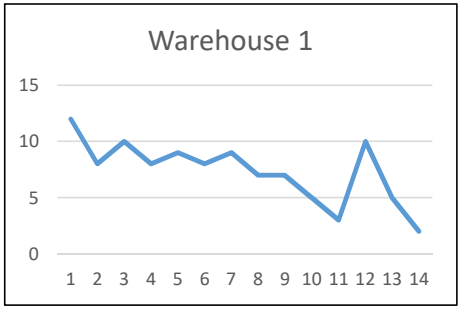
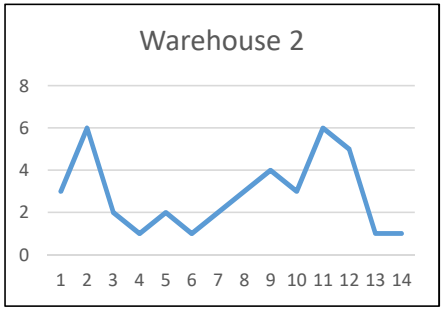


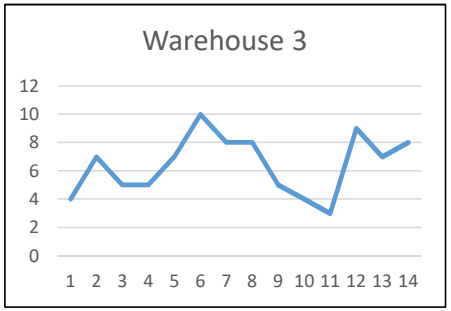
Figure 6-27

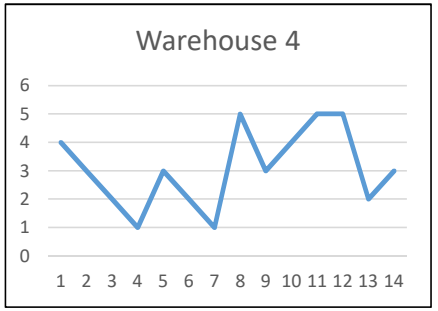
	Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10	Day 11	Day 12	Day 13	Day 14	ADU
Warehouse 1	12	8	10	8	9	8	9	7	7	5	3	10	5	2	7.4
Warehouse 2	3	6	2	1	2	1	2	3	4	3	6	5	1	1	2.9
Warehouse 3	4	7	5	5	7	10	8	8	5	4	3	9	7	8	6.4
Warehouse 4	4	3	2	1	3	2	1	5	3	4	5	5	2	3	3.1
Sourcing Unit	23	24	19	15	21	21	20	23	19	16	17	29	15	14	19.7

Figure 6-28


Warehouse 1
15
10
5
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14


Warehouse 2
8
6
4
2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14


Warehouse 3
12
10
8
6
4
2
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14


Warehouse 4
6
5
4
3
2
1
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14

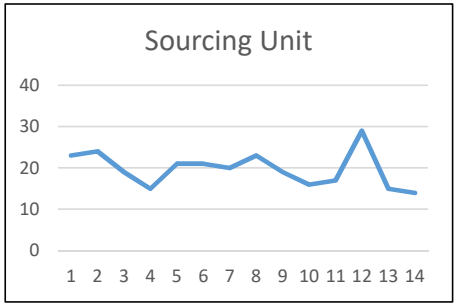

Sourcing Unit
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14

Figure 6-29

	ADU	SD	CV
Warehouse 1	7.357	2.68879	0.365467
Warehouse 2	2.857	1.726149	0.604152
Warehouse 3	6.429	2.02535	0.315054
Warehouse 4	3.071	1.334396	0.434454
Sourcing Unit	19.714	4.043135	0.205087

Figure 6-30

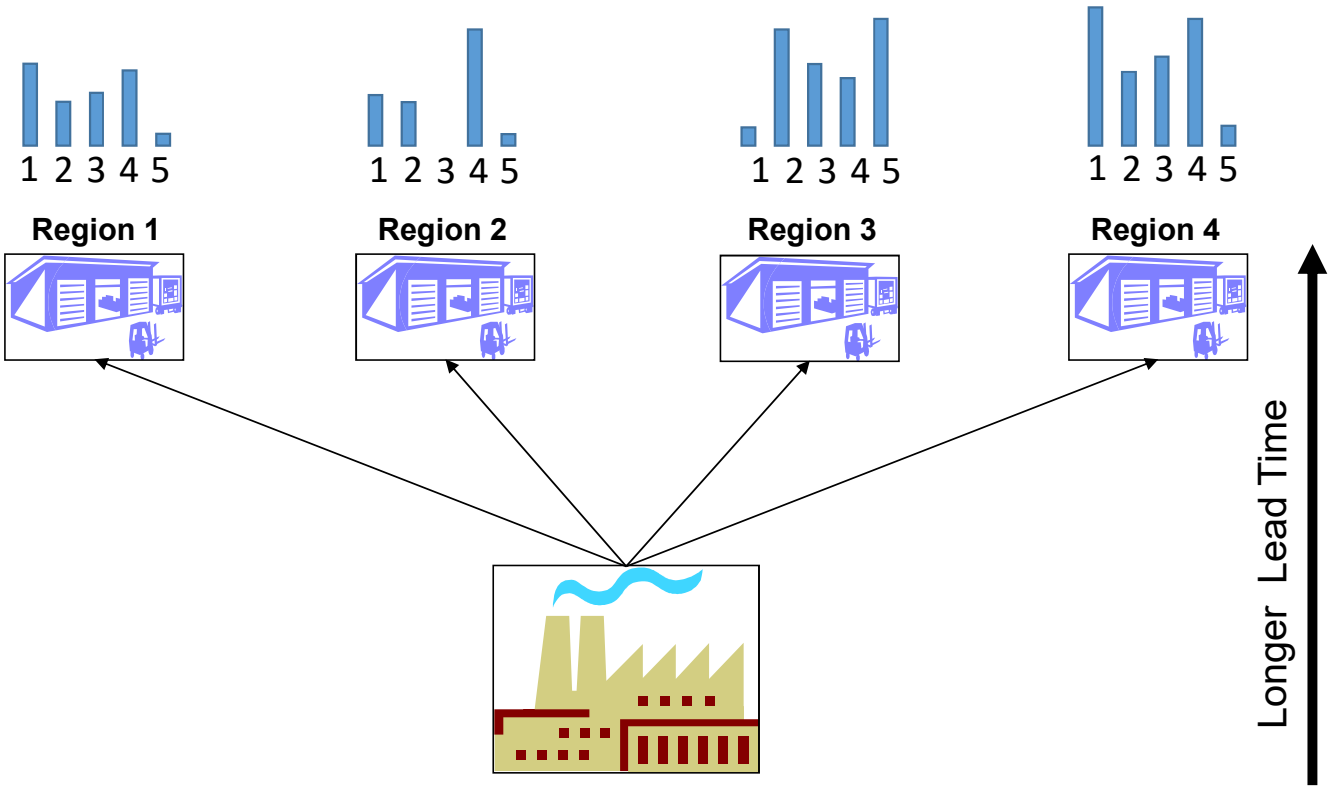

1 2 3 4 5
Region 1
1 2 3 4 5
Region 2
1 2 3 4 5
Region 3
1 2 3 4 5
Region 4
Longer Lead Time

Figure 6-31

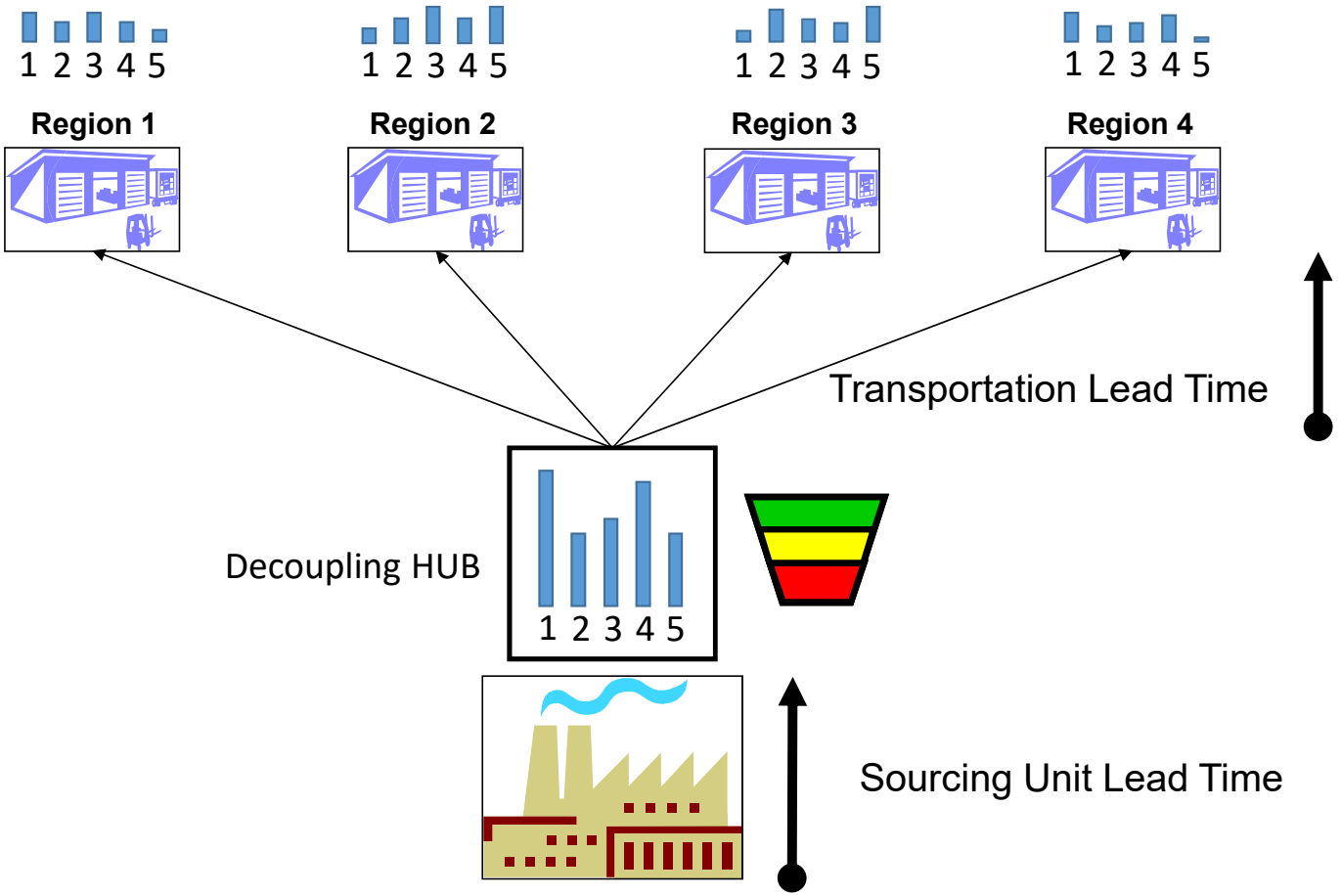

1 2 3 4 5
Region 1
1 2 3 4 5
Region 2
1 2 3 4 5
Region 3
1 2 3 4 5
Region 4
Transportation Lead Time
Decoupling HUB
1 2 3 4 5
Sourcing Unit Lead Time

Figure 6-32

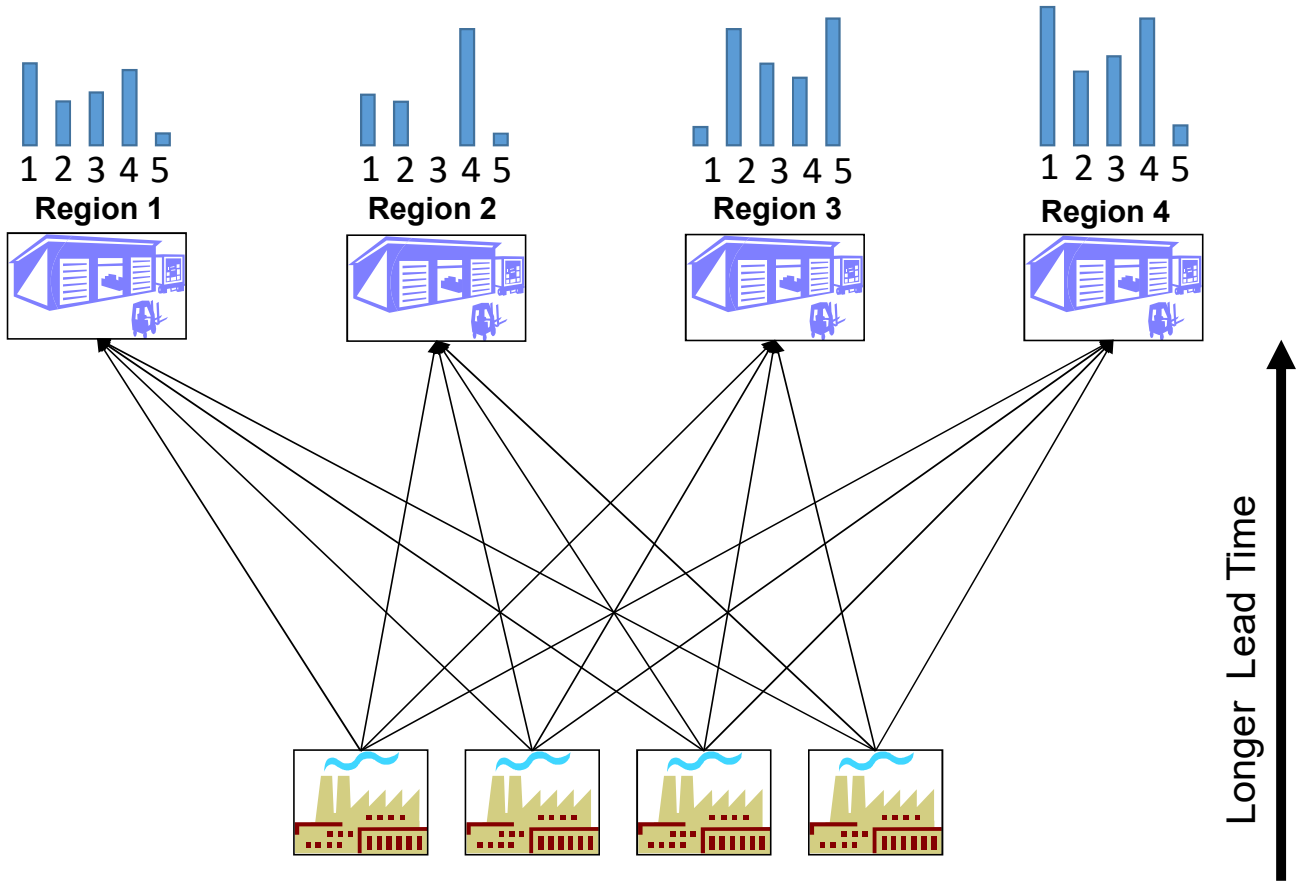

1 2 3 4 5
Region 1
1 2 3 4 5
Region 2
1 2 3 4 5
Region 3
1 2 3 4 5
Region 4
Longer Lead Time

Figure 6-33

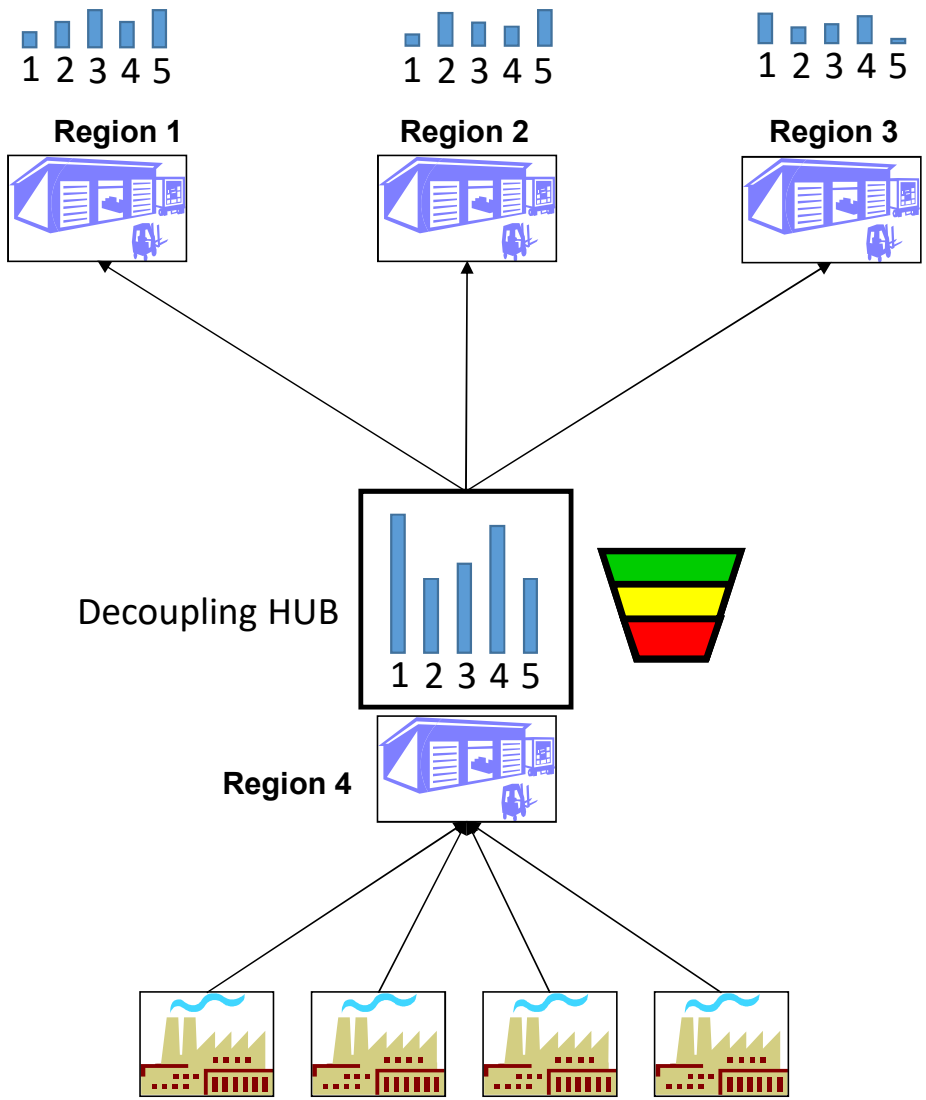

1 2 3 4 5
1 2 3 4 5
1 2 3 4 5
Region 1
Region 2
Region 3
Decoupling HUB
1 2 3 4 5
Region 4

Figure 6-34

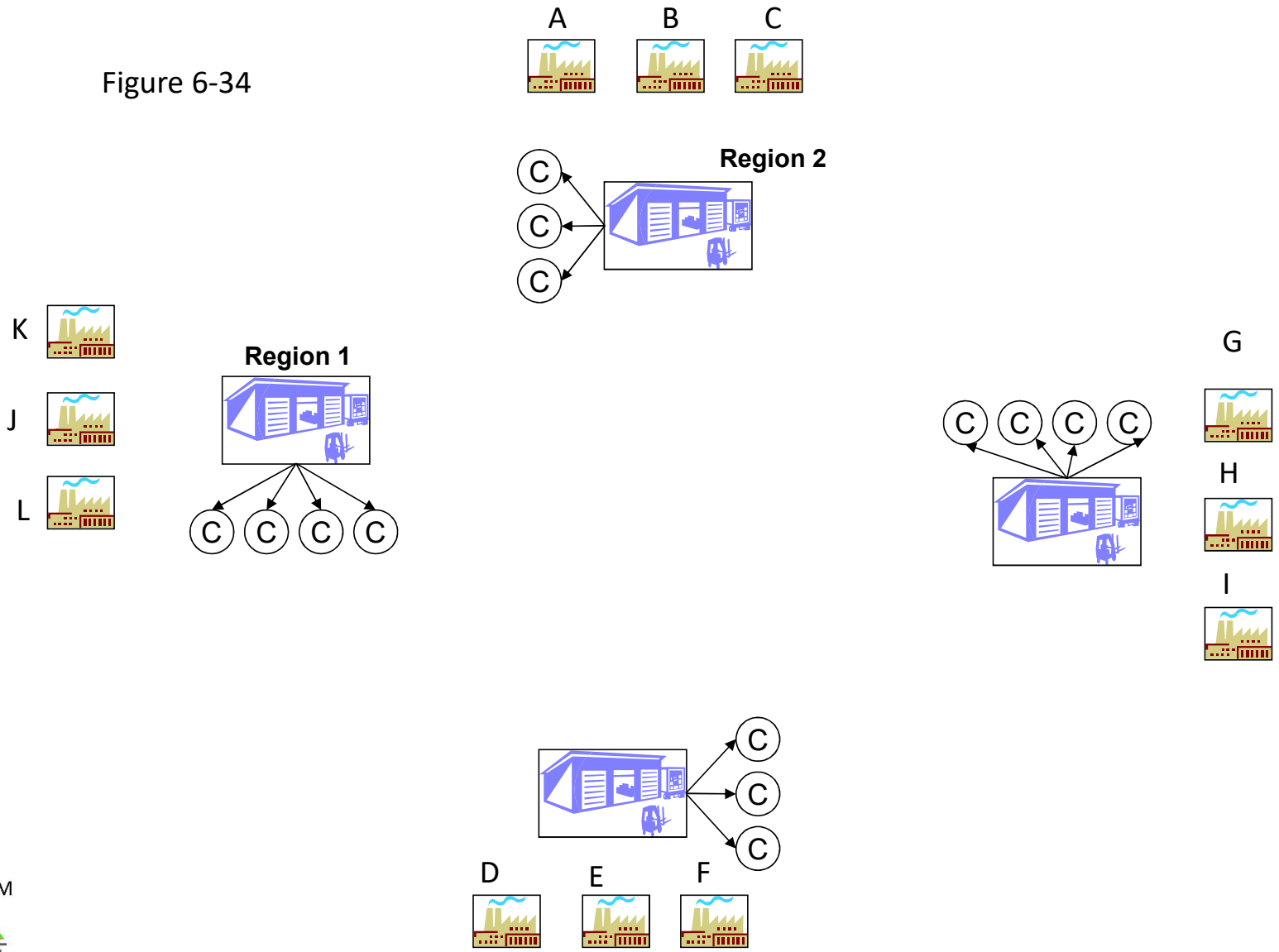


Figure 6-35

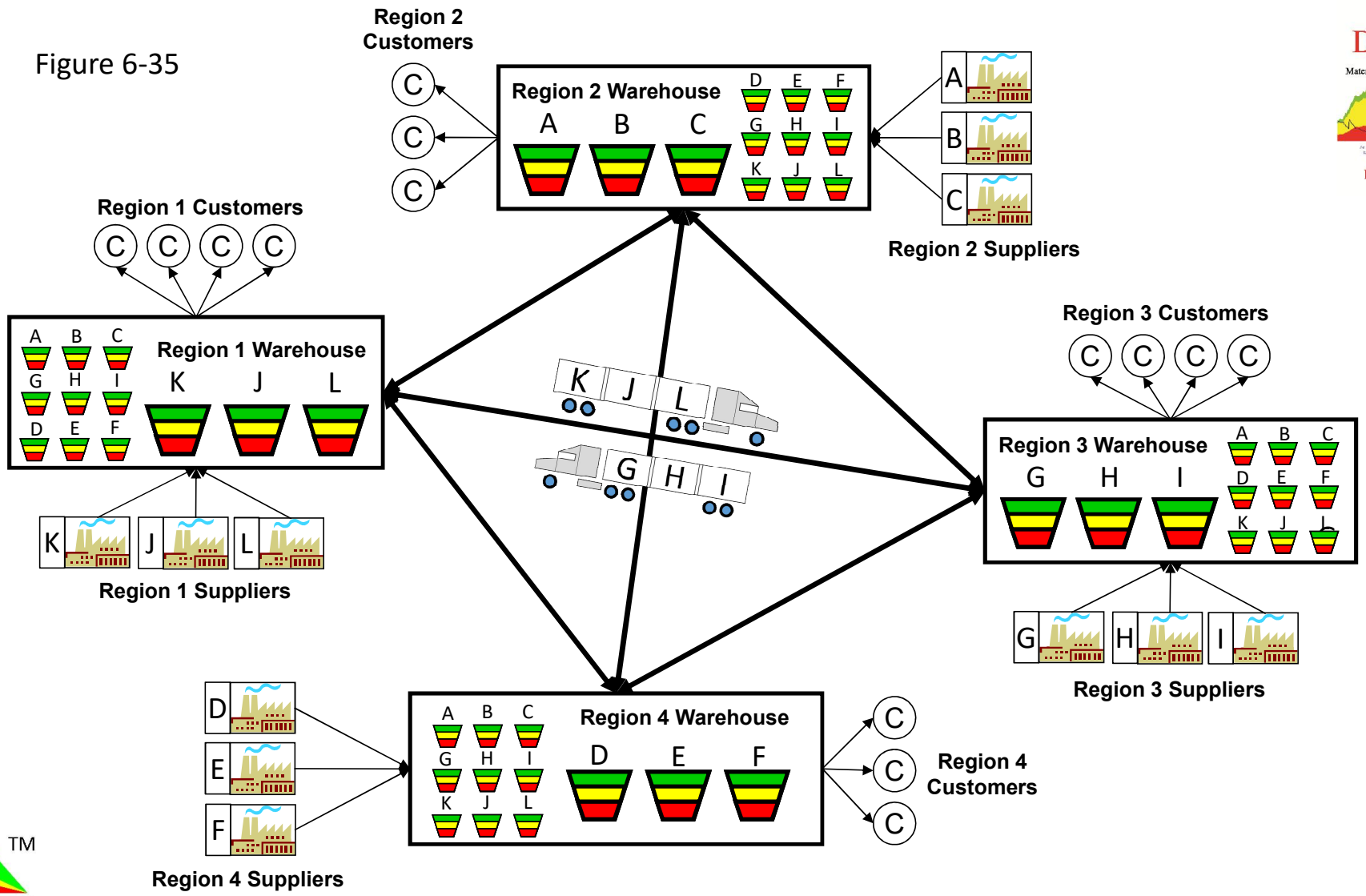
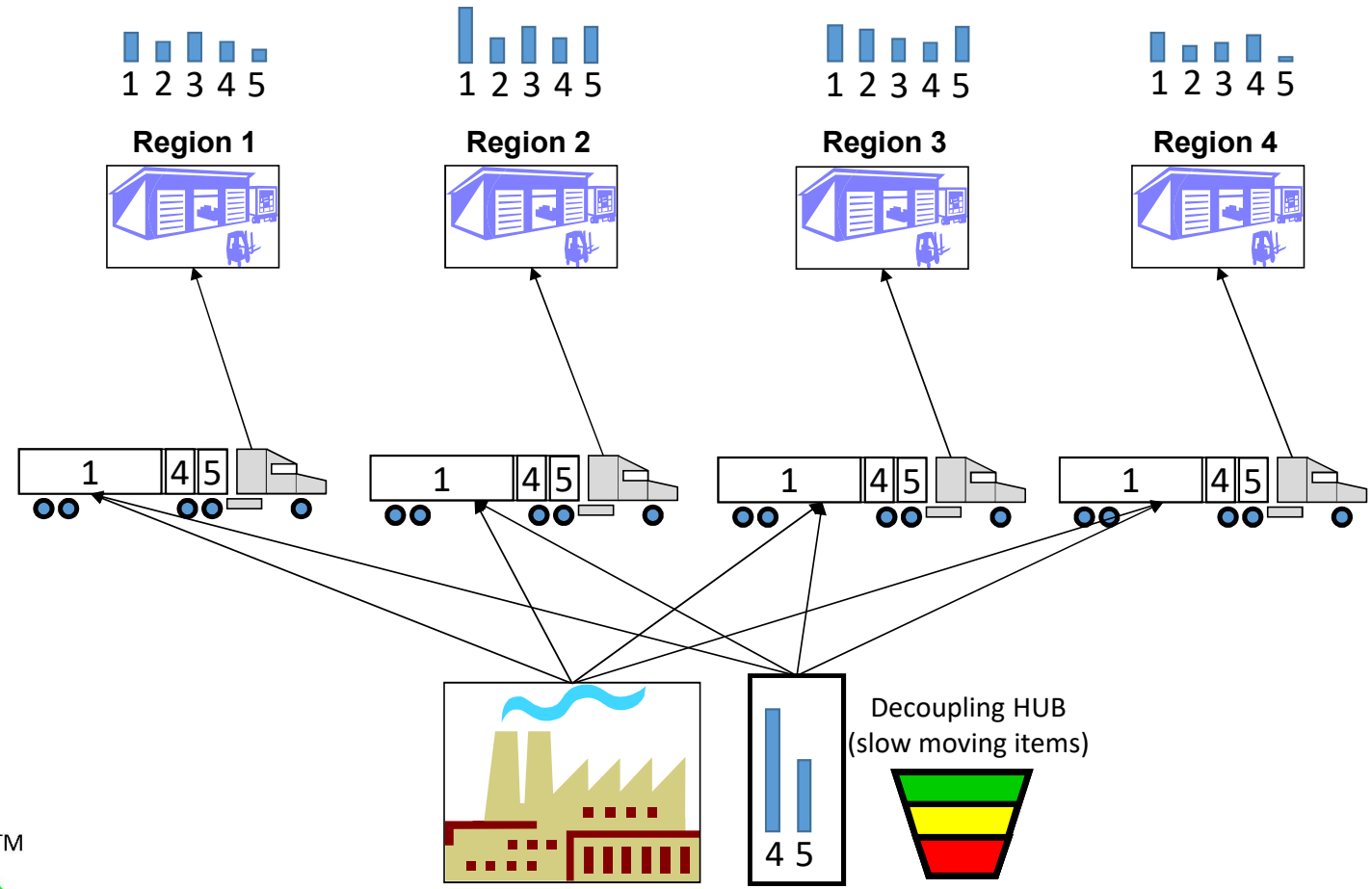
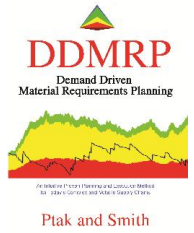

Region 2 Customers
C
C
C
Region 2 Warehouse
A B C
D E F
G H I
K J L
A
B
C
Region 2 Suppliers
Region 1 Customers
C C C C
A B C
G H I
D E F
Region 1 Warehouse
K J L
K
J
L
Region 1 Suppliers
K J L
G H I
Region 3 Customers
C C C C
Region 3 Warehouse
G H I
A B C
D E F
K J L
G
H
I
Region 3 Suppliers
D
E
F
Region 4 Suppliers
A B C
G H I
K J L
Region 4 Warehouse
D E F
C
C
C
Region 4 Customers

Figure 6-36


1 2 3 4 5
Region 1
1 2 3 4 5
Region 2
1 2 3 4 5
Region 3
1 2 3 4 5
Region 4
1 4 5
1 4 5
1 4 5
1 4 5
4 5
Decoupling HUB
(slow moving items)



Chapter 7

Strategic Buffers

Figure 7-1

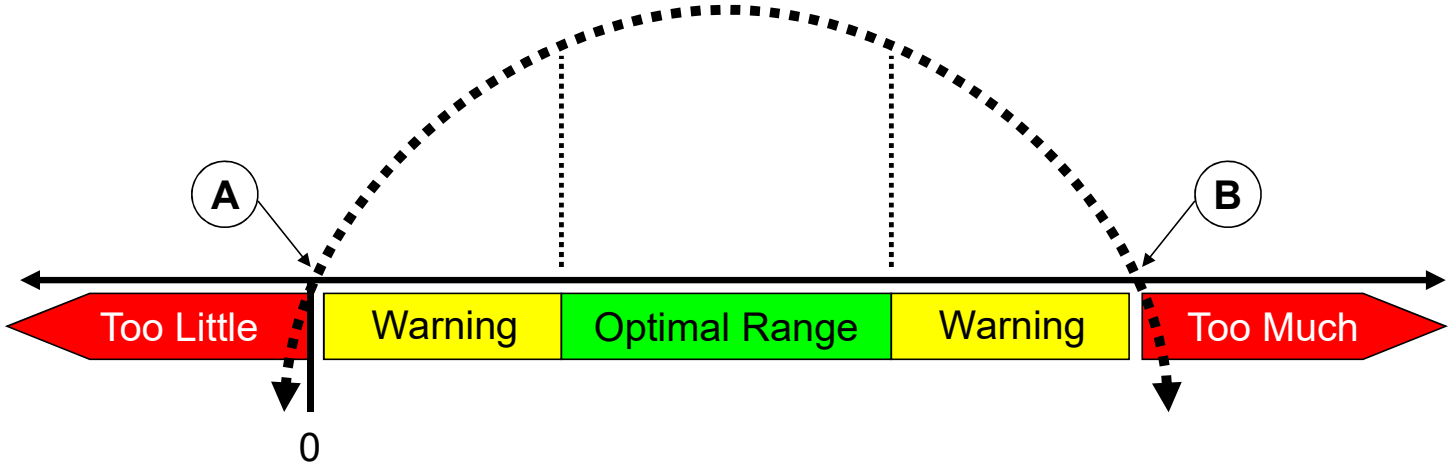
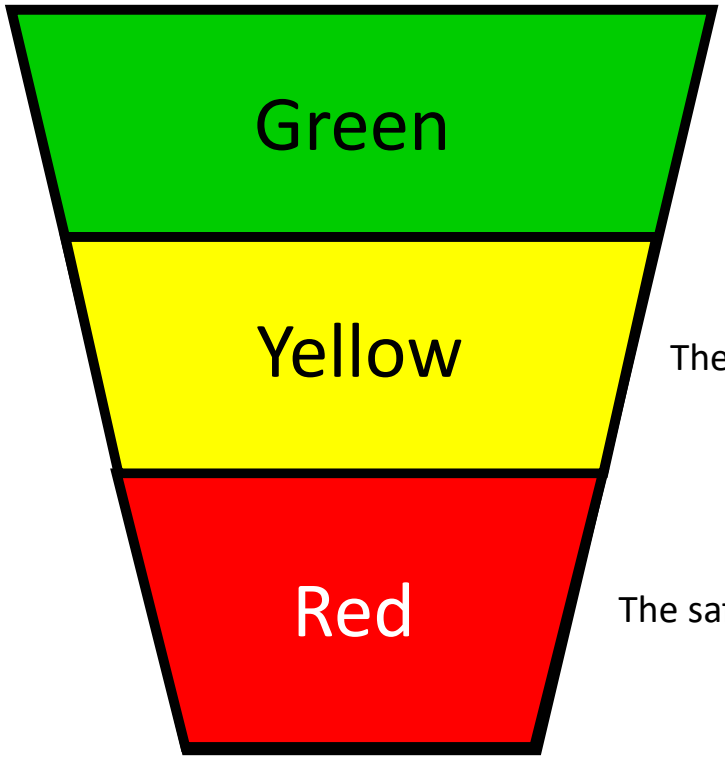


Figure 7-2



The heart of the order generation aspect of the buffer determining the frequency of order generation and the minimum size of each order.

The heart of the demand coverage in the buffer

The safety embedded in the buffer position

Figure 7-3

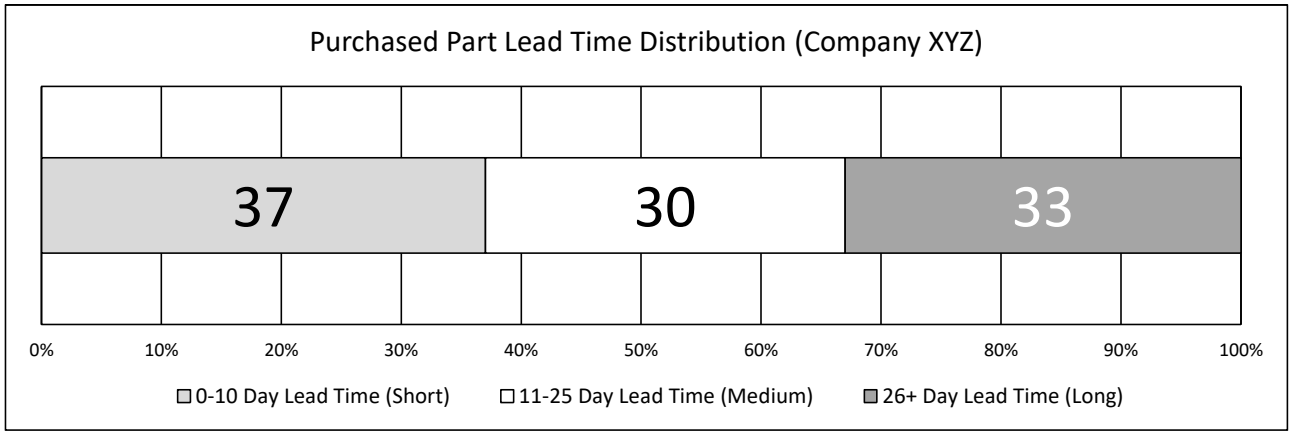

Purchased Part Lead Time Distribution (Company XYZ)
37
30
33
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0-10 Day Lead Time (Short)
11-25 Day Lead Time (Medium)
26+ Day Lead Time (Long)

Figure 7-4

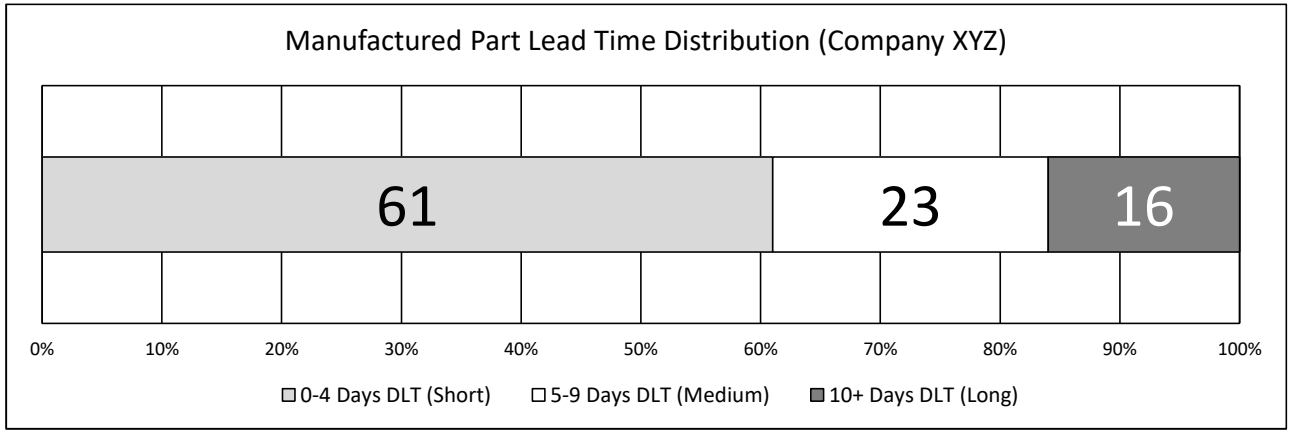

Manufactured Part Lead Time Distribution (Company XYZ)
61
23
16
0%
10%
20%
30%
40%
50%
60%
70%
80%
90%
100%
0-4 Days DLT (Short)
5-9 Days DLT (Medium)
10+ Days DLT (Long)

Figure 7-5

Lead Time Factor Range	
Long Lead Time	20-40% Average Daily Usage (ADU) x Decoupled Lead Time (DLT)
Medium Lead Time	41-60% ADU x DLT
Short Lead Time	61-100% ADU x DLT

Figure 7-6

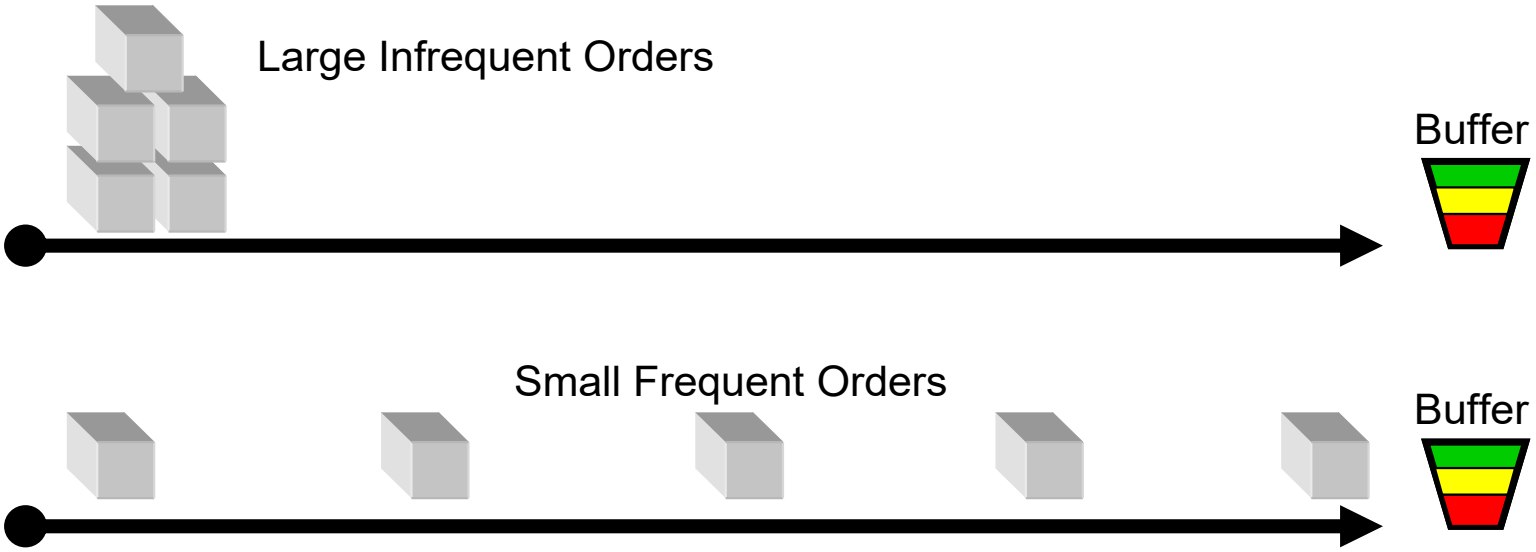

Large Infrequent Orders
Buffer
Small Frequent Orders
Buffer

Figure 7-7

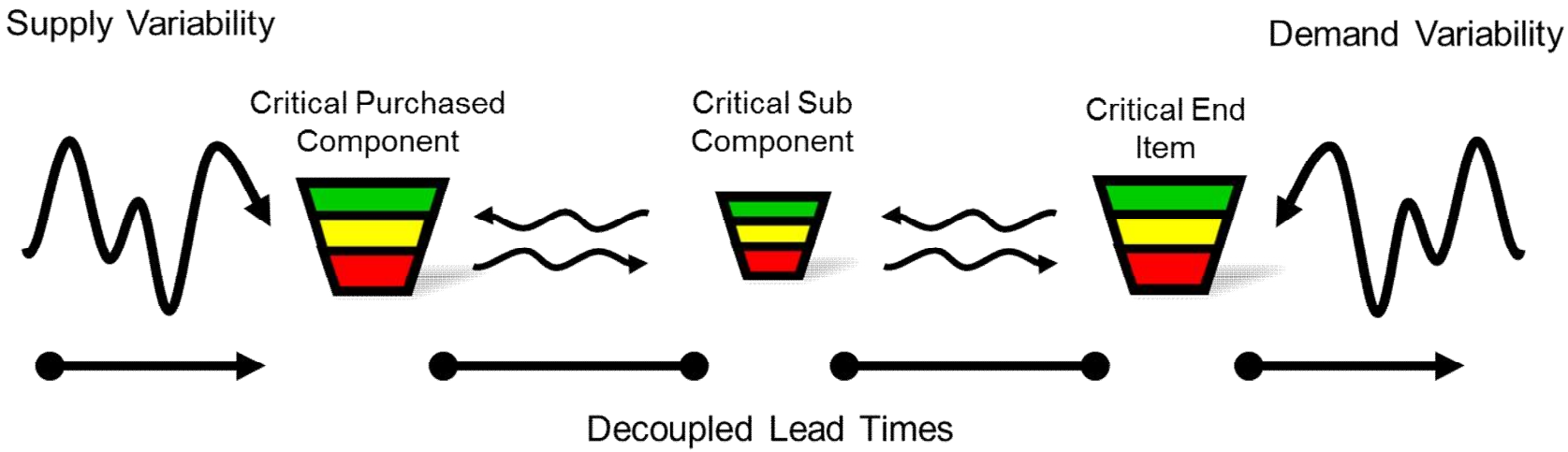

Supply Variability
Demand Variability
Critical Purchased Component
Critical Sub Component
Critical End Item
Decoupled Lead Times

Figure 7-8

Purchased Parts (Company XYZ)

	Low	Medium	High	Total
Short	12	15	10	37
Medium	6	16	8	30
Long	11	14	8	33
Total	29	45	26	100

Figure 7-9

Manufactured Parts (Company XYZ)

	Low	Medium	High	Total
Short	51	21	5	77
Medium		6	1	7
Long		10	6	16
Total	51	37	12	100

Figure 7-10

Variability Factor Range	
High Variability	61-100%+ of Safety Base
Medium Variability	41-60% of Safety Base
Low Variability	0-40% of Safety Base

Figure 7-11

Lead Time Category		Part Type					Variability Category
		Purchased	Manufactured	Distributed	Intermediate		
	Short	PSL	MSL	DSL	ISL	Low	
		PSM	MSM	DSM	ISM	Medium	
		PSH	MSH	DSH	ISH	High	
	Medium	PML	MML	DML	IML	Low	
		PMM	MMM	DMM	IMM	Medium	
		PMH	MMH	DMH	IMH	High	
	Long	PLL	MLL	DLL	ILL	Low	
		PLM	MLM	DLM	ILM	Medium	
		PLH	MLH	DLH	ILH	High	

Figure 7-12

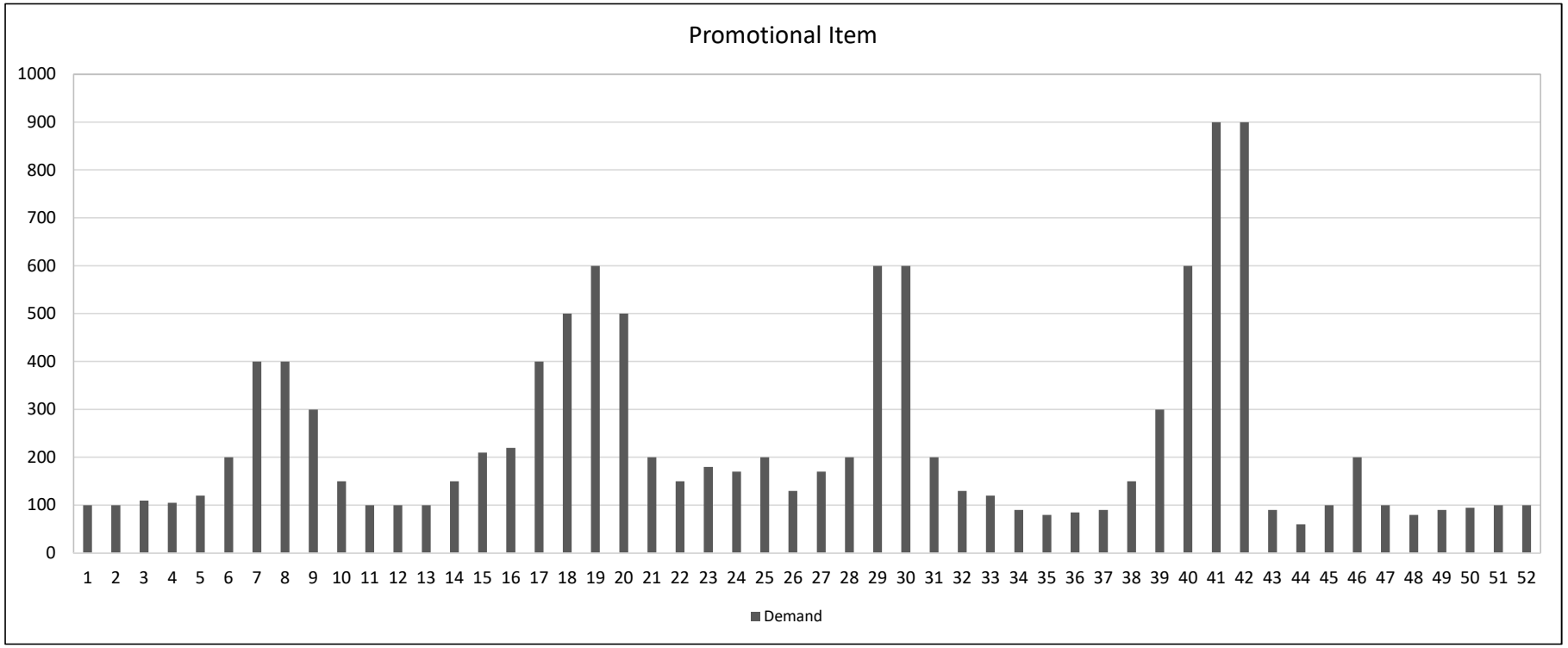

Promotional Item
1000
900
800
700
600
500
400
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
Demand

Figure 7-13

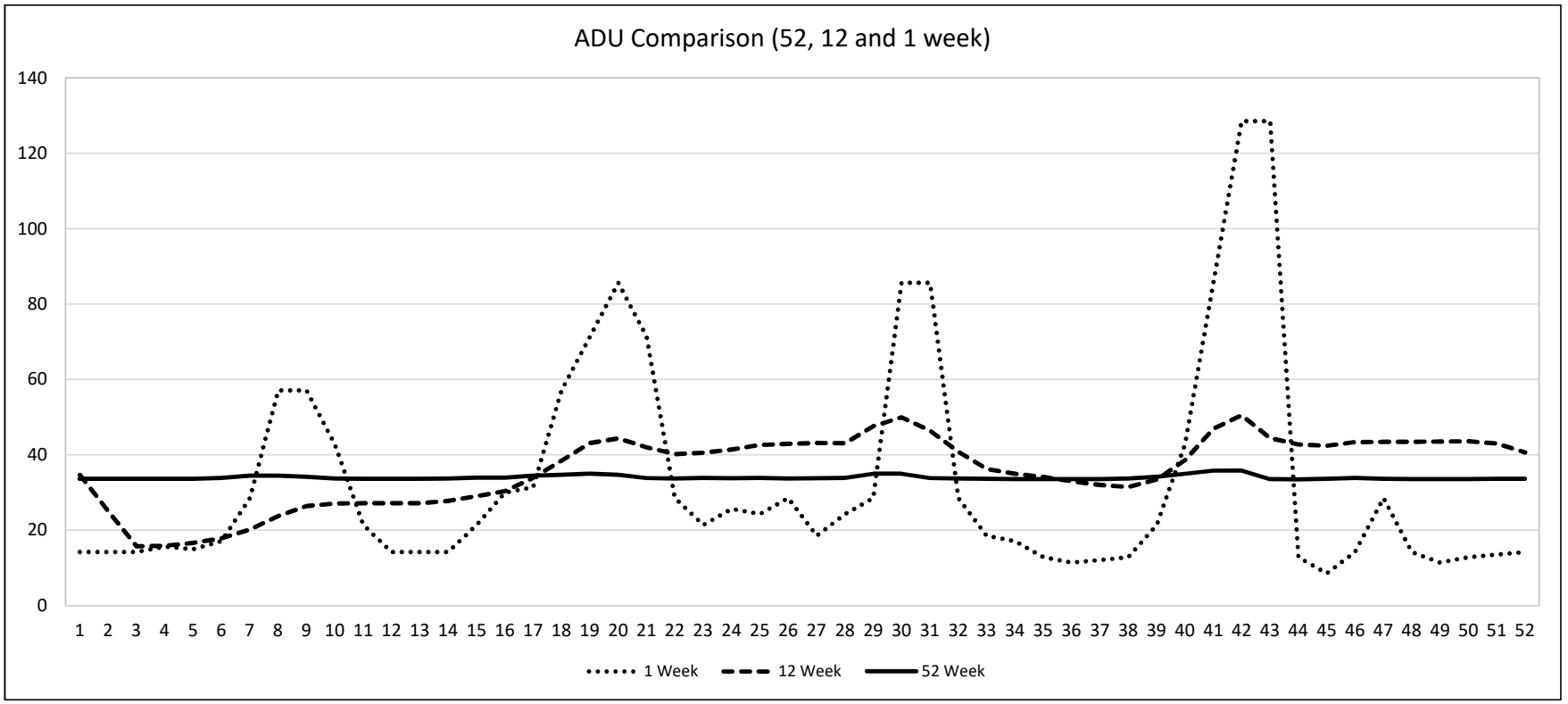

ADU Comparison (52, 12 and 1 week)
140
120
100
80
60
40
20
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
1 Week
12 Week
52 Week

Figure 7-14

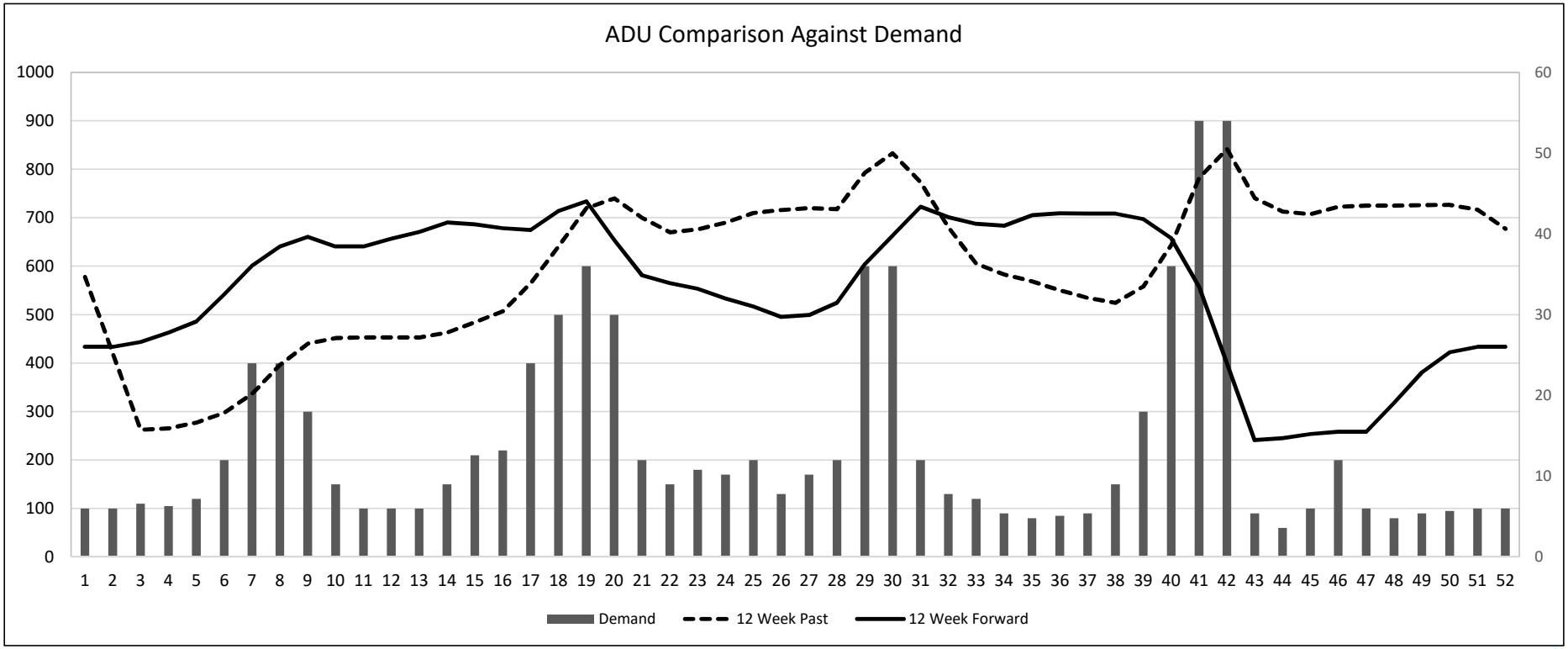

ADU Comparison Against Demand
1000
900
800
700
600
500
400
300
200
100
0
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
Demand
12 Week Past
12 Week Forward

Figure 7-15

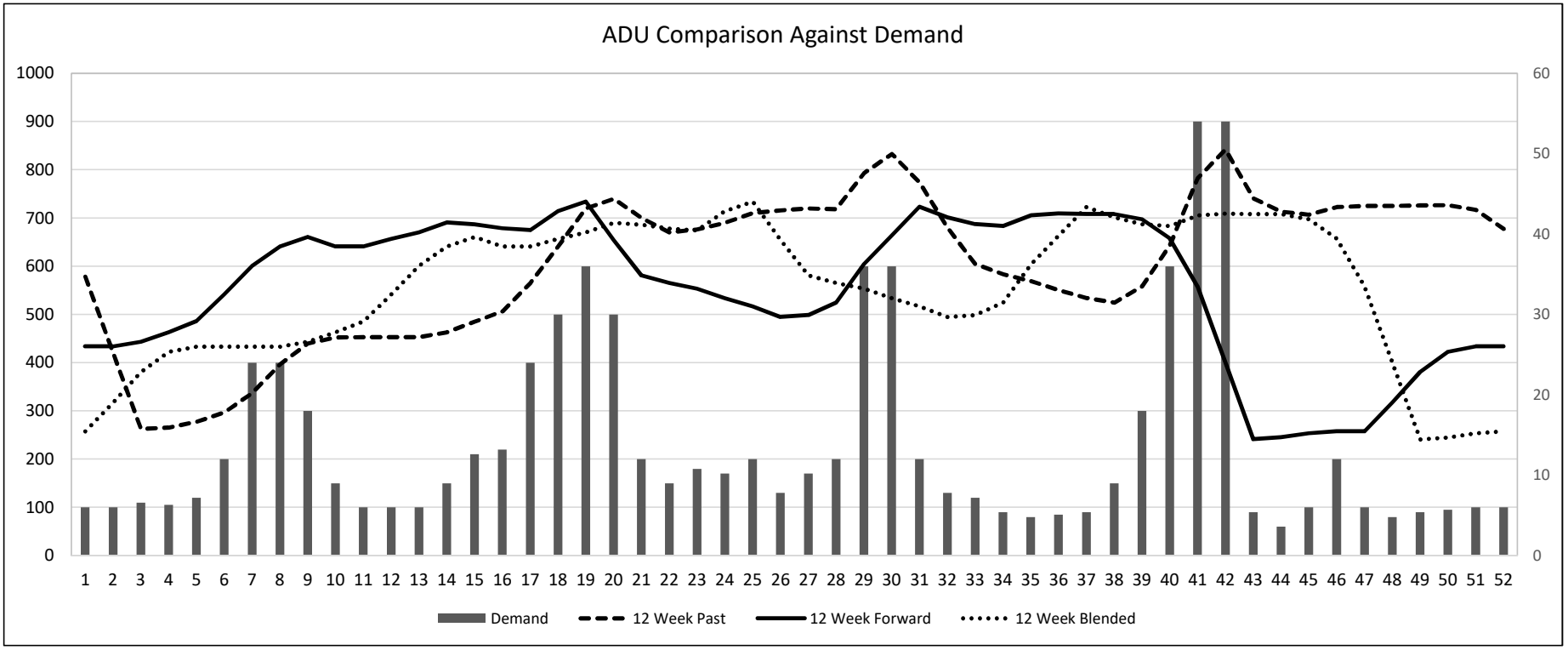

ADU Comparison Against Demand
1000
900
800
700
600
500
400
300
200
100
0
60
50
40
30
20
10
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
Demand
12 Week Past
12 Week Forward
12 Week Blended

Figure 7-16

Week	Estimated ADU	Included Estimate	Actual ADU	Included Actual	Sum (Estimate and Actual)	Actualized ADU
1	3000.0	36000.0	2678	2678	35678.0	2973.2
2	3000.0	33000.0	3174	5852.0	35852.0	2987.7
3	3000.0	30000.0	2987	8839.0	35839.0	2986.6
4	3000.0	27000.0	3412	12251.0	36251.0	3020.9
5	3000.0	24000.0	3541	15792.0	36792.0	3066.0
6	3000.0	21000.0	3210	19002.0	37002.0	3083.5
7	3000.0	18000.0	3810	22812.0	37812.0	3151.0
8	3000.0	15000.0	2978	25790.0	37790.0	3149.2
9	3000.0	12000.0	3214	29004.0	38004.0	3167.0
10	3000.0	9000.0	3611	32615.0	38615.0	3217.9
11	3000.0	6000.0	2874	35489.0	38489.0	3207.4
12	3000.0	3000.0	3210	38699.0	38699.0	3224.9

Figure 7-17

Part #123		
Location	ADU	Lead Time
Warehouse 1	7.4	2 days
Warehouse 2	2.9	2 days
Warehouse 3	6.4	3 days
Warehouse 4	3.1	4 days
Hub	19.7	1 day

Figure 7-18

Part Trait	Buffer Profile Assignment			
Average Daily Usage (ADU) Lead Time Minimum Order Quantity (MOQ) Location (Distributed parts only)	X	Lead Time Factor Variability Factor	=	Buffer & Zone Levels

Figure 7-19

EXAMPLE	
Average Daily Usage	10
Buffer Profile	M, M (.5), L (.33)
MOQ	50
Imposed or Desired Order Cycle (DOC)	7 days
Decoupled Lead Time (DLT)	12 days

Figure 7-20

Example Part Buffer Calculation			
Average Daily Usage	10	Green Zone	**70**
Buffer Profile	M, M (.5), L (.33)		LT Factor: 60 (DLT (12)x ADU (10) x Lead Time Factor (.5))
MOQ	50		Minimum Order Quantity: 50
Imposed or Desired Order Cycle (DOC)	7 days		Order Cycle: 70 (7(OC) x 10(ADU))
Decoupled Lead Time (DLT)	12 days	Yellow Zone	**120** (12(DLT) x 10(ADU))
		Red Zone	**80** (Red Base (60) + Red Safety (20))
			Red Base: 60 (DLT (12)x ADU (10) x Lead Time Factor (.5))
			Red Safety: 20 (Red Base (60) x Variability Factor (.5))

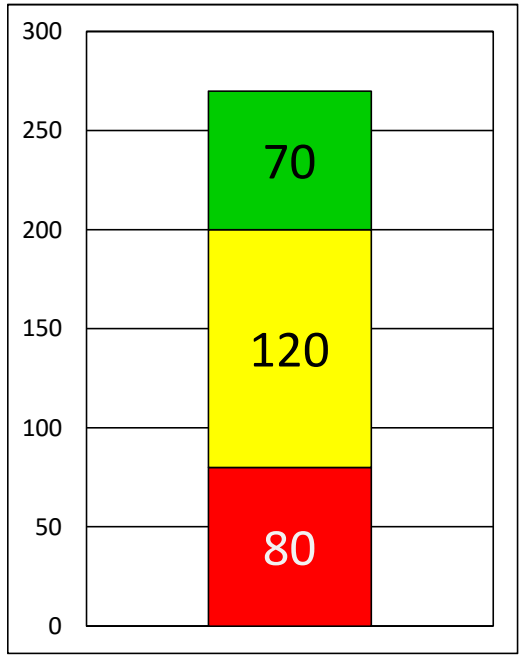


Figure 7-21

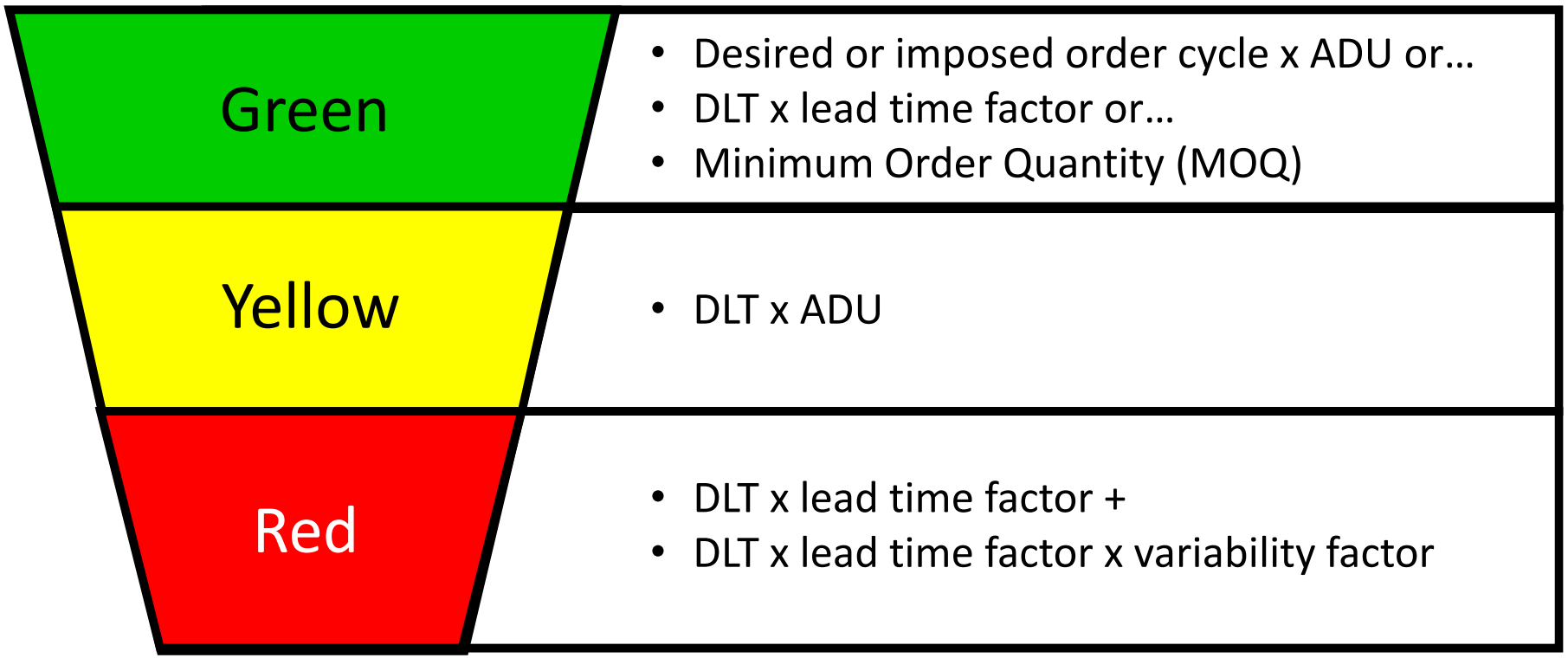

Green
• Desired or imposed order cycle x ADU or…
• DLT x lead time factor or…
• Minimum Order Quantity (MOQ)
Yellow
• DLT x ADU
Red
• DLT x lead time factor +
• DLT x lead time factor x variability factor

Figure 7-22

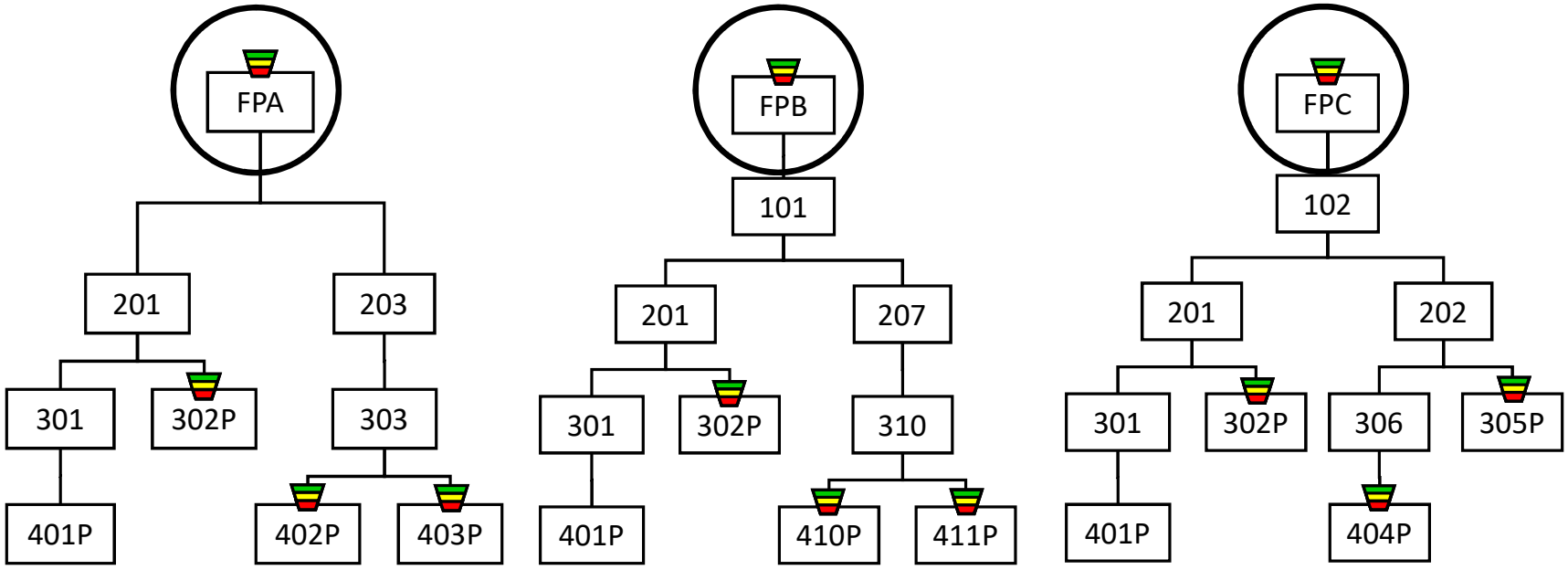

FPA
201
203
301
302P
303
401P
402P
403P
FPB
101
201
207
301
302P
310
401P
410P
411P
FPC
102
201
202
301
302P
306
305P
401P
404P

Figure 7-23

Parent Make Items (M)		Lead Time Factor	Variability Category	Variability Factor
Long Lead Time	8+ days	.25	High	.75
Medium Lead Time	3-8 days	.4	Medium	.5
Short Lead Time	1-2 days	.7	Low	.25
Intermediate Make Items (I)				
Long Lead Time	8+ days	.25	High	.7
Medium Lead Time	3-8 days	.4	Medium	.5
Short Lead Time	1-2 days	.7	Low	.2
Purchased Items (P)				
Long Lead Time	20+ days	.3	High	.75
Medium Lead Time	11-19 days	.5	Medium	.5
Short Lead Time	1-10 days	.7	Low	.25

Figure 7-24

FPA	
Average Daily Usage	250
Buffer Profile	M, L (.25), M (.5)
MOQ	250
Desired Order Cycle (DOC)	3 days
Decoupled Lead Time (DLT)	20 days
FPB	
Average Daily Usage	100
Buffer Profile	M, L (.25), M (.5)
MOQ	250
Desired Order Cycle	3 days
Decoupled Lead Time (DLT)	23 days
FPC	
Average Daily Usage	300
Buffer Profile	M, L (.25), M (.5)
MOQ	250
Desired Order Cycle	3 days
Decoupled Lead Time (DLT)	23 days

Figure 7-25

FPA		FPC	
Green Zone	**1250**	Green Zone	**1725**
	LT Factor: 1250 (5000 x .25)		LT Factor: 1725 (6900 x .25)
	Minimum Order Quantity: 250		Minimum Order Quantity: 250
	Order Cycle: 750 (3(DOC) x 250(ADU))		Order Cycle: 900 (3(DOC) x 300(ADU))
Yellow Zone	**5000** (20(DLT) x 250(ADU))	Yellow Zone	**6900** (23(DLT) x 300(ADU)
Red Zone	**1875** (1250 + 625)	Red Zone	**2588** (1725 + 863)
	Base: 1250 (5000 x .25)		Base: 1725 (6900 x .25)
	Safety: 625 (1250 x .5)		Safety: 863 (1725 x .5)
FPB			
Green Zone	**575**		
	LT Factor: 575 (2300 x .25)		
	Minimum Order Quantity: 250		
	Order Cycle: 300 (3(DOC) x 100(ADU))		
Yellow Zone	**2300** (23(DLT) x 100(ADU))		
Red Zone	**863** (575 + 287.5)		
	Base: 575 (2300 x .25)		
	Safety: 287.5 (575 x .5)		

Figure 7-26

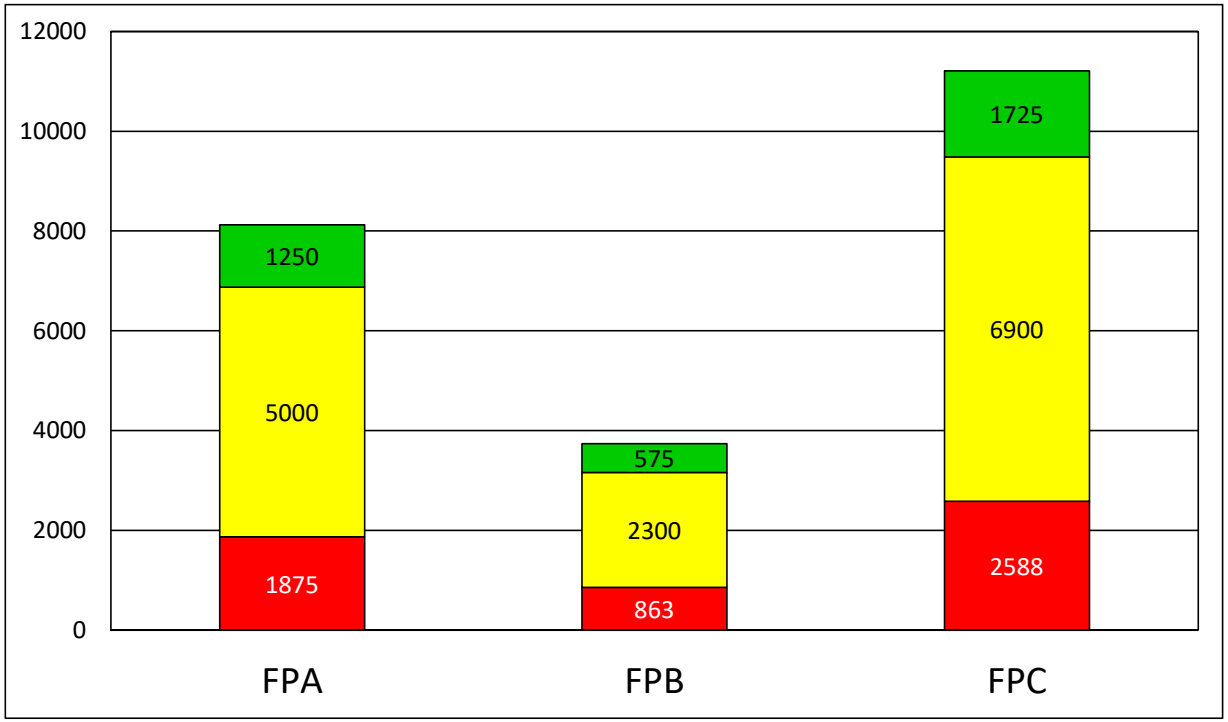

12000
10000
8000
6000
4000
2000
0
1250
5000
1875
575
2300
863
1725
6900
2588
FPA
FPB
FPC

Figure 7-27

Buffer Comparison (FPA)			
Before 201 Decoupling			
Average Daily Usage	250	Green Zone	**1250**
Buffer Profile	M, L (.25), M (.5)		LT Factor: 1250 (5000 x .25)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle (DOC)	3 days		Order Cycle: 750 (3(DOC) x 250(ADU))
Decoupled Lead Time (DLT)	20 days	Yellow Zone	**5000** (20(DLT) x 250(ADU))
		Red Zone	**1875** (1250 + 625)
			Base: 1250 (5000 x .25)
			Safety: 625 (1250 x .5)
After 201 Decoupling			
Average Daily Usage	250	Green Zone	**750**
Buffer Profile	M, M (.4), L (.25)		LT Factor: 700 (1750 x .4)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 750 (3(DOC) x 250(ADU))
DLT After Decoupling	7 days	Yellow Zone	**1750** (7(DLT) x 250(ADU)
		Red Zone	**875** (700 + 175)
			Base: 700 (1750 x .4)
			Safety: 175 (700 x .25)

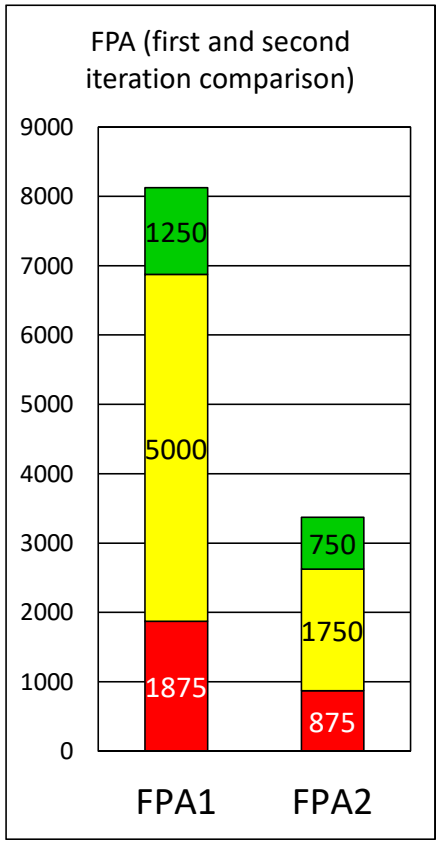


Figure 7-28

Buffer Comparison (FPB)			
Before 201 Decoupling			
Average Daily Usage	100	Green Zone	**575**
Buffer Profile	M, L (.25), M (.5)		LT Factor: 575 (2300 x .25)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 300 (3(DOC) x 100(ADU))
Decoupled Lead Time (DLT)	23 days	Yellow Zone	**2300** (23(DLT) x 100(ADU))
		Red Zone	**863** (575 + 287.5)
			Base: 575 (2300 x .25)
			Safety: 287.5 (575 x .5)
After 201 Decoupling			
Average Daily Usage	100	Green Zone	**360**
Buffer Profile	M, M (.4), M (.5)		LT Factor: 360 (900 x .4)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 300 (3(DOC) x 100(ADU))
DLT After Compression	9 days	Yellow Zone	**900** (9(DLT) x 100(ADU)
		Red Zone	**540** (360 + 180)
			Base: 360 (900 x .4)
			Safety: 180 (360 x .5)

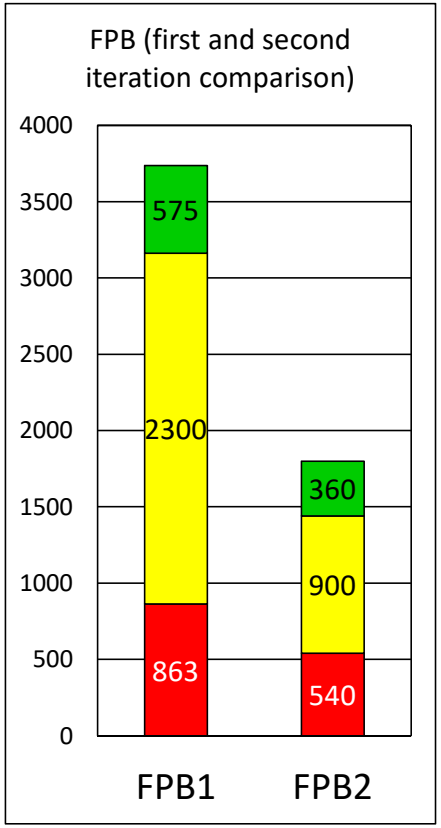


Figure 7-29

Buffer Comparison (FPC)			
Before 201 Decoupling			
Average Daily Usage	300	Green Zone	**1725**
Buffer Profile	M, L (.25), M (.5)		LT Factor: 1725 (6900 x .25)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 900 (3(DOC) x 300(ADU))
Decoupled Lead Time (DLT)	23 days	Yellow Zone	**6900** (23(DLT) x 300(ADU)
		Red Zone	**2588** (1725 + 863)
			Base: 1725 (6900 x .25)
			Safety: 863 (1725 x .5)
After 201 Decoupling			
Average Daily Usage	300	Green Zone	**960**
Buffer Profile	M, M (.4), L (.25)		LT Factor: 960 (2400 x .4)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 750 (3(DOC) x 250(ADU))
DLT After Compression	8 days	Yellow Zone	**2400** (8(DLT) x 300(ADU)
		Red Zone	**1200** (960 + 240)
			Base: 960 (2400 x .4)
			Safety: 240 (960 x .25)

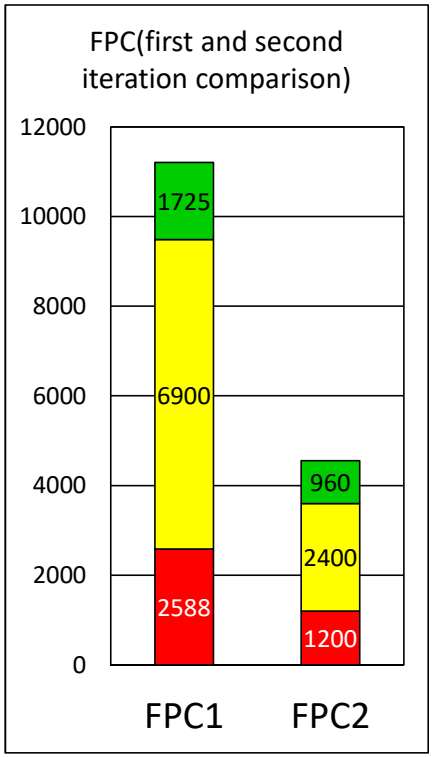


Figure 7-30

Buffer Worksheet (201)			
Average Daily Usage	650	Green Zone	**3088**
Buffer Profile	I, L (.25), M (.5)		LT Factor: 3088 (12350 x .25)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 1950 (3(DOC) x 650(ADU))
Decoupled Lead Time (DLT)	19 days	Yellow Zone	**12350** (19(DLT) x 650(ADU)
		Red Zone	**4632** (3088 + 1544)
			Base: 3088 (12350 x .25)
			Safety: 1544 (3088 x .5)

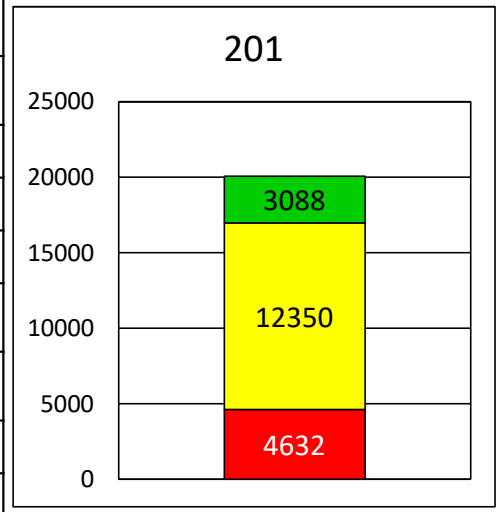


Figure 7-31

Buffer Worksheet (203)			
Average Daily Usage	250	Green Zone	**750**
Buffer Profile	I, M (.5), L (.2)		LT Factor: 750 (1500 x .5)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 750 (3(DOC) x 250(ADU))
Decoupled Lead Time (DLT)	6 days	Yellow Zone	**1500** (6(DLT) x 250(ADU)
		Red Zone	**900** (750 + 150)
			Base: 750 (1500 x .5)
			Safety: 150 (750 x .2)

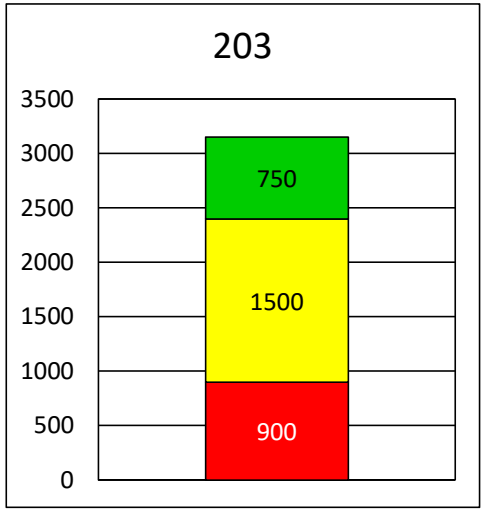


Figure 7-32

Buffer Comparison (201)			
Before 401P Decoupling			
Average Daily Usage	650	Green Zone	**3088**
Buffer Profile	I, L (.25), M (.5)		LT Factor: 3088 (12350 x .25)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 1950 (3(DOC) x 650(ADU))
Decoupled Lead Time (DLT)	19 days	Yellow Zone	**12350** (19(DLT) x 650(ADU)
		Red Zone	**4632** (3088 + 1544)
			Base: 3088 (12350 x .25)
			Safety: 1544 (3088 x .5)
After 401P Decoupling			
Average Daily Usage	650	Green Zone	**1950**
Buffer Profile	I, L (.25), L (.2)		LT Factor: 1463 (5850 x .25)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 1950 (3(DOC) x 650(ADU))
DLT After Compression	9 days	Yellow Zone	**5850** (9(DLT) x 650(ADU)
		Red Zone	**1756** (1463 + 293)
			Base: 1463 (5850 x .25)
			Safety: 293 (1463 x .2)

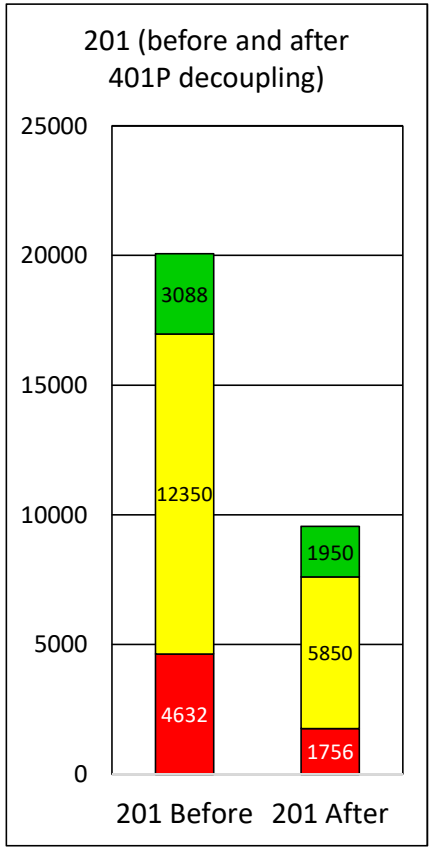


Figure 7-33

Buffer Worksheet (401P)			
Average Daily Usage	650	Green Zone	**1950**
Buffer Profile	P, L (.3), L (.25)		LT Factor: 1950 (6500 x .3)
MOQ	250		Minimum Order Quantity: 250
Desired Order Cycle	3 days		Order Cycle: 1950 (3(DOC) x 650(ADU))
Decoupled Lead Time (DLT)	10 days	Yellow Zone	**6500** (10(DLT) x 650(ADU)
		Red Zone	**2438** (1950 + 488)
			Base: 1950 (6500 x .3)
			Safety: 488 (1950 x .25)

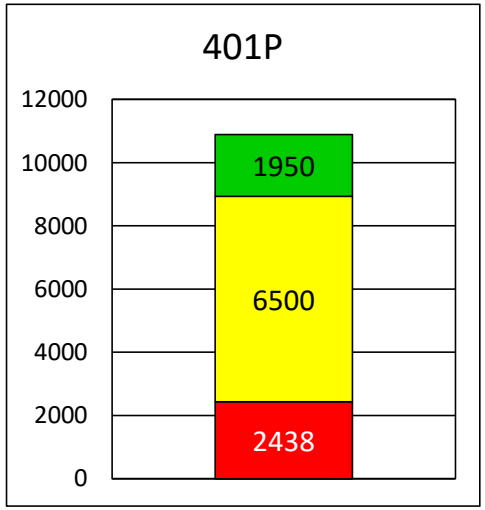


Figure 7-34 (portrait)

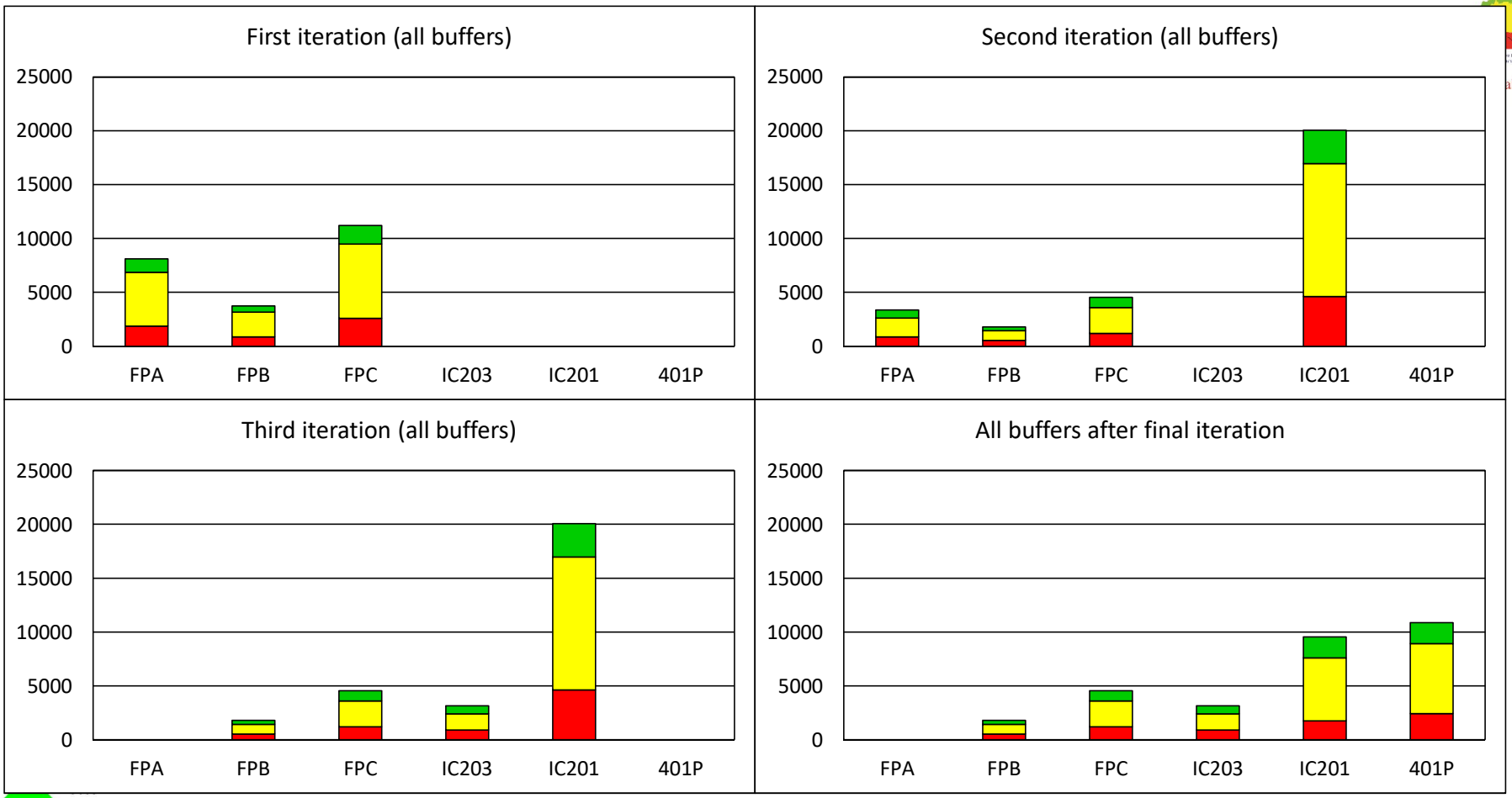
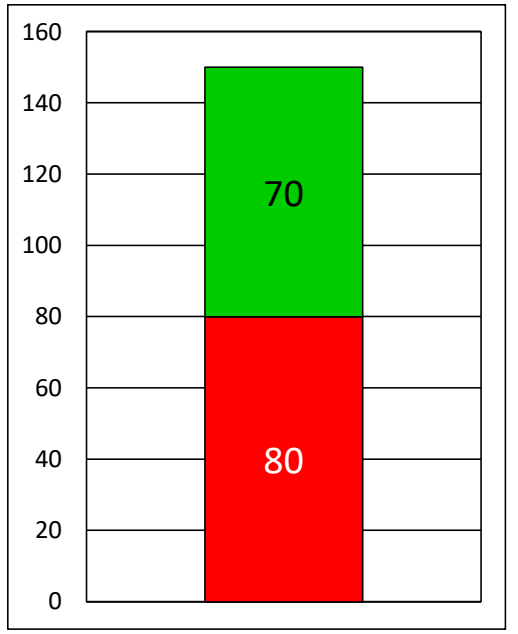
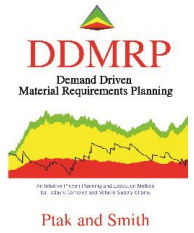


Figure 7-35

Example Part Buffer Calculation			
Average Daily Usage	10	Green Zone	**70**
Buffer Profile	M, M (.5), L (.33)		LT Factor: 60 (DLT (12)x ADU (10) x Lead Time Factor (.5))
MOQ	50		Minimum Order Quantity: 50
Imposed or Desired Order Cycle (DOC)	7 days		Order Cycle: 70 (7(OC) x 10(ADU))
Decoupled Lead Time (DLT)	12 days	Yellow Zone	Not Applicable
		Red Zone	**80** (Red Base (60) + Red Safety (20))
			Red Base: 60 (DLT (12)x ADU (10) x Lead Time Factor (.5))
			Red Safety: 20 (Red Base (60) x Variability Factor (.33))





Chapter 8

Buffer Adjustments

Figure 8-1

Date	Red	Yellow	Green	ADU	RedBase	RedSafety	DLT	LTF	VF
1-Jan	70	100	50	10	50	20	10	0.5	0.4
15-Jan	84	150	75	15	75	30	10	0.5	0.4
1-Feb	128.8	230	115	23	115	46	10	0.5	0.4
15-Feb	212.8	380	190	38	190	76	10	0.5	0.4
1-Mar	252	450	225	45	225	90	10	0.5	0.4
15-Mar	291.2	520	260	52	260	104	10	0.5	0.4
1-Apr	308	550	275	55	275	110	10	0.5	0.4
15-Apr	324.8	580	290	58	290	116	10	0.5	0.4
1-May	302.4	540	270	54	270	108	10	0.5	0.4
15-May	313.6	560	280	56	280	112	10	0.5	0.4
1-Jun	324.8	580	290	58	290	116	10	0.5	0.4
15-Jun	296.8	530	265	53	265	106	10	0.5	0.4

Figure 8-2

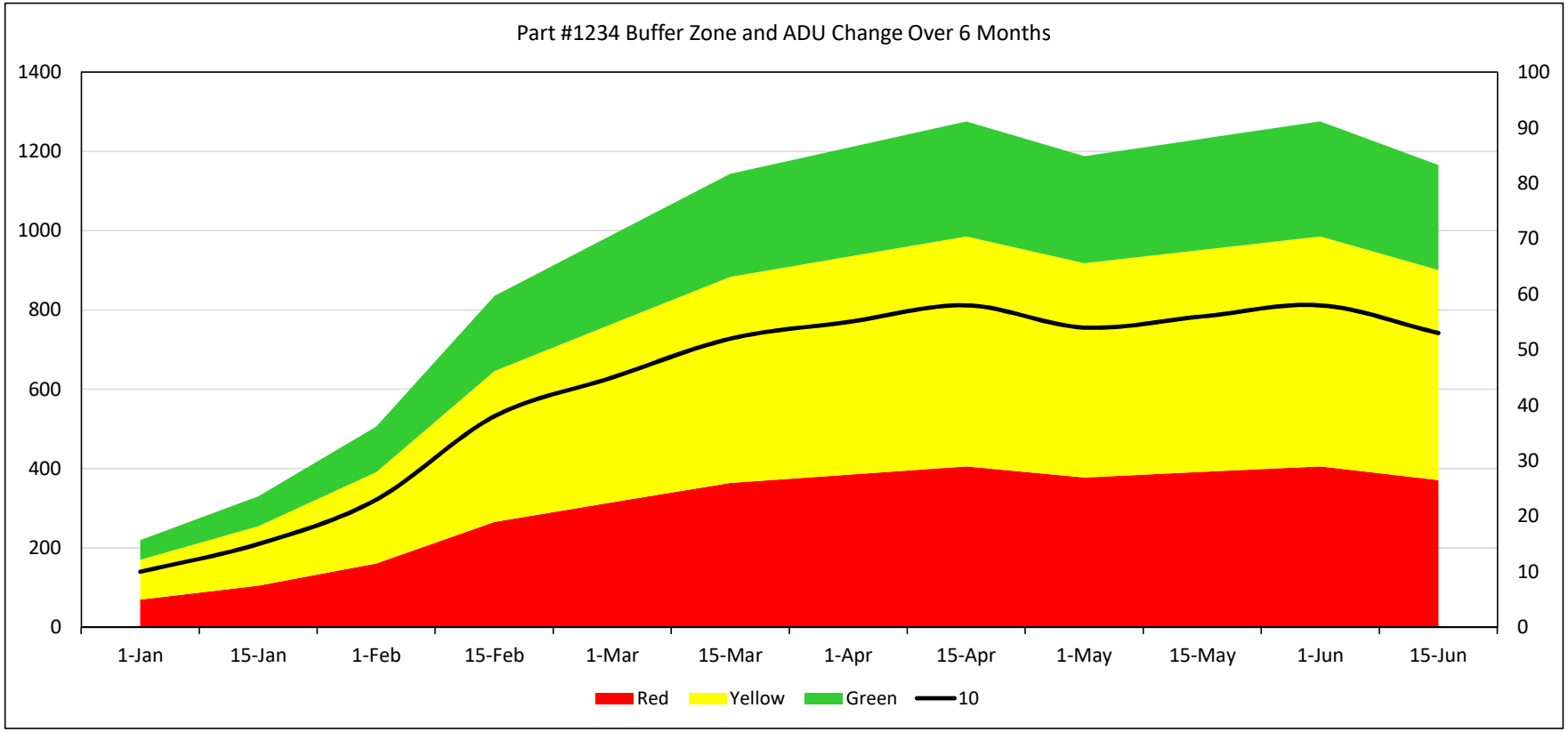

Part #1234 Buffer Zone and ADU Change Over 6 Months
1400
1200
1000
800
600
400
200
0
100
90
80
70
60
50
40
30
20
10
0
1-Jan
15-Jan
1-Feb
15-Feb
1-Mar
15-Mar
1-Apr
15-Apr
1-May
15-May
1-Jun
15-Jun
Red
Yellow
Green
10

Figure 8-3

	Red	Yellow	Green	ADU	RedBase	RedSafety	DLT	LTF	VF	MOQ	Green (LTF)
1-Jan	70	100	50	10	50	20	10	0.5	0.4	0	50
15-Jan	84	150	75	15	75	30	10	0.5	0.4	0	75
1-Feb	128.8	230	115	23	115	46	10	0.5	0.4	0	115
15-Feb	212.8	380	190	38	190	76	10	0.5	0.4	0	190
1-Mar	252	450	225	45	225	90	10	0.5	0.4	0	225
15-Mar	291.2	260	182	52	182	72.8	5	0.7	0.4	0	182
1-Apr	308	275	192.5	55	192.5	77	5	0.7	0.4	0	192.5
15-Apr	324.8	290	203	58	203	81.2	5	0.7	0.4	0	203
1-May	302.4	270	189	54	189	75.6	5	0.7	0.4	0	189
15-May	313.6	280	196	56	196	78.4	5	0.7	0.4	0	196
1-Jun	324.8	290	203	58	203	81.2	5	0.7	0.4	0	203
15-Jun	296.8	265	185.5	53	185.5	74.2	5	0.7	0.4	0	185.5

Figure 8-4

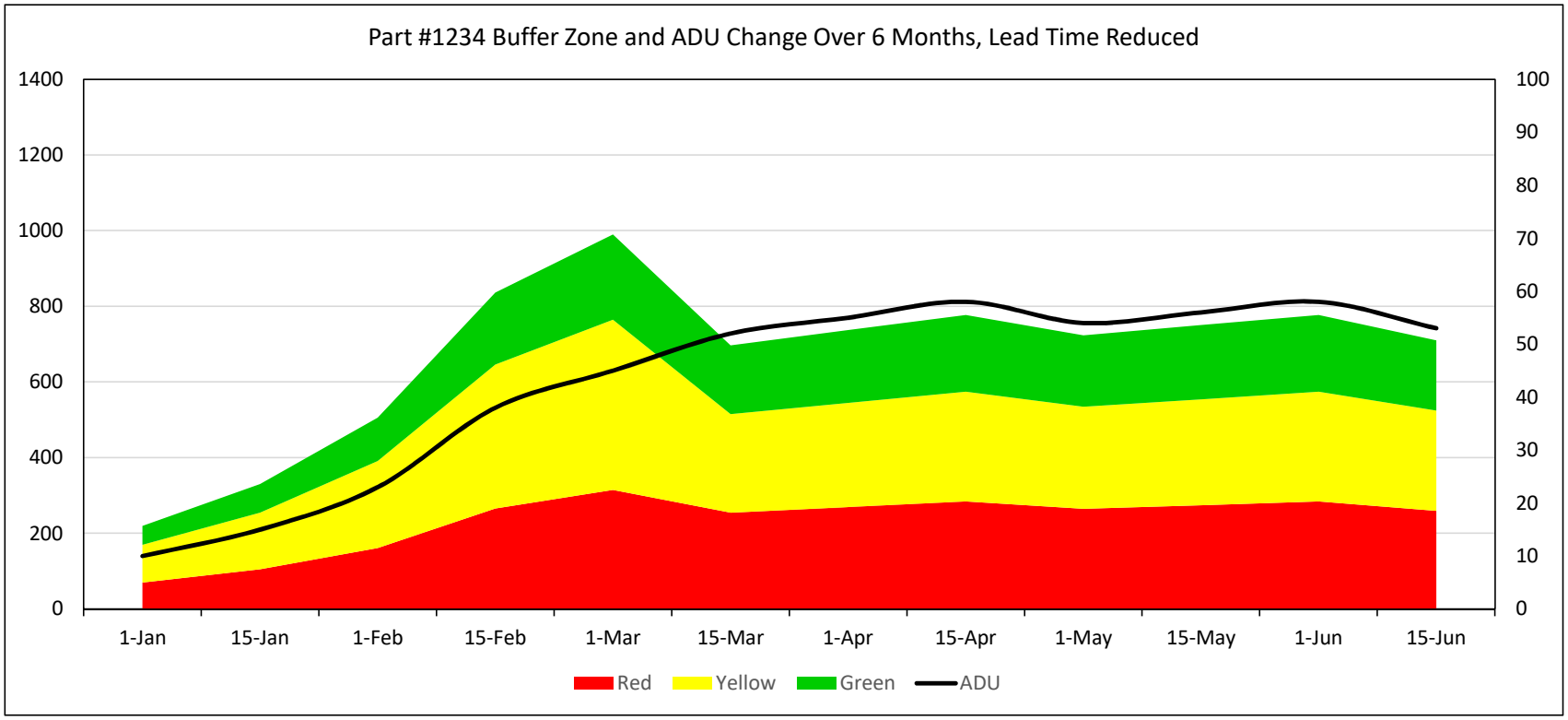

Part #1234 Buffer Zone and ADU Change Over 6 Months, Lead Time Reduced
1400
1200
1000
800
600
400
200
0
100
90
80
70
60
50
40
30
20
10
0
1-Jan
15-Jan
1-Feb
15-Feb
1-Mar
15-Mar
1-Apr
15-Apr
1-May
15-May
1-Jun
15-Jun
Red
Yellow
Green
ADU

Figure 8-5

	Red	Yellow	Green	ADU	RedBase	RedSafety	DLT	LTF	VF	MOQ	Green (LTF)
1-Jan	70	100	50	10	50	20	10	0.5	0.4	0	50
15-Jan	84	150	75	15	75	30	10	0.5	0.4	0	75
1-Feb	128.8	230	115	23	115	46	10	0.5	0.4	0	115
15-Feb	212.8	380	190	38	190	76	10	0.5	0.4	0	190
1-Mar	252	450	225	45	225	90	10	0.5	0.4	0	225
15-Mar	353.6	260	182	52	130	91	5	0.5	0.7	0	182
1-Apr	374	275	192.5	55	137.5	96.25	5	0.5	0.7	0	192.5
15-Apr	394.4	290	400	58	145	101.5	5	0.5	0.7	400	203
1-May	367.2	270	400	54	135	94.5	5	0.5	0.7	400	189
15-May	380.8	280	400	56	140	98	5	0.5	0.7	400	196
1-Jun	394.4	290	400	58	145	101.5	5	0.5	0.7	400	203
15-Jun	360.4	265	400	53	132.5	92.75	5	0.5	0.7	400	185.5

Figure 8-6

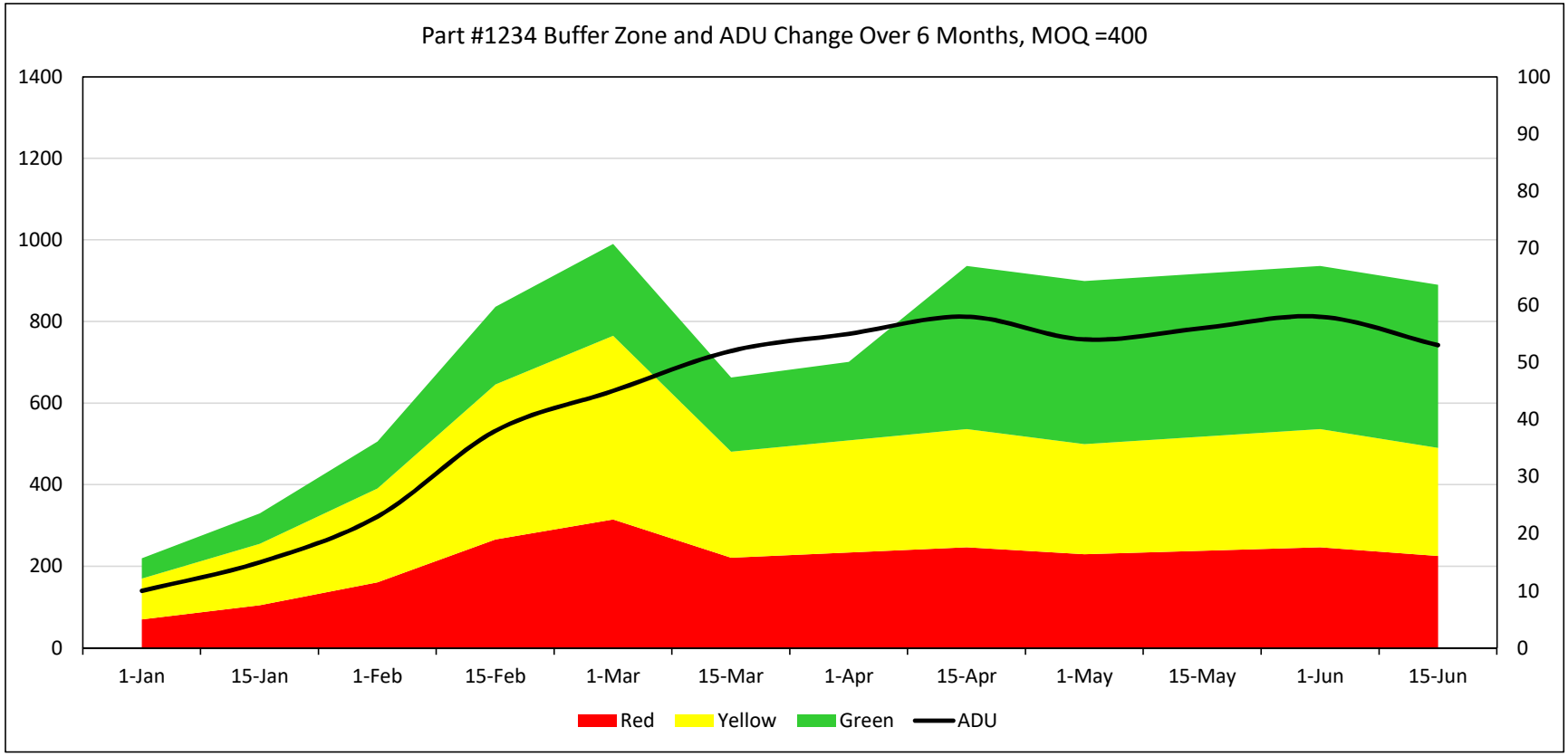

Part #1234 Buffer Zone and ADU Change Over 6 Months, MOQ =400
1400
1200
1000
800
600
400
200
0
100
90
80
70
60
50
40
30
20
10
0
1-Jan
15-Jan
1-Feb
15-Feb
1-Mar
15-Mar
1-Apr
15-Apr
1-May
15-May
1-Jun
15-Jun
Red
Yellow
Green
ADU

Figure 8-7

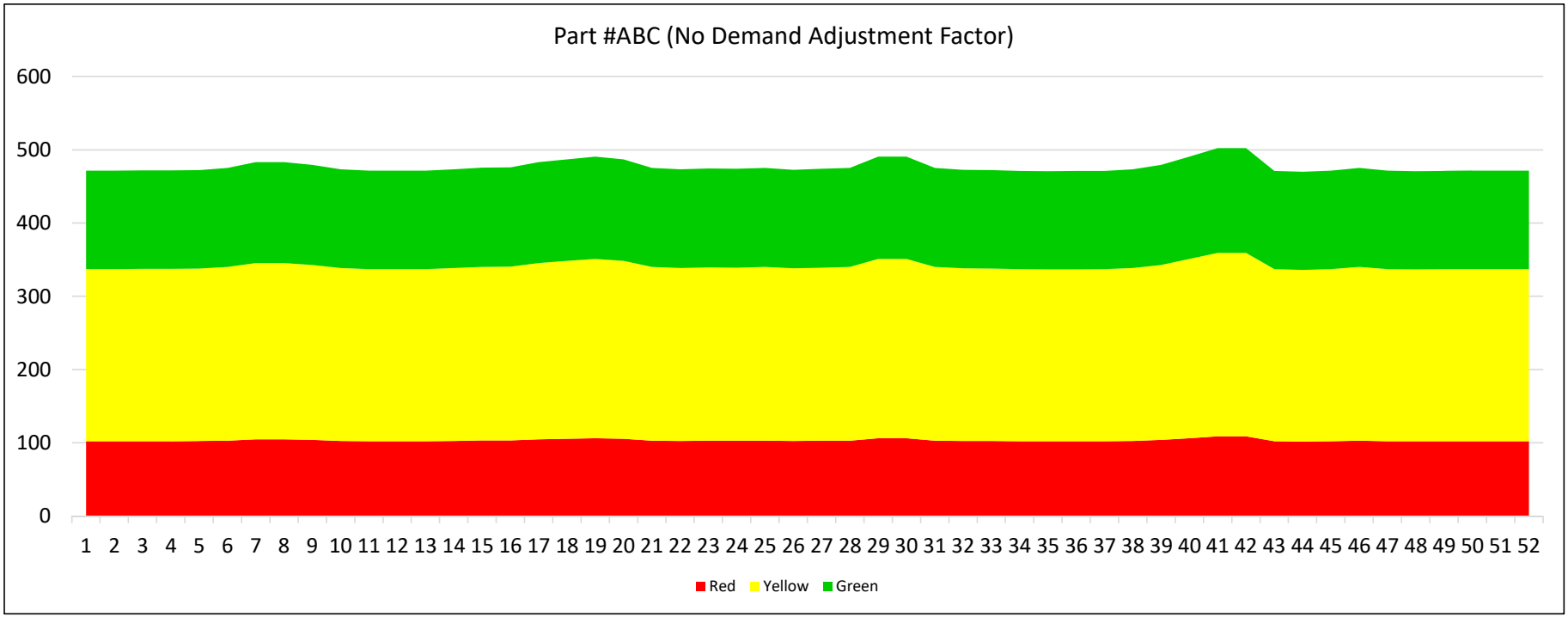
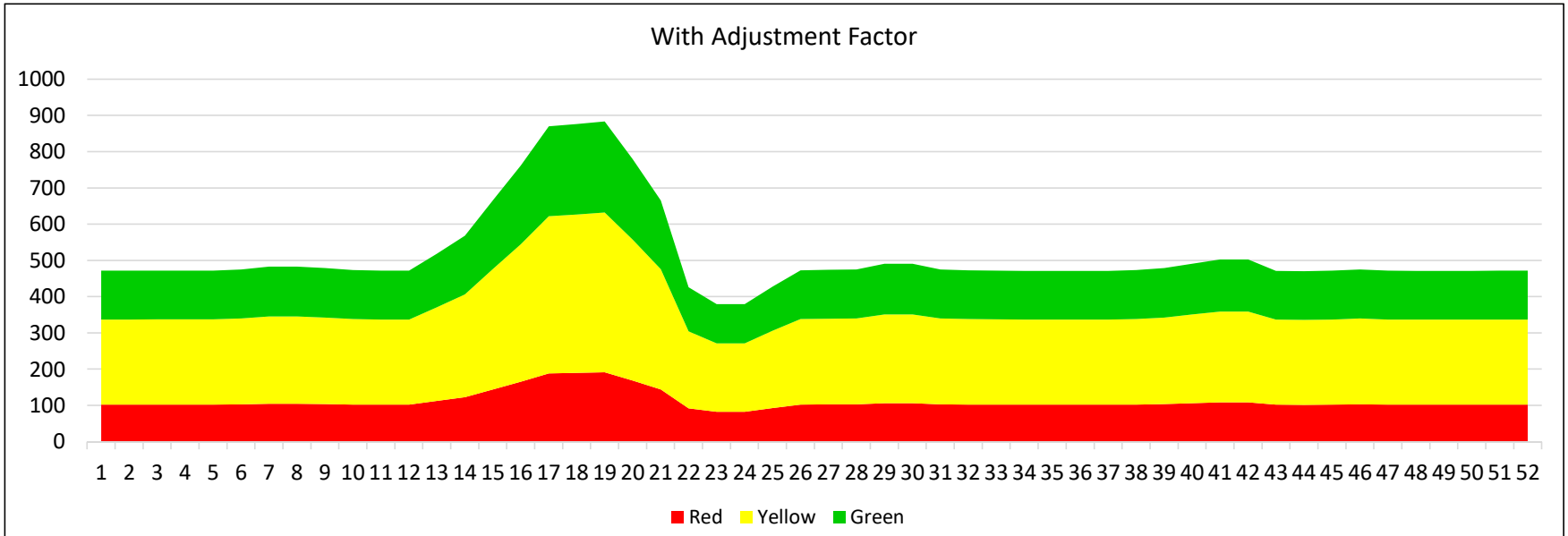

Part #ABC (No Demand Adjustment Factor)
600
500
400
300
200
100
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
Red
Yellow
Green

Figure 8-8



Week	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26
Original ADU	33.59	33.59	33.72	33.89	33.91	34.41	34.68	34.96	34.68	33.86	33.72	33.80	33.78	33.86	33.67
DAF	1.00	1.10	1.20	1.40	1.60	1.80	1.80	1.80	1.60	1.40	0.90	0.80	0.80	0.90	1.00
Adjusted ADU	33.59	36.94	40.47	47.44	54.26	61.94	62.43	62.93	55.49	47.40	30.35	27.04	27.02	30.47	33.67

Figure 8-9

Week	Projected ADU	DAF	Adjusted ADU
1	2000	0	0
2	2000	0.1	200
3	2000	0.2	400
4	2000	0.3	600
5	2000	0.4	800
6	2000	0.5	1000
7	2000	0.6	1200
8	2000	0.7	1400
9	2000	0.8	1600
10	2000	0.9	1800
11	2000	1	2000
12	2000	1	2000

Figure 8-10

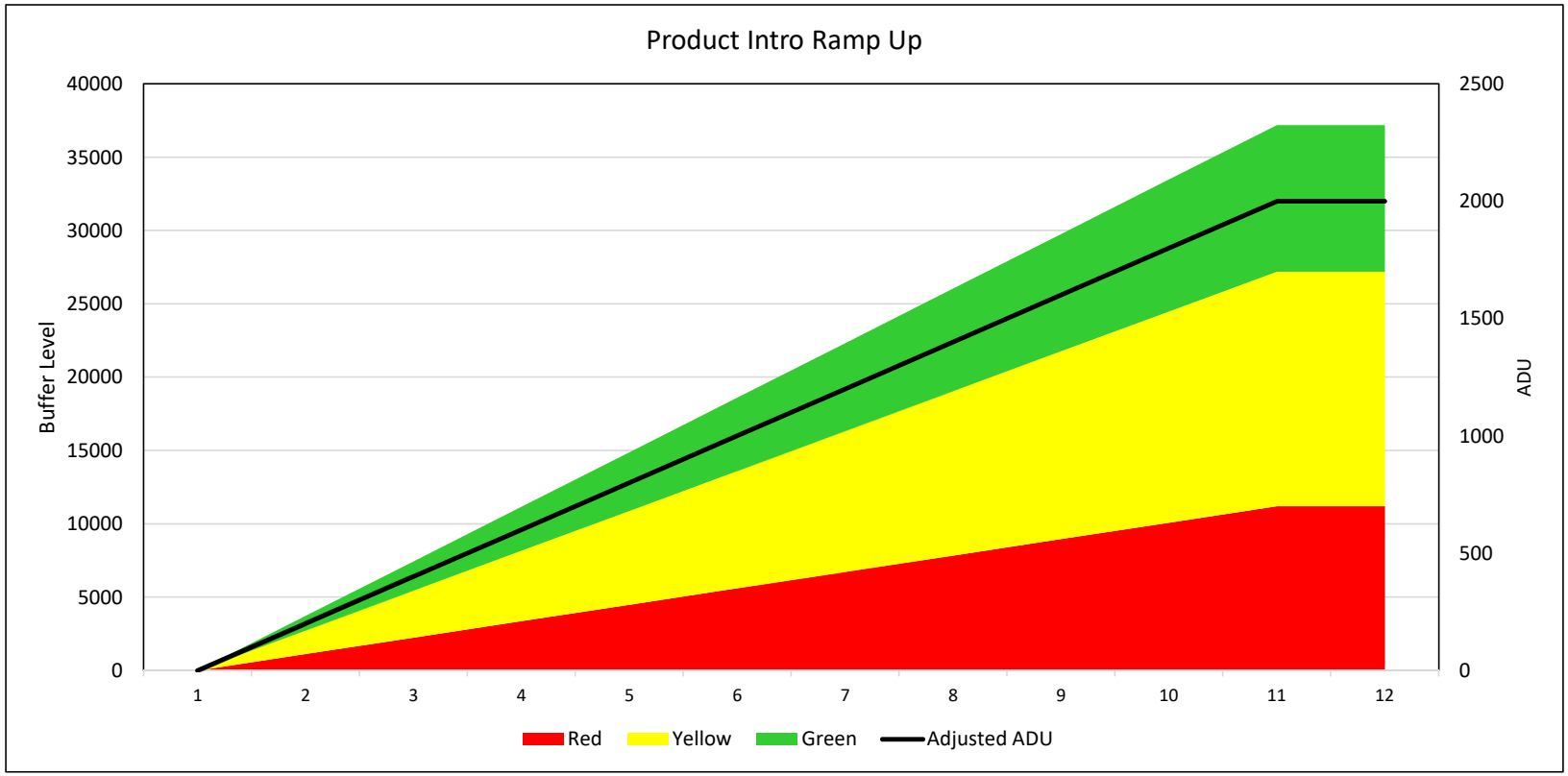

Product Intro Ramp Up
Buffer Level
ADU
40000
35000
30000
25000
20000
15000
10000
5000
0
2500
2000
1500
1000
500
0
1
2
3
4
5
6
7
8
9
10
11
12
Red
Yellow
Green
Adjusted ADU

Figure 8-11

Week	ADU	DAF	Adjusted ADU
1	300	1	300
2	300	1	300
3	300	1	300
4	300	1	300
5	300	0.8	240
6	300	0.6	180
7	300	0.4	120
8	300	0.2	60
9	300	0	0
10	300	0	0
11	300	0	0
12	300	0	0

Figure 8-12

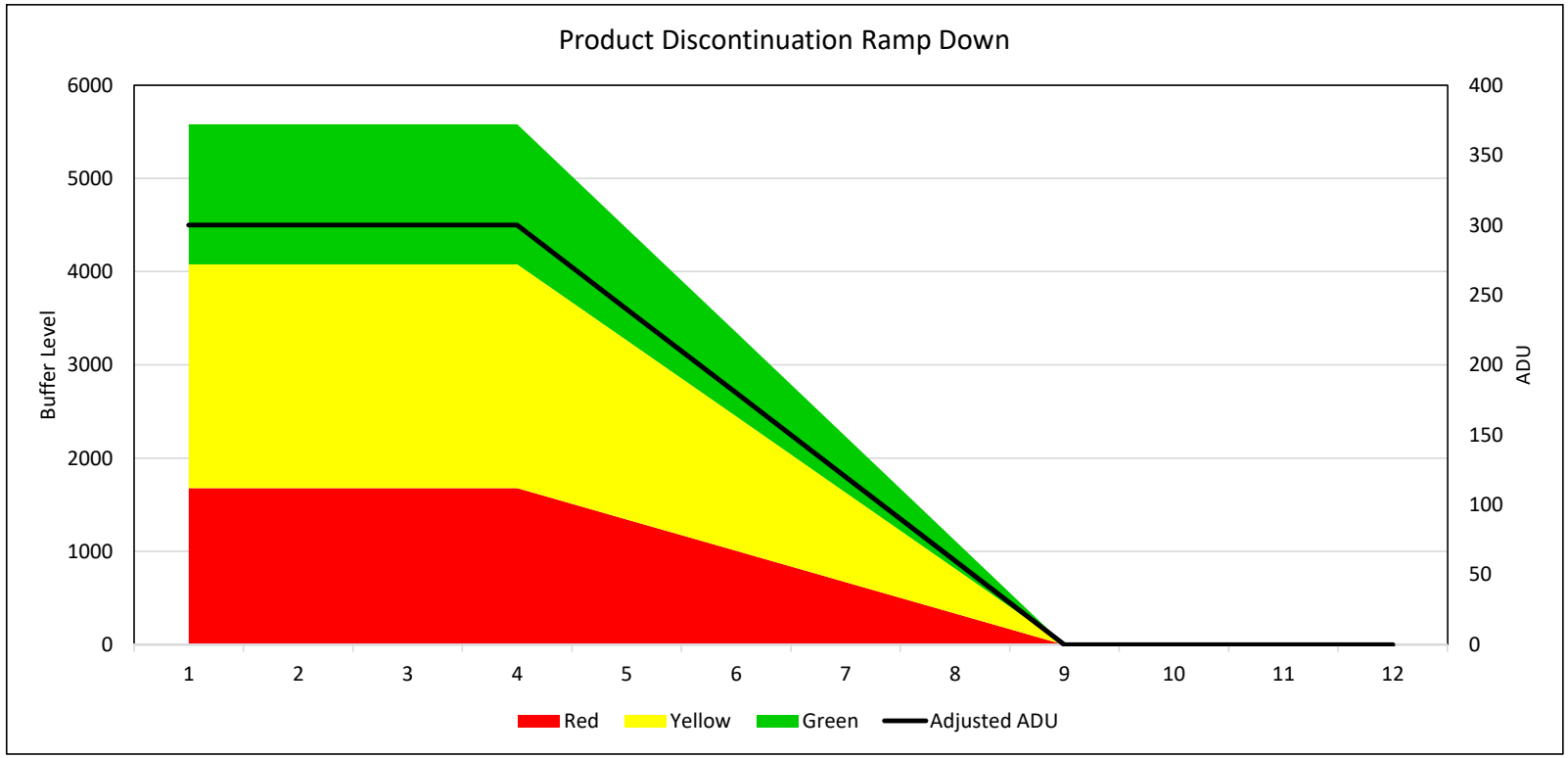
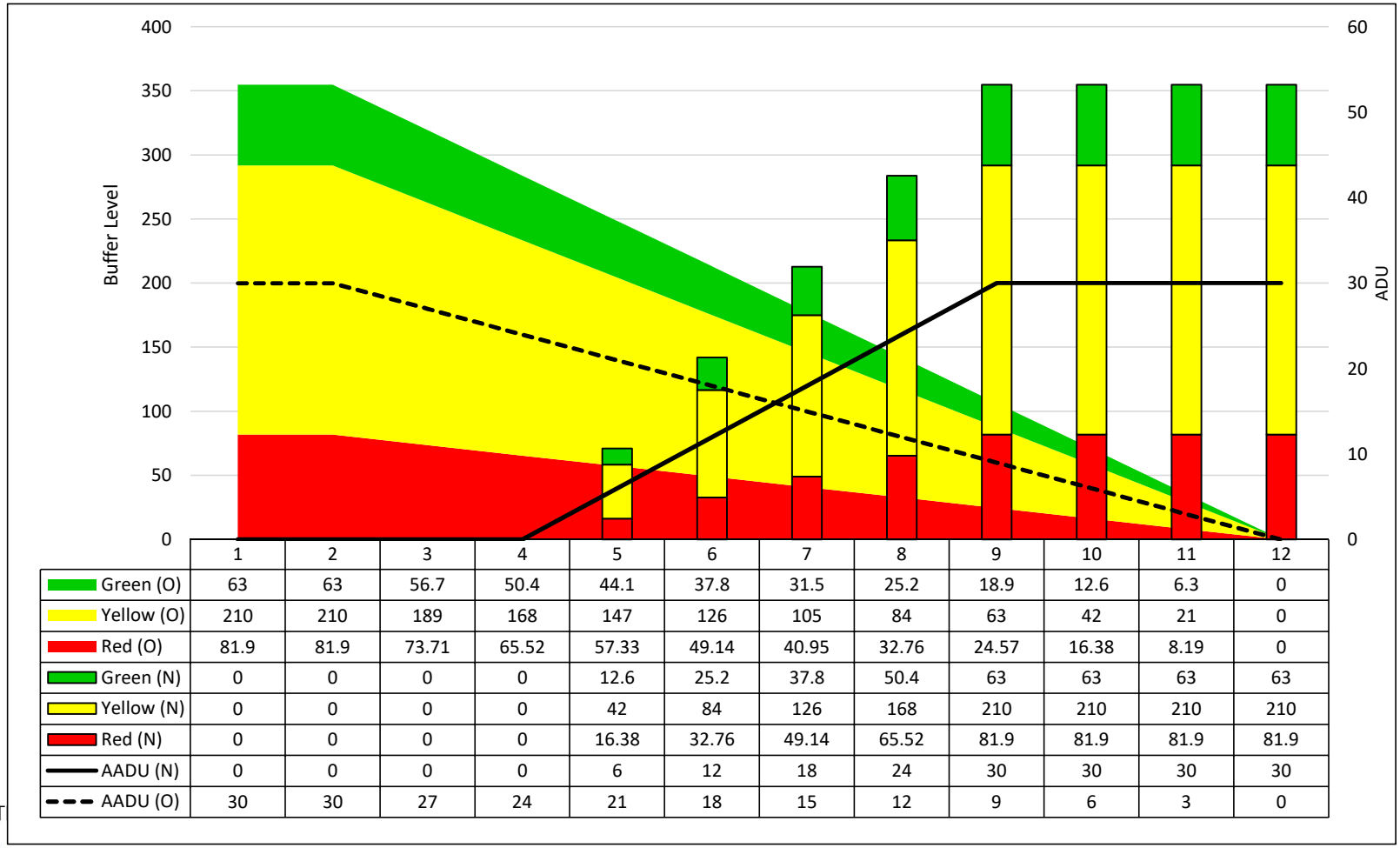

Product Discontinuation Ramp Down
Buffer Level
ADU
6000
5000
4000
3000
2000
1000
0
400
350
300
250
200
150
100
50
0
1
2
3
4
5
6
7
8
9
10
11
12
Red
Yellow
Green
Adjusted ADU

Figure 8-13

Week	ADU	DAF (Old)	Adjusted ADU(Old)	DAF (New)	Adjusted ADU(New)
1	30	1	30	0	0
2	30	1	30	0	0
3	30	0.9	27	0	0
4	30	0.8	24	0	0
5	30	0.7	21	0.2	6
6	30	0.6	18	0.4	12
7	30	0.5	15	0.6	18
8	30	0.4	12	0.8	24
9	30	0.3	9	1	30
10	30	0.2	6	1	30
11	30	0.1	3	1	30
12	30	0	0	1	30

Figure 8-14

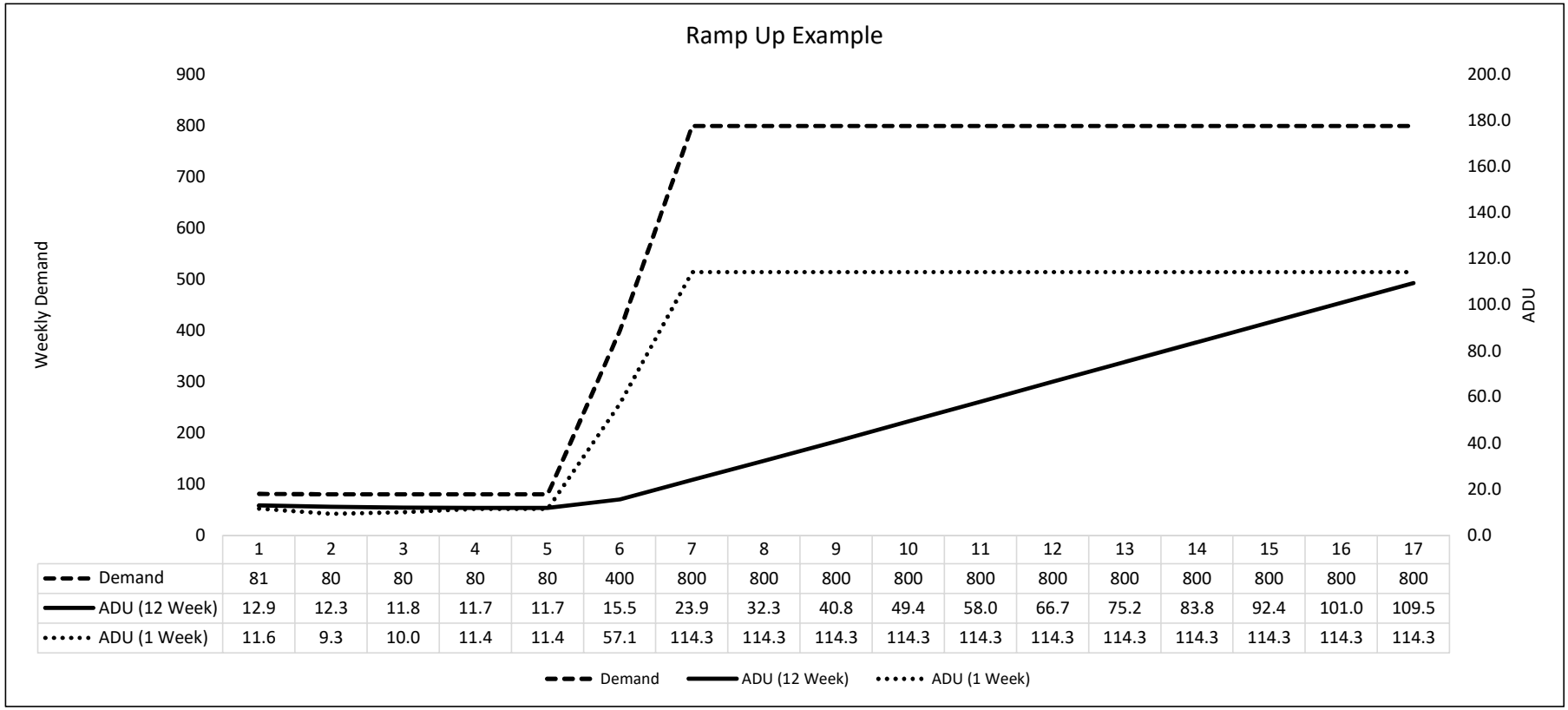


	1	2	3	4	5	6	7	8	9	10	11	12
Green (O)	63	63	56.7	50.4	44.1	37.8	31.5	25.2	18.9	12.6	6.3	0
Yellow (O)	210	210	189	168	147	126	105	84	63	42	21	0
Red (O)	81.9	81.9	73.71	65.52	57.33	49.14	40.95	32.76	24.57	16.38	8.19	0
Green (N)	0	0	0	0	12.6	25.2	37.8	50.4	63	63	63	63
Yellow (N)	0	0	0	0	42	84	126	168	210	210	210	210
Red (N)	0	0	0	0	16.38	32.76	49.14	65.52	81.9	81.9	81.9	81.9
AADU (N)	0	0	0	0	6	12	18	24	30	30	30	30
AADU (O)	30	30	27	24	21	18	15	12	9	6	3	0

Figure 8-15

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Sales	81	80	80	80	80	400	800	800	800	800	800	800	800	800	800	800	800
ADU (1 Week)	11.6	9.3	10.0	11.4	11.4	57.1	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3
ADU (12 Week)	12.9	12.1	11.5	11.4	11.4	15.2	23.6	32.0	40.5	49.1	57.7	66.4	74.9	83.7	92.4	101.0	109.5
ADU Differential	0.9	0.8	0.9	1.0	1.0	3.8	4.8	3.6	2.8	2.3	2.0	1.7	1.5	1.4	1.2	1.1	1.0

Figure 8-16



	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Demand	81	80	80	80	80	400	800	800	800	800	800	800	800	800	800	800	800
ADU (12 Week)	12.9	12.3	11.8	11.7	11.7	15.5	23.9	32.3	40.8	49.4	58.0	66.7	75.2	83.8	92.4	101.0	109.5
ADU (1 Week)	11.6	9.3	10.0	11.4	11.4	57.1	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3

Figure 8-17

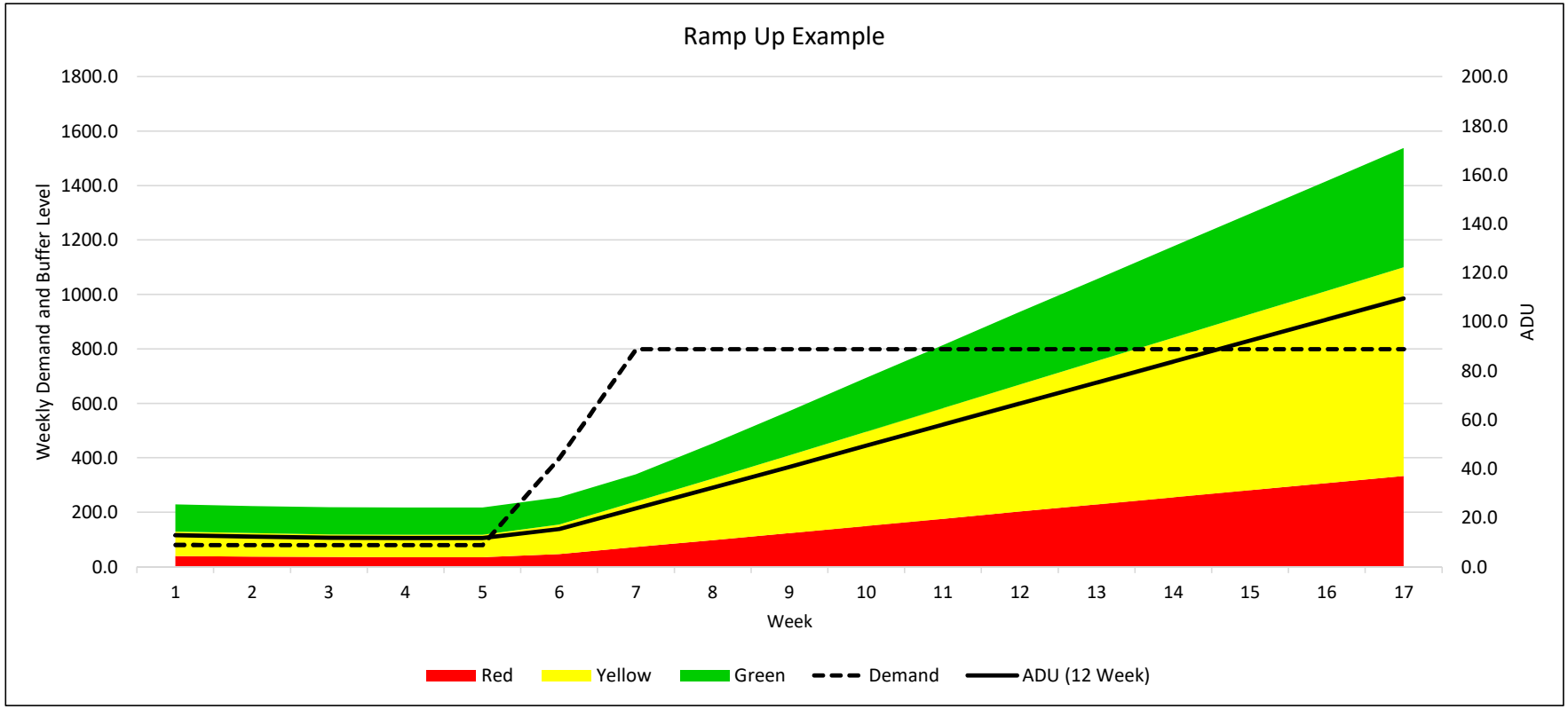

Ramp Up Example
1800.0
1600.0
1400.0
1200.0
1000.0
800.0
600.0
400.0
200.0
0.0
Weekly Demand and Buffer Level
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
ADU
1
2
3
4
5
6
7
8
9
10
11
12
13
14
15
16
17
Week
Red
Yellow
Green
Demand
ADU (12 Week)

Figure 8-18

Week	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17
Sales	81	80	80	80	80	400	800	800	800	800	800	800	800	800	800	800	800
ADU (1 Week)	11.6	11.4	11.4	11.4	11.4	57.1	112.4	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3
ADU (12 Week)	12.9	12.3	11.8	11.7	11.7	15.5	23.9	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3	114.3
ADU Differential	0.9	0.9	1.0	1.0	1.0	3.7	4.8	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0
DAF	1.0	2.5	3.5	4.5	6.0	6.0	4.7	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0	1.0

Figure 8-19

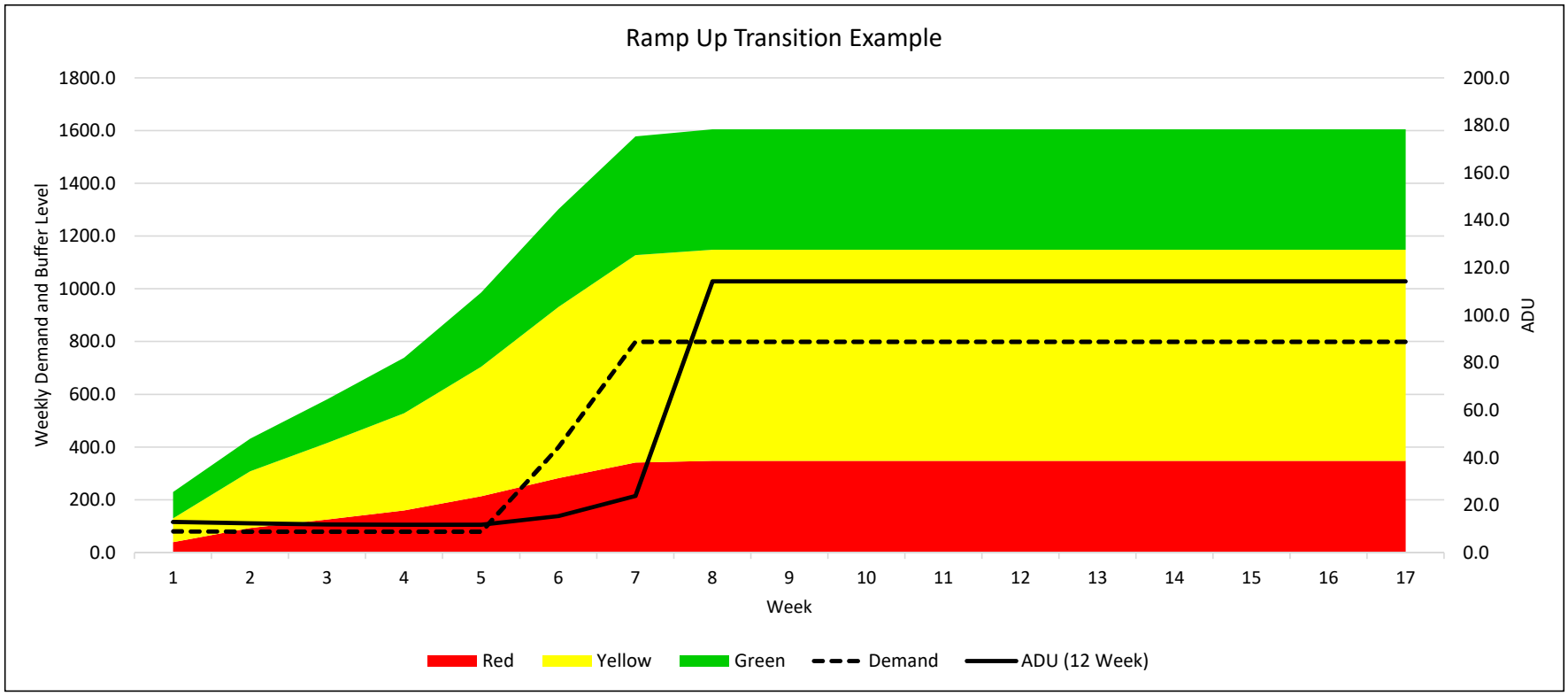

Ramp Up Transition Example
Weekly Demand and Buffer Level
ADU
Week
1800.0
1600.0
1400.0
1200.0
1000.0
800.0
600.0
400.0
200.0
0.0
200.0
180.0
160.0
140.0
120.0
100.0
80.0
60.0
40.0
20.0
0.0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17
Red
Yellow
Green
Demand
ADU (12 Week)

Figure 8-20

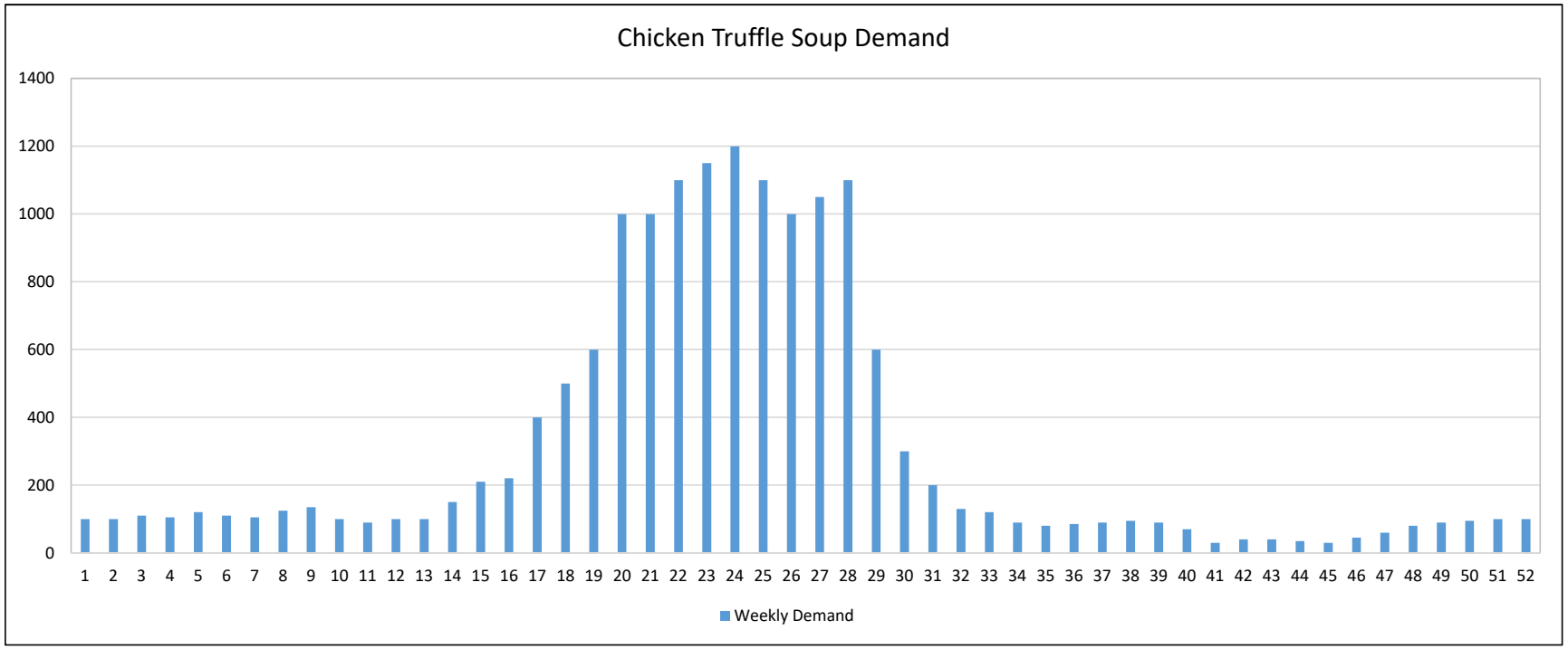

Chicken Truffle Soup Demand
1400
1200
1000
800
600
400
200
0
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
Weekly Demand

Figure 8-21

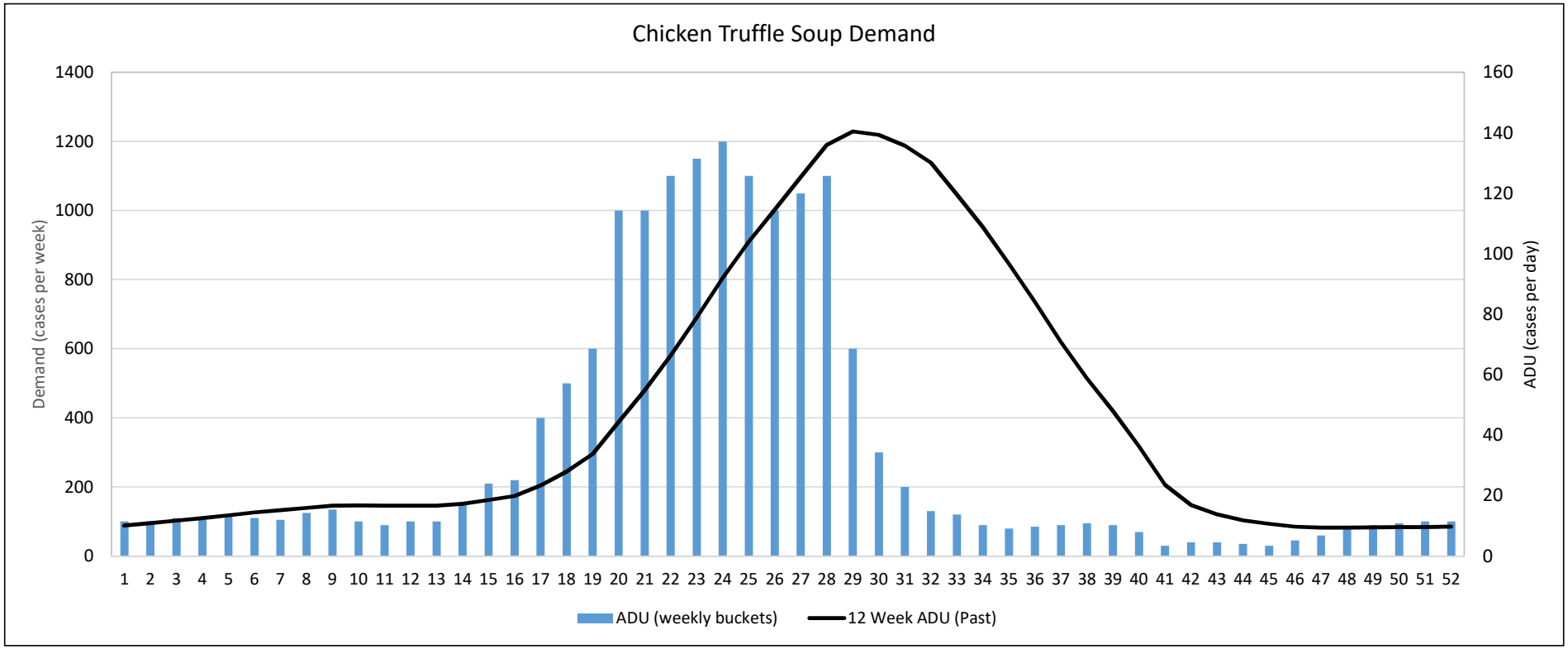

Chicken Truffle Soup Demand
Demand (cases per week)
ADU (cases per day)
0
200
400
600
800
1000
1200
1400
0
20
40
60
80
100
120
140
160
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
ADU (weekly buckets)
12 Week ADU (Past)

Figure 8-22

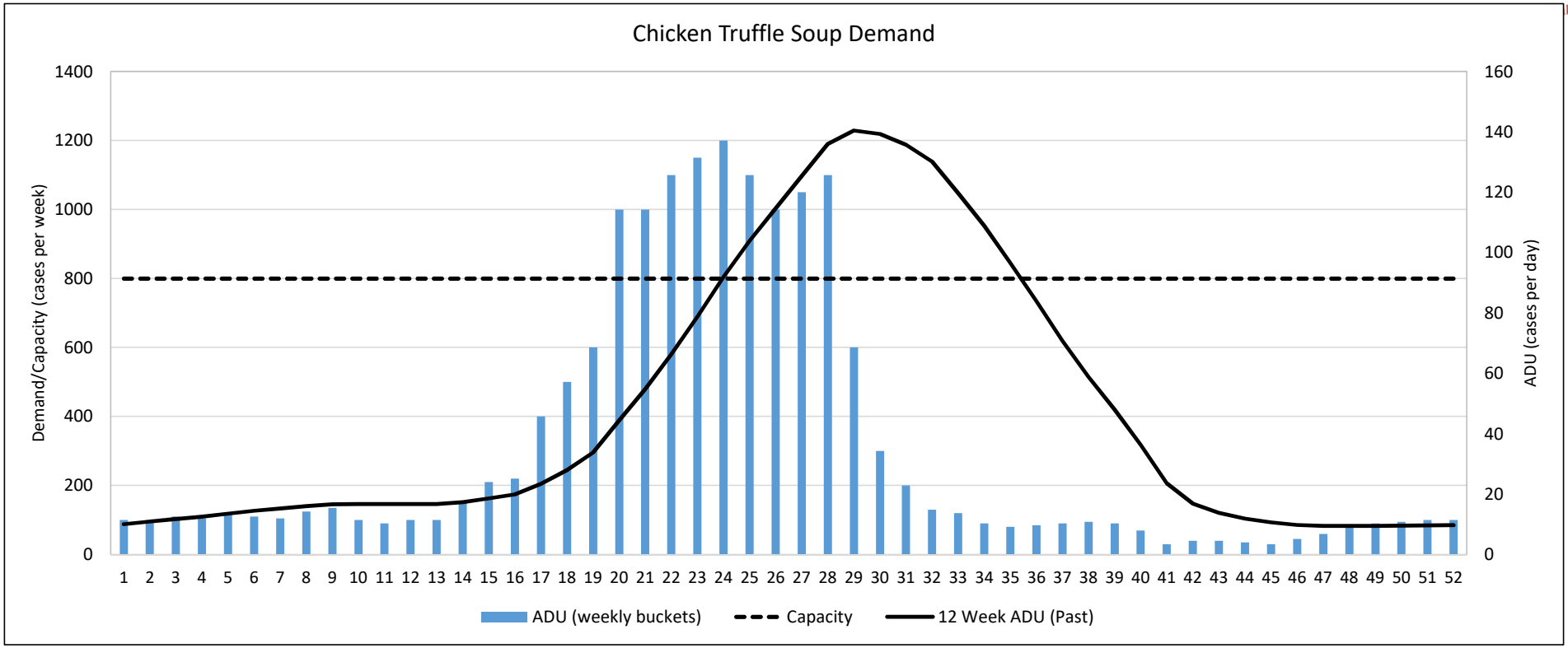

Chicken Truffle Soup Demand
Demand/Capacity (cases per week)
ADU (cases per day)
0
200
400
600
800
1000
1200
1400
0
20
40
60
80
100
120
140
160
1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 32 33 34 35 36 37 38 39 40 41 42 43 44 45 46 47 48 49 50 51 52
ADU (weekly buckets)
Capacity
12 Week ADU (Past)

Figure 8-23

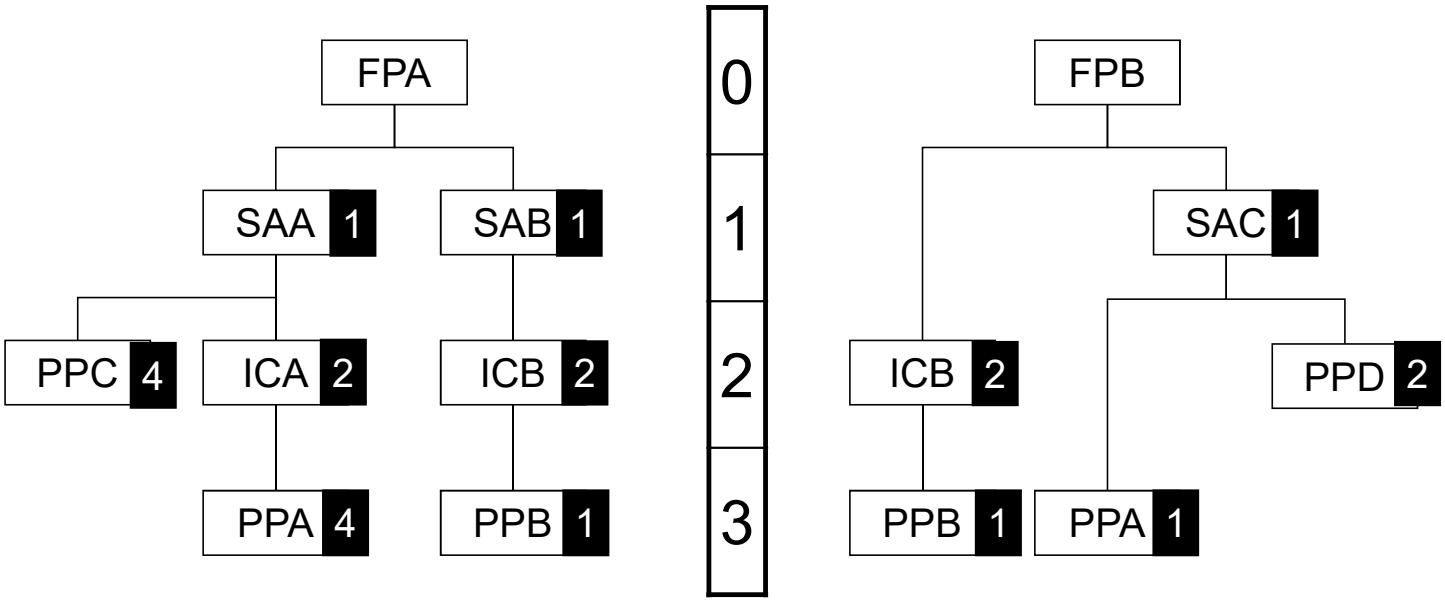

FPA
SAA 1
SAB 1
PPC 4
ICA 2
ICB 2
PPA 4
PPB 1
0
1
2
3
FPB
SAC 1
ICB 2
PPD 2
PPB 1
PPA 1

Figure 8-24

Item #	BOM Level	ADU	Adjusted ADU	FPA Ratio	FPB Ratio	DAF
FPA	0	100	140			2
FPB	0	200	200			1
SAA	1	100	200	1		2.0
SAB	1	100	200	1		2.0
SAC	1	200	200		1	1.0
PPC	2	400	800	4		2.0
ICA	2	200	400	2		2.0
ICB	2	600	800	2	2	1.3
PPD	2	400	400		2	1.0
PPA	3	600	1000	4	1	1.7
PPB	3	300	400	1	1	1.3