MCMASTER UNIVERSITY

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PORTER SIMULATION

User Manual Revision 1

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1 Introduction

Welcome to the User Manual for the Hamilton Health Science's Porter Simulation, designed for use at the Juravinski Hospital in Hamilton Ontario. This manual will guide a Hamilton Health Science professional through the functions and features available when using the simulation software. In addition, this manual will provide you steps for software setup, an overview of the configuration settings (user interface) and provide troubleshooting options should any issues arise.

2 Installation

Setup of the Porter Simulation is quick and easy, by following these steps the software will be accessible for use. This software is designed to be installed on Windows XP/Vista/7/8.

1. Locate the Porter Simulation folder on your computer. This folder will be located on a USB removable device, CD or through an email download.
2. Inside the folder, double click to run the Porter Simulation-0.1-win32.msi
3. Pick a directory to install the application. Default directory will be automatically filled in
4. Wait for the installer to finish then click "Finish"
5. The Porter Simulation shortcut will now appear on your desktop where it can be accessed

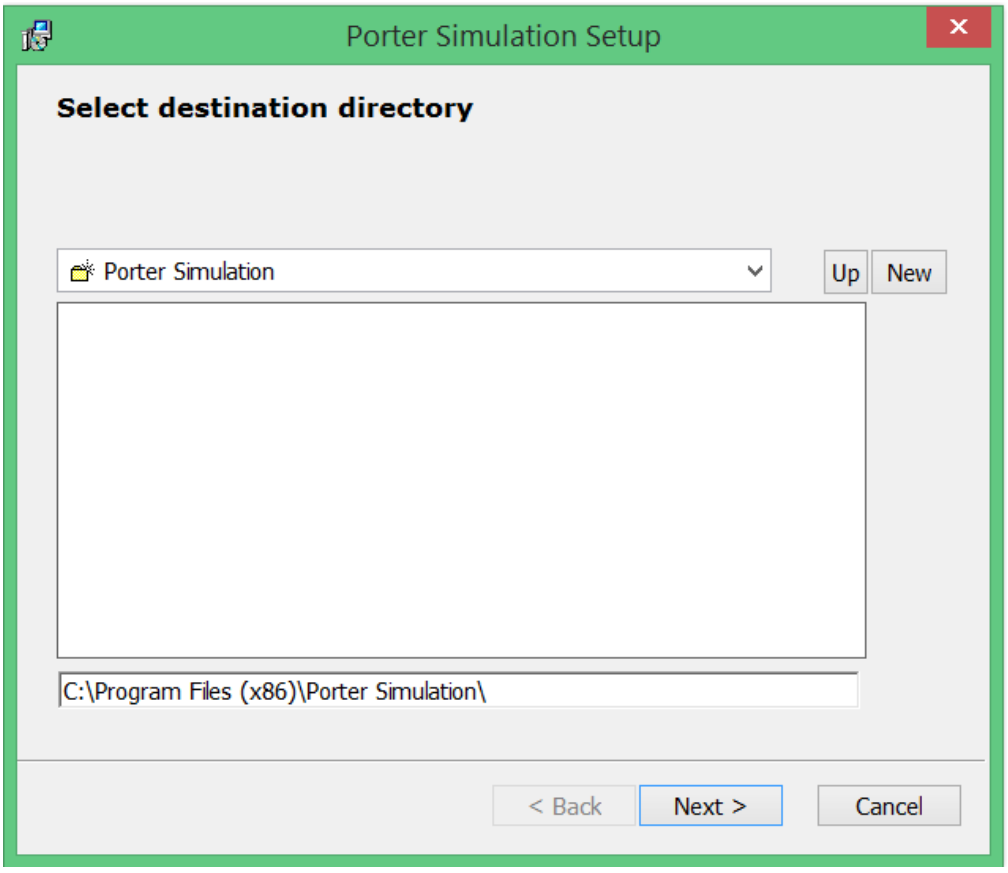

Figure 2.1: Pick a directory

3 Input Configuration

The first step in using the software is to configure the simulation with a series of different inputs. These different input variables represent changes to the hospital environment, which will affect the simulated results.

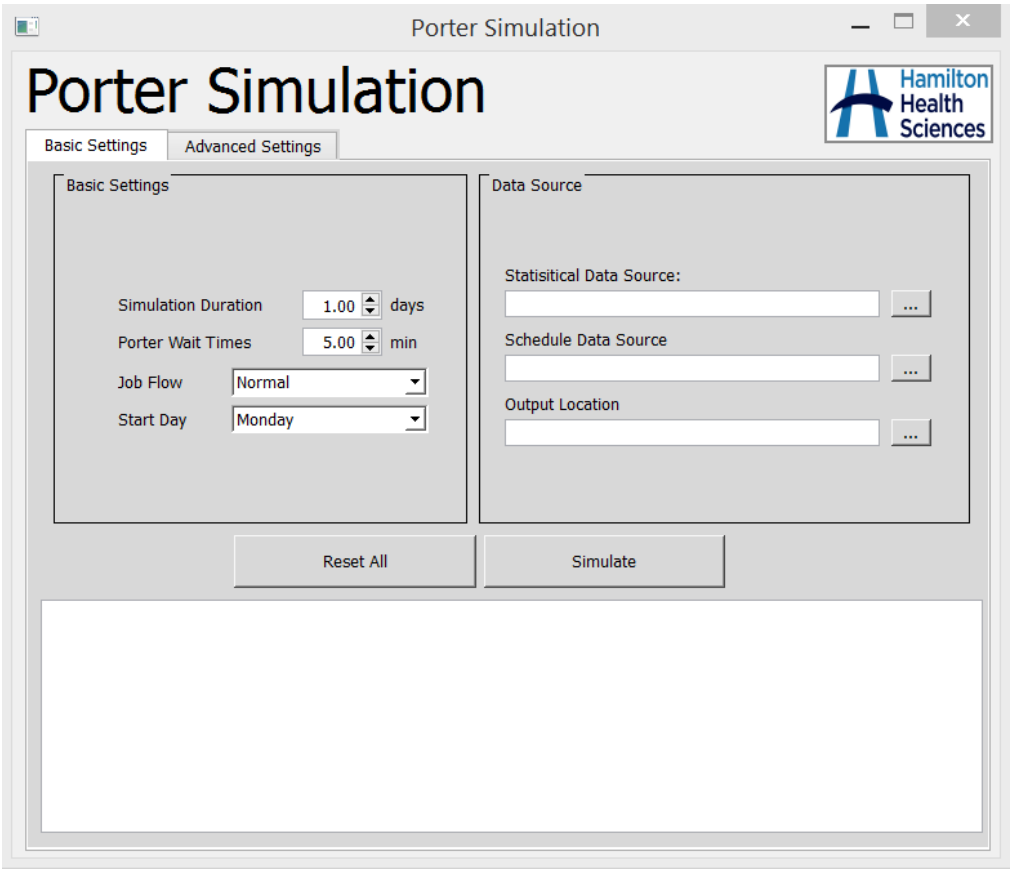

Figure 3.1: Basic Settings

3.1 Basic Settings - General

These general settings define base values for the simulation.

(i) **Simulation Duration:** Number of days the software will simulate events. Minimum: 1 Maximum: 7

(ii) **Porter Wait Times:** Maximum number of minutes a porter waits for a delay (patient, equipment, nurse) before cancelling the job

(iii) **Job Flow:** The rate of event generation during the course of the simulation. Higher flow cause more jobs to appear in a time frame depending on the statistical data

(iv) **Start Day:** Define the first day the simulation generates events from. For example; specifying Tuesday means day 1 events will only come from Tuesdays of the statistical data source, day 2 events will come from Wednesday

3.2 Basic Settings - Data Source

The Data Source setting allows selection of different source input files, pre-configured to aid HHS users in testing a variety of hospital conditions and elements.

(i) **Statistical Data Source:** Determines which source file will be used to provide the simulation with statistical distribution information

(ii) **Schedule Data Source:** Determines which source file will be used to provide scheduling information to be used during simulation

(iii) **Output Location:** Determines the Location to store output data

3.3 Advanced Settings - Dispatcher

The dispatcher will be ordering the pending jobs and giving them to available porters. These settings reflect the current dispatcher system at Jurvinski Hospital.

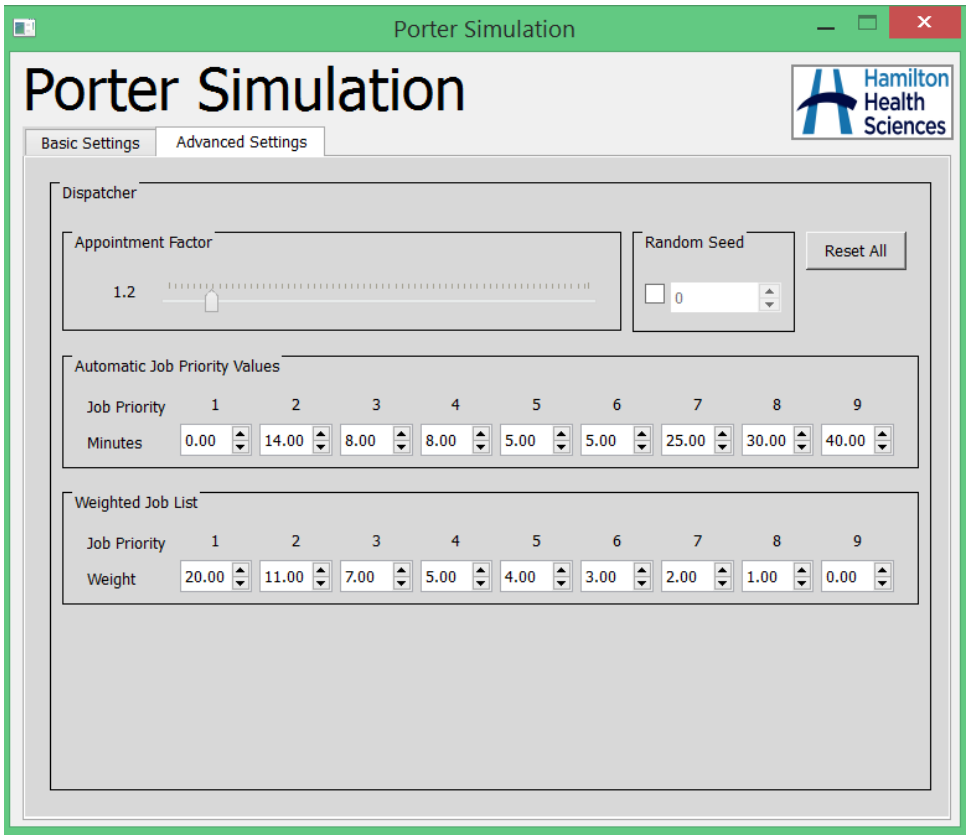

Figure 3.2: Advanced Settings

(i) **Appointment Factor:** Jobs that are scheduled in advanced need to be given priority over jobs generated on-demand. Increasing the appointment factor will decrease the time scheduled jobs spend waiting for a porter.

(ii) **Automatic Job Priority Values:** Jobs waiting for a porter need to increase their priority after waiting for a specified amount of time. The "Minutes" will determine how long a job waits until it increases in priority.

(iii) **Weighted Job List:** Jobs of different priorities need to have different weights. This weight helps determine how quickly the job should be assigned to a porter.

(iv) **Random Seed:** Gives the user the ability to specify a random seed variable. Specific seeds will give unique output data linked to that seed. Setting this value to 0 will make the simulation choose a random seed during runtime

3.4 Porter Schedule

Porters need to be scheduled by shifts in order to give the users flexibility over the simulation. This will allow the user full control over the amount of porters available over the course of a simulation.

	A	B	C	D	E
1	Shift ID	StartTime	EndTime	Porter Ids	Day
2	0	8:00 AM	1:00 PM	0,1,4	0
3	1	4:00 AM	1:00 PM	2,4,7	4,6,7
4	3	10:00 AM	6:00 PM	9,2,7	2
5	4	8:00 AM	1:00 PM	0,1,5	1
6	5	4:00 AM	1:00 PM	2,4,8	4,6,8
7	6	10:00 AM	6:00 PM	9,2,8	3
8	7	8:00 AM	1:00 PM	0,1,6	2
9	8	4:00 AM	1:00 PM	2,4,9	4,6,9
10	9	10:00 AM	6:00 PM	9,2,9	4
11	10	8:00 AM	1:00 PM	0,1,5	3
12					

Figure 3.3: Porter Schedule

(i) **Shift ID:** An identifier for a shift. The Shift ID will allow for easier traceability of shifts in the output data.

(ii) **StartTime:** A shift will begin at this time in the simulation.

(iii) **EndTime:** A shift will end at this time in the simulation.

(iv) **Porters Ids:** Allows for the assignment of one or more porter(s) to a shift. A porter is assigned to a shift by adding an identifier. Multiple porters can be assigned to the same shift by adding multiple identifiers each separated by a comma. In the Figure 3.3 *Shift ID 0* has three porters assigned to it *0,1,4*.

(v) **Day:** The day of the week on which the shift occurs. It must be a number from 1-7, 1 being day 1 as specified by Start Day and 7 being day 7.

4 Dashboard

Once the simulation has finished modeling and computing the data, the results of all of the completed jobs are exported to an excel file. The file is located at the directory specified in **Output Location**. Upon opening the file please enable macros as specified by your version of Microsoft Excel. Once macros have been enabled click the "Recalculate" button from any of the

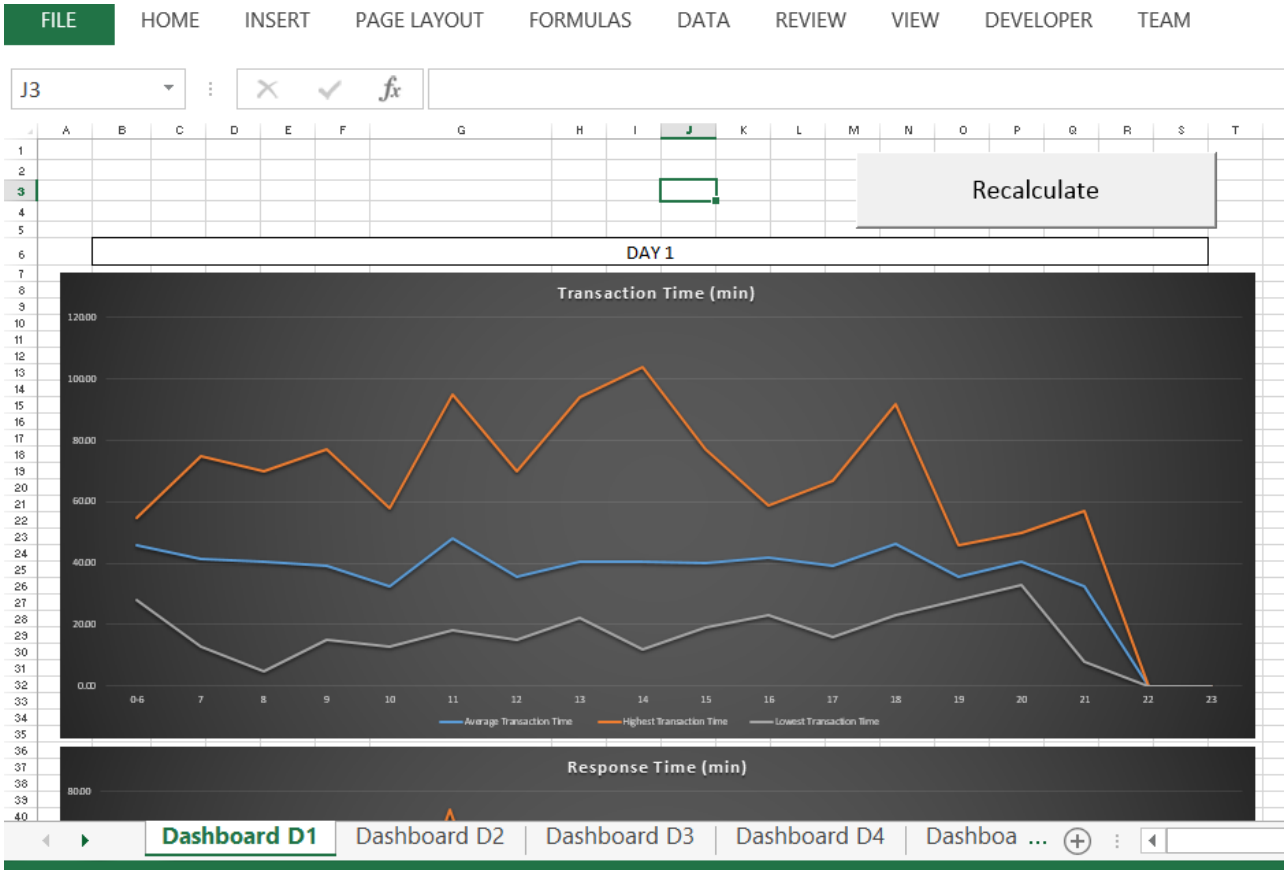

Figure 4.1: Dashboard

Day views to calculate the statistics and update all the graphs. Each tab represents data for one day of simulation broken up into 18 time intervals.

(i) **Transaction Time:** Represents the transaction time for a job created in a specific time interval. Transaction time is defined as the time from when a job has been created to when a job has been complete. Chart contains High, Low and Average values.

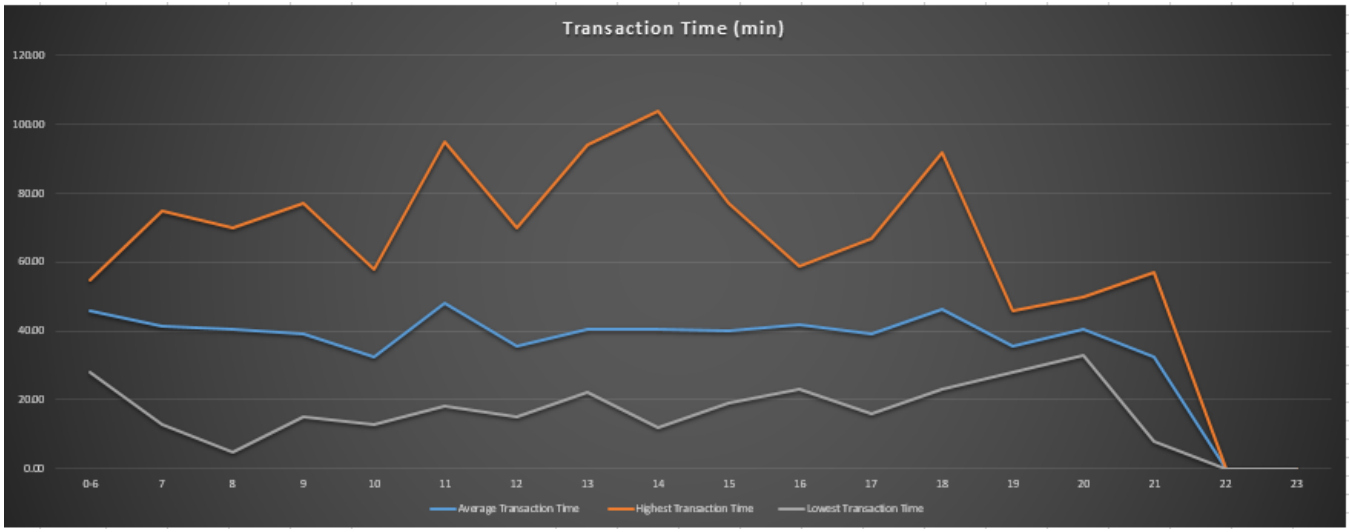

Figure 4.2: Transaction Time

(ii) **Response Time:** Represents the response time for a job created in a specific time interval. Response time is defined as the time from when a job has been created to when a job has been taken on by a porter. Chart contains High, Low and Average values.

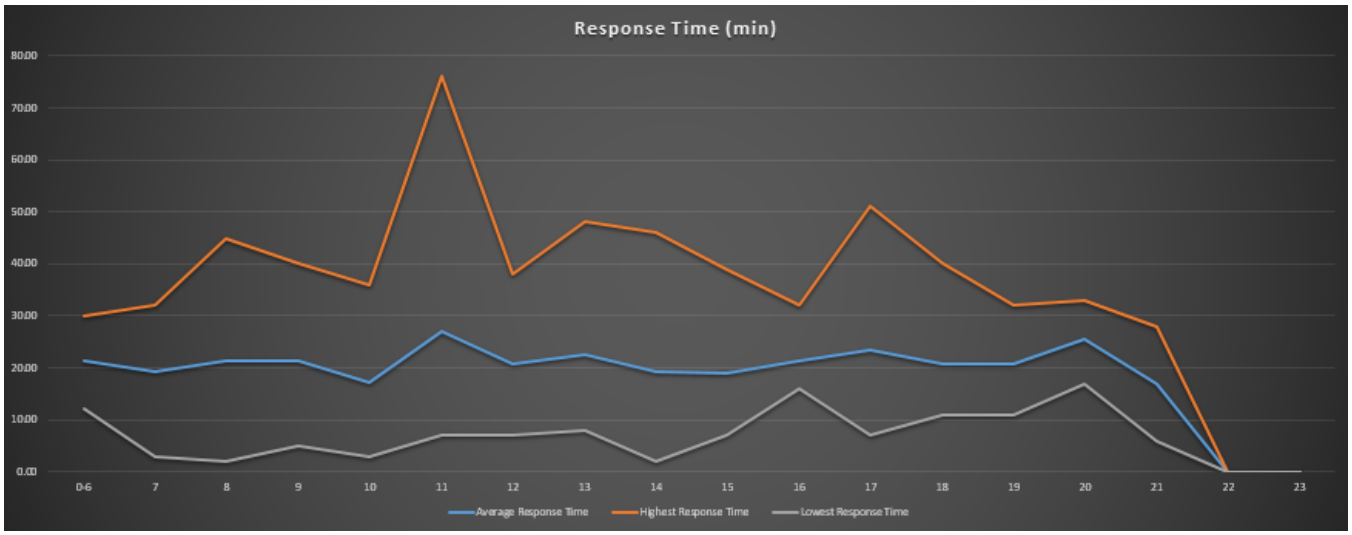

Figure 4.3: Response Time

(iii) **In Progress Time:** Represents the in progress time for a job created in a specific time interval. In progress time is

defined as the time from when a job has been taken on by a porter to when a job has been complete. Chart contains High, Low and Average values.

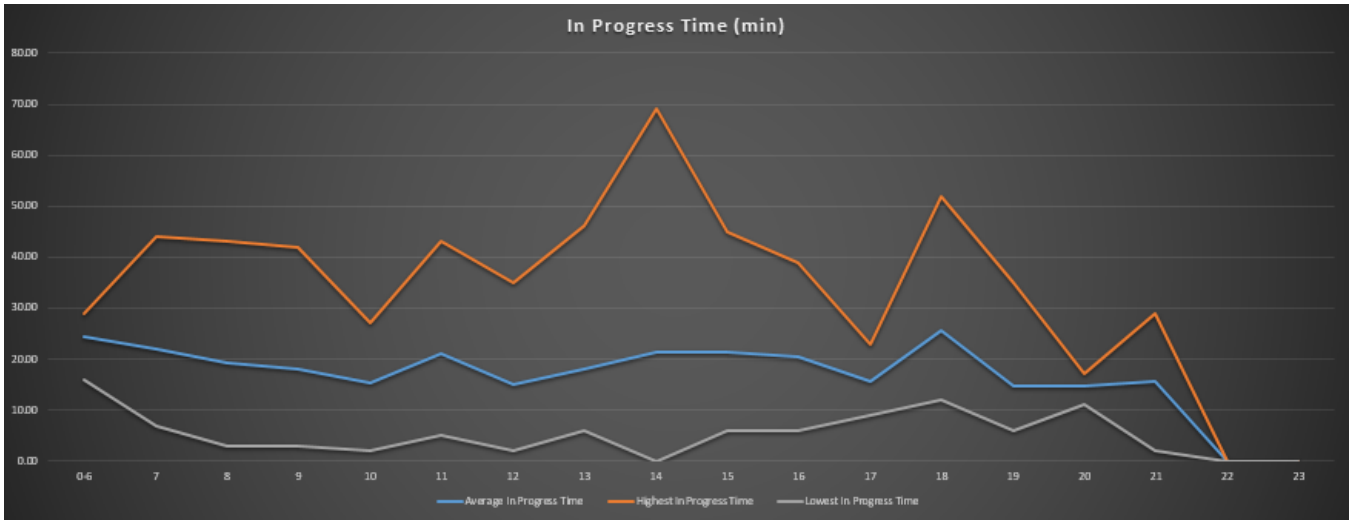

Figure 4.4: In Progress Time

(iv) **Total Number of Jobs Complete:** Represents the number of jobs completed in a specific time interval.

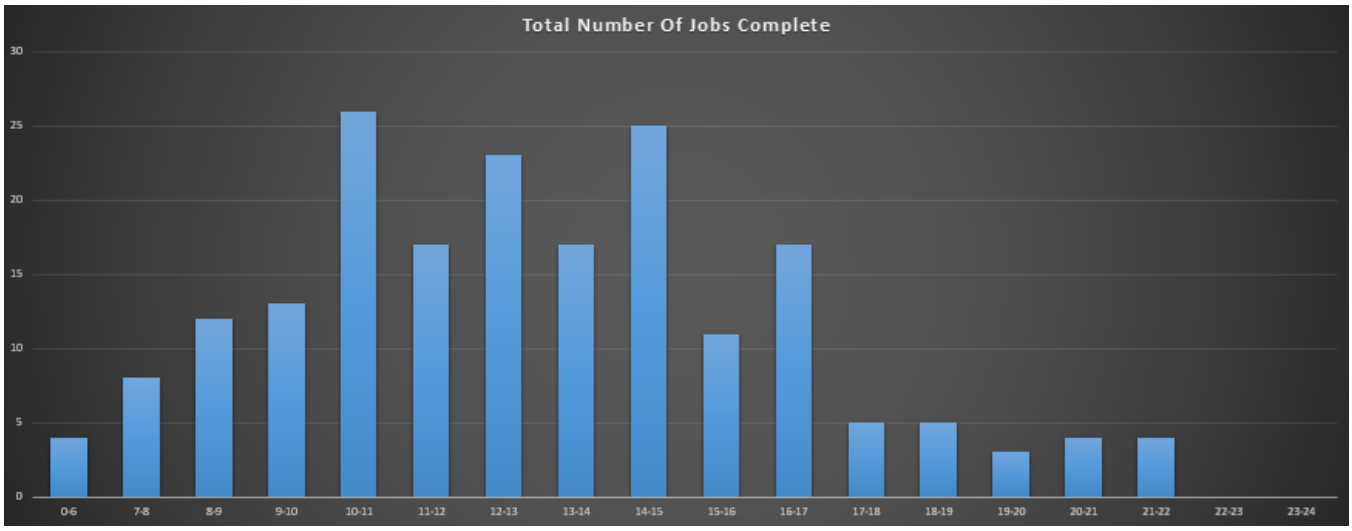

Figure 4.5: Total Number of Jobs Complete

(v) **Average Transaction Time vs. Jobs Complete vs. Pending Jobs:** Pending Jobs represent any jobs that are still active at the end of each time interval. Number of Complete Jobs and Average Transaction Times are overlaid here.

(vi) **Cumulative Cancelled Jobs:** Represents the total number of cancelled jobs for at the end of each time interval

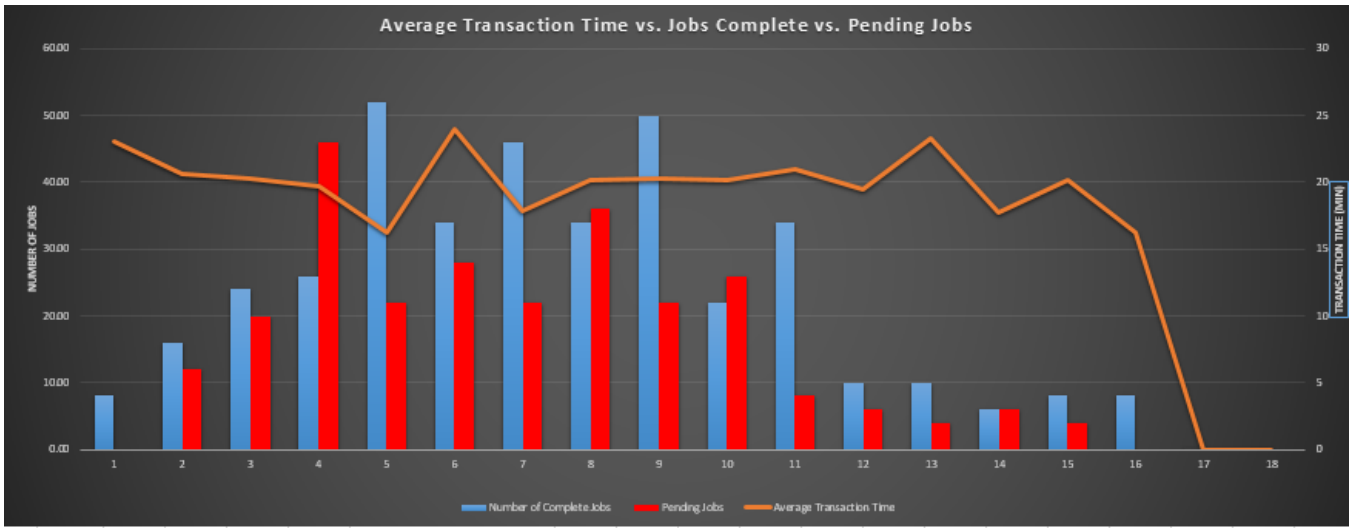

Figure 4.6: Combination Chart

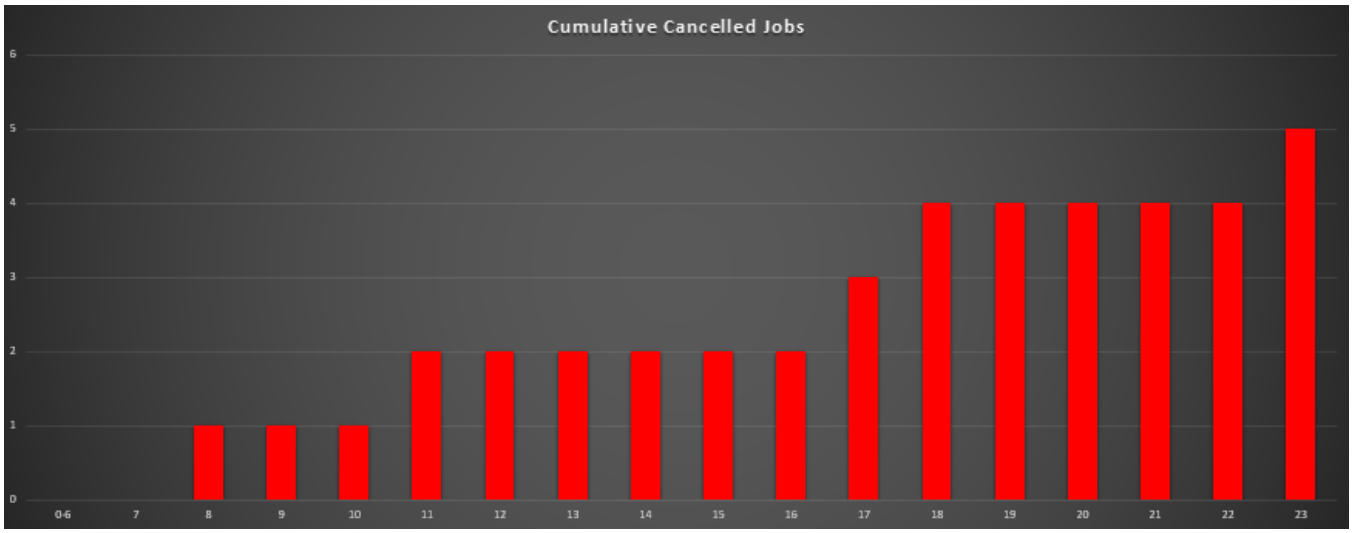

Figure 4.7: Cumulative Cancelled Jobs

5 TROUBLESHOOTING

The Porter Simulation has been designed to operate effectively and error free, however, this troubleshooting section will help address any minor issues that may arise.

(i) **Missing Files and Locations:** Failing to specify the correct locations of required files will result in program halts

(ii) **Incorrect Schedule Data:** In the event of incorrect schedule input, the program will halt and alert you with the location of the error

(iii) **Simulation Stops:** In the event that the simulation is running and suddenly halts before producing output data, it will be necessary to close the simulation manually by clicking the X in the top right corner of the window. If the simulation continues to malfunction, please contact the development team.

6 FIGURES AND TABLES APPENDIX

(a) Figure 2.1: Installer.png

(b) Figure 3.1: BasicSettings.png

(c) Figure 3.2: AdvancedSettings.png

(d) Figure 3.3: Schedule.png

7 LEGAL AND COPYRIGHT INFORMATION

8 CONTACT INFORMATION

The Development team can be contacted for praise or support at PorterSimulationPros@Gmail.com.