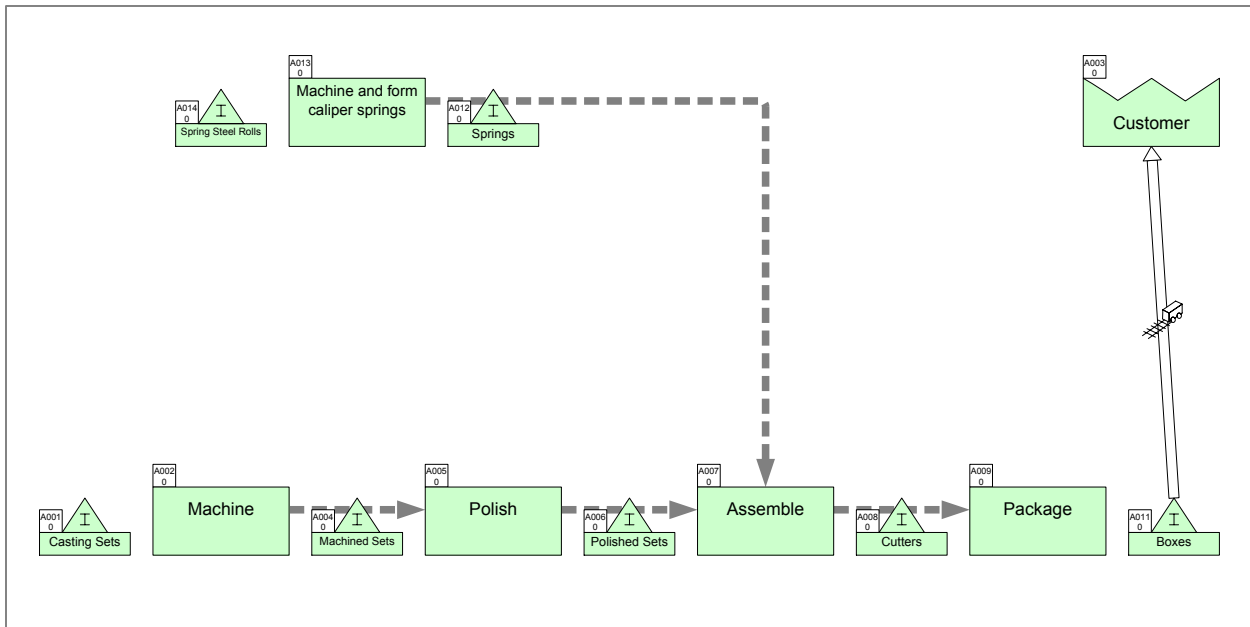


Quick Manufacturing Tutorial

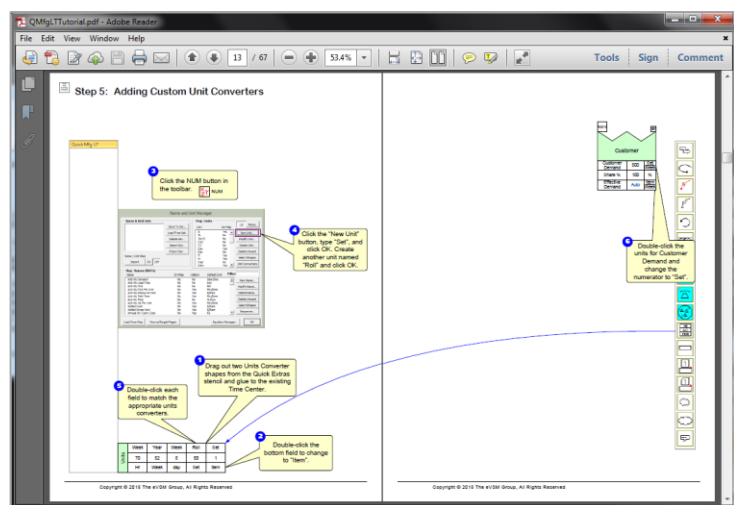
This tutorial will guide you through the steps to draw a simple map, perform common calculations, and plot charts using the Quick Manufacturing stencil.



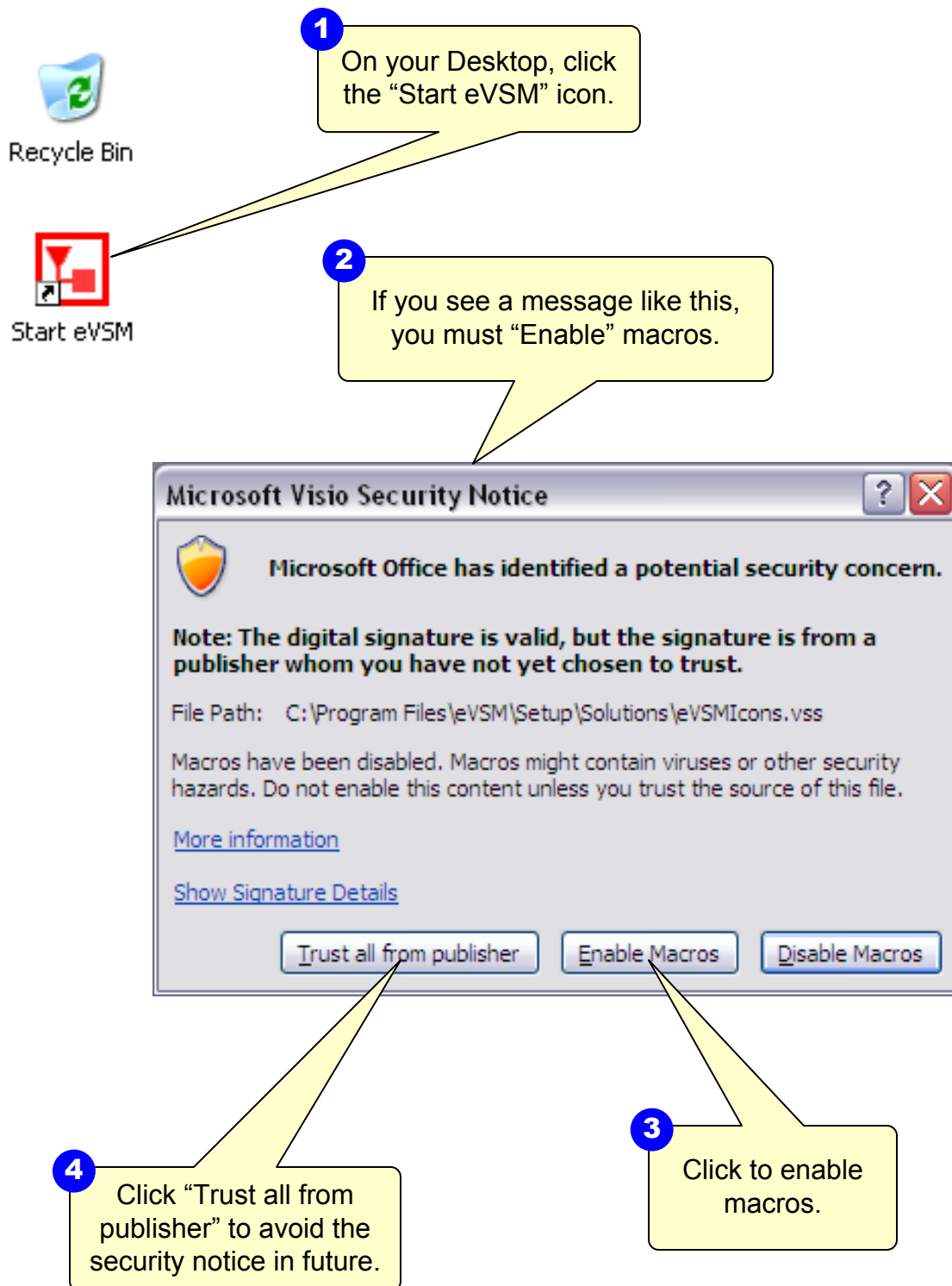
Viewing/printing eVSM Tutorial:

This tutorial is designed for two page layout. If printing, you will need double-sided print.

For on-screen viewing, save the PDF file to your PC and then open it in Acrobat Reader (not in a web browser). In the Acrobat menus, click "View>Page Display", make sure "Show Cover Page in Two Page View" is checked and then select "Two Page View".



Step 1: Start eVSM



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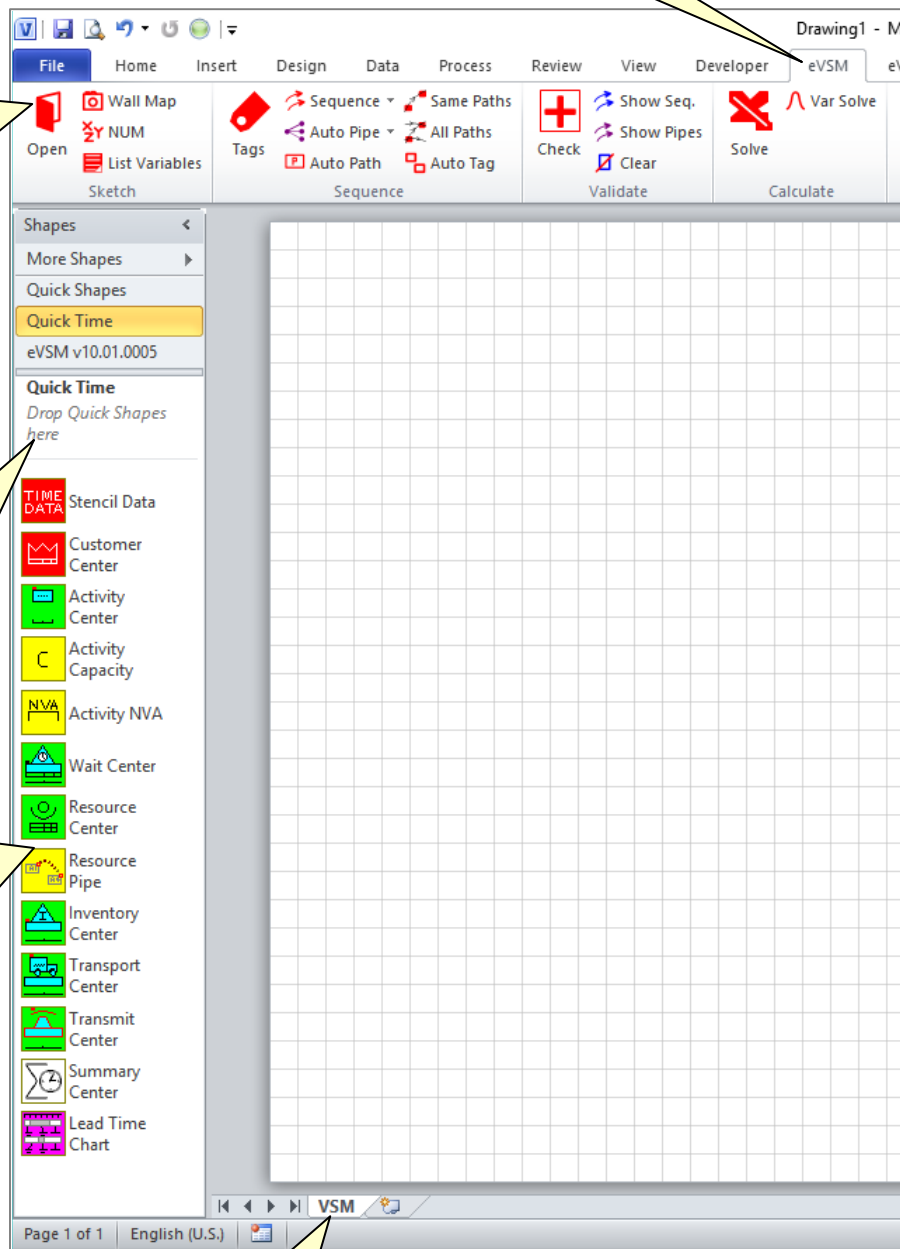
The eVSM Environment

eVSM adds this toolbar to Visio as well as the stencils on the left and right. If the eVSM toolbar disconnects, click File>Save As and save the file, close the file, then re-open it. This tip can be used for other crashes in eVSM.

A new map is initiated by selecting your application area from the "Open" button. Only the stencils required for your selected application area will open on the left side.

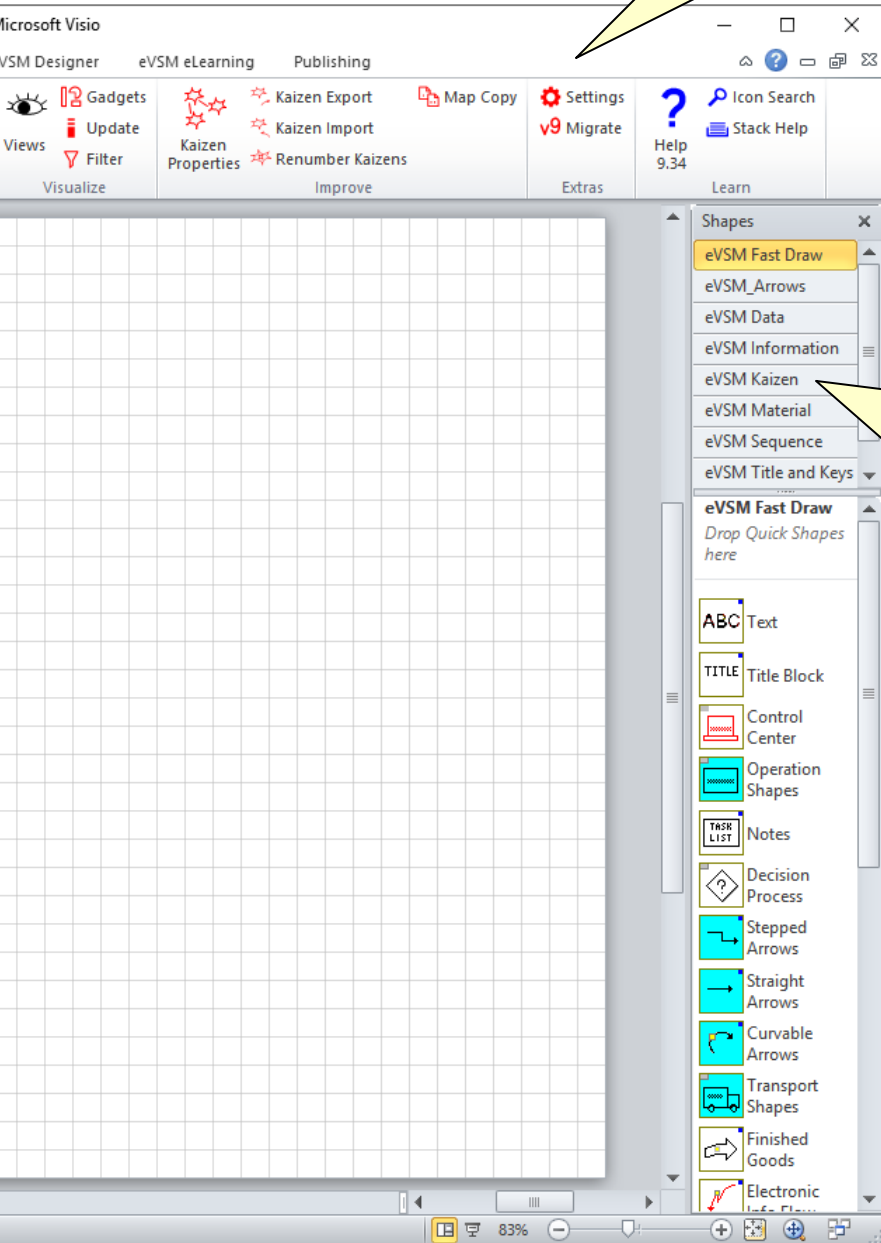
The left hand side has the Quick eVSM stencils which are optimized for specific application areas such as manufacturing vs office vs healthcare.

The Quick stencils contain macro shapes which are often collections of individual eVSM shapes with pre-built names, units, equations, and other properties.



A Visio file can have multiple pages which are accessed with these tabs. Each page gets locked to a chosen eVSM application and then not be used for other applications.

Hover over each button in the eVSM Toolbar to learn what it does. Detailed help and tutorials are available at the eVSM help site which can be accessed via this button.



The stencils on the right contain individual base eVSM icons. These are organized into separate stencils (arrows, data, etc.) to make it easier to find shapes.

Step 2: Learn eVSM Basics

Quick Mfg LT

1

Avoid re-sizing eVSM shapes. Instead grow the drawing page when needed. To resize the page, hold down the “Ctrl” key, and then drag any page edge to the required size. This method works on all four edges of the page.

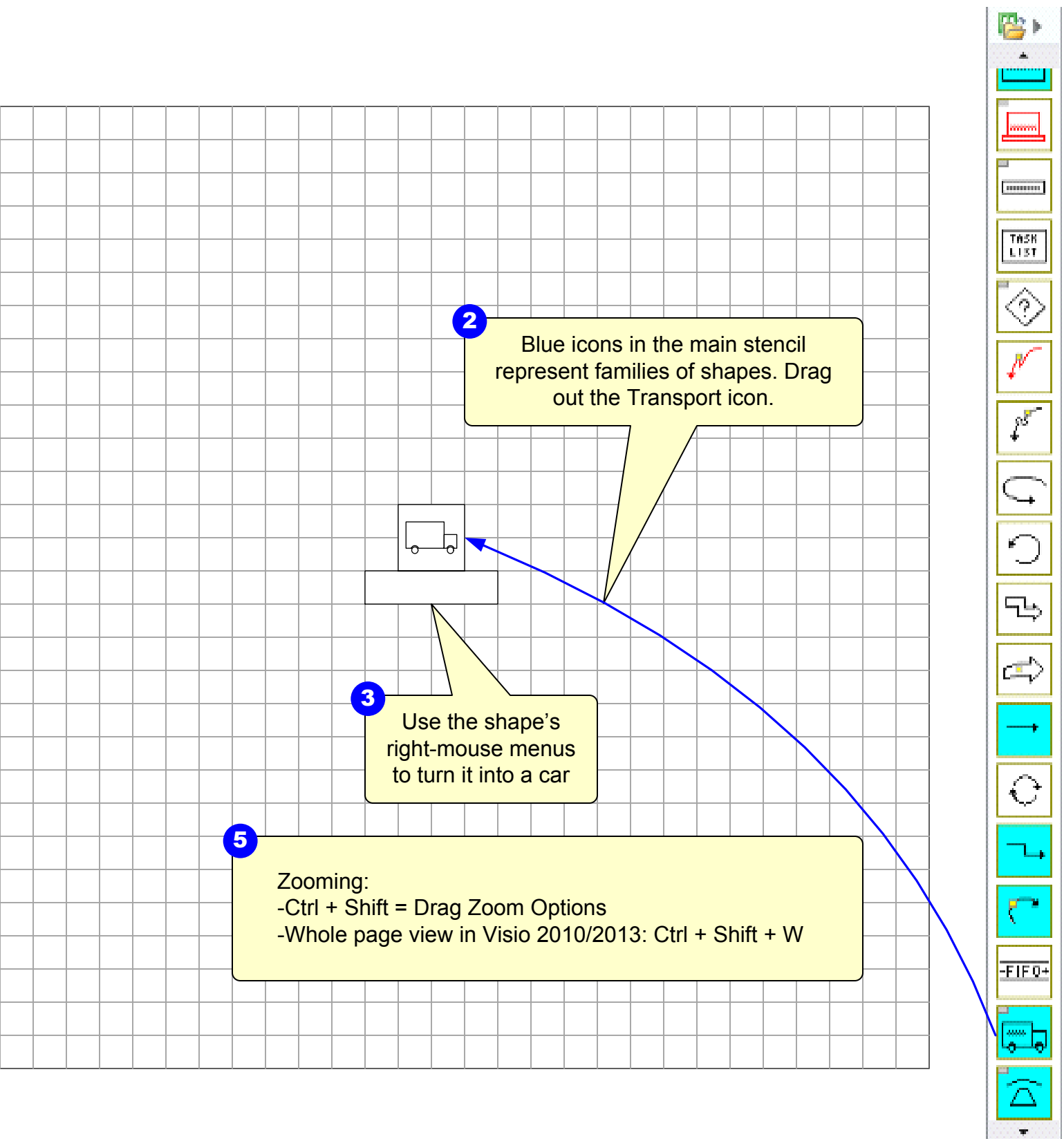


4

Save your Visio file and then insert a new page via the right-mouse menus on the page-tabs.

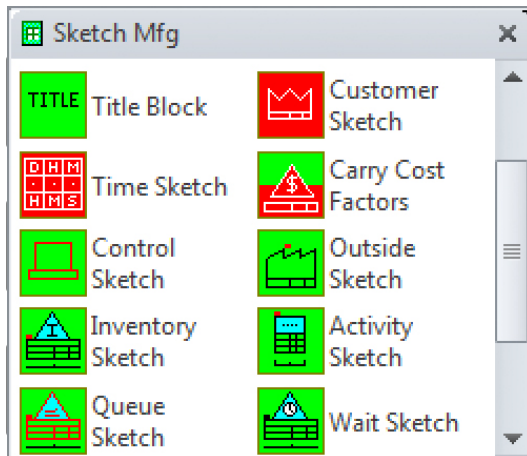
VSM

Quick_eVSM

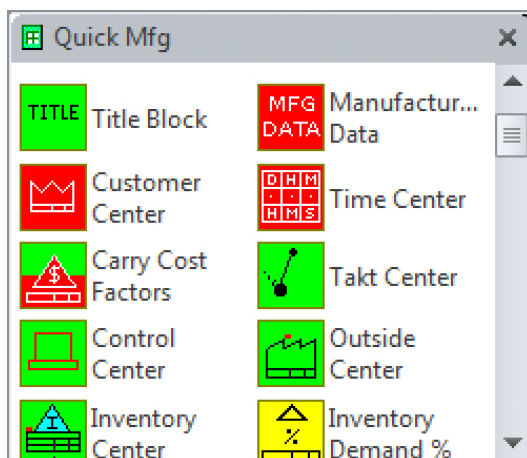


Quick Mfg Stencils Overview

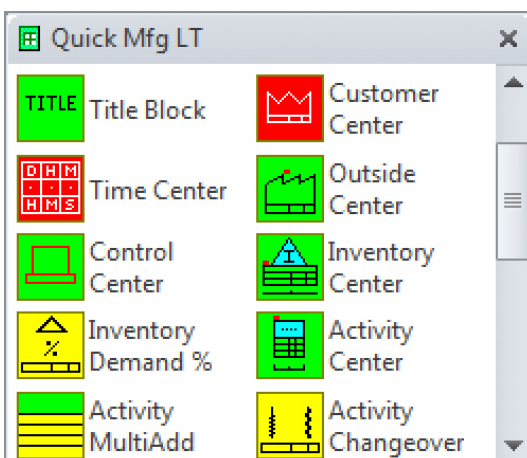
Quick Manufacturing has three stencils.



The Sketch stencil allows you to capture the value stream flow with no data shapes. Data shapes can later be added automatically via right mouse button menus.



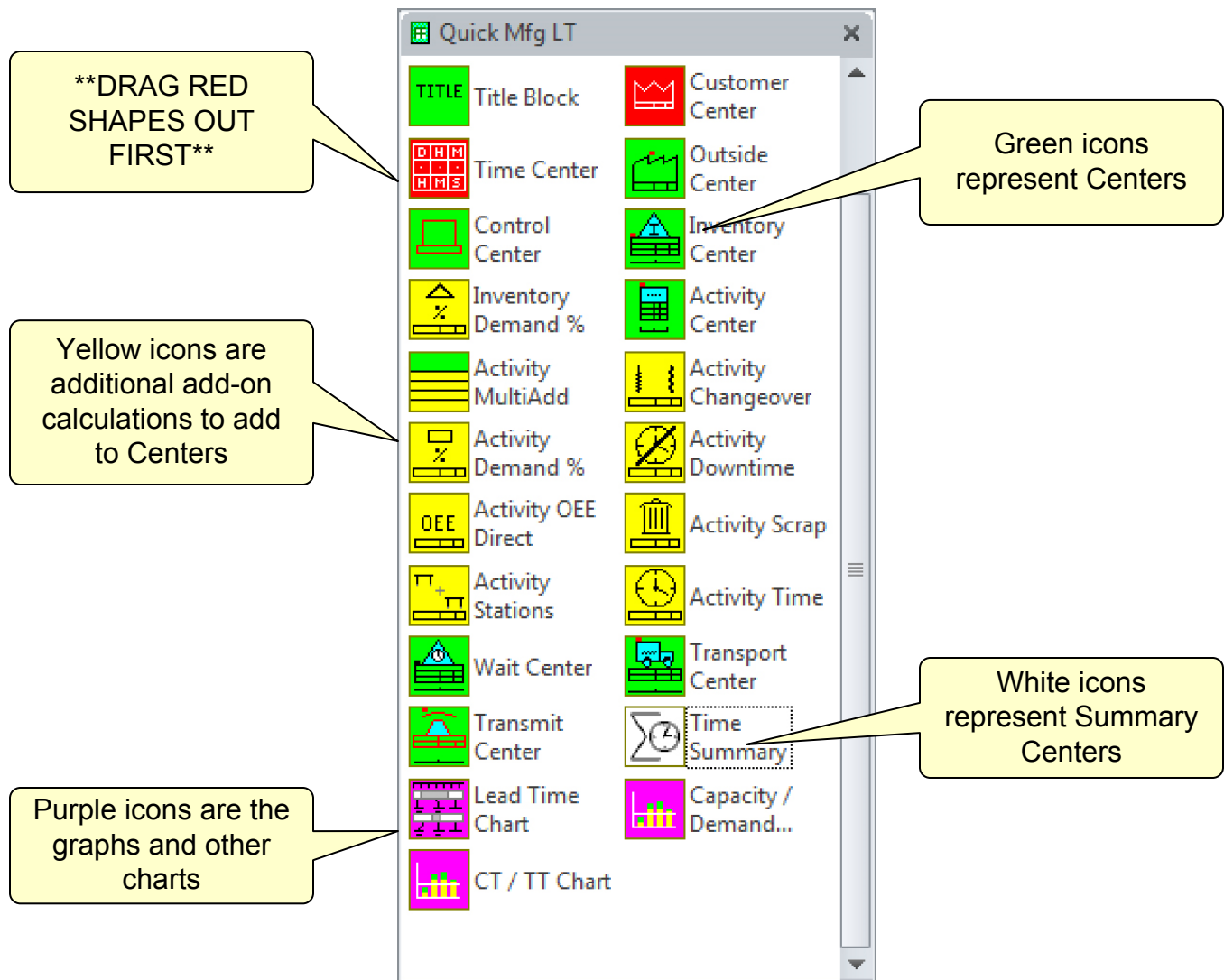
The full Quick stencil contains all of the macro shapes available in Quick manufacturing. Includes the full set of add-on (yellow icons) calculations.



The LT stencil contains all the flow shapes but only a small subset of the add-on (yellow icons) calculations. Great for new users and for users who don't need the advanced calculations.

Quick Stencil Icon Colors

Below is an overview of the Quick Mfg stencil shapes.



Step 3: Using the wall map sketcher

Often value stream maps are started on walls or paper. Converting a hand-drawn map can be tedious and error prone. An easy way to handle this is to take a clear picture of the map, import it into eVSM and then draw the electronic map, directly on to of the picture. This page shows how the eVSM Wall Map function can help with this. You can use a picture of any map to learn this step, if you don't have one, download a copy from:

<http://www.evsm.com/wallmap>

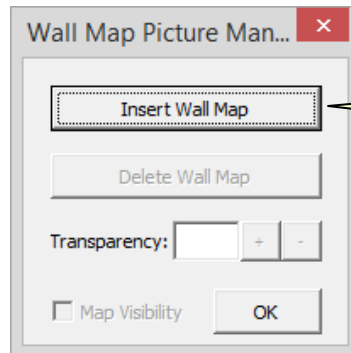
Quick Mfg LT

1

Click the Wall Map button in the toolbar to import a wall map picture into eVSM.

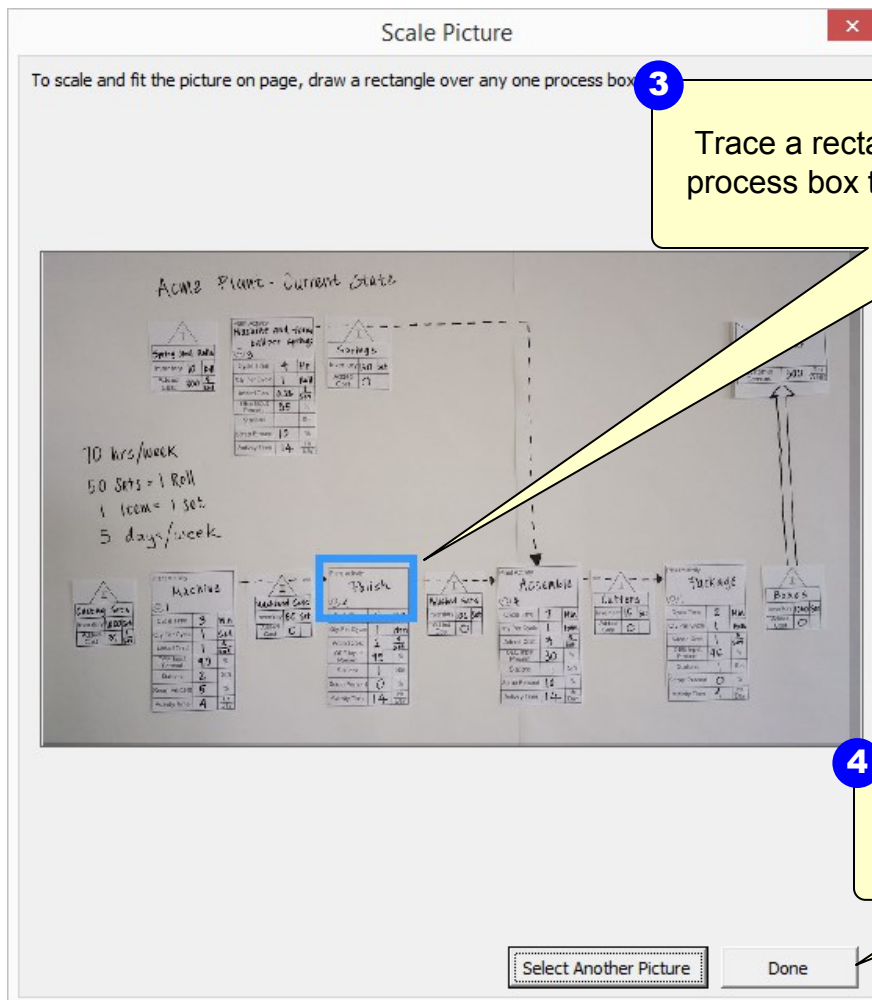


Wall Map



2

Click the Insert Wall Map button to browse for the image on your computer.



3

Trace a rectangle over any one process box to scale the picture.

4

Click Done when finished.

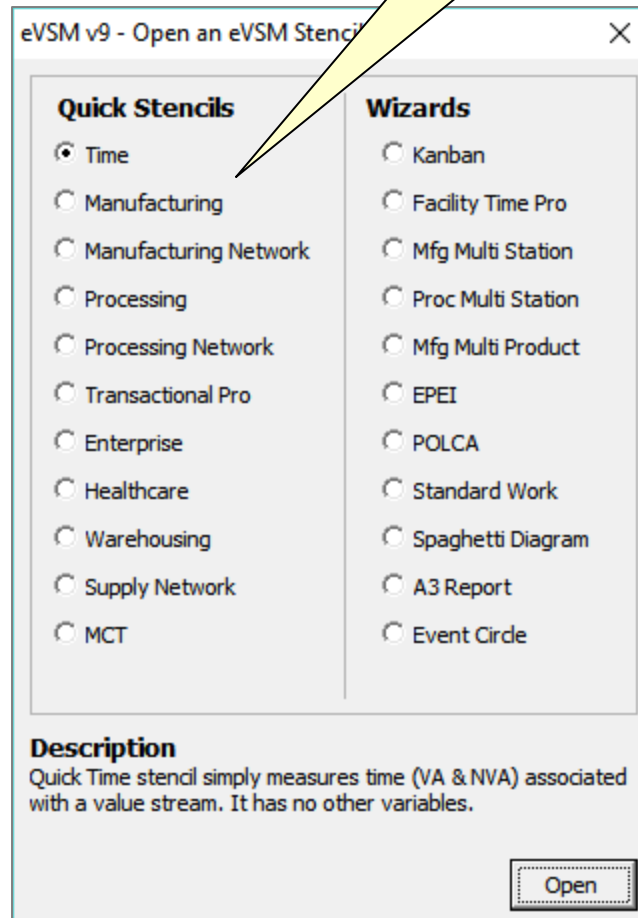
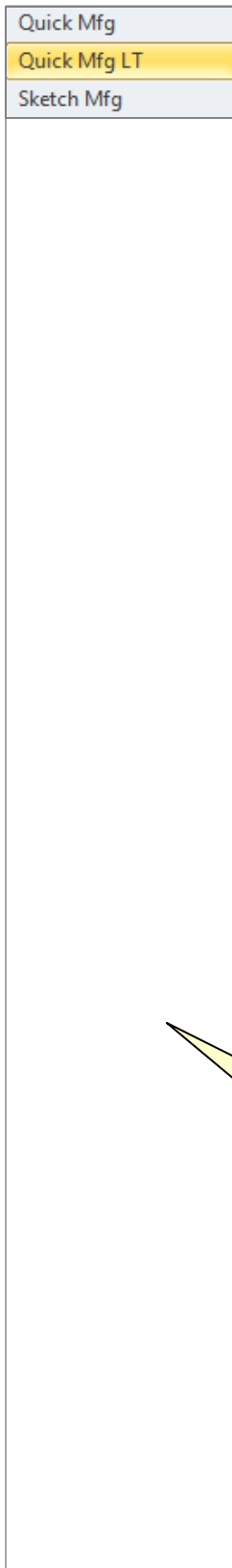
Step 4: Initiate the map for Quick Manufacturing LT

1

Click the  Open button in the eVSM toolbar.

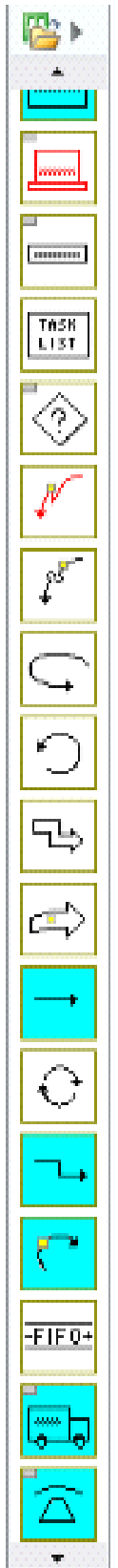
2

Select Manufacturing, and click Open.



3

The Manufacturing stencils will open on the left. For this tutorial, use the Quick Mfg LT.



Step 4B: Initiate the map for Quick Manufacturing LT

Quick Mfg LT

Customer Center

Time Center

1 Drag out the two red icons first. This is very important!

2 Set to US Units and click OK.

Select map units

Select the unit types and currency unit for this map:

Currency: \$

US Units Metric Units

OK

6 Enter available hours per week here. This is actual work hours after subtracting break time.

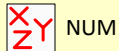
Units	Year	Week	Week
	52	5	70
	Week	day	Hr

Step 5: Adding Custom Unit Converters

Quick Mfg LT

3

Click the NUM button in the toolbar.



NUM

Name and Unit Manager

Name & Unit Sets

Save To Set..

Load From Set..

Delete Set..

Import Set..

Export Set..

Name / Unit Alias

Import On Off

Map : Units

Unit	On Map
\$	Yes
%	No
1to10	No
Cntr	No
CO	No
Day	Yes
Doc	No
ft	Yes
Hr	Yes
Impr	No
Item	Yes

US Metric

New Unit..

Modify Unit..

Delete Unit..

Delete Unused

Select Shapes

Unit Converters

Map : Names (NVU's)

Name	On Map	Hidden	Default Unit
Activity Demand	No	No	Item/Day
Activity Lead Time	No	No	Day
Activity NVA	No	No	Min
Activity NVA Per Unit	No	Yes	Min/Item
Activity Resource Cost	No	Yes	\$/Item
Activity Takt Time	No	Yes	Min/Item
Activity Time	No	No	Hr/Day
Activity VA Per Unit	No	Yes	Min/Item
Added Cost	No	Yes	\$/Item
Added Scrap Cost	No	Yes	\$/Item
Annual Inv Carry Cost	No	Yes	K\$

Filter:

New Name..

Modify Name..

Delete Name..

Delete Unused

Select Shapes

Sequence..

Load From Map Source/Target Pages Equation Manager.. OK

4

Click the "New Unit" button, type "Set", and click OK. Create another unit named "Roll" and click OK.

5

Double-click each field to match the appropriate units converters.

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

2

Double-click the bottom field to change to "Item".

6

Double-click the units for Customer Demand and change the numerator to "Set".


A0010		all
Customer		
Customer Demand	1000	Set Week
Customer Demand	100	%
Effective Demand	Auto	Item Week

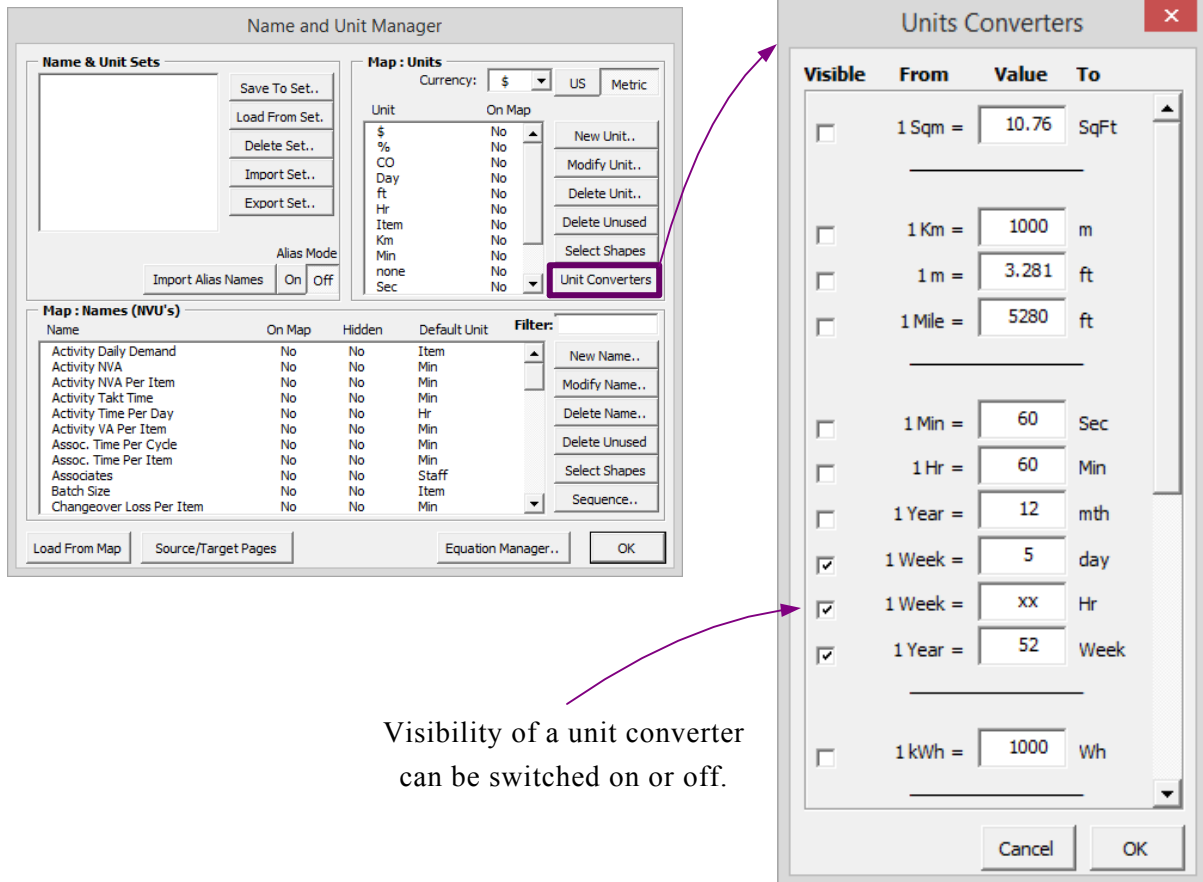
1

Drag out two Units Converter shapes from the "eVSM Data" stencil and glue to the existing Time Center.

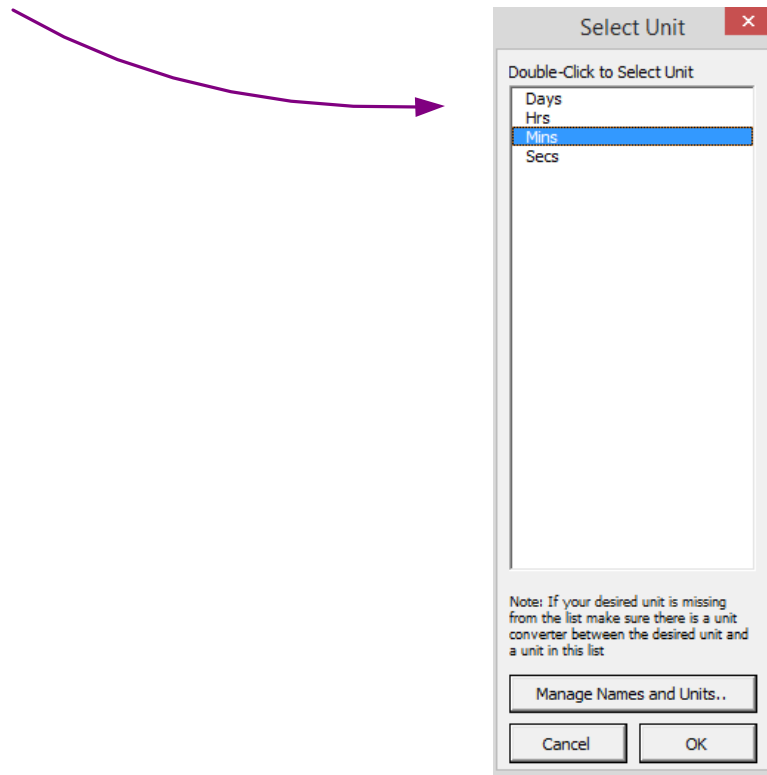
-
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-

Unit Converters Usage

- Secs/Mins, Mins/Hrs units converters are hidden
- Made visible through **NUM** button in the toolbar  NUM




- Unit families eliminate errors when changing units
- Only Time units will appear when double-clicking on Mins to change to Hrs



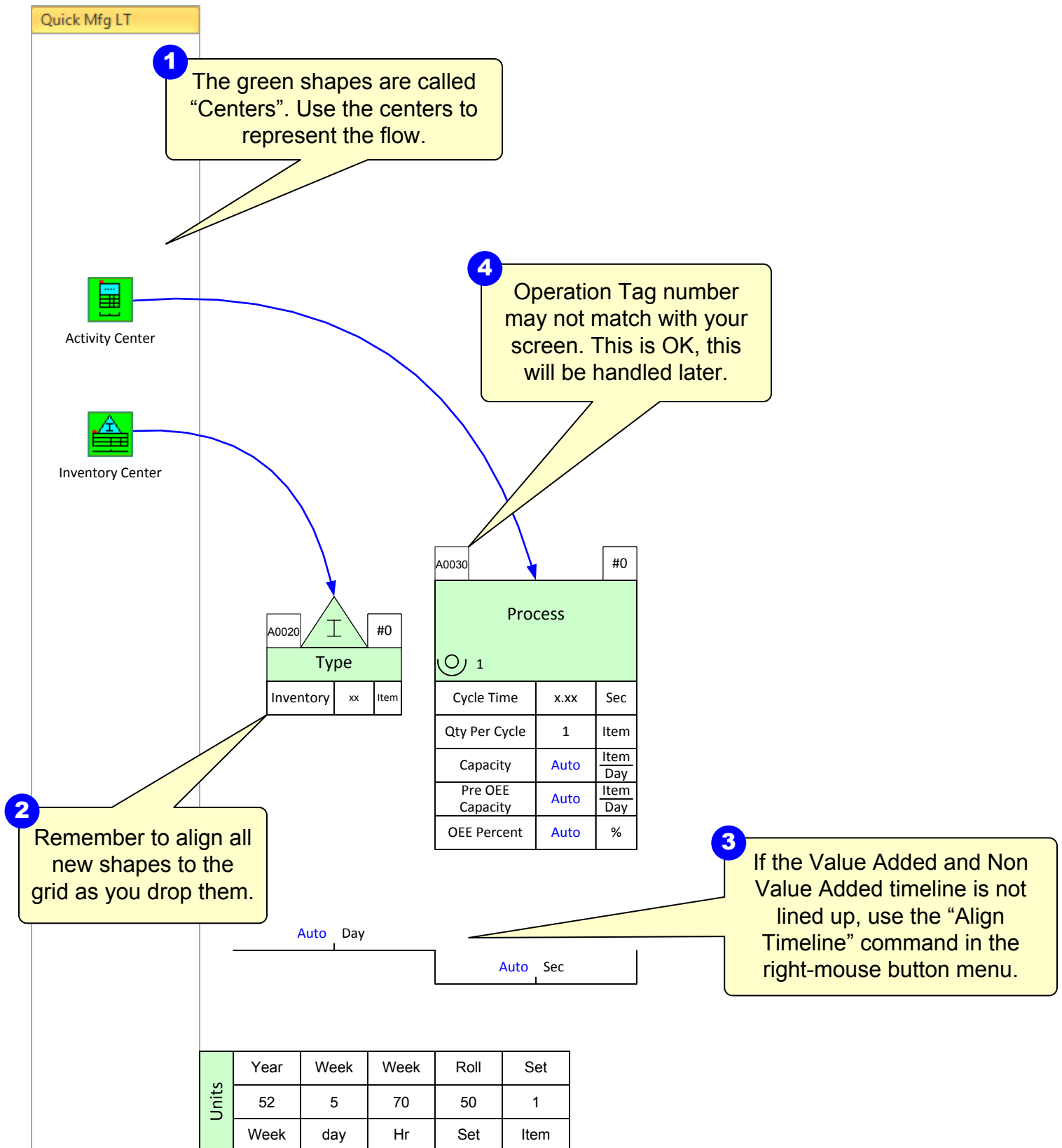
- If desired unit does not appear:
 - Create a new unit -- OR --
 - Place a units converter on map

- Use **NUM button** in toolbar to create the new unit
- New unit will require units converter to connect default unit to new unit

Hr
60
Min

- New unit will appear in “Select Unit” window when double-click unit (family)  NUM
- If desired unit was in the NUM, add a units converter to the map
- Built-in error proofing to prevent incompatible units

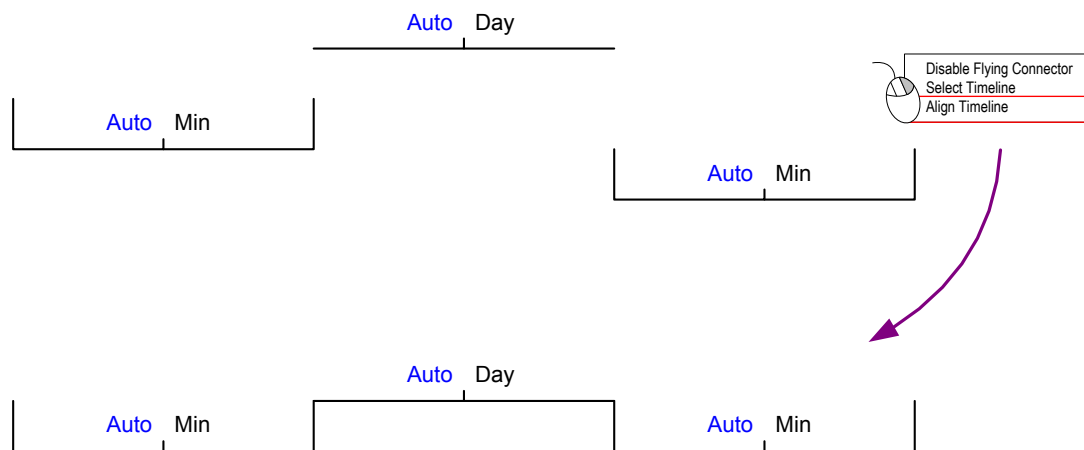
Step 6: Draw the flow



A0010	all	
Customer		
Customer Demand	1000	Set Week
Share %	100	%
Effective Demand	Auto	Item Week

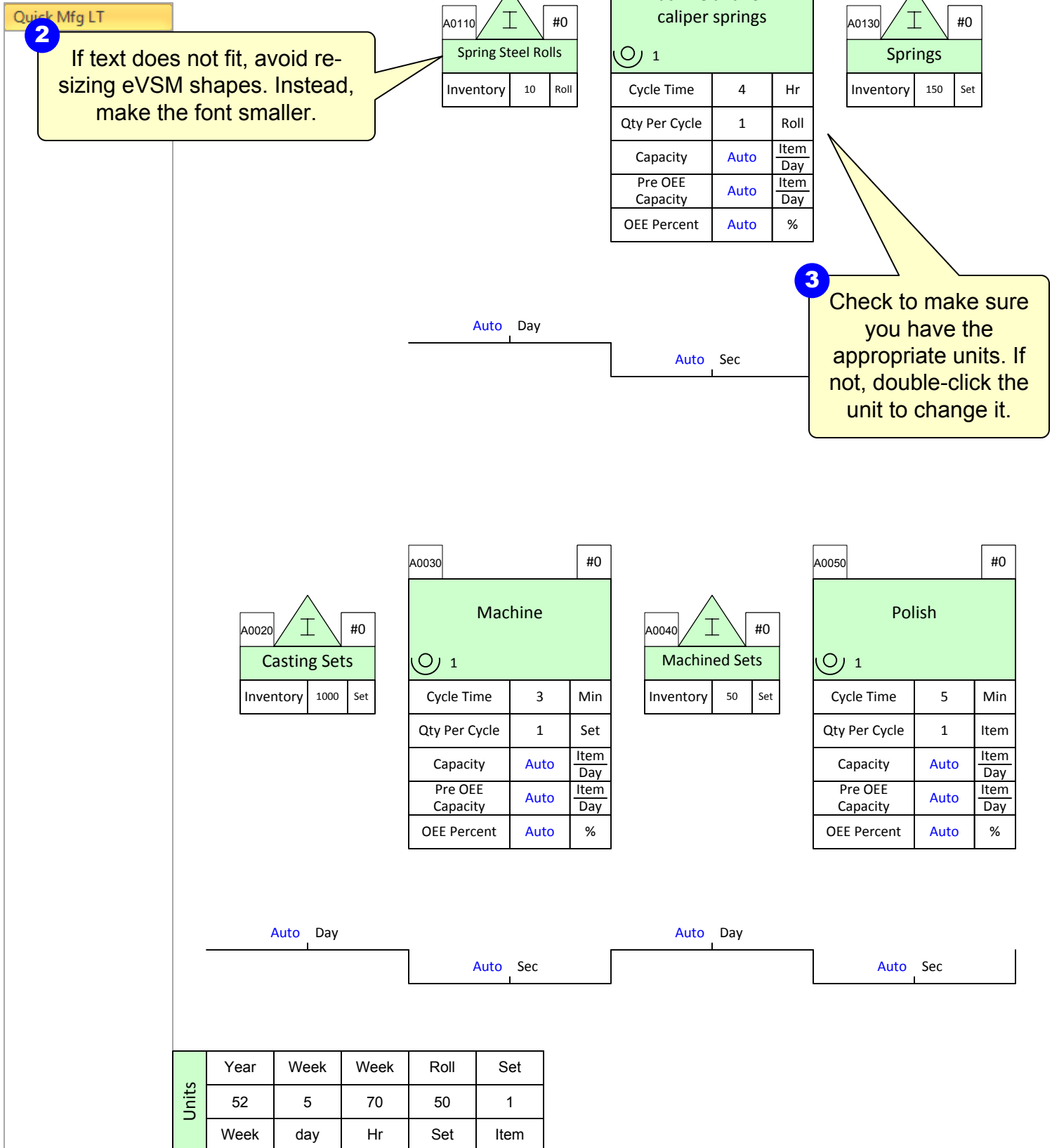
Working with the timeline

- Shift the entire timeline up or down, use “Select Timeline” in the right-mouse menu
- If that option doesn’t appear in the menu, make sure you have the entire VA or NVA shape selected and try again
- “Align Timeline” function also in the right-mouse menu will create the ladder timeline for you if the VA and NVA shapes are not correctly aligned, as shown below

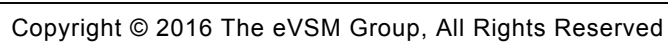
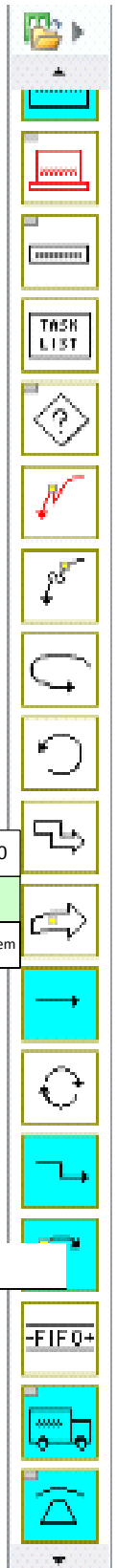


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Step 7: Complete the flow and enter data



Complete as shown below, including annotation, data values, and units.



Fractional Units

- Fractional units makes specifying and computing demand quantities or production times easier
- Provides better control of data entry and display
- Fractional units changed like any other unit on map using the NUM button in the toolbar

Data Entry Hints

A0040	I	1
Type		
Inventory	xx	Item

A0030		1
Process		
1		
Cycle Time	x.xx	Sec
Qty Per Cycle	1	Item
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%

Input values with a default x.xx are mandatory and require a numeric value otherwise the map will not solve

Auto
Day

Auto
Sec

Little's Law:

$$\text{Wait Time (Non-Value Added)} = \text{Inventory} / \text{Customer Demand}$$

- When entering data use tab key to go to next NVU
- Non-Value Added and Value Added ladders are already glued to Activity Center and Inventory Center, respectively
- The standard NVUs on an Activity Center are required for calculations and MUST NOT be deleted

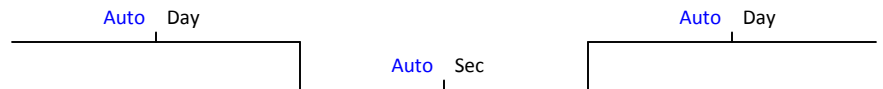
Step 8: Add Arrows from Main Stencil

Quick Mfg LT

A0110	I	#0
Spring Steel Rolls		
Inventory	10	Roll

A0120		#0
Machine and form caliper springs		
	1	
Cycle Time	4	Hr
Qty Per Cycle	1	Roll
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%

A0130	I	#0
Springs		
Inventory	150	Set



2

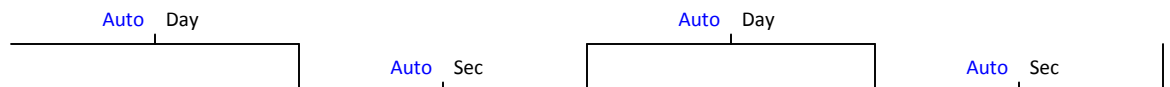
Glue all arrows at both ends.

A0020	I	#0
Casting Sets		
Inventory	1000	Set

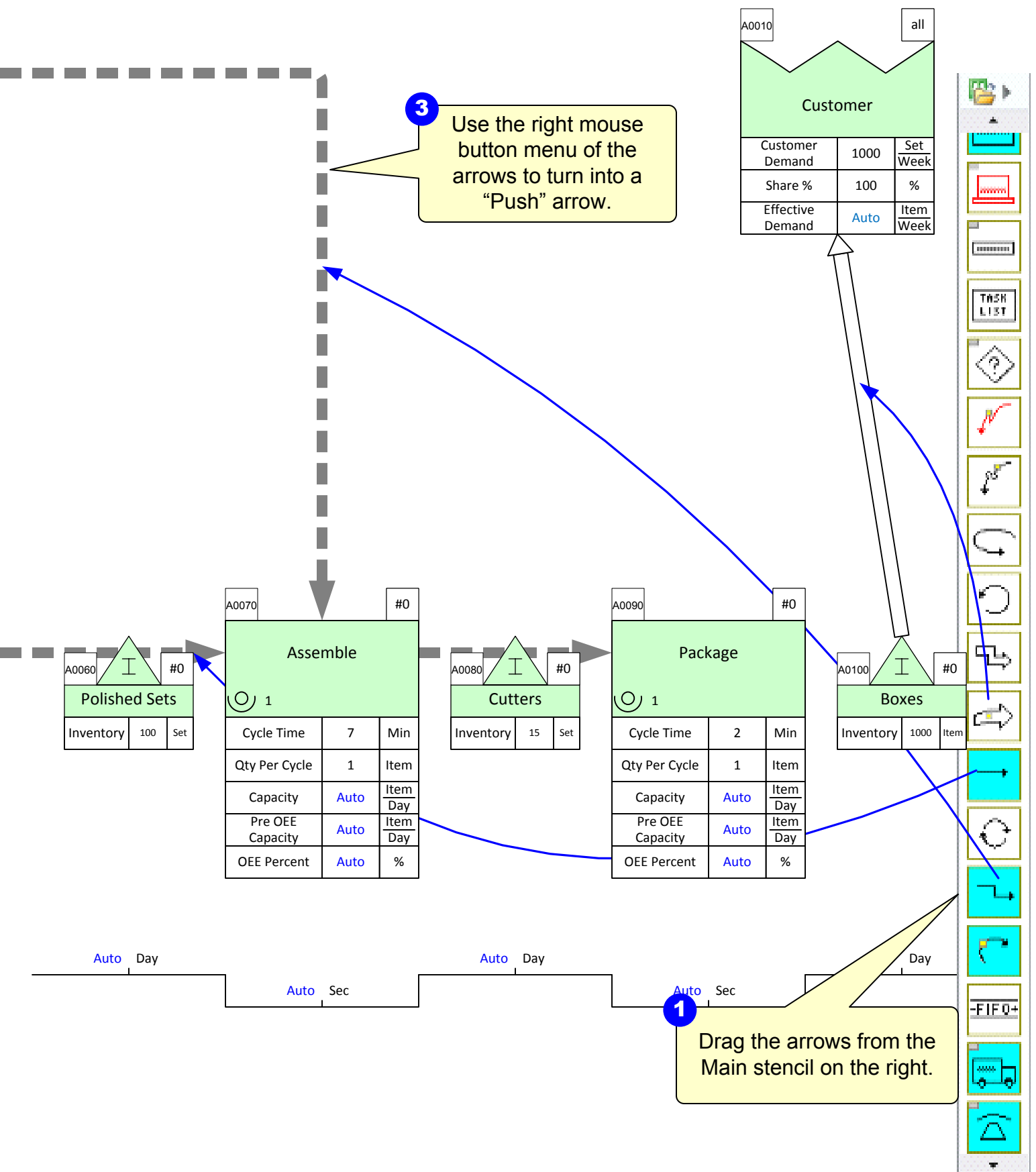
A0030		#0
Machine		
	1	
Cycle Time	3	Min
Qty Per Cycle	1	Set
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%

A0040	I	#0
Machined Sets		
Inventory	50	Set

A0050		#0
Polish		
	1	
Cycle Time	5	Min
Qty Per Cycle	1	Item
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%



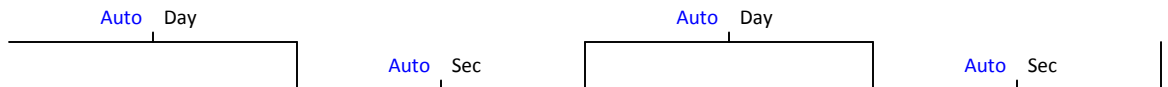
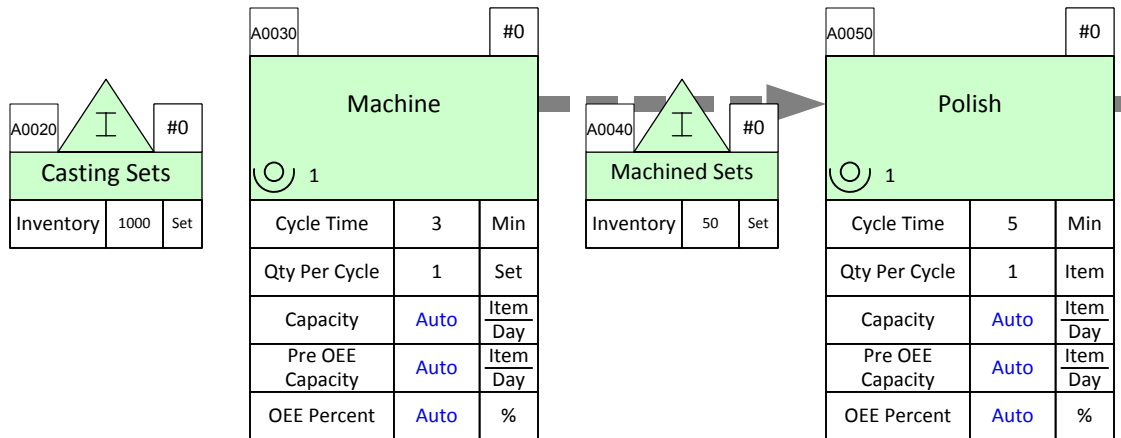
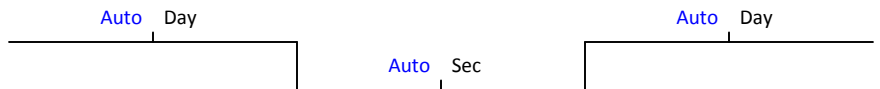
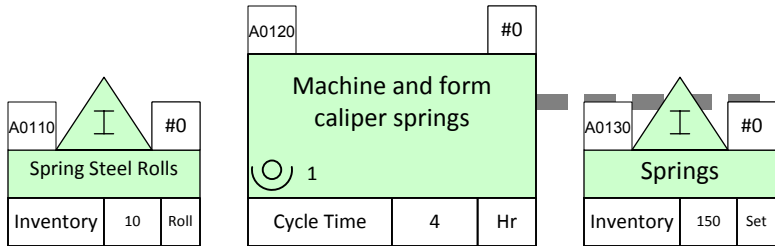
Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

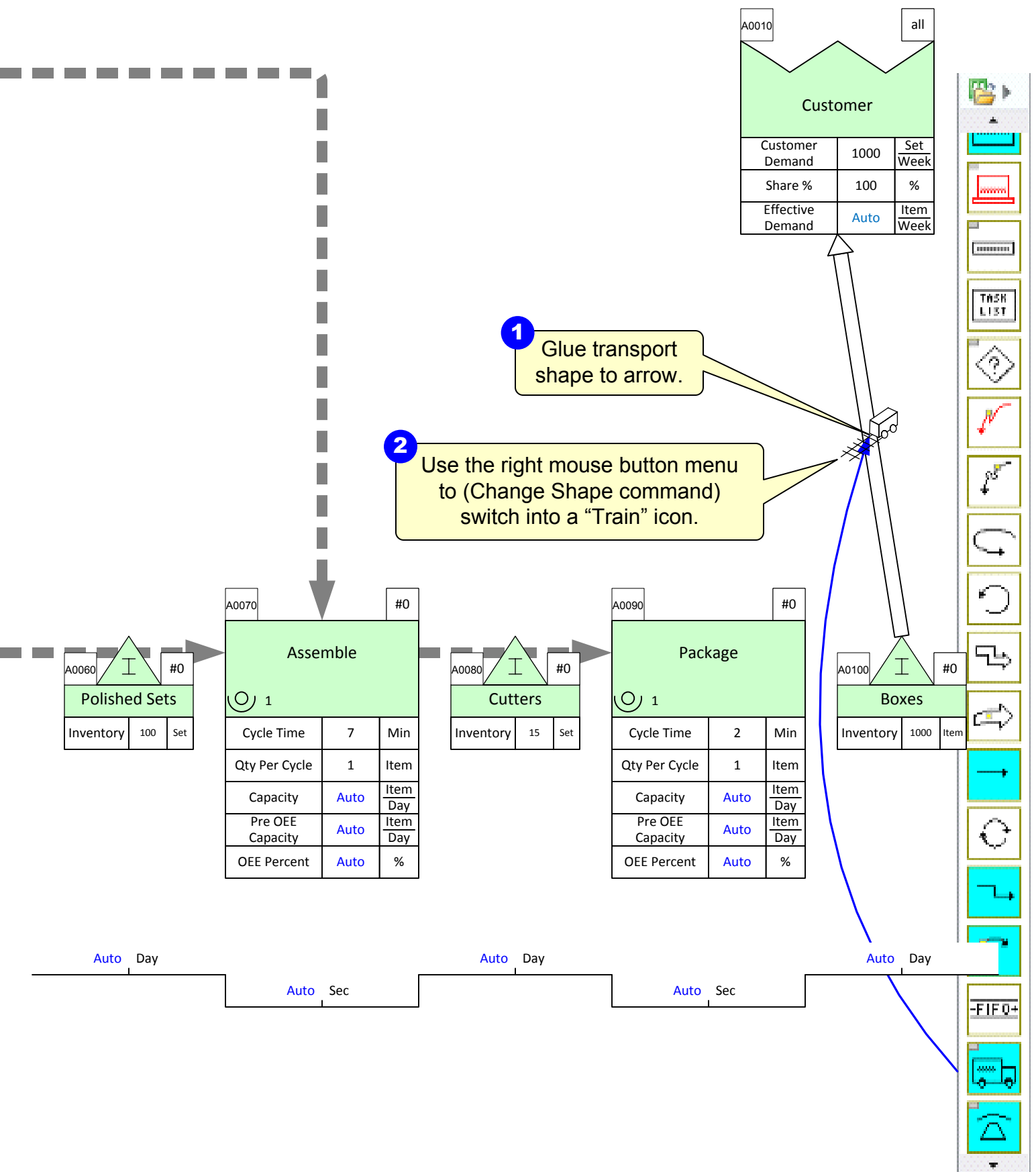


Step 9: Add Transport shapes

Quick Mfg LT

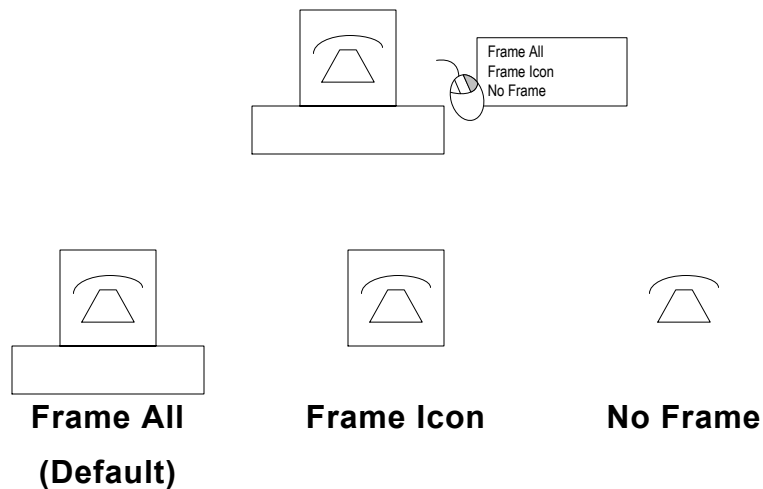
Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item





Transport, Transmit, and Flow Shapes

- Transport, Transmit, and Flow Shapes now have text box framed to allow data values to be added if needed
 - If data is added to shape, an Operation Tag and Path Locator needs to be added
- To remove frame, right-click on shape and select “Frame Icon”

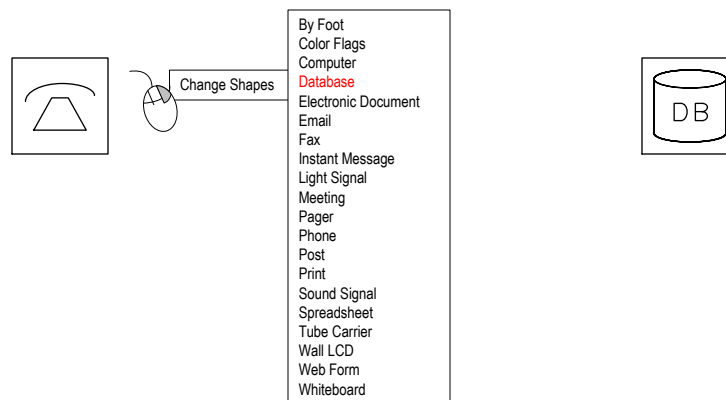


- Use Text Block tool to move text

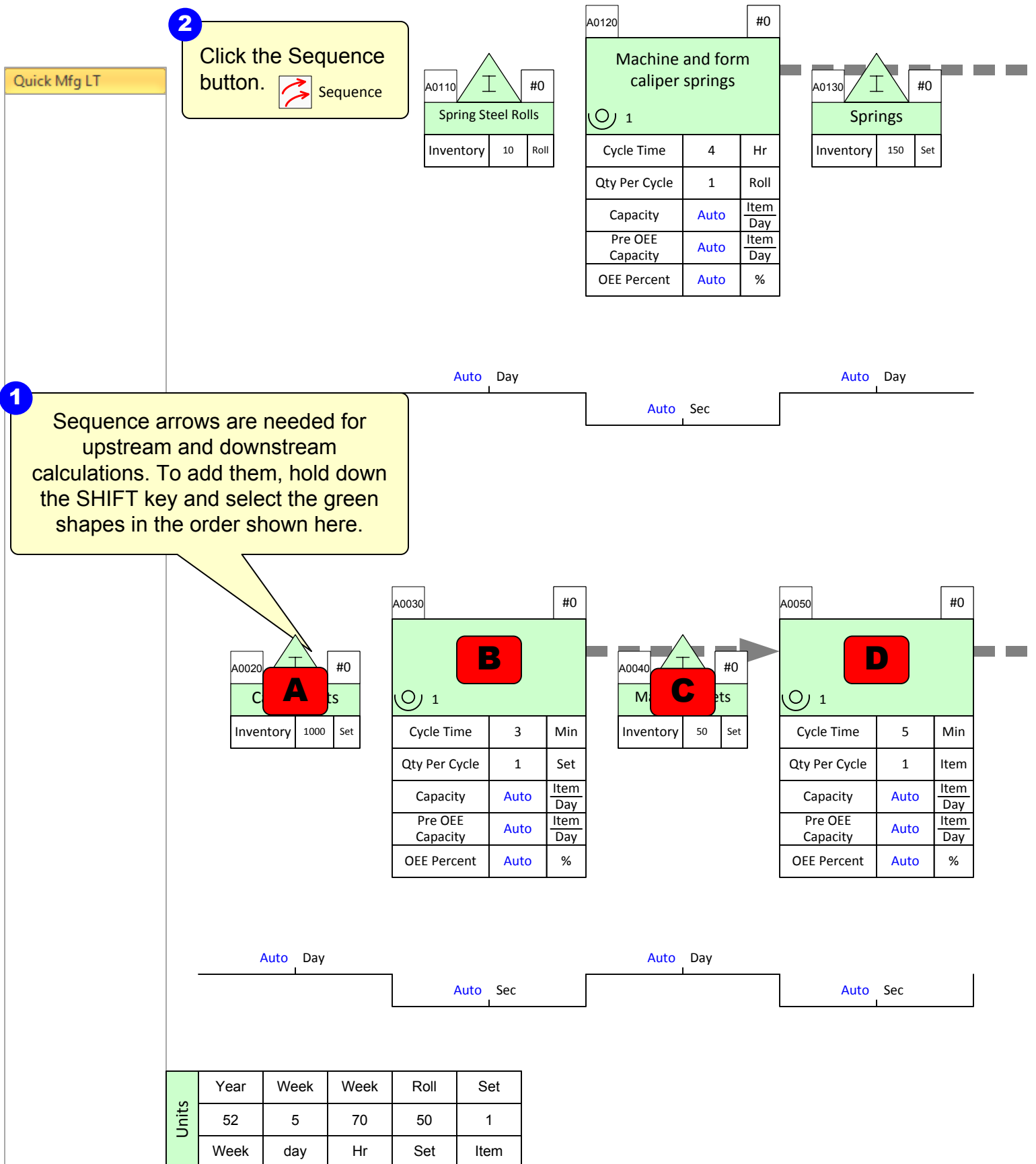


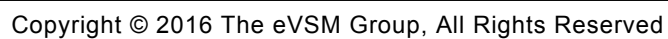
Blue Stack Shapes

- Blue icon stack has other shapes to choose
- Right-click on shape and select desired shapes
- Use the **Stack Help** button in the toolbar to see complete list of shapes in a stack after selecting a blue or green stack icon from a stencil



Step 10: Sequence Arrows







Sequence Arrows



Sequence

- Provide a means of generating tag numbers in upstream to downstream sequence (using the **AutoTag** button)  Auto Tag
- Provide a means of generating path numbers that comprehend all of the paths on the map (using the **Auto Path** button)  Auto Path
- Are the basis for upstream/downstream calculations in the built-in eVSM equations
- Sequence arrows can be added for a few centers at a time or in a continuous path.

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Step 11: Sequence Path 2

Quick Mfg LT

2

For the second path, hold the SHIFT key and select the green shapes A to D in the order shown. Then click the Sequence button.

A0110		#0
Sp	A	olls
Inventory	10	Roll

A0120		#0
Machine form cal		
	B	ings
1		
Cycle Time	4	Hr
Qty Per Cycle	1	Roll
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%

A0130		#0
	C	
Inventory	150	Set

Auto Day

Auto Sec

Auto Day

A0020		#0
	I	
Casting Sets		
Inventory	1000	Set

A0030		#0
Machine		
	I	
1		
Cycle Time	3	Min
Qty Per Cycle	1	Set
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%

A0040		#0
	I	
Machined Sets		
Inventory	50	Set

A0050		#0
Polish		
	I	
1		
Cycle Time	5	Min
Qty Per Cycle	1	Item
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%

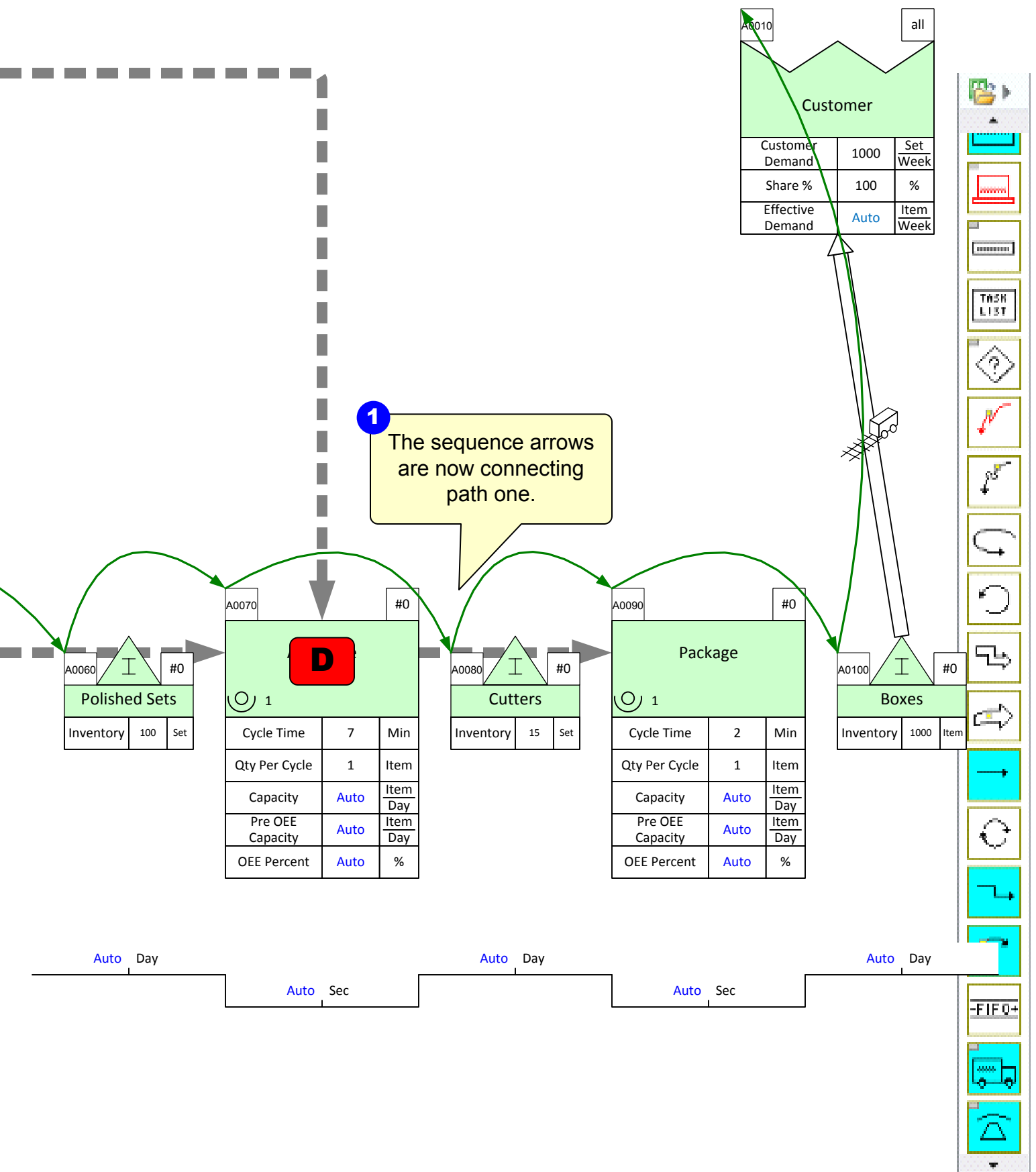
Auto Day

Auto Sec

Auto Day

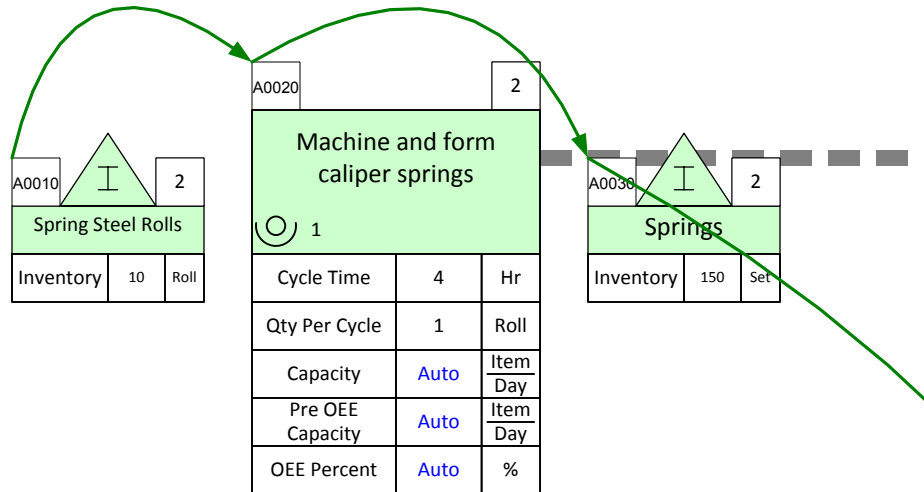
Auto Sec

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item




Step 12: Use Auto Path to Generate Path ID's based on Sequence Arrows


Quick Mfg LT

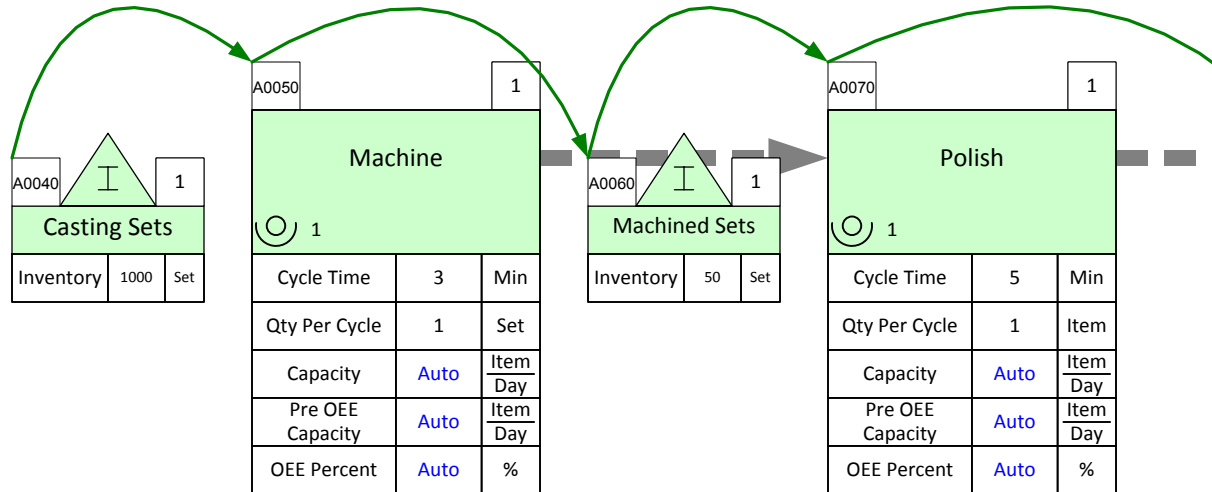


2 Click Auto Path to automatically generate Path numbers based on Sequence arrows. The path numbers on your map might not exactly match the ones on this example, and that is okay.

 Auto Path

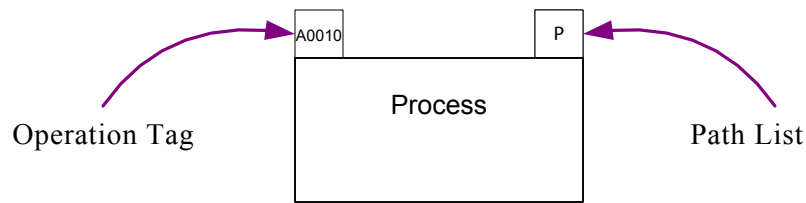
3 Click AutoTag again to re-order the tags based on the new sequence arrows.

 Auto Tag



Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

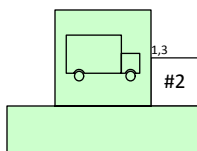
Path List



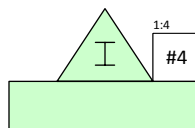
- Path List: The Path List is used to identify a path that an activity (or other shape able to be tagged) belongs to. The shape is glued above the top right corner of the shape.
- An activity can belong to no paths, one or more, or all paths. The benefit of assigning path numbers to activities is that the associated activity variables (like NVA time) can be summed up across the map in a path specific sense.
- After you have used the Auto Path function, the Path List will appear as either of the following:

- ☐ All The center is on all paths
- ☐ 6 The center is only on path 6
- ☐ #4 The center is on 4 different paths

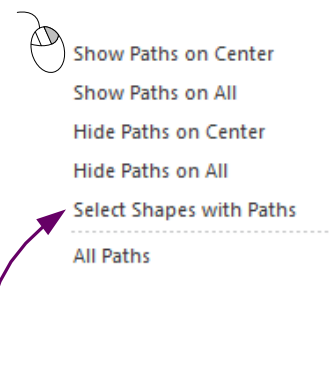
Right clicking on the Path List shape will pull up a menu to display all the path numbers on each center/page, or to hide all paths on each center or for the whole page.



The "1,3" indicates that this center is on paths 1 and 3



The "1:4" indicates that this center is on paths 1 through 4 (1, 2, 3, 4)



Using the "Select Shapes with Paths" option will highlight all shapes on the map that have those specific path numbers.

Operation Tags

- Operation Tags:
 - Provides short name for process step
 - Identifies process step to Excel for calculations
 - Defines the order in which data is plotted on charts
 - Operation Tags MUST be 1-alpha and 4-numeric characters (ie: A0200)
 - Are typically assigned using the [Auto Tag](#) button and AFTER sequence arrows have been applied

Step 13: Time Summary by Path

1 Drag out two Time Summary Centers.

2 Double-click to change this path filter to "1" using the Path Filter Manager.

3 Double-click to change this unit to 2.

4 Double-click to change both units to Min on each Time Summary.

Path Filter Manager

All Paths	Selected Paths
all	1
1	
2	

>> <<

Highlight

Cancel OK

Z0010 P

Time Summary		
Lead Time	Auto	Day
Total Value Added	Auto	Min
Value Added Percent	Auto	%
Takt Time	Auto	Min Item
Total Cycle Time	Auto	Min

Z0020 P

Time Summary		
Lead Time	Auto	Day
Total Value Added	Auto	Min
Value Added Percent	Auto	%
Takt Time	Auto	Min Item
Total Cycle Time	Auto	Min

Spring Steel Rolls

Inventory	10	Roll
-----------	----	------

A0080 2

Springs		
Inventory	150	Set

A0010 1

Casting Sets		
Inventory	1000	Set

A0020 1

Machine		
Cycle Time	3	Min
Qty Per Cycle	1	Set
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%

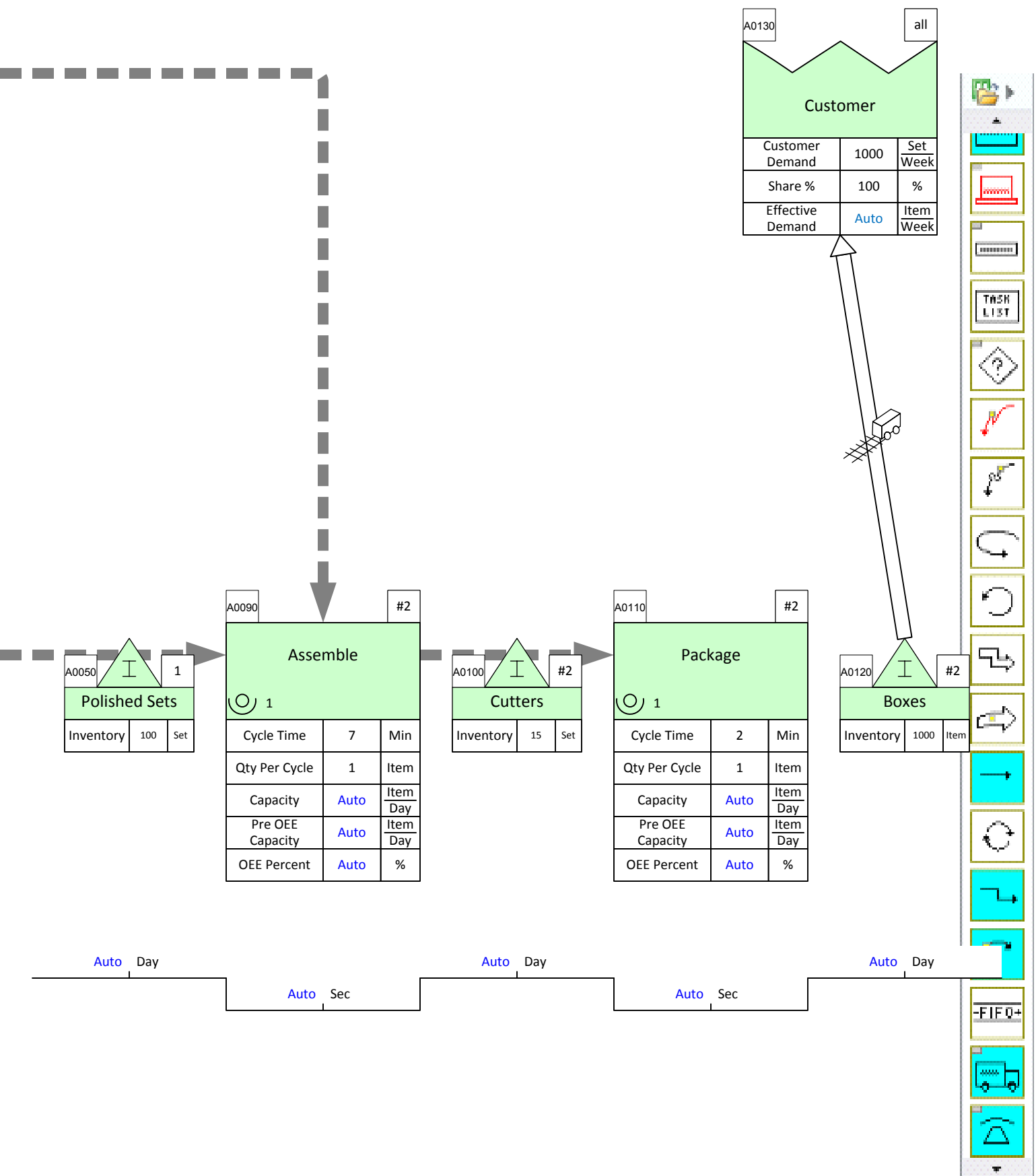
A0030 1

Machined Sets		
Inventory	50	Set

A0040 1

Polish		
Cycle Time	5	Min
Qty Per Cycle	1	Item
Capacity	Auto	Item Day
Pre OEE Capacity	Auto	Item Day
OEE Percent	Auto	%

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item



Step 14: Perform Calculations

Quick Mfg LT

Z0010		P
Time Summary		
Lead Time	10.85	Day
Total Value Added	17.00	Min
Value Added Percent	0.19	%
Takt Time	4.20	Min Item
Total Cycle Time	17.00	Min

A0060	I	2
Spring Steel Rolls		
Inventory	10	Roll

A0070		2
Machine and form caliper springs		
	1.00	
Cycle Time	4	Hr
Qty Per Cycle	1	Roll
Capacity	175.00	Item Day
Pre OEE Capacity	175.00	Item Day
OEE Percent	100.00	%

A0080	I	2
Springs		
Inventory	150	Set

Z0020		P
Time Summary		
Lead Time	8.62	Day
Total Value Added	249.00	Min
Value Added Percent	3.44	%
Takt Time	4.20	Min Item
Total Cycle Time	249.00	Min

2.50 Day

14400.00 Sec

0.75 Day

3

When complete, note that all blue values show calculated results

A0010	I	1
Casting Sets		
Inventory	1000	Set

A0020		1
Machine		
	1.00	
Cycle Time	3	Min
Qty Per Cycle	1	Set
Capacity	280.00	Item Day
Pre OEE Capacity	280.00	Item Day
OEE Percent	100.00	%

A0030	I	1
Machined Sets		
Inventory	50	Set

A0040		1
Polish		
	1.00	
Cycle Time	5	Min
Qty Per Cycle	1	Item
Capacity	168.00	Item Day
Pre OEE Capacity	168.00	Item Day
OEE Percent	100.00	%

5.00 Day

180.00 Sec

0.25 Day

300.00 Sec

4

Double-click the unit if you would like to change it to minutes, or any other time measure.

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

First Check then Solve

Users should first Check and then Solve the map.

Check Button Check

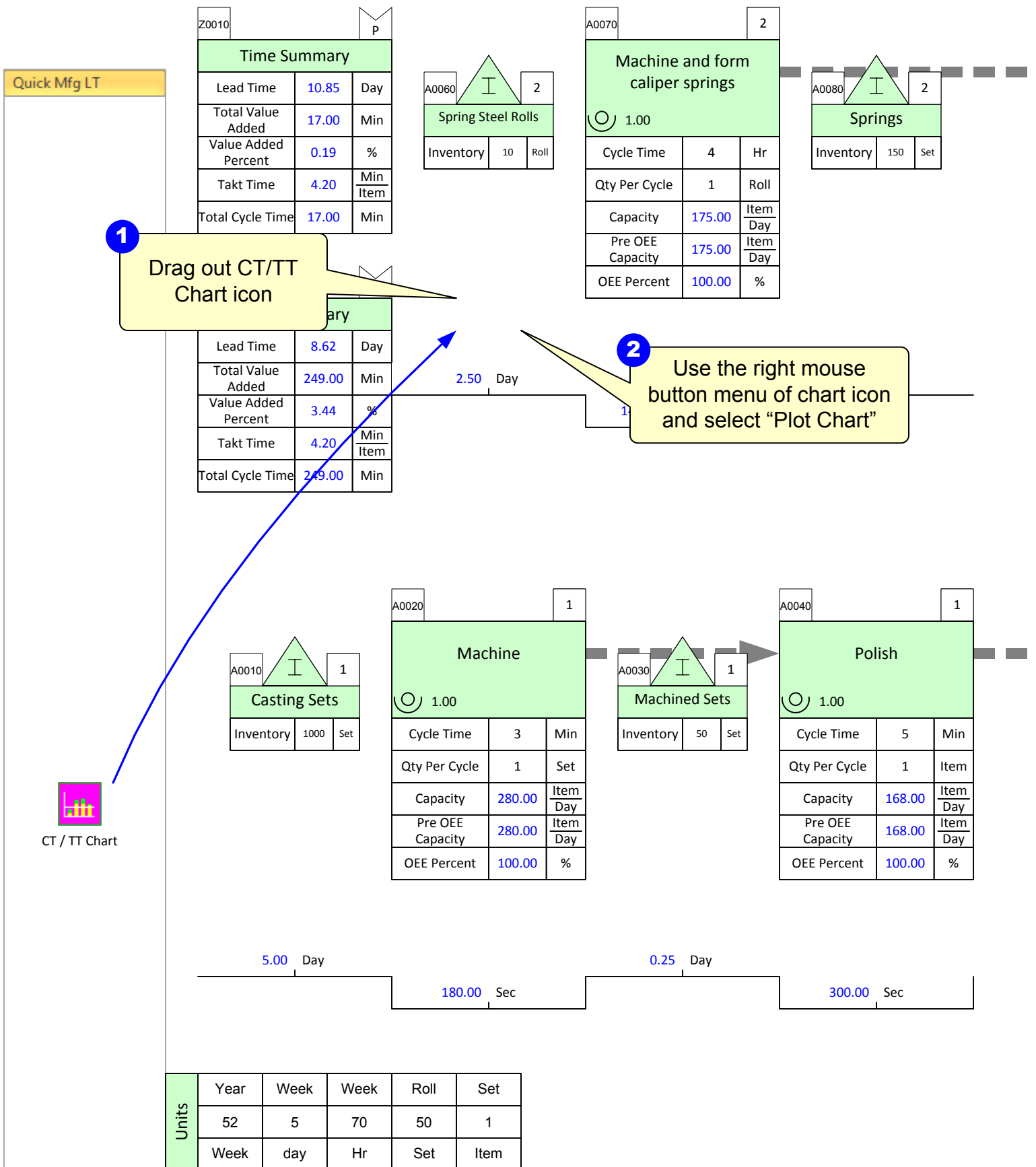
- Performs comprehensive model checking
- Fixes obvious problem
- Provides list of outstanding issues

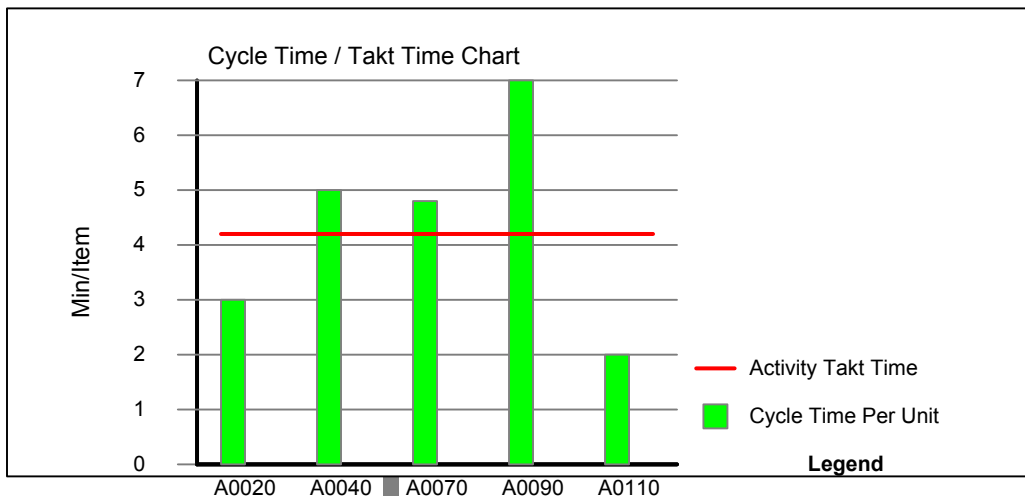
Solve Button Solve

- Performs basic model checking
- Stops if there is any obvious issues like missing data values
- Solves the built-in equations and puts the results on the map
- Exports data to an Excel spreadsheet

This area intentionally left blank

Step 15: Add Cycle Time Takt Time Chart



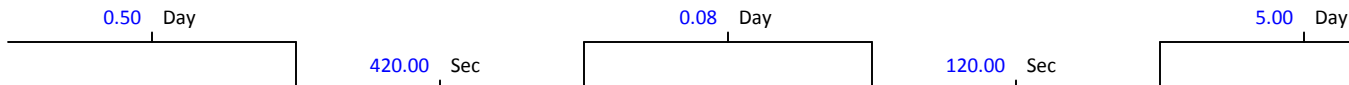


130	Customer		all
Customer Demand	1000	Set Week	
Share %	100	%	
Effective Demand	1000.00	Item Week	

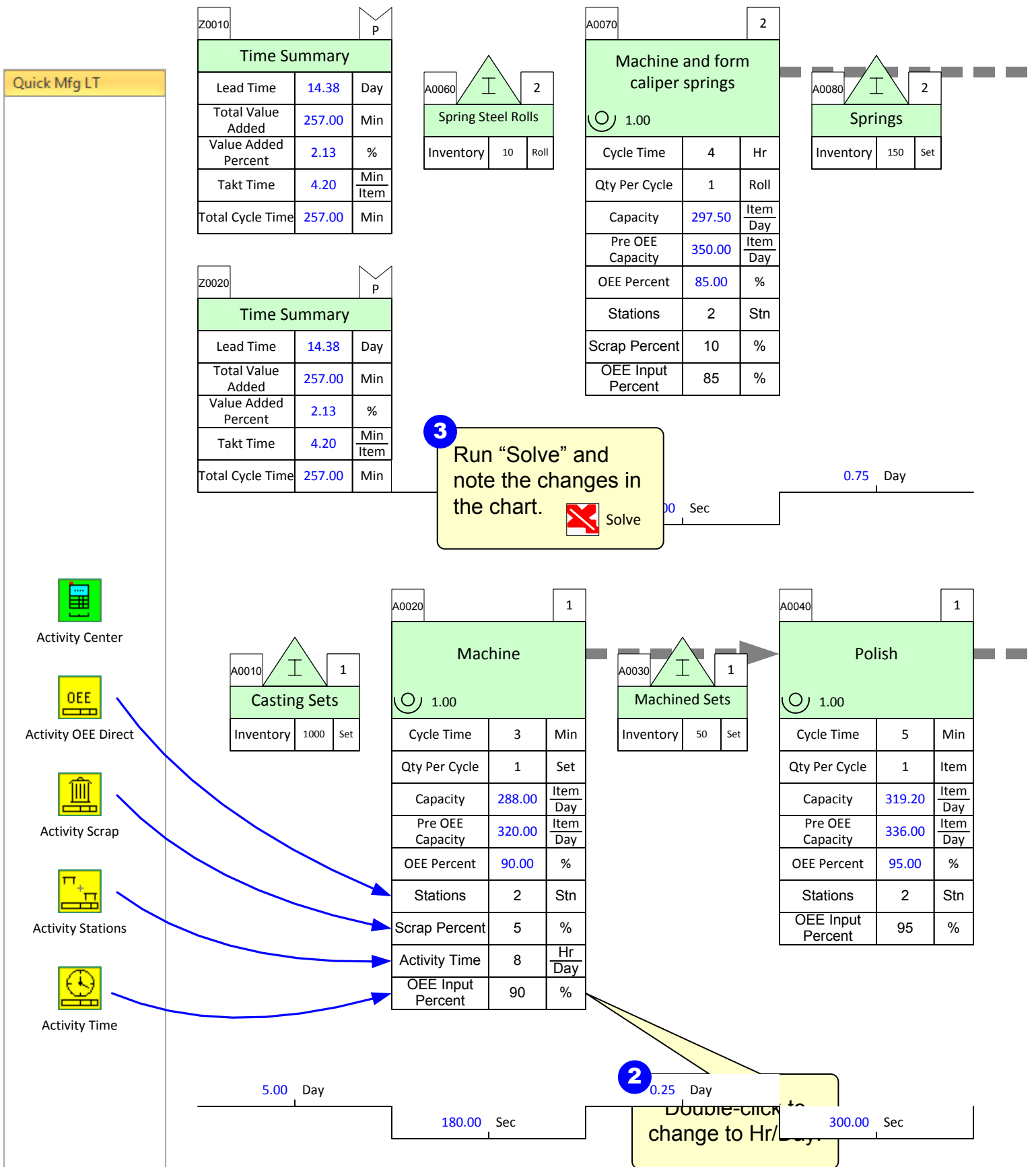
A0050	Polished Sets		A0090	Assemble		#2
Inventory	100	Set	1.00	Cycle Time	7	Min
				Qty Per Cycle	1	Item
				Capacity	120.00	Item Day
				Pre OEE Capacity	120.00	Item Day
				OEE Percent	100.00	%

A0100	Cutters		A0110	Package		#2
Inventory	15	Set	1.00	Cycle Time	2	Min
				Qty Per Cycle	1	Item
				Capacity	420.00	Item Day
				Pre OEE Capacity	420.00	Item Day
				OEE Percent	100.00	%


A0120	Boxes		#2
Inventory	1000	Item	



Step 16: Try Add-on Calculations: OEE, Scrap, Activity Time




Step 17: Hide/Show Cost Variables

1 Click the Views button in the toolbar.  Views

Quick Mfg LT

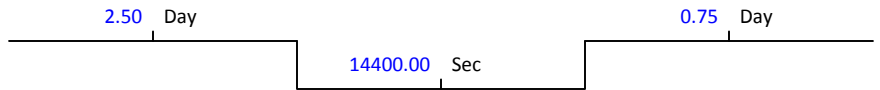
Z0010			P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min/Item	
Total Cycle Time	257.00	Min	

A0060	I	2
Spring Steel Rolls		
Inventory	10	Roll
Cumulative Cost	6.00	\$ Item
Added Cost	300	\$ Roll


A0070			2
Machine and form caliper springs			
 1.00			
Cycle Time	4	Hr	
Qty Per Cycle	1	Roll	
Capacity	297.50	Item Day	
Pre OEE Capacity	350.00	Item Day	
OEE Percent	85.00	%	
Added Cost	0.25	\$ Set	
Cumulative Cost	6.94	\$ Item	
Stations	2	Stn	
Scrap Percent	10	%	
OEE Input Percent	85	%	

A0080	I	2
Springs		
Inventory	150	Set
Cumulative Cost	6.94	\$ Item
Added Cost	0.00	\$ Item


Z0020			P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min Item	
Total Cycle Time	257.00	Min	

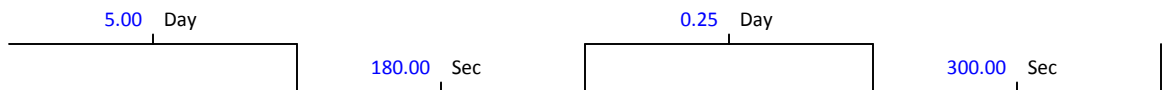


A0010	I	1
Casting Sets		
Inventory	1000	Set
Cumulative Cost	37.00	\$ Item
Added Cost	37	\$ Set

A0020			1
Machine			
 1.00			
Cycle Time	3	Min	
Qty Per Cycle	1	Set	
Capacity	288.00	Item	Day
Pre OEE Capacity	320.00	Item	Day
OEE Percent	90.00	%	
Added Cost	1	\$	Set
Cumulative Cost	40.00	\$	Item
Stations	2	Stn	
Scrap Percent	5	%	
Activity Time	8	Hr	Day
OEE Input Percent	90	%	

A0030	I	1
Machined Sets		
Inventory	50	Set
Cumulative Cost	40.00	\$ Item
Added Cost	0.00	\$ Item

A0040			1
Polish			
 1.00			
Cycle Time	5	Min	
Qty Per Cycle	1	Item	
Capacity	319.20	<u>Item</u> Day	
Pre OEE Capacity	336.00	<u>Item</u> Day	
OEE Percent	95.00	%	
Added Cost	2	<u>\$</u> Set	
Cumulative Cost	42.00	<u>\$</u> Item	
Stations	2	Stn	
OEE Input Percent	95	%	



Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

Variable Visibility

Center/Add-on Name	Variable Name(s)	Visibility	Multi-Add
Customer Center	Customer Demand	<input checked="" type="checkbox"/>	
	Share %	<input checked="" type="checkbox"/>	
	Effective Demand	<input checked="" type="checkbox"/>	
Inventory Center	Inventory	<input checked="" type="checkbox"/>	
	Non Value Added	<input checked="" type="checkbox"/>	
	Cumulative Cost	<input checked="" type="checkbox"/>	
	Added Cost	<input checked="" type="checkbox"/>	
	Duration	<input type="checkbox"/>	
	End Time	<input type="checkbox"/>	
	Inventory Value	<input type="checkbox"/>	
	Annual Inv Carry Cost	<input type="checkbox"/>	
	Computed Inv Demand	<input type="checkbox"/>	
	Check Time	<input type="checkbox"/>	

A0130			all
Customer			
Customer Demand	1000	Set	Week
Share %	100	%	
Effective Demand	1000.00	Item	Week

2 Check the Cumulative Cost visibility box.

3 Check the Added Cost visibility box and click OK.

A0050	I	1
Polished Sets		
Inventory	100	Set
Cumulative Cost	42.00	\$/Item
Added Cost	0.00	\$/Item

A0100	I	#2
Assemble		
1.00		
Cycle Time	7	Min
Qty Per Cycle	1	Item
Capacity	192.00	Item Day
Pre OEE Capacity	240.00	Item Day
OEE Percent	80.00	%
Added Cost	3	\$/Set
Cumulative Cost	57.72	\$/Item
Stations	2	Stn
Scrap Percent	10	%
OEE Input Percent		

A0100	I	#2
Cutters		
Inventory	15	Set
Cumulative Cost	57.72	\$/Item
Added Cost	0.00	\$/Item

A0120	I	#2
Package		
1.00		
Cycle Time	2	Min
Qty Per Cycle	1	Item
Capacity	228.00	Item Day
Pre OEE Capacity	240.00	Item Day
OEE Percent	95.00	%
Added Cost	1	\$/Set
Cumulative Cost	58.72	\$/Item
Activity Time	8	Hr Day
OEE Input Percent	95	%

A0120	I	#2
Boxes		
Inventory	1000	Item
Cumulative Cost	58.72	\$/Item
Added Cost	0.00	\$/Item

4 Now that the Added Cost and Cumulative Cost variables are visible, fill in the data values for Added Cost and click the Solve button.

5 Make sure the correct unit is selected for each center.

0.50 Day

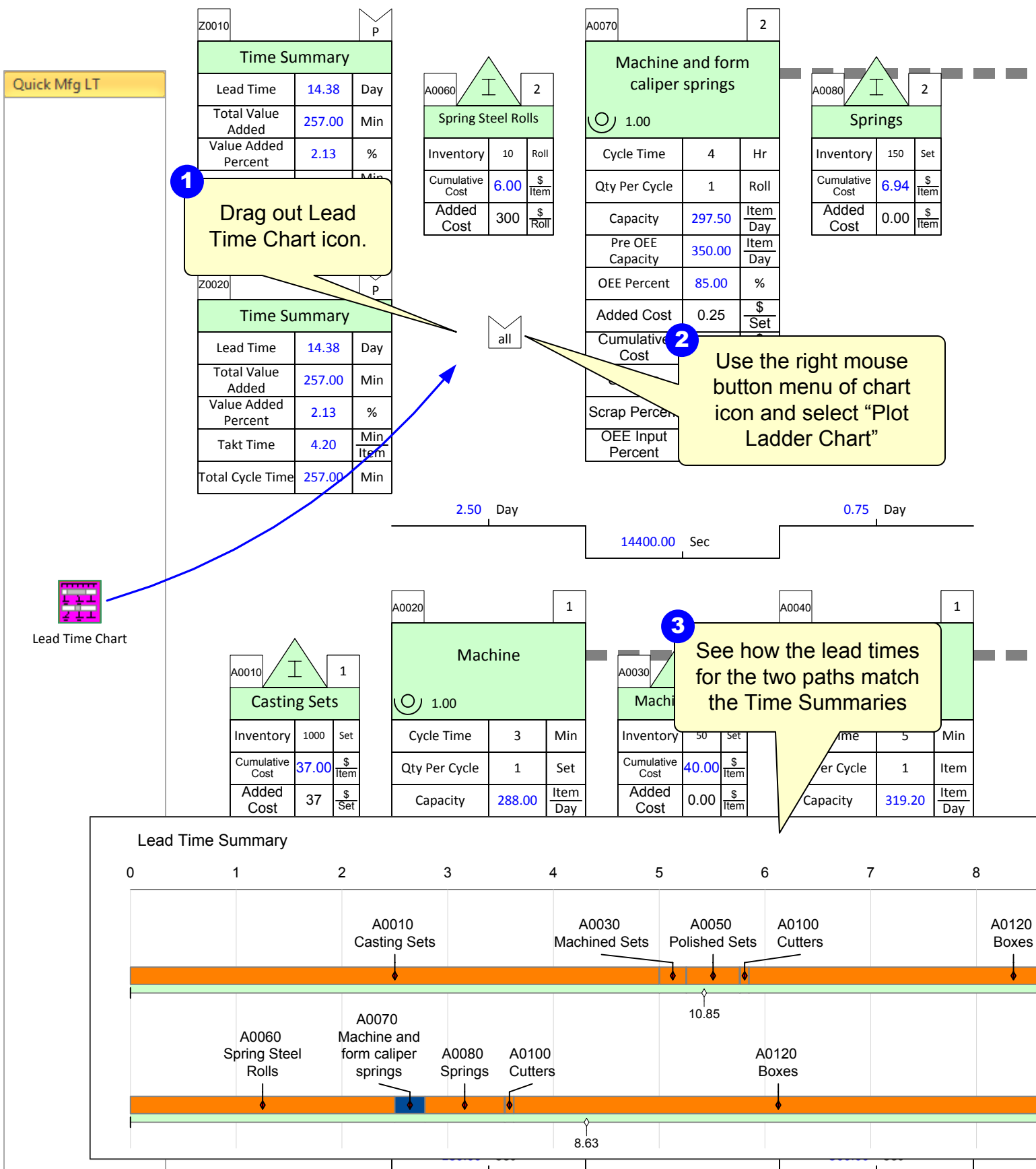
420.00



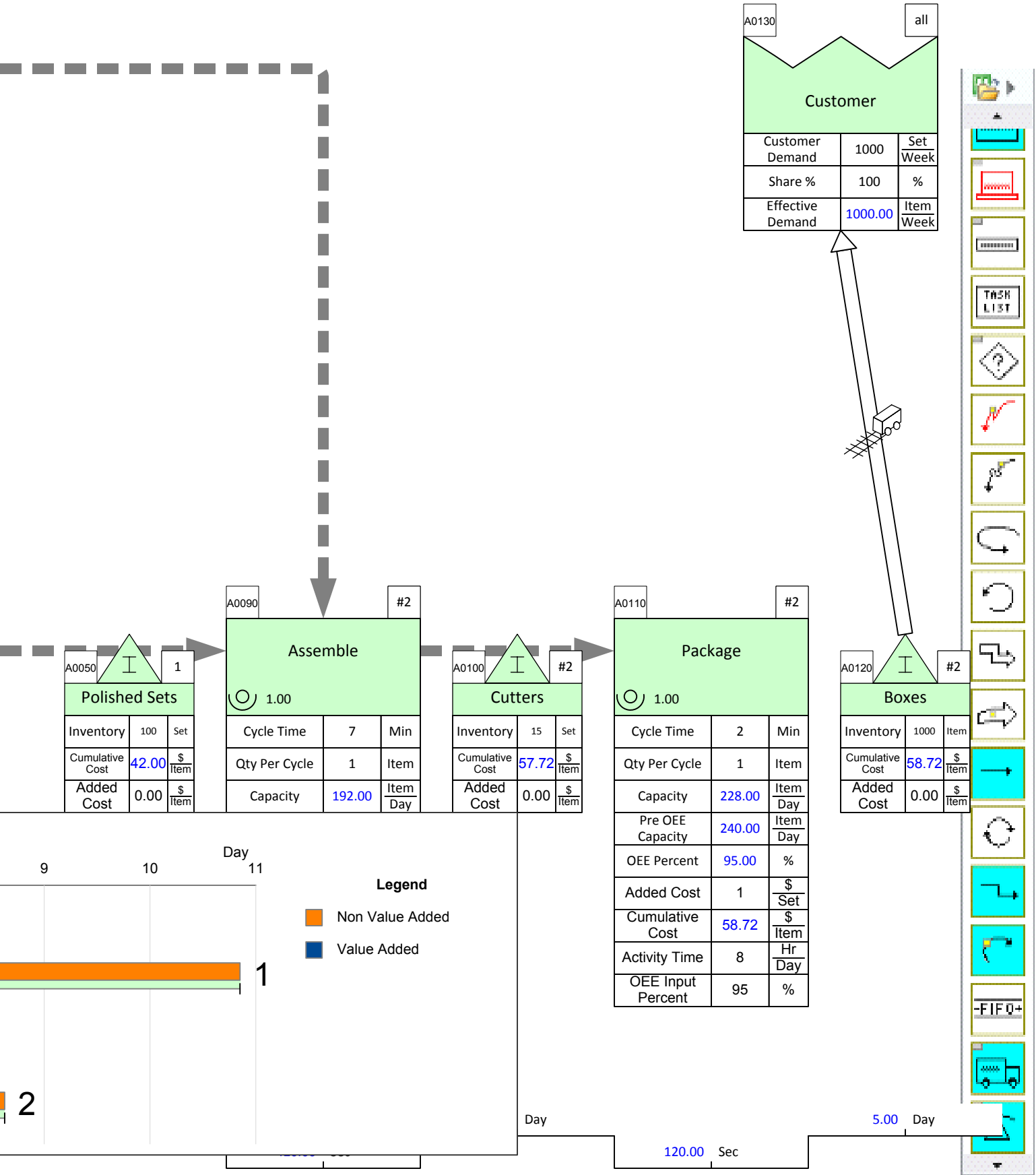
120.00 Sec

5.00 Day

Step 18: Plot Lead Time Chart




Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item



Step 19: Resource Modeling

Quick Mfg LT

Resource Center

Z0010			 P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min Item	
Total Cycle Time	257.00	Min	

Z0020			P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min	Item
Total Cycle Time	257.00	Min	

A0060	I	2
Spring Steel Rolls		
Inventory	10	Roll
Cumulative Cost	6.00	\$ Item
Added Cost	300	\$ Roll

A0070			2
Machine and form caliper springs			
1.00			
Cycle Time	4	Hr	
Qty Per Cycle	1	Roll	
Capacity	297.50	Item Day	
Pre OEE Capacity	350.00	Item Day	
OEE Percent	85.00	%	
Added Cost	0.25	\$ Set	
Cumulative Cost	6.94	\$ Item	
Stations	2	Stn	
Scrap Percent	10	%	
OEE Input Percent	85	%	


A0080	I	2
Springs		
Inventory	150	Set
Cumulative Cost	6.94	\$ Item
Added Cost	0.00	\$ Item

2.50 Day


0.75 Day

14400.00 Sec

A0010	I	1
Casting Sets		
Inventory	1000	Set
Cumulative Cost	37.00	\$ Item
Added Cost	37	\$ Set

A0020			1
Machine			
 1.00			
Cycle Time	3	Min	
Qty Per Cycle	1	Set	
Capacity	288.00	Item	Day
Pre OEE Capacity	320.00	Item	Day
OEE Percent	90.00	%	
Added Cost	1	\$	Set
Cumulative Cost	40.00	\$	Item
Stations	2	Stn	
Scrap Percent	5	%	
Activity Time	8	Hr	Day
OEE Input Percent	90	%	

A0030	I	1
Machined Sets		
Inventory	50	Set
Cumulative Cost	40.00	\$ Item
Added Cost	0.00	\$ Item

A0040			1
Polish			
 1.00			
Cycle Time	5	Min	
Qty Per Cycle	1	Item	
Capacity	319.20	<u>Item</u> Day	
Pre OEE Capacity	336.00	<u>Item</u> Day	
OEE Percent	95.00	%	
Added Cost	2	<u>\$</u> Set	
Cumulative Cost	42.00	<u>\$</u> Item	
Stations	2	Stn	
OEE Input Percent	95	%	

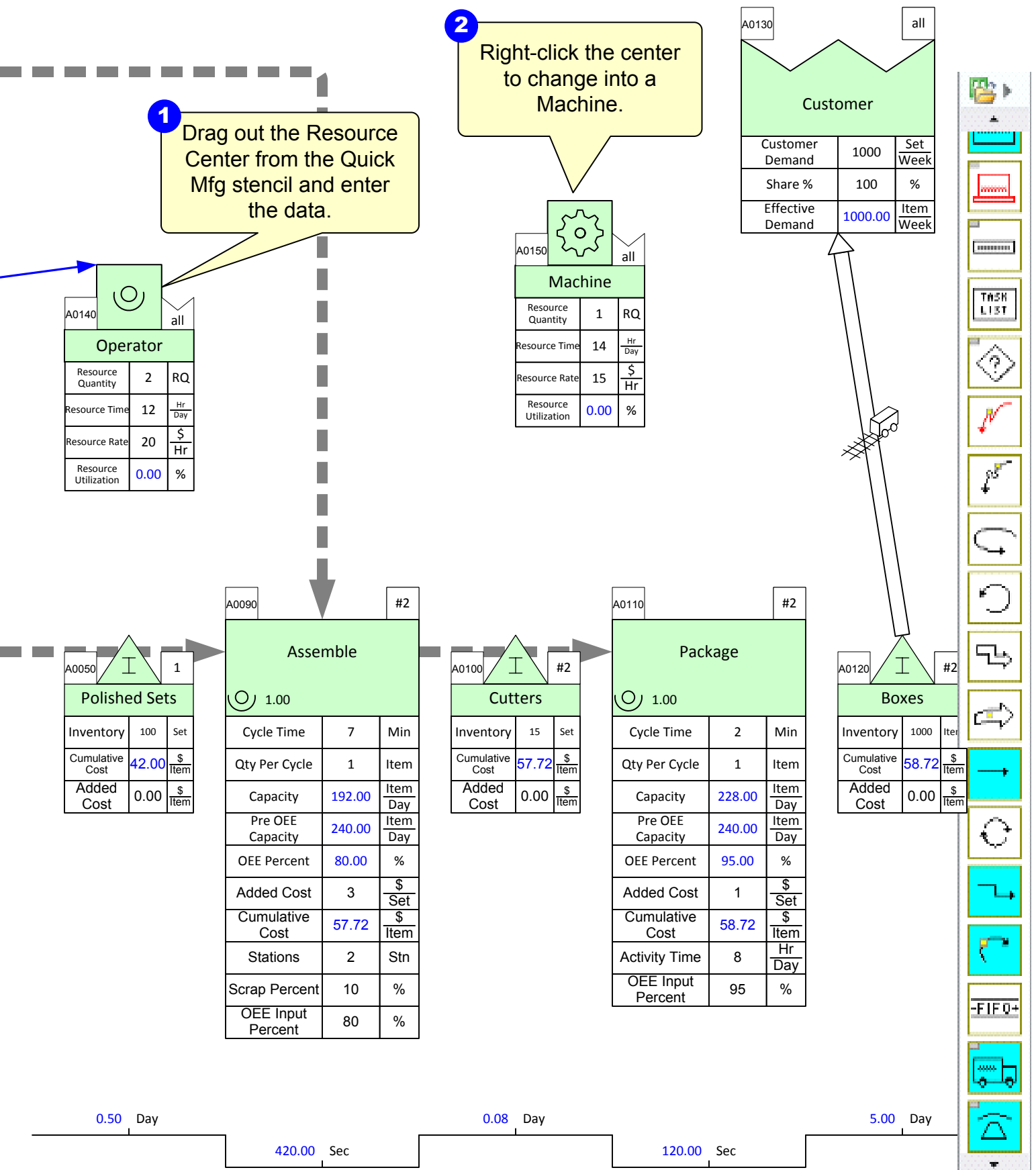
5.00 Day

0.25 Day

180.00 Sec

300.00 Sec

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item




Step 20: Adding Resource Pipes

Quick Mfg LT

Z0010			P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min Item	
Total Cycle Time	257.00	Min	

A0060	I	2
Spring Steel Rolls		
Inventory	10	Roll
Cumulative Cost	6.00	\$ Item
Added Cost	300	\$ Roll

A0070			2
Machine and form caliper springs			
 1.00			
Cycle Time	4	Hr	
Qty Per Cycle	1	Roll	
Capacity	297.50	Item Day	
Pre OEE Capacity	350.00	Item Day	
OEE Percent	85.00	%	
Added Cost	0.25	\$ Set	
Cumulative Cost	6.94	\$ Item	

A0080	I	2
Springs		
Inventory	150	Set
Cumulative Cost	6.94	\$ Item
Added Cost	0.00	\$ Item

Z0020			P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min Item	
Total Cycle Time	257.00	Min	


2 Add Resource Pipes for the appropriate Resource Centers to Activity Centers. Make sure the correct unit is changed for the data on the Resource Pipe.

Resource PT	5	Min Item
-------------	---	----------

0.75 Day

14400.00 Sec

A0010	I	1
Casting Sets		
Inventory	1000	Set
Cumulative Cost	37.00	\$ Item
Added Cost	37	\$ Set

A0020			1
Machine			
 1.00			
Cycle Time	3	Min	
Qty Per Cycle	1	Set	
Capacity	288.00	Item	Day
Pre OEE Capacity	320.00	Item	Day
OEE Percent	90.00	%	
Added Cost	1	\$	Set
Cumulative Cost	40.00	\$	Item
Stations	2	Stn	
Scrap Percent	5	%	
Activity Time	8	Hr	Day
OEE Input Percent	90	%	

A0030	I	1
Machined Sets		
Inventory	50	Set
Cumulative Cost	40.00	\$ Item
Added Cost	0.00	\$ Item

A0040			1
<div>Polish</div> <div><div><div></div><div></div><div></div></div>1.00</div>			
Cycle Time	5	Min	
Qty Per Cycle	1	Item	
Capacity	319.20	Item	Day
Pre OEE Capacity	336.00	Item	Day
OEE Percent	95.00	%	
Added Cost	2	\$	Set
Cumulative Cost	43.67	\$	Item
Stations	2	Stn	
OEE Input Percent	95	%	

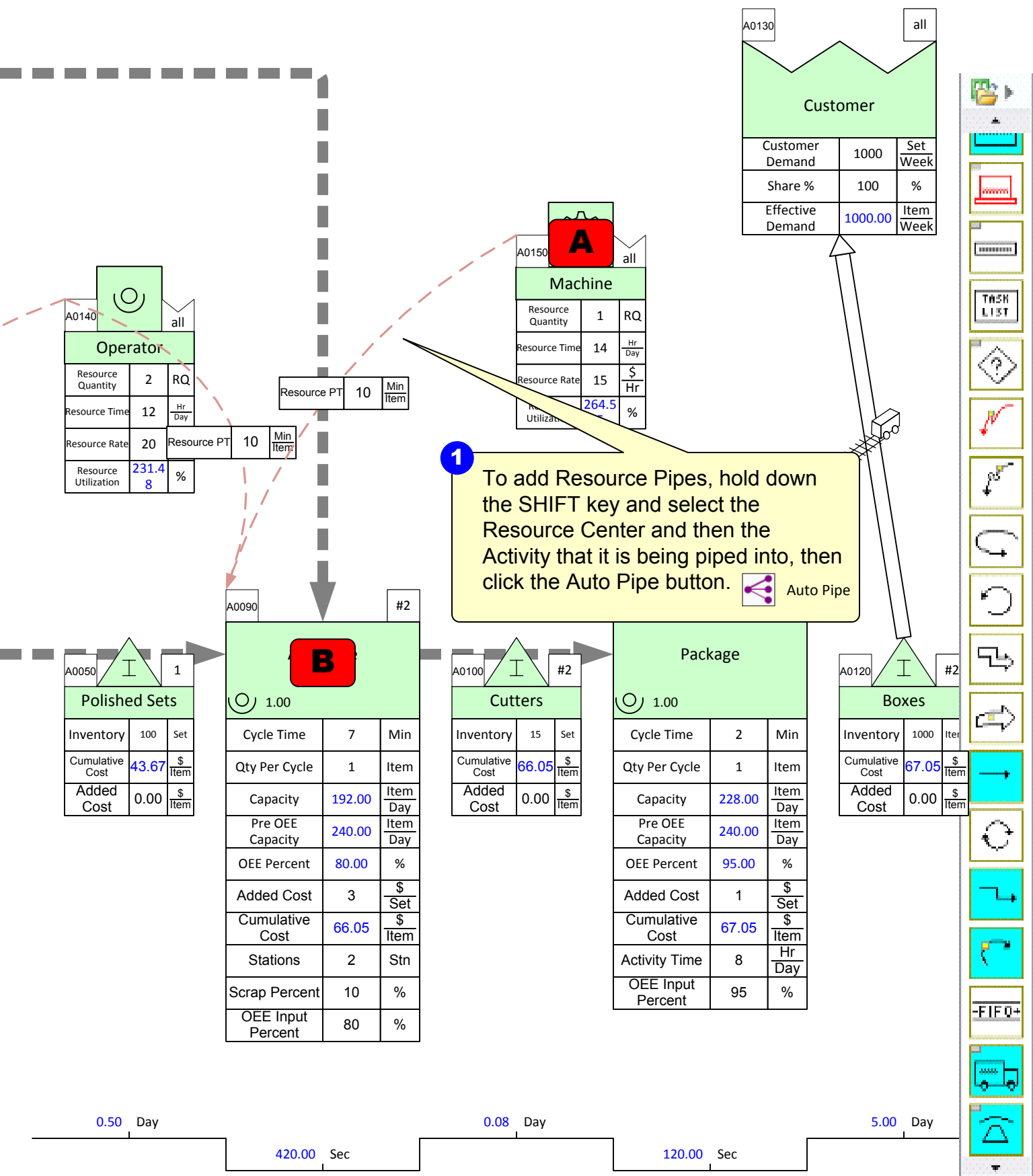
5.00 Day

0.25 Day


180.00 Sec

300.00 Sec

Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item



Step 21: Resource Balance Chart

1 Click the Solve button to update the new calculations.  Solve

2 Switch to the Quick Mfg setncil


 Resource Balance Chart

3 Drag out the Resource Balance Chart shape.

4 Use the right mouse button menu of chart icon and select "Plot Chart"

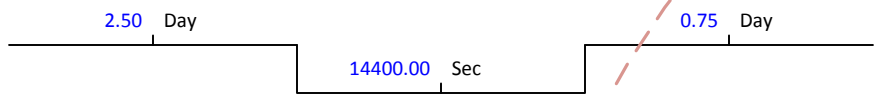
Z0010			P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min	Item
to the	257.00	Min	


A0060	I	2
Spring Steel Rolls		
Inventory	10	Roll
Cumulative Cost	6.00	\$ / Item
Added Cost	300	\$ / Roll


A0070			
Machine and form caliper springs			
	1.00		
Cycle Time	4	Hr	
Qty Per Cycle	1	Roll	
Capacity	297.50	Item Day	
Pre OEE Capacity	350.00	Item Day	
OEE Percent	85.00	%	
Added Cost	0.25	\$ Set	
Cumulative Cost	6.94	\$ Item	
Stations	2	Stn	
Scrap Percent	10	%	
OEE Input Percent	85	%	

A0080		I		2	
Springs					
Inventory	150	Set			
Cumulative Cost	6.94	\$ / Item			
Added Cost	0.00	\$ / Item			

Z0020		P	
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min Item	
Total Cycle Time	257.00	Min	

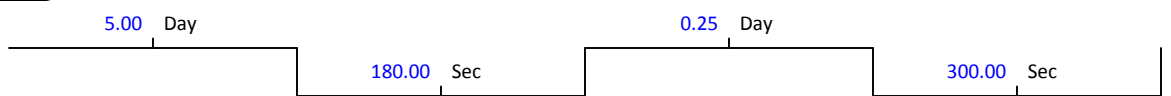


A0010		1
Casting Sets		
Inventory	1000	Set
Cumulative Cost	37.00	\$ Item
Added Cost	37	\$ Set

A0020		1	
Machine			
 1.00			
Cycle Time	3	Min	
Qty Per Cycle	1	Set	
Capacity	288.00	Item Day	
Pre OEE Capacity	320.00	Item Day	
OEE Percent	90.00	%	
Added Cost	1	\$ Set	
Cumulative Cost	4	Use the button icon and	
Stations			
Scrap Percent			
Activity Time			
OEE Input Percent	90	%	


A0030	I	1
Machined Sets		
Inventory	50	Set
Cumulative Cost	40.00	\$ / Item
Added Cost	0.00	\$ / Item

A0040		1
Polish		
1.00		
Cycle Time	5	Min
Qty Per Cycle	1	Item
Capacity	319.20	Item Day
Pre OEE Capacity	336.00	Item Day
OEE Percent	95.00	%
Added Cost	2	\$ Set
Cumulative Cost	43.67	\$ Item
Stations	2	Stn
OEE Input Percent	95	%




Step 22: Kaizen Improvements

Quick Mfg

Z0010			 P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min Item	
Total Cycle Time	257.00	Min	

A0060	I	2
Spring Steel Rolls		
Inventory	10	Roll
Cumulative Cost	6.00	\$ Item
Added Cost	300	\$ Roll

A0070			2
Machine and form caliper springs			
 1.00			
Cycle Time	4	Hr	
Qty Per Cycle	1	Roll	
Capacity	297.50	Item Day	
Pre OEE Capacity	350.00	Item Day	
OEE Percent	85.00	%	
Added Cost	0.25	\$ Set	
Cumulative Cost	6.94	\$ Item	
Stations	2	Stn	
Scrap Percent	10	%	
OEE Input Percent	85	%	

A0080	I	2
Springs		
Inventory	150	Set
Cumulative Cost	6.94	\$ Item
Added Cost	0.00	\$ Item

Z0020			P
Time Summary			
Lead Time	14.38	Day	
Total Value Added	257.00	Min	
Value Added Percent	2.13	%	
Takt Time	4.20	Min Item	
Total Cycle Time	257.00	Min	


2.50 Day

14400.00 Sec


0.75 Day

Resource PT	5	Min Item
-------------	---	----------

A0010	I	1
Casting Sets		
Inventory	1000	Set
Cumulative Cost	37.00	\$ Item
Added Cost	37	\$ Set

A0020			1
Machine			
	1.00		
Cycle Time	3	Min	
Qty Per Cycle	1	Set	
Capacity	288.00	Item Day	
Pre OEE Capacity	320.00	Item Day	
OEE Percent	90.00	%	
Added Cost	1	\$ Set	
Cumulative Cost	40.00	\$ Item	
Stations	2	Stn	
Scrap Percent	5	%	
Activity Time	8	Hr Day	

A0030	I	1
Machined Sets		
Inventory	50	Set
Cumulative Cost	40.00	\$ Item
Added Cost	0.00	\$ Item

A0040			1
Polish			
 1.00			
Cycle Time	5	Min	
Qty Per Cycle	1	Item	
Capacity	319.20	<u>Item</u> Day	
Pre OEE Capacity	336.00	<u>Item</u> Day	
OEE Percent	95.00	%	
Added Cost	2	<u>\$</u> Set	
Cumulative Cost	43.67	<u>\$</u> Item	
Stations	2	Stn	
OEE Input Percent	95	%	

002
Excessive capital tied up in raw materials inventory

2

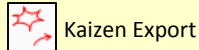
Right click kaizen and select "Edit Kaizen". Add relevant information in the Kaizen Properties form, such as Impact and Ease of Implementation values.


0.25 Day

300.00 Sec


Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

3 Click the Kaizen Export button in the toolbar to create a kaizen report in Excel.




A0140		all
Operator		
Resource Quantity	2	RQ
Resource Time	12	Hr Day
Resource Rate	20	Resou
Resource Utilization	231.48	%

Resource PT	10	Min Item
-------------	----	----------

A0150		all
Machine		
Resource Quantity	1	RQ
Resource Time	14	$\frac{\text{Hr}}{\text{Day}}$
Resource Rate	15	$\frac{\$}{\text{Hr}}$
Resource Utilization	264.5 5	%

A0130			all
Customer			
Customer Demand	1000	Set	Week
Share %	100	%	
Effective Demand	1000.00	Item	Week

Assemble process is a bottleneck because of low OEE and high scrap

A0050		1
Polished Sets		
Inventory	100	Set
Cumulative Cost	43.67	\$ Item
Added Cost	0.00	\$ Item

A0090		#2
Assemble		
1.00		
Cycle Time	7	Min
Qty Per Cycle	1	Item
Capacity	192.00	Item Day
Pre OEE Capacity	240.00	Item Day
OEE Percent	80.00	%
Added Cost	3	\$ Set
Cumulative Cost	66.05	\$ Item
Stations	2	Stn
Scrap Percent	10	%
OEE Input Percent	80	%

A0100	I	#2
Cutters		
Inventory	15	Set
Cumulative Cost	66.05	\$ Item
Added Cost	0.00	\$ Item

A0110	#2	
Drag out 1 starbursts for Quick Extra		
1.00		
Cycle Time	2	Min
Qty Per Cycle	1	Item
Capacity	228.00	Item Day
Pre OEE Capacity	240.00	Item Day
OEE Percent	95.00	%
Added Cost	1	\$ Set
Cumulative Cost	67.05	\$ Item
Activity Time	8	Hr Day
OEE Input Percent	95	%

Inventory	1000	Item
Cumulative Cost	67.05	\$ Item
Added Cost	0.00	\$ Item

1 Drag out Kaizen starbursts from the Quick Extras stencil.



0.50 Day

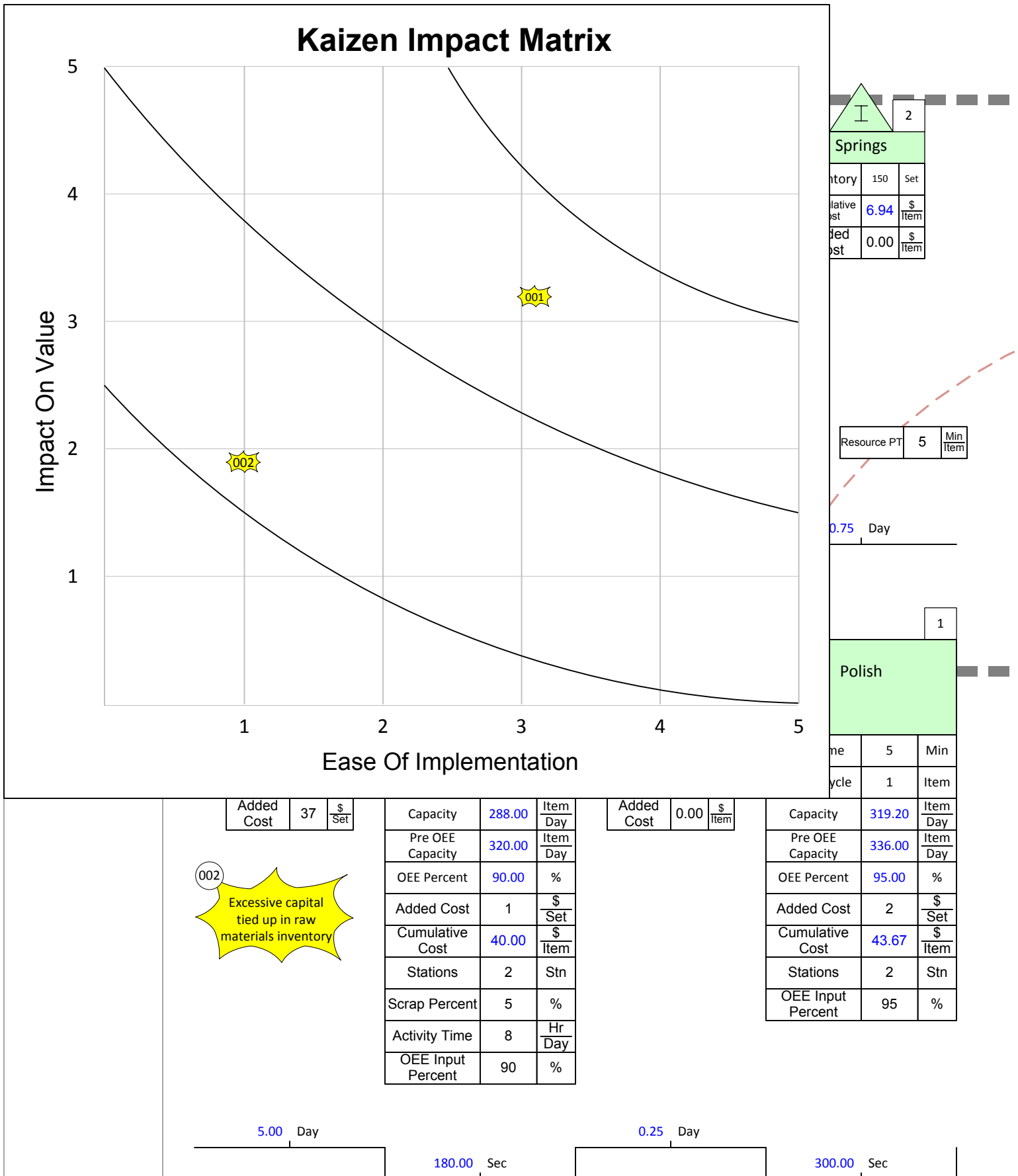
420.00 Sec

0.08 Day

120.00 Sec

5.00 Day

Step 23: Kaizen Impact Matrix



Units	Year	Week	Week	Roll	Set
	52	5	70	50	1
	Week	day	Hr	Set	Item

1 Drag out the Kaizen Impact Matrix and right-click to plot.

Kaizen Impact Matrix

A0130	Customer			all
Customer Demand	1000	Set	Week	
Share %	100	%		
Effective Demand	1000.00	Item	Week	

A0140	all	Operator			
Resource Quantity	2	RQ			
Resource Time	12	Hr Day			
Resource Rate	20	Resource PT	10	Min Item	
Resource Utilization	231.48	%			

Resource PT	10	Min Item
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A0150	all	Machine			
Resource Quantity	1	RQ			
Resource Time	14	Hr Day			
Resource Rate	15	\$ Hr			
Resource Utilization	264.55	%			

Assemble process is a bottleneck because of low OEE and high scrap

A0050	1	Polished Sets			
Inventory	100	Set			
Cumulative Cost	43.67	\$ Item			
Added Cost	0.00	\$ Item			

A0090		#2
Assemble		
1.00		
Cycle Time	7	Min
Qty Per Cycle	1	Item
Capacity	192.00	<u>Item</u> Day
Pre OEE Capacity	240.00	<u>Item</u> Day
OEE Percent	80.00	%
Added Cost	3	<u>\$</u> Set
Cumulative Cost	66.05	<u>\$</u> Item
Stations	2	Stn
Scrap Percent	10	%
OEE Input Percent	80	%

A0100	#2	Cutters			
Inventory	15	Set			
Cumulative Cost	66.05	\$ Item			
Added Cost	0.00	\$ Item			

A0110			#2
Package			
 1.00			
Cycle Time	2	Min	
Qty Per Cycle	1	Item	
Capacity	228.00	Item	Day
Pre OEE Capacity	240.00	Item	Day
OEE Percent	95.00	%	
Added Cost	1	\$	Set
Cumulative Cost	67.05	\$	Item
Activity Time	8	Hr	Day
OEE Input Percent	95	%	

A0120	#2	Boxes			
Inventory	1000	Item			
Cumulative Cost	67.05	\$ Item			
Added Cost	0.00	\$ Item			

