

Workplace Planner Tutorial

Hospital Example from Purdue

Acknowledgement

This tutorial was developed for Purdue University Calumet under the direction of Professor Susan Scachitti, Professor of Industrial Engineering Technology (IET). The project was conducted by Matthew Wirtz, an undergraduate IET student, and focused on process planning and using Proplanner software to analyze lean improvements in a healthcare laboratory.

Traditionally associated with manufacturing environments, the usefulness of Lean technology is today being recognized for its benefits in a variety of organizations that extend beyond manufacturing such as healthcare, retail, and government. Professor Scachitti and other Purdue University Calumet faculty have been utilizing various advanced technology such as the Proplanner software to apply Lean, Six Sigma, and other traditional Industrial Engineering concepts to improve organizations profitability, productivity and quality. We would like to thank David Sly and the Proplanner staff for the opportunity to validate the usefulness of this software in a non-traditional lean environment.

TUTORIAL: Specimen Testing in a Hospital Laboratory

STEP 1: To get started, run AutoCAD and *Open* the file called “HOSPITAL LABORATORY.DWG”. You should be able to see the Proplanner Applications menu on your screen. (See Figure 1) If not, you will need to load this menu using the Menu Installation Guide included in the Install.pdf.



Figure 1

STEP 2: Select the “W” Proplanner icon button, and when the WPP application loads it will present an intro screen similar to that shown below. (See Figure 2) Simply clicking anywhere on this screen will load the main WPP application window.

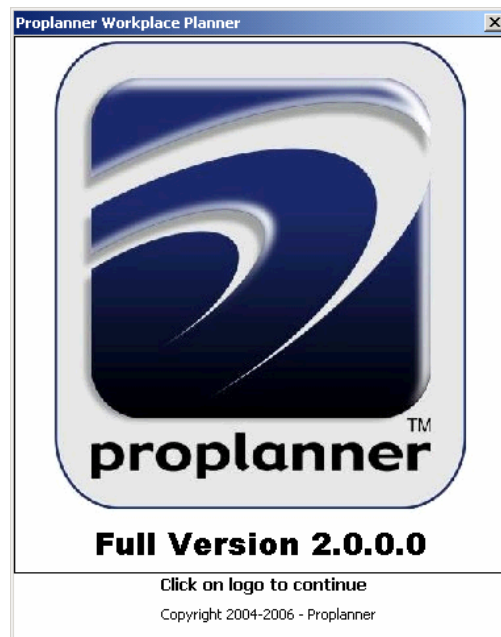


Figure 2

STEP 3: To import an existing workplace routing file, select the **File Open** button from the top right corner of the **Routings** tab screen. (See Figure 3) Then select the “HOSPITAL LABORATORY ROUTING.CSV” file provided with this tutorial.

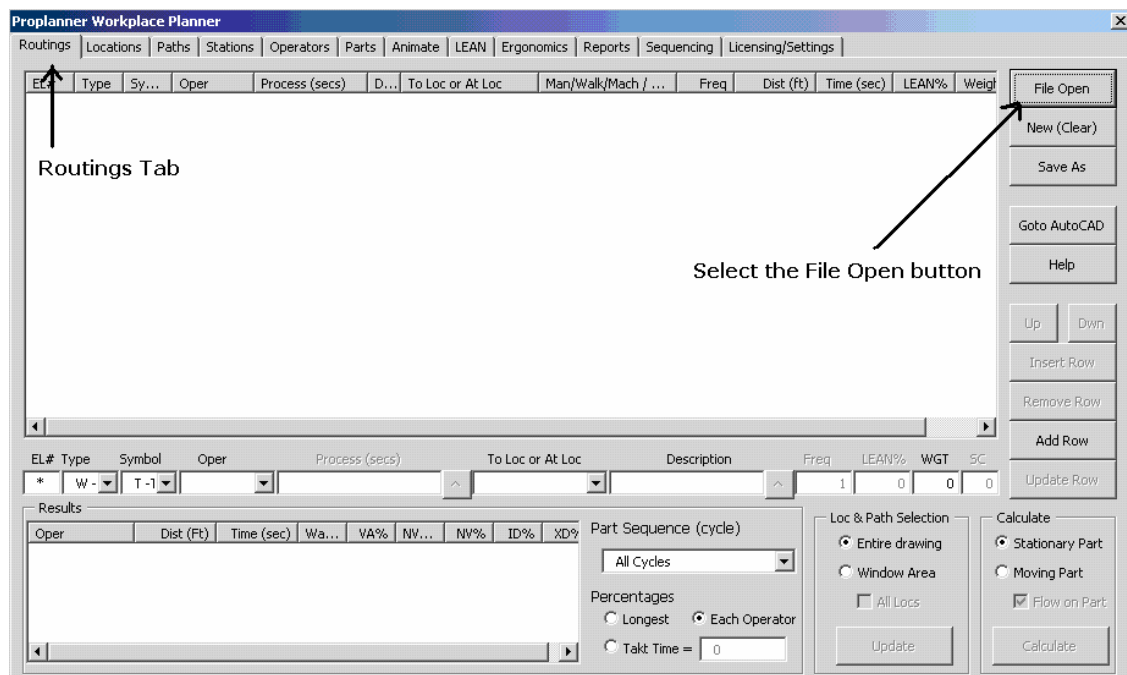


Figure 3

STEP 4: You should now be able to select the **Calculate** button in the bottom right of the screen to analyze the initial workplace layout. The results of this calculation can be seen

in the Distance and Time columns in the right side of the routings window and in the Results Area in the bottom left corner. (See Figure 4) In addition, the flow lines should have been drawn in your layout. After being directed to AutoCAD, select the **Return to Workplace Planner** button. Click on the row for Element 23. Click the **Up** button until the highlighted row becomes Element 14.

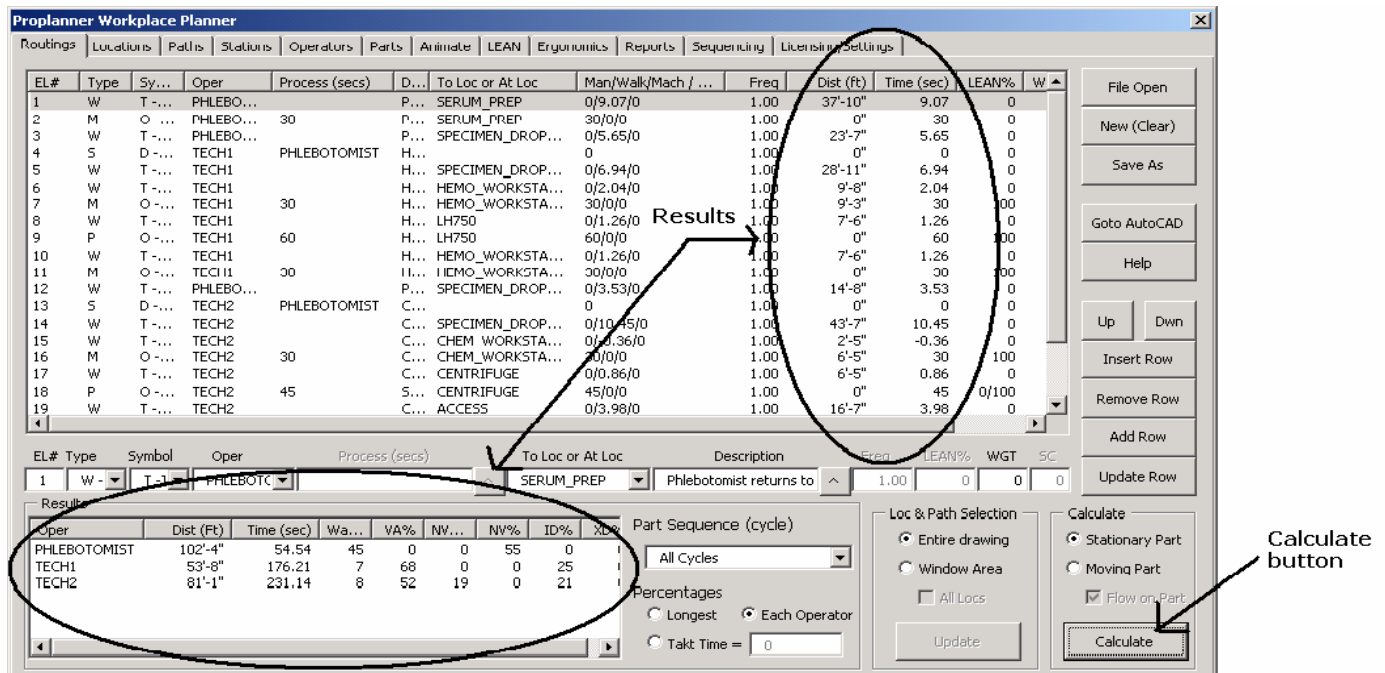


Figure 4

STEP 5: In the **Operators** tab, notice the **Start Location** of TECH1 is in HEMO_WORKSTATION and TECH2 is in CHEM_WORKSTATION. The **Start Location** needs to be changed from the default of START when creating your own routing. You can now select the **Locations** tab to see the location text that Proplanner found on the PP_LOCATIONS layer within the drawing. (See Figure 5) The text has already been added for you, however you could add additional location(s) by selecting the **Add Location** button in the middle right of this screen, under DWG Select, or by going into AutoCAD and simply placing text manually on this layer. Workplace planner will also notify you if a specific location is missing from the drawing but is defined in the routings, and will ask you to locate it in the drawing when the Calculate button is clicked. If you ever need to move a location, highlight the location, click **Erase Location**, and then click Calculate to put the move the location. After the calculation, click on each path from where the old location was and delete them. Recalculate to get updated paths.

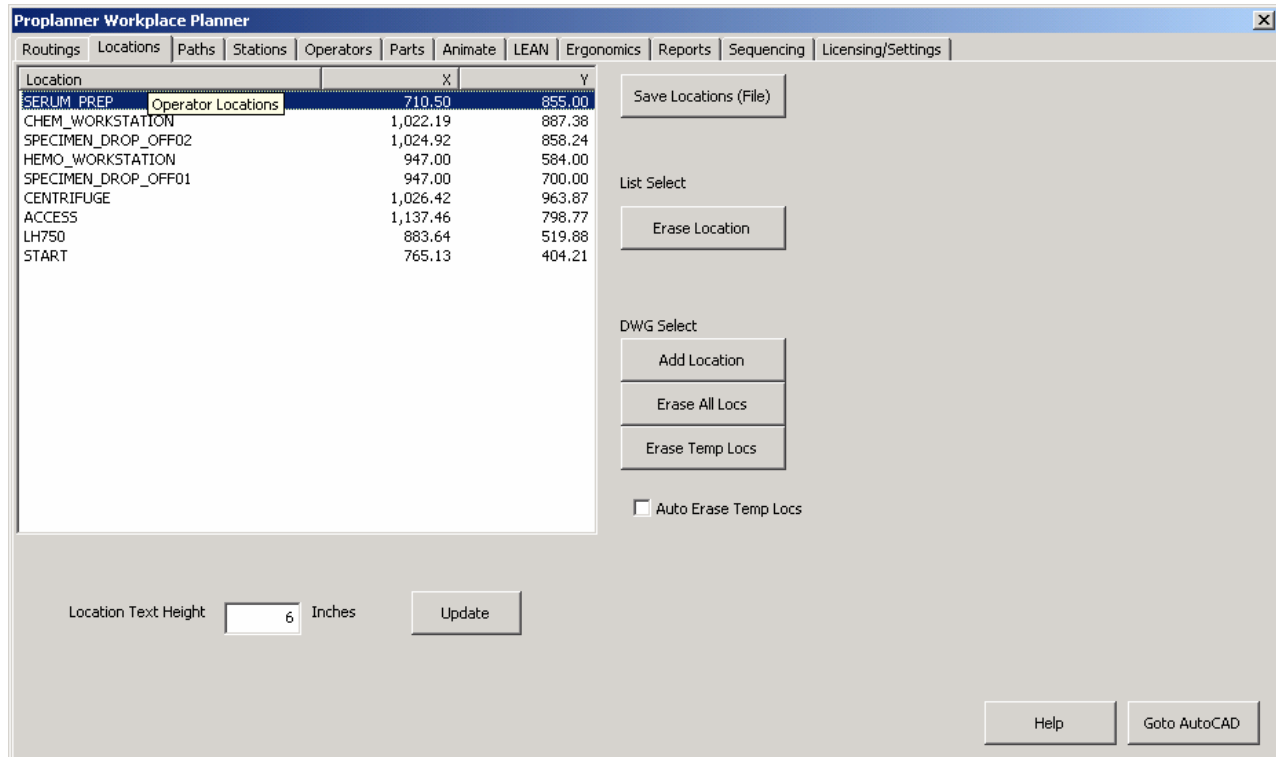


Figure 5

STEP 6: You can now select the *GotoAutoCAD* to see the walk paths that were drawn by Proplanner in the workplace between the locations. Proplanner automatically generates flow paths using Euclidean (point-to-point) lines.

STEP 7: Most of the flow paths currently move through counters and walls. To replace this straight line flow path with one that moves around the counters and walls select the *Edit/Redo Path* button in the *DWG Select* section of the *Paths Tab*. (See Figure 6)

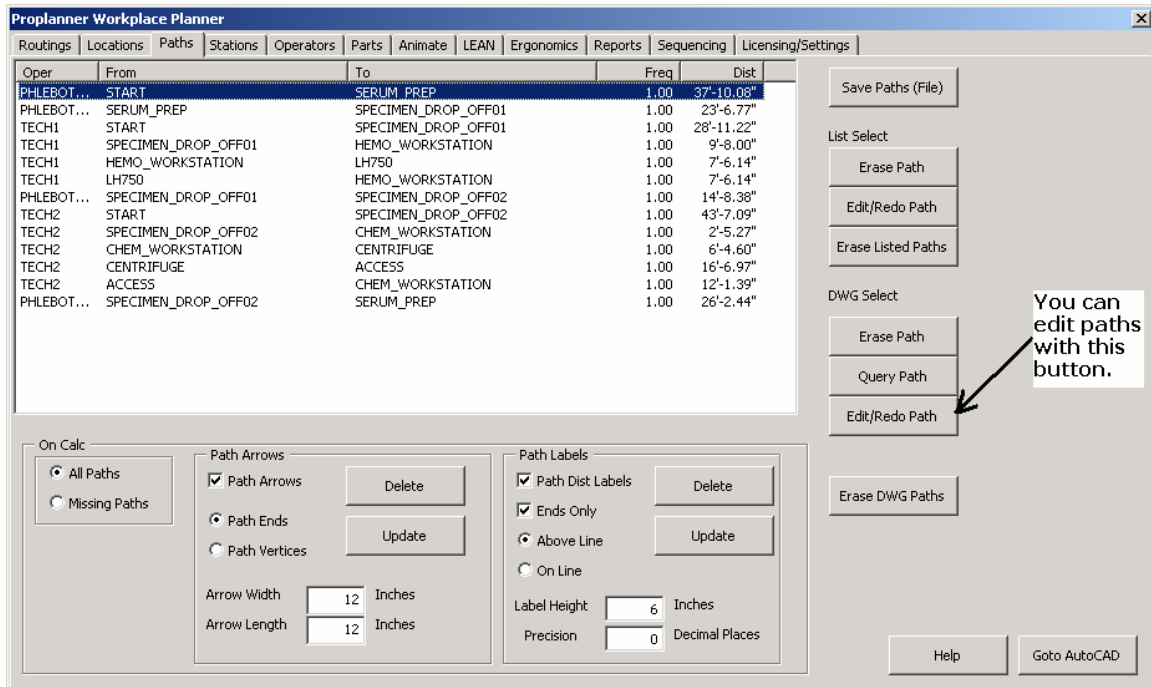


Figure 6

Note: Editing paths can also be done by clicking the **Edit/Upd Path** button found in the Workplace Planner toolbar located in the drawing. When editing multiple paths at a single time, this method seems to be easier.

STEP 8: The WPP window will now disappear and you will be in the AutoCAD application window. AutoCAD is prompting you to select a path to replace with a new manually drawn one. Select the green path that begins at START and ends in SERUM_PREP. (See Figure 7)

STEP 9: The original path will now disappear and you will be prompted to enter a path from START to SERUM_PREP. Simply pick points starting from where the path originated, around the wall, and then finally to SERUM_PREP. (See Figure 8) When you pick your last point at SERUM_PREP you can press **Enter** on the keyboard, or click your right mouse button. A WPP Alert window will show up. Click "OK". You will then either be returned to the Paths tab in the WPP application, or back to the AutoCAD drawing; depending on which method of editing you are using.

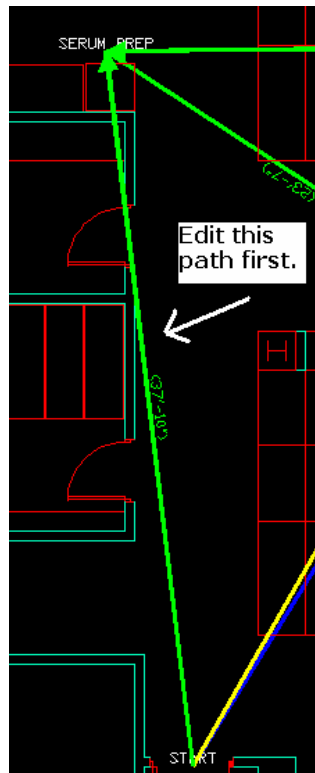


Figure 7

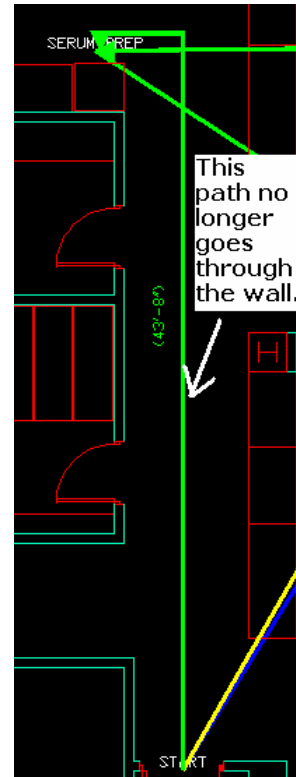


Figure 8

STEP 10: Now edit the remaining three green path lines (the phlebotomist's paths) that travel through counters. The paths manually created should still take the least amount of distance as possible, because workplace planner calculates total distance traveled into the results.

STEP 11: To evaluate the impact of this change. Make sure that the study is set to Stationary Part (right above the calculate button in the bottom right of the routings tab). Select the **Calculate** button. Your new total walk distance and time will be updated, and your paths will be updated. (See Figure 9)

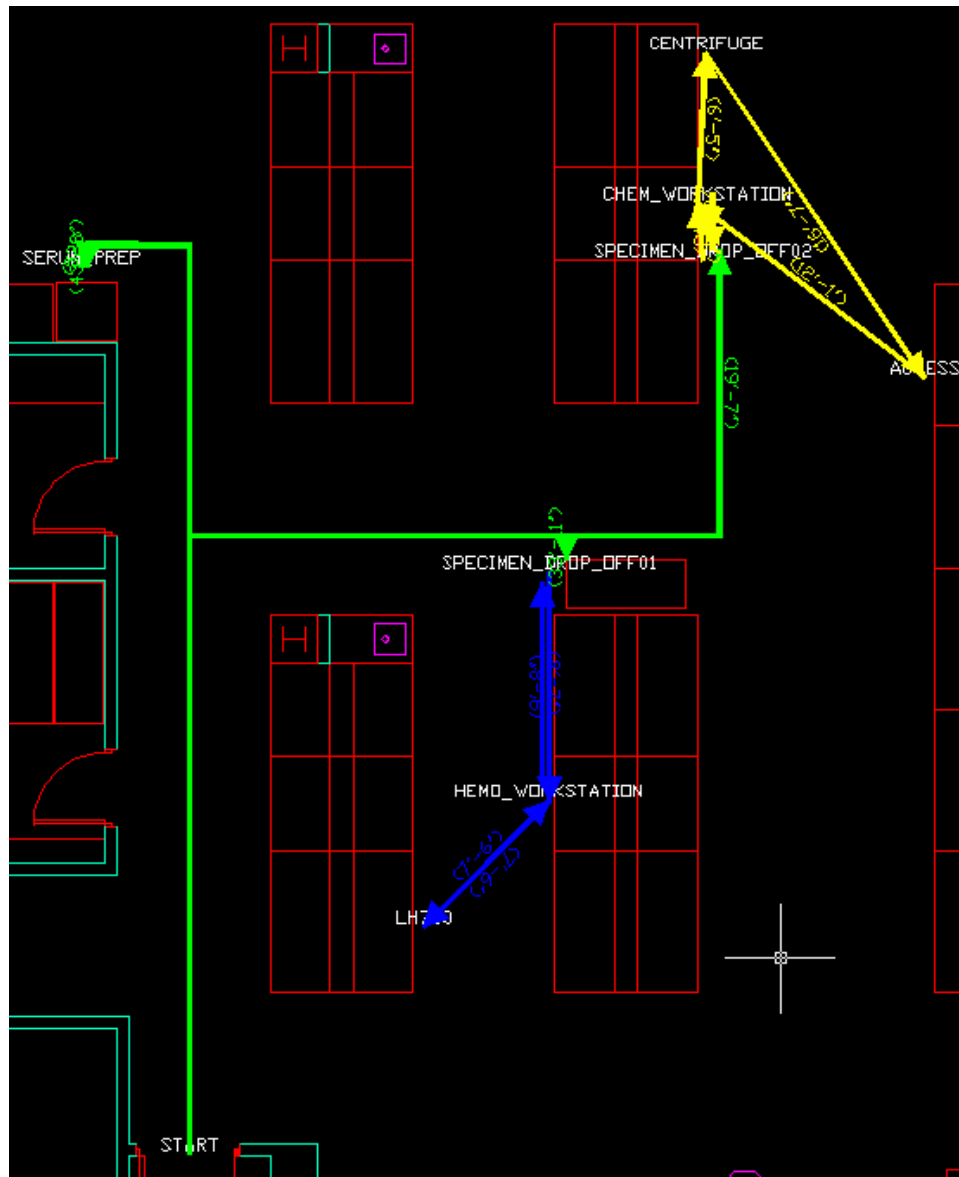


Figure 9

STEP 12: Now select the *Operators* tab again to see the operators in your study. This window is filled when you load, or define, your routings. Every time that you use a unique operator name, it will appear in this window. From this window, you can set the walking speed of your operators, their starting positions, and the color of their flow paths. An ability to set the maximum distance traveled into the previous workstation to work on a moving part has also been included here. (See Figure 10)

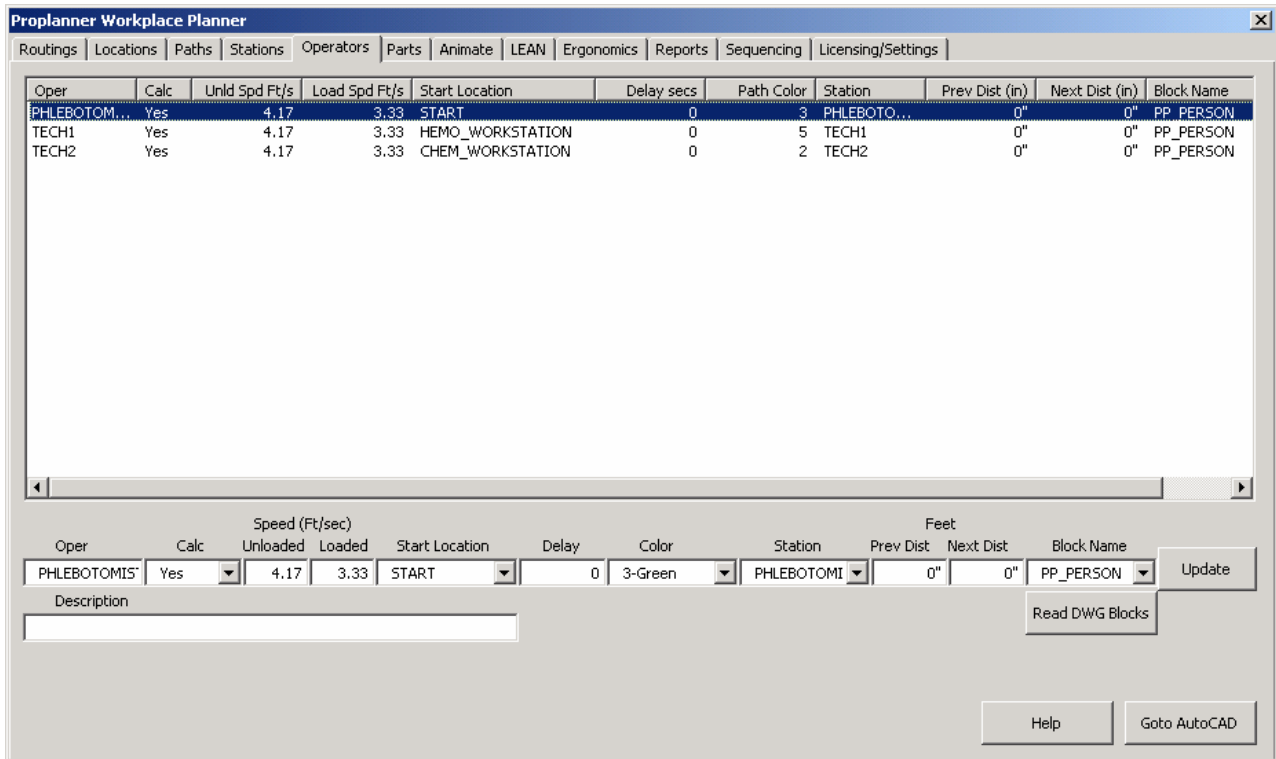


Figure 10

STEP 13: Still in the *Operators* tab, select the Block Name of “PP_PERSON” in the pull-down box. Next, select the *Animate* tab to see the animation options. Change the **Motion Delay** to 0.2. Finally select the *Animate* button in the bottom right corner to watch the operators perform the work in 2D. When the animation finishes, you will see a screen with the total animation time displayed. (See Figure 11)

Note: This time is dependent on your simulation **Move Increment** value specified in the *Animate* tab window and thus may not agree exactly with the final results. Decreasing the **Move Increment** will increase the accuracy of your results and will slow down your animation.

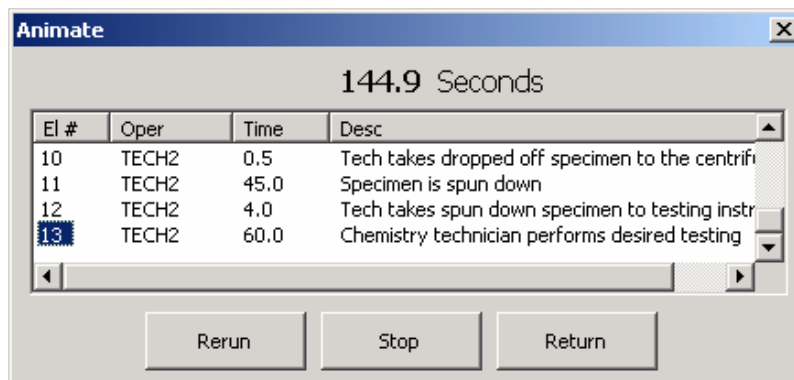


Figure 11

STEP 14: Now you are going to add two new routes to our existing routing. To do this, select the last row in the routing window (Element 23) and press the **Insert Row** button. Now select the new row (Element 24). Change the **Type** to “W – Walk Move,” the **Symbol** to “T – Transport,” (this should be done automatically) enter the location name “FREEZER” in the **To Loc or At Loc** column, and change the **Description** to “Chemistry technician takes specimen to freezer for storage.” Now press the **Update Row** button. Now click on Element 11 and click **Insert Row**, and do the same for Element 12 as you did for Element 24. The **Description** should read, “Hematology technician takes specimen to freezer for storage.” Again, click **Update Row**.

STEP 15: Select the **Calculate** button to re-Calculate the workstation cycle time and paths. Since you added a new location that has not yet been placed in the drawing, the WPP will alert you to this fact. A prompt that reads, “Some Locations are missing, Select OK to add them” will appear. Selecting **OK** on this window will take you into the AutoCAD window and allow you to select the position for the missing location. Now select a position in the drawing for our FREEZER. The FREEZER is the bottom right hand corner of the drawing (See Figure 12)

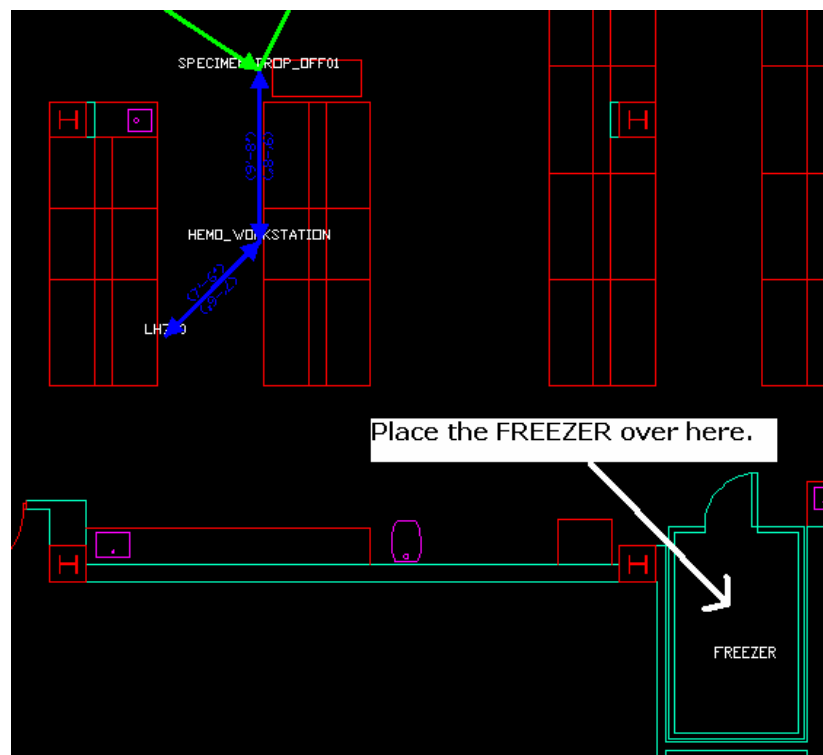


Figure 12

STEP 16: Edit both the new paths to the FREEZER similarly to how you edited the paths in steps 7-9. When you are through editing the paths click the **Return To Workplace Planner** button and click **Calculate** in the **Routings** tab.

STEP 17: The output abilities of the WPP can be seen in the Results window in the bottom left on the ***Routings*** tab, the Lean Chart on the ***LEAN*** tab, and the reports created on the ***Reports*** tab.

The Lean Chart is automatically created for our example. (See Figure 13)

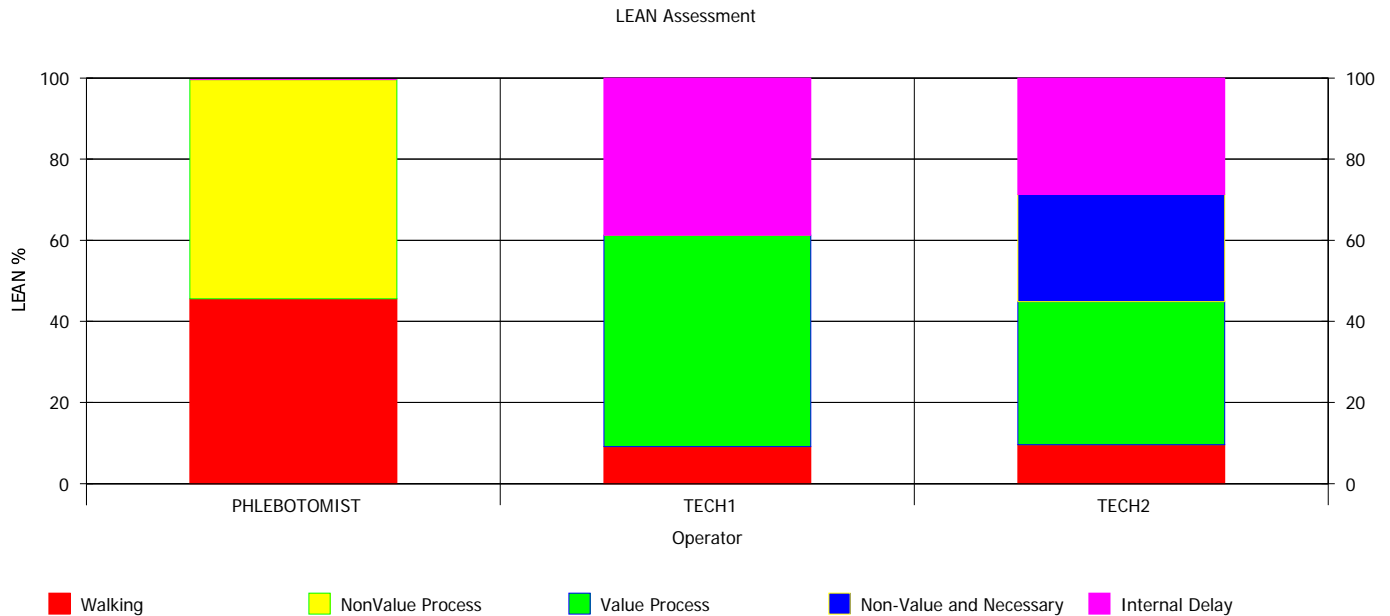


Figure 13

The Station Report can be created on the ***Reports*** tab by selecting Get Image; setting your stations TAKT time, in this scenario the TAKT time has been set to 167.5 seconds; and clicking ***Show Report***. Workplace will generate a Station Report, which breaks down the process into an actual process chart. (See Figure 14) The Station Report output can be exported directly to Excel, saved, or printed.

OPERATOR: TECH1									
SYMBOL	STEP	LOCATION	DESCRIPTION ELEMENT/ACTIVITY	FREQUENCY	DISTANCE FEET	PROCESS SECONDS	WALK SECONDS	DELAY SECONDS	TOTAL SECONDS
○⇨□□▽	4	HEMO_WORKSTATION	Internal Delay	1				44.7	44.7
○⇨□□▽	5	SPECIMEN_DROP_OFF01	Hematology tech picks up dropped off specimen	1	9.67		2.04		2.04
○⇨□□▽	6	HEMO_WORKSTATION	Hematology tech takes specimen to computer	1	9.67		2.04		2.04
●⇨□□▽	7	HEMO_WORKSTATION	Hematology tech puts in the computer that the specimen was received	1		30			30
○⇨□□▽	8	LH750	Hematology tech walks specimen over to testing instrument	1	7.51		1.26		1.26
●⇨□□▽	9	LH750	Hematology tech performs desired testing	1		60			60
○⇨□□▽	10	HEMO_WORKSTATION	Hematology tech walks back to the computer	1	7.51		1.26		1.26
●⇨□□▽	11	HEMO_WORKSTATION	Hematology tech verifies the results in the computer	1		30			30
○⇨□□▽	12	FREEZER	Hematology tech takes specimen to freezer for storage	1	36.07		8.65		8.65
					70.43	120	15.25	44.7	179.95

Figure 14

Congratulations!! You have now completed the tutorial on using the Proplanner Workplace Planner for stationary parts specifically designed for a hospital laboratory.