



Scenario Guide

Point of Dispensing Simulation Program for Leveraging and Evaluating Resources (POD SimPLER) helps public health emergency planners understand their current capacity, forecast potential bottlenecks, and estimate additional resource needs when planning for operating Points of Dispensing (PODs) during response to an emergency or planned event.

This interactive tool can also be used as a training tool for locations that are beginning to draft POD plans and those who have not conducted full-scale POD exercises.

Disclaimer

These instructions and the corresponding software, POD SimPLER (Point of Dispensing Simulation Program for Leveraging and Evaluating Resources), are based on information obtained from real exercises and calculational models. Reasonable efforts have been made to present accurate and reliable information. The user, however, assumes responsibility for the consequences of using this information. Neither the Centers for Disease Control and Prevention, nor any of their employees, make any warranty, express or implied, or assume any legal responsibility for the accuracy or completeness of the information and instructions contained on this website and in the POD SimPLER software. Use of specific trade names and commercial sources does not constitute an endorsement by the authors or by the Centers for Disease Control and Prevention.

Contents

Scenario 1	4
Topics Covered	4
Narrative.....	4
Given Inputs for Input Screen:.....	4
Summary Output Screen	9
Hourly Output Screen.....	11
Suggested Actions	11
Scenario 2	12
Topics Covered:	12
Narrative.....	12
Given Inputs for Input Screen:.....	13
Summary Output Screen	15
Hourly Output Screen.....	17
Suggested Actions	18
Scenario 3	25
Topics Covered:	25
Narrative.....	25
Given Inputs for Input Screen:.....	25
Summary Output Screen	26
Suggested Actions	26
Summary.....	33

Scenario Walk Throughs

To assist new users in understanding the features and functions of POD SimPLER, this document provides three step-by-step walk-through scenarios. If you need assistance running specific scenarios contact simpler@cdc.gov.

Scenario 1

This first scenario will start with basic inputs for POD SimPLER based on a potentially high casualty public health emergency. We will be using all stations in the selected POD Station Setup.

Topics Covered

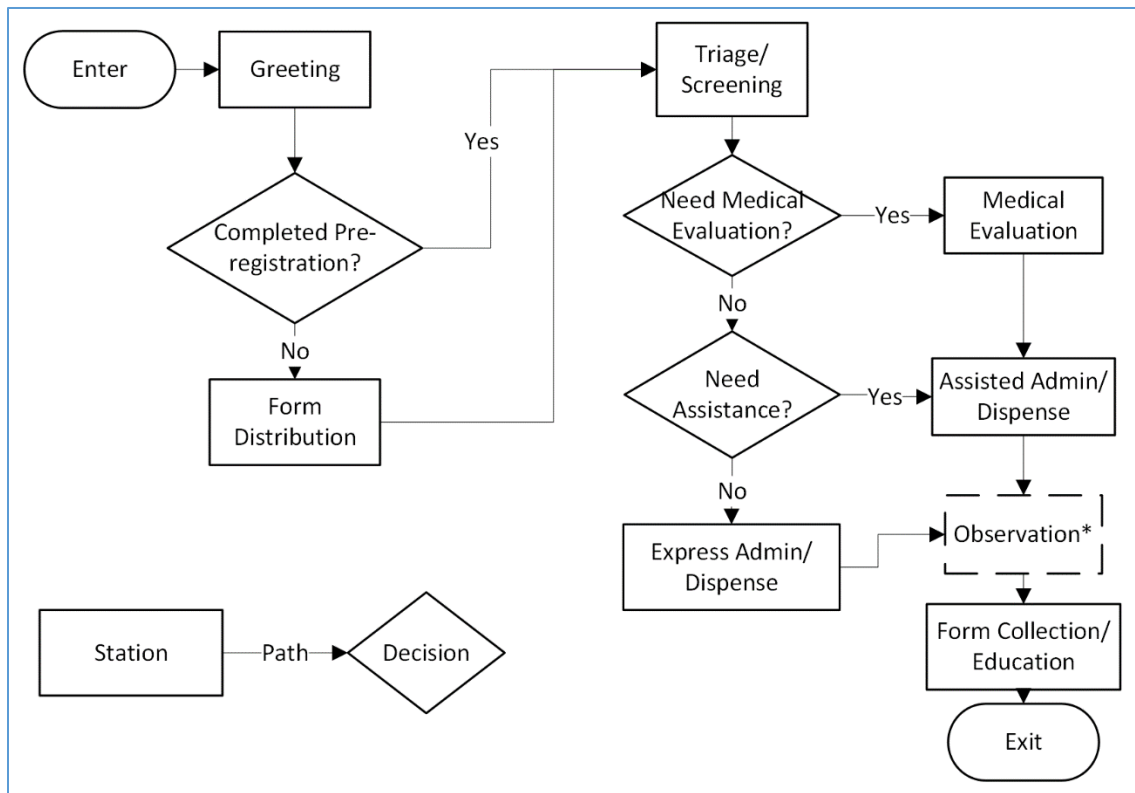
- Basic tool functionality
- Multiple POD sites

Narrative

A hospital located in a city on the eastern seaboard receives several persons with an unknown illness. Doctors suspect each patient is suffering from the same highly infectious disease based on presenting signs and symptoms. City public health authorities alert public health officials at the state and federal level; experts confirm that the illness is due to infection from Virus A. National security agencies, working together with federal, state, and local health officials, determine the disease is the result of an intentional release of Virus A. You have just received a phone call from the state emergency operations center (EOC) and are tasked with setting up and operating PODs to administer vaccines to 12,000 people potentially exposed in your jurisdiction, within 48 hours. That means on average processing 6,000 people per day.

Given Inputs for Input Screen:

Your current POD plan looks most like the POD Station Setup #2 (shown below) and will operate as a walk-in POD, administering the vaccine for Virus A. The staff will help the incoming population fill out their information at registration. Since this is not a routine vaccination and you believe people might have questions about the vaccine, you will have a 5-minute briefing video that groups of 25 individuals will watch before receiving the vaccine. Individuals will need to be screened to determine the need for medical services, so you will assign staff members to sort the population to appropriate vaccine administration stations. You plan to have an observation area with chairs where those who have received the vaccine will wait for approximately 15 to 30 minutes, depending on their likelihood for an adverse reaction. Following this waiting period, individuals will be asked to sign up for a symptom-monitoring text service and to receive additional educational materials.



Select information about your POD:

POD Station Setup

Service Method

Medication Delivery Method

You decide that you will operate four POD sites, each of which will process 1,500 people in 12 hours each day. Each POD will operate with the same staffing and setup. You don't feel you have time to create an online form for people to fill out prior to arriving at the PODs, so you decide that none of your arrivals will pre-register, meaning that they will all have to register on site at the POD. Based on data available to you about your community, you estimate that 25% of the arriving population will need assistance based on some type of access and/or functional needs. Ten percent will require some degree of medical evaluation before receiving the vaccine. You are unsure of the rate that people will arrive and since you are not offering appointments you assume that people will arrive at an even arrival rate.

Select information about the population arriving at your POD: ?

Estimated arriving population

1500 ✓

% Pre-Registered

0 ✓

% Needing Assistance

25 ✓

% Needing Medical Evaluation

10 ✓

Arrival Distribution

uniform

You plan on administering shots for 12 hours each day and setting your hours of operation to be 7 a.m. to 7 p.m. (12 hours).

Select the time your POD will be open each day: ?

Hours of Operation (per day)

12 ✓

For the first day of your POD operations, you will assume that one staff member will service each lane, except for the briefing session and Observation Area, where one staff member will be assigned to monitor up to 25 and 30 people respectively. Your POD will have two greeting lanes, 12 lanes for on-site registration services, briefing sessions for groups of 25 people at a time, five lanes for triage/screening, one lane for your Medical Evaluation Station, five lanes at both Express and Assisted Administration stations, 50 seats in the Observation Area, and three lanes for education where each lane will have a table where individuals will sign up for symptom-monitoring and to receive additional information.

Select the number of stations in your POD site:

Add a zero to eliminate a station from your POD Station Setup.



Assign Staff
per Lane

		Minimum Staff
Greeting	2 ▾	2
Form Distribution/Registration	12 ▾	12
Briefing	25 ▾	1
Triage/Screening	5 ▾	5
Medical Evaluation	1 ▾	1
Express Administration	5 ▾	5
Assisted Administration	5 ▾	5
Observation Area	50 ▾	2
Form Collection/Education	3 ▾	3
Total		36

After completing the information about your POD on the input page, you will be able to assess if you can administer vaccines to the throughput target of 1,500 people per day, given the selections below.

Select information about your POD:

POD Station Setup ?
Service Method
Medication Delivery Method

Select information about the population arriving at your POD:

Estimated arriving population ?
% Pre-Registered ▼
% Needing Assistance ▼
% Needing Medical Evaluation ▼
Arrival Distribution

Select the time your POD will be open each day:

Hours of Operation (per day) ▼ ?

Select the number of stations in your POD site:

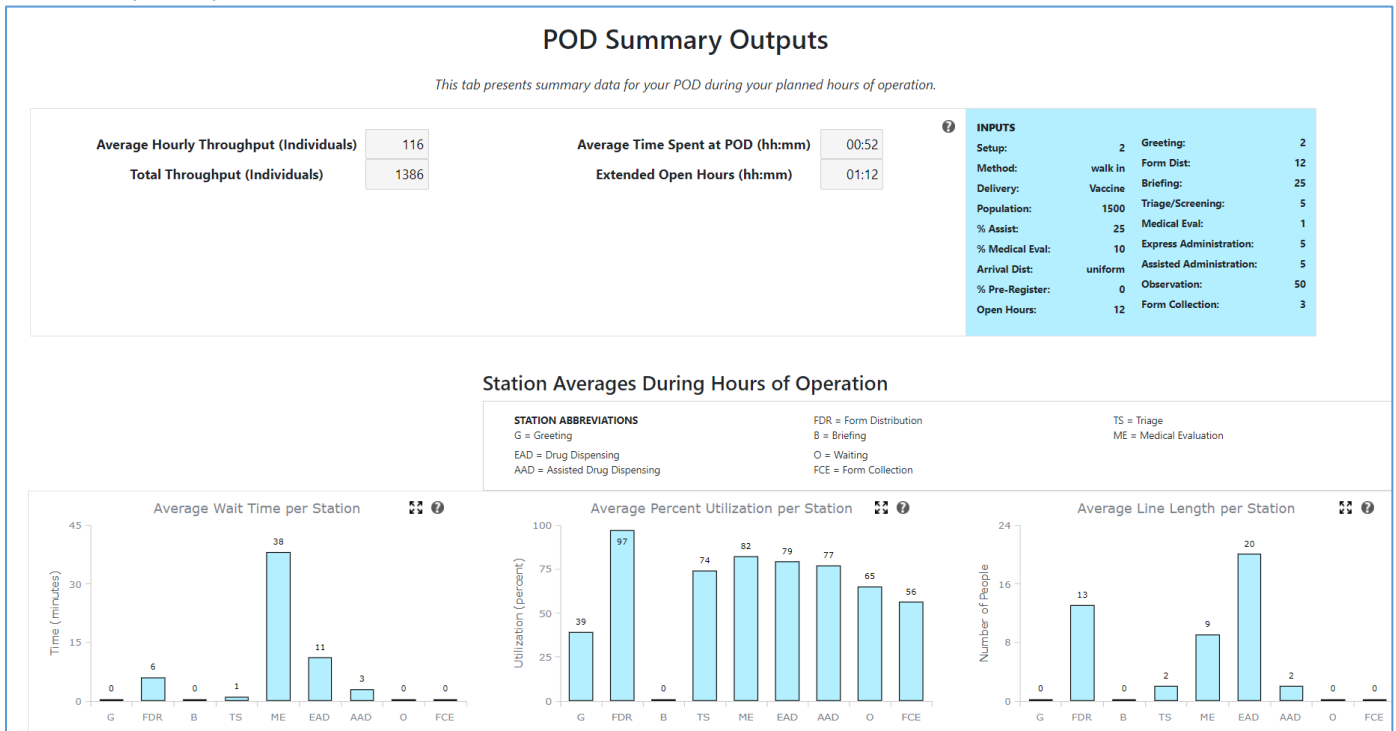
Add a zero to eliminate a station from your POD Station Setup.

Assign Staff per Lane ?

		Minimum Staff
Greeting	<input type="text" value="2"/> ▼	<input type="text" value="2"/>
Form Distribution/Registration	<input type="text" value="12"/> ▼	<input type="text" value="12"/>
Briefing	<input type="text" value="25"/> ▼	<input type="text" value="1"/>
Triage/Screening	<input type="text" value="5"/> ▼	<input type="text" value="5"/>
Medical Evaluation	<input type="text" value="1"/> ▼	<input type="text" value="1"/>
Express Administration	<input type="text" value="5"/> ▼	<input type="text" value="5"/>
Assisted Administration	<input type="text" value="5"/> ▼	<input type="text" value="5"/>
Observation Area	<input type="text" value="50"/> ▼	<input type="text" value="2"/>
Form Collection/Education	<input type="text" value="3"/> ▼	<input type="text" value="3"/>
Total		<input type="text" value="36"/>

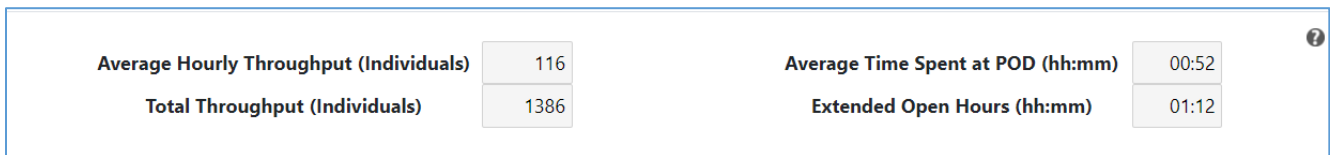
Hours of Operation: 12 hours
 # of people Arriving: 1500
 Percent Pre-registered: 0%
 Percent Needing Assistance: 25%
 Percent Needing Medical Eval: 10%
 Arrival Distribution: Uniform
 Number of Stations:
 Greeting: 2
 Form Distribution/Registration: 12
 Briefing: 25
 Triage/Screening: 5
 Medical Eval: 1
 Express Administration: 5
 Assisted Administration: 5
 Observation Area (seats): 50
 Form Collection/Education: 3

Summary Output Screen



Takeaways from Summary Outputs

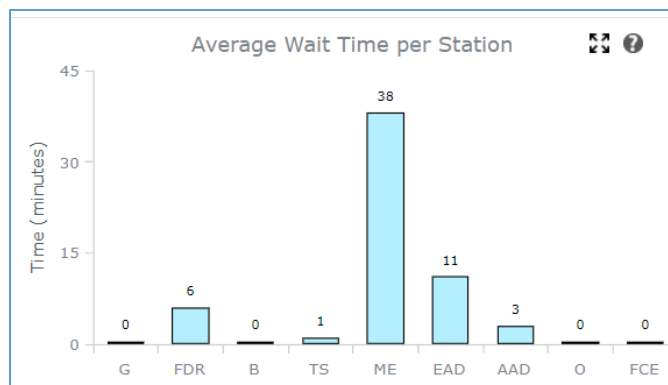
Looking at the Summary Outputs Screen (see snippet above and below) we will walk through the questions listed in the *Using POD SimPLER to Answer Specific Questions* section.



- Can I achieve my throughput goals?
 Yes, we can achieve our throughput goals with our current POD setup and plans. **Total throughput** is 1,386. This is within 5–10% of our desired throughput of 1,500 individuals.
- How much longer will I need to stay open to process everyone at the POD?
 The entry for “**Extended Open Hours**” is 1 hour and 12 minutes. The POD should be able to finish processing most individuals within their planned hours and only extend for about another hour. Note that POD SimPLER provides estimates based on modeling and values should be taken as approximations.
- How long can individuals arriving at the POD expect to be there?
 The entry for “**Average Time Spent at POD**” by an individual is approximately 52 minutes. Looking at the station average graphs, we see that, on average, the lines and wait times are short. This means individuals are flowing quickly through the POD.

- Which station is causing my bottlenecks?

For this POD SimPLER estimate, no stations would be considered major bottlenecks. The station with the highest utilization is the Registration Station, but on average the line and wait time is short enough to not be of concern. The station with the longest wait time is the Medical Evaluation Station with a wait time of 38 minutes. Since only a small fraction of



people are arriving at this station during hours of operation, it's possible that this average length of wait could be acceptable (note that this is the average wait and not the maximum). Examples of factors that might contribute to deciding if a 38-minute average wait at the Medical Evaluation Station is a concern requiring action include the type of medical issues being identified and whether the facility size or configuration can accommodate the line that would form. By looking at our station averages, we can see the average line length at the Medical Evaluation Station is 9 people. Although wait times swell at certain parts of the day, the line length does not grow particularly long.

- How quickly do bottlenecks appear?

Major bottlenecks do not appear in this POD SimPLER estimate.

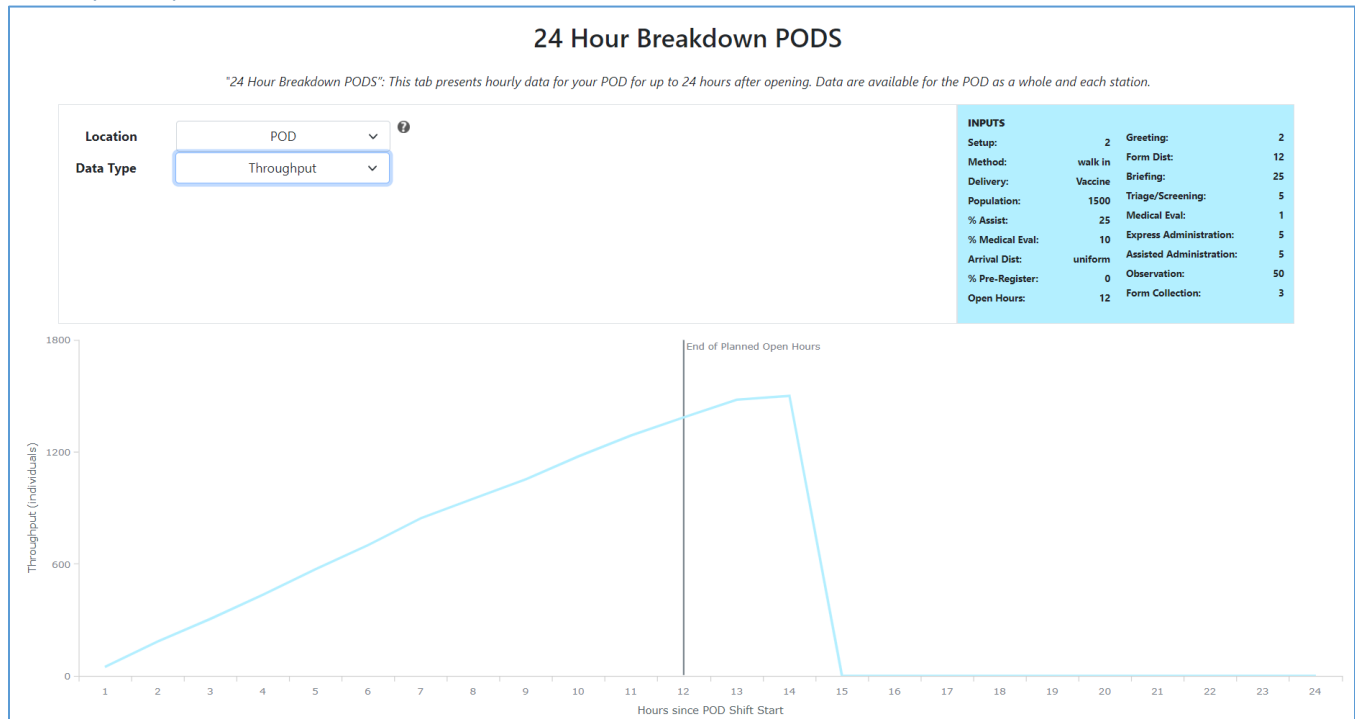
- Do I have enough space for when bottlenecks occur?

Major bottlenecks do not appear in this POD SimPLER estimate. The longest average line at a station is 19 people, so there may not be a concern about space allocation. However, the square footage of the POD site should be considered.

- Where can I possibly pull additional resources?

Major bottlenecks do not appear in this POD SimPLER estimate, but if we wanted to increase capacity at the Registration or Medical Evaluation stations, we may want to increase the number of staff members and lanes available at those stations. We might consider moving a staff member from the Greeting Station or Education Station since output metrics from those stations (utilization, wait time, and line length) are low.

Hourly Output Screen



Key Takeaways from Hourly Output Screen

This POD SIMPLER estimate shows that our POD has no major bottlenecks, so we will check the 24-hour breakdown for the POD (snippet above) cumulative throughput just to confirm that we completed processing all individuals shortly after the end of the hours of operation. While we do not process everyone within 12 hours, we do see that we are able to process them within 14 hours. Due to the simulated nature of the estimates in the tool, a real event may complete their goal throughput of 1,500 individuals within 12 hours depending on population needs and other factors.

Suggested Actions

From looking at all information, we find that it is likely that we will be able to process the arriving population with our current POD plans and resources in a 12-hour operational period or shortly after. Other factors (operational, behavioral, and psychosocial) could potentially enhance or diminish POD processes, but the utilization and wait times are estimated to be low. The on-site staff will need to maintain close and routine operational awareness and, if necessary, adapt operations.

Scenario 2

This scenario is the same scenario as above, but the number of available staff members has decreased, and you now have the option of pre-registration. This is an example of how changing pre-registration availability and staffing for a POD can impact the overall throughput of individuals.

Topics Covered:

- Adjusting staff member numbers per lane
- Implementing off-site pre-registration
- Using the POD SIMPLER Comparison Tool

Narrative

Several news media outlets have released alarming reports about the Virus A incident and many of your volunteers, concerned for their safety, have decided not to assist with your POD. You know that registration paperwork can take significant time for the staff, so you are considering using a neighboring community's vaccine registration system. This would allow people to enter information online prior to arriving for their vaccination. Fortunately, you already have a communications infrastructure in place to message your jurisdiction about the online form option, increasing the likelihood that arriving people will fill it out ahead of time. You estimate that half (50%) of the jurisdiction will complete the form. There will still be individuals who choose not to do so or are unable to fill out the form prior to arrival, and this means you will still offer registration services on site. However, you might be able to dedicate a portion of the staff formerly assigned to the Registration Station to help with other stations that are understaffed due to lack of volunteers. Before committing to the online form, you want to see how your POD might operate with the new online service and a reconfiguration of the staff.

Given Inputs for Input Screen:

You will still use “POD Station Setup” option 2 and will operate the POD as a walk-in, meaning everyone will still physically enter the building for administration of the vaccine. The information about your population is the same, keeping the “% pre-registered” at 0. You will have 12 hours of operation where you are administering vaccines to the public.

Select information about your POD: ?	
POD Station Setup	2
Service Method	walk in
Medication Delivery Method	Vaccine

Select information about the population arriving at your POD: ?	
Estimated arriving population	1500
% Pre-Registered	0
% Needing Assistance	25
% Needing Medical Evaluation	10
Arrival Distribution	uniform

Select the time your POD will be open each day: ?	
Hours of Operation (per day)	12

Due to your reduced numbers of staff members, inputs for your stations will be different. When entering information about the number of lanes at each station, you will reduce the number of lanes for the Registration, Triage/Screening, and Education stations. Your POD will have one greeting lane, seven lanes for on-site registration services, briefing sessions for groups of 25 people at a time, three lanes for triage/screening, one lane active for the Medical Evaluation Station, five lanes at both the Express and Assisted Administration stations, 50 seats in the Observation Area, and three lanes for the Education Station. You will assume that one staff member will be servicing each lane except for the briefing session and Observation Area where one staff member will be assigned to watch up to 25 and 30 people, respectively.

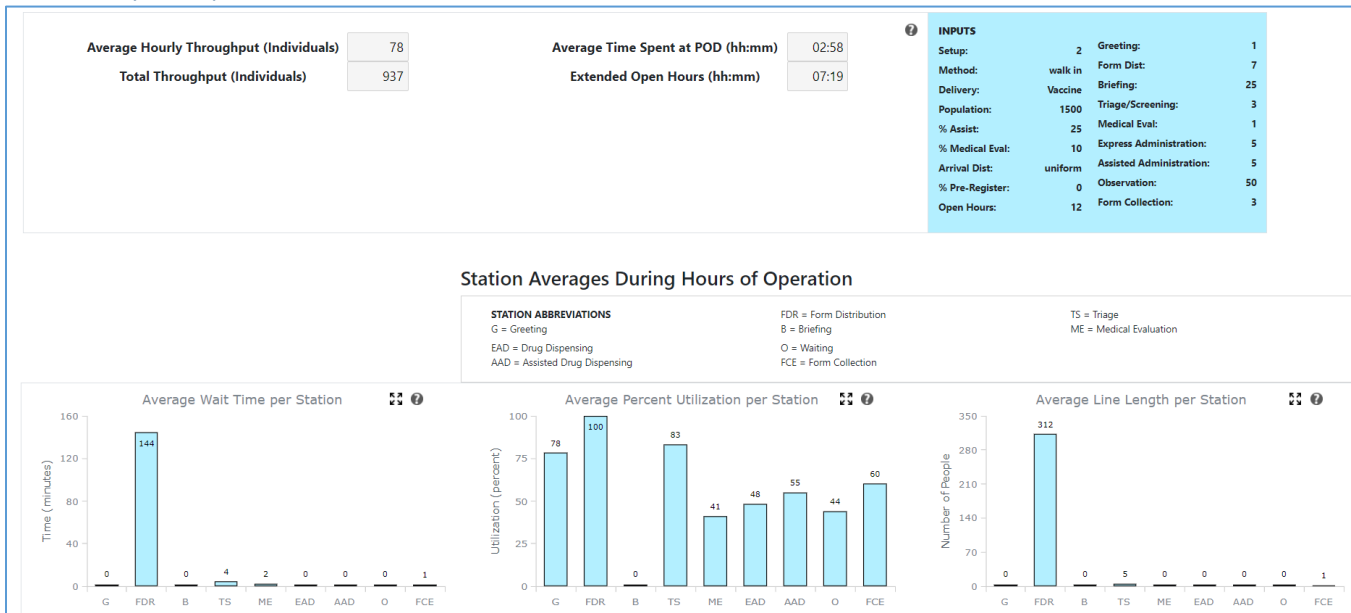
Select the number of stations in your POD site:
Add a zero to eliminate a station from your POD Station Setup.

Hours of Operation: 12 hours
 # of people Arriving: 1500
 Percent Pre-registered: 0%
 Percent Needing Assistance: 25%
 Percent Needing Medical Eval: 10%
 Arrival Distribution: Uniform
 Number of Stations:
 Greeting: 1 (-1)
 Form Distribution/Registration: 7 (-5)
 Briefing: 25
 Triage/Screening: 3 (-2)
 Medical Eval: 1
 Express Administration: 5
 Assisted Administration: 5
 Observation Area (seats): 50
 Form Collection/Education: 3

Assign Staff per Lane
?

		Minimum Staff
Greeting	1 ▾	1
Form Distribution/Registration	7 ▾	7
Briefing	25 ▾	1
Triage/Screening	3 ▾	3
Medical Evaluation	1 ▾	1
Express Administration	5 ▾	5
Assisted Administration	5 ▾	5
Observation Area	50 ▾	2
Form Collection/Education	3 ▾	3
Total		28

Summary Output Screen



Takeaways from Summary Outputs

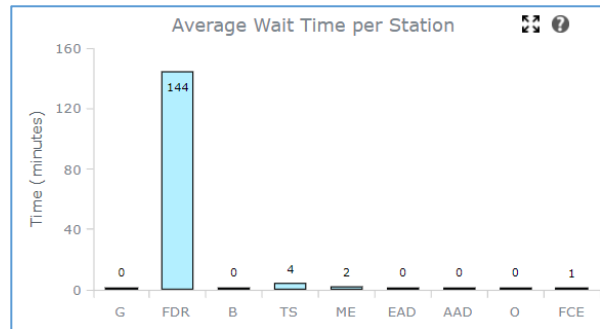
Looking at this information, we can quickly assess that we are not processing all individuals within our 12 hours of operation and that the Registration Station (abbreviated as FDR) appears to be a bottleneck. Below we will walk through the questions from the *Using POD SimPLER to Answer Specific Questions* section.



- Can I achieve my throughput goals?**
 No, we will not be able to achieve our throughput goal of 1,500 individuals in 12 hours. The **total throughput** is 937 individuals, approximately 60% of our throughput goal. This indicates there is at least one bottleneck in our POD.
- How much longer will I need to stay open to process everyone at the POD?**
 The **extended open hours** is 7 hours and 19 minutes. The POD would need to stay open approximately 8 additional hours beyond the current hours of operation to process all individuals. A nearly 20-hour operation would require more staff members than a 12-hour operation and therefore POD planners might consider adding an additional day of vaccination or consider reducing bottlenecks, which we address below through adjusting staffing and adding pre-registration. Note that POD SimPLER provides estimates based on modeling and values should be taken as approximations.

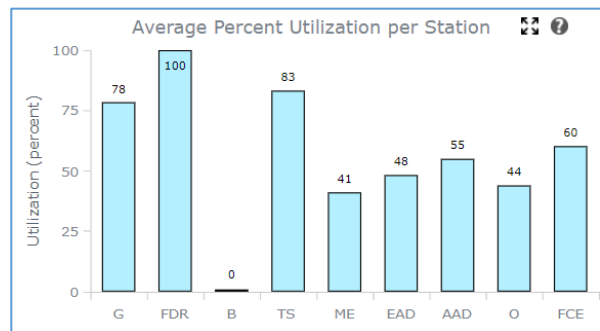
- How long can individuals arriving at the POD expect to be there?

The **average time spent at POD** by an individual is approximately 3 hours. For our current example, we will say that we have concluded that a 3-hour average time spent at POD is unacceptable and that we want individuals to be at the POD for less than an hour and a half. We will try to reduce bottlenecks and bring down the average individual processing time in additional POD SimPLER estimates in this example.



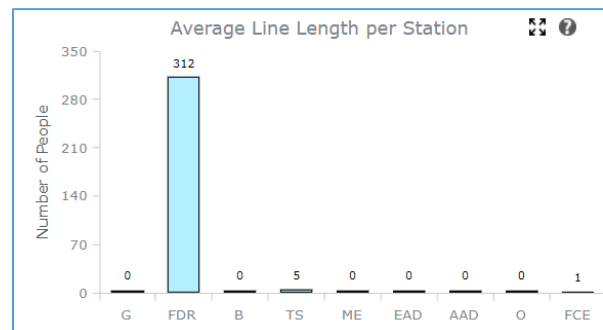
- Which station is causing my bottlenecks?

Registration appears to be the main bottleneck with an average wait time of over 2 hours, average utilization of 100%, and average line length of 312 people. The Registration Station is likely the station that will benefit the most if we add pre-registration. **Note:** since registration is at the beginning of the process, making adjustments that increase the throughput of registration may result in bottlenecks at later stations in the process. We may want to be proactive and add at least one more resource at the Triage/Screening Station as the utilization rate will only increase beyond its current 83%. A potential reason we don't see other bottlenecks is because our population is stuck at the Registration Station.



- Do I have enough space for when bottlenecks occur?

Due to the size of the facility we have chosen, we do not have enough space for the bottleneck at the Registration Station. The average line length for registration during the hours of operation is 312 people. Let us assume that the room with the Registration Station has an occupancy of 150 people with chairs, tables, and a standing room area. This means that we need to find a way to reduce the long lines building up at the Registration Station. Note that 312 is the average line length for the Registration Station, not the maximum. We will check the potential maximum line length for the Registration Station on the Hourly Output Screen.



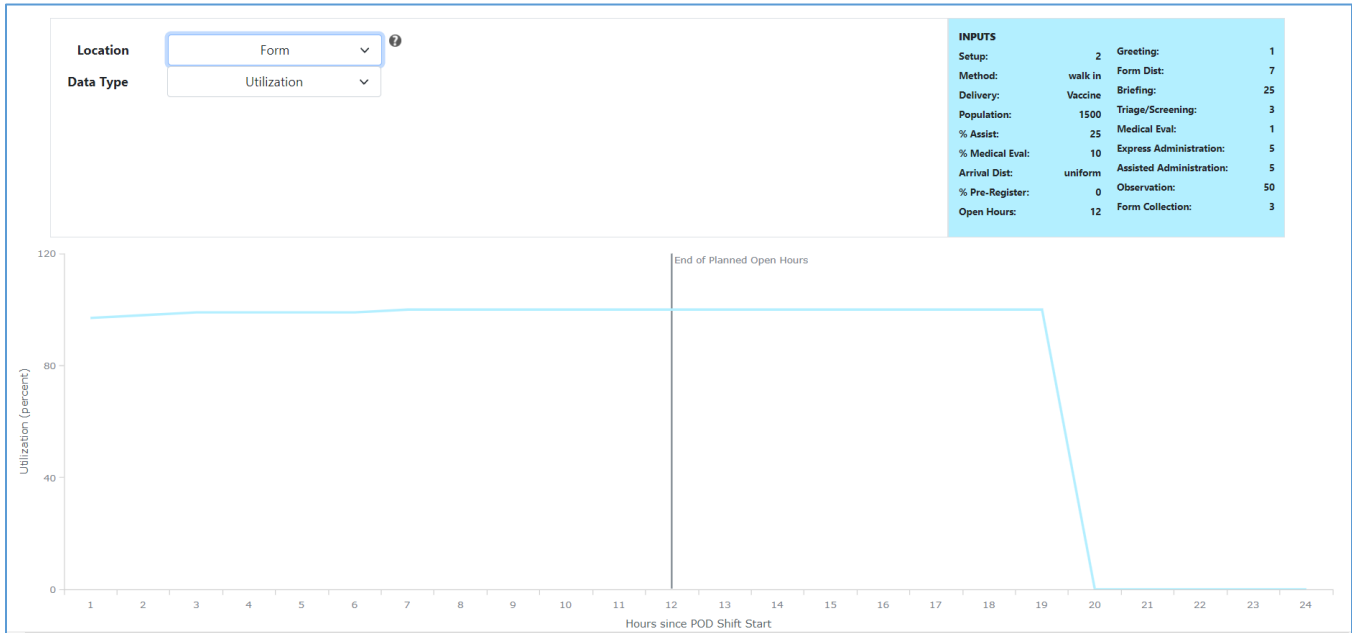
- Where can I possibly pull additional resources?

The Education Station has lower utilization and no lines. This station could be a potential place to move staff members from, to reduce the bottleneck at the Registration Station. Since we are unsure about the impact removing the bottleneck at the Registration Station will have, we will

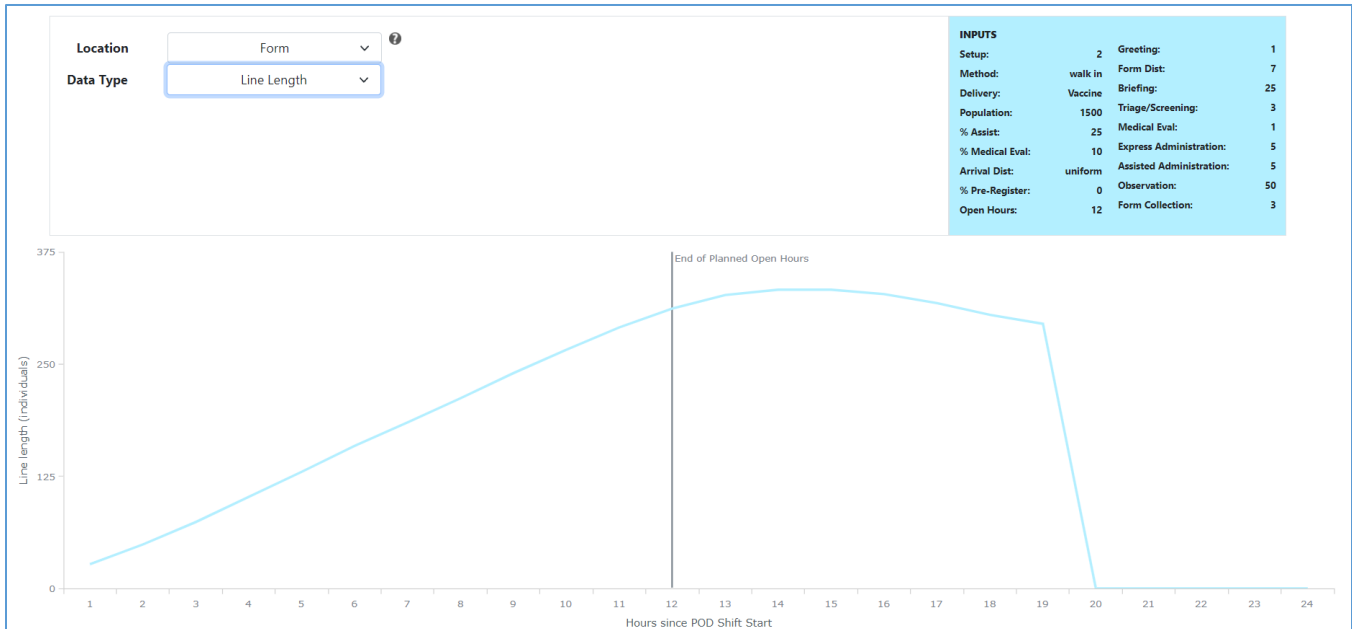
wait to move staff members from other stations until we see the impact of adding pre-registration.

Hourly Output Screen

The Hourly Output screen can provide us with a more detailed view of the bottleneck at registration.



- How quickly do bottlenecks appear?
Registration starts with high utilization and stays at 90% or higher for the entire hours of operation. Registration continues to be 100% utilized until 7 hours after end of processing hours (19 hours total). The Registration Station is a major limiting station for your POD throughput.



- Do I have enough space for when bottlenecks occur? Continued

We know that we do not have enough space for registration and can use the Hourly Output Screen to see how long the lines might grow while we continue to process all remaining individuals.

The line length continues to increase after planned hours of operation and does not decrease until several hours later.

Key Takeaways From Hourly Output Screen

Registration is the largest bottleneck and is limiting movement of the population through the rest of our POD. We will run a few additional POD SimPLER estimates in the next section to see how our proposed changes will impact our estimated throughput and total time needed to process all arriving individuals.

Suggested Actions

We will explore two POD SimPLER estimates to evaluate the impact of adding online pre-registration and changing staff member allocation per lane which allows us to add resources at other stations.

POD Estimate With the Addition of Pre-registration

First, we will try a POD setup where we employ pre-registration. The population will receive a web-link to the registration form with instructions via various media channels. We will assume that 50% of the population will preregister prior to arriving at the POD. Using the Toggle Comparison Tool, we will add this new scenario to our other scenario which will allow us to do a side-by-side comparison.

Given Inputs for Input Screen

All inputs will remain the same, but we will change “% preregistered” to 50%

Toggle Comparison Tool

	Original	Comparison
POD Station Setup	2	
Service Method	walk in	walk ▾
Medication Delivery Method	Vaccine	Vacci ▾
Living at your POD:		
Estimated arriving population	1500 ▾	1500 ▾
% Pre-Registered	0 ▾	50 ▾
% Needing Assistance	25 ▾	25 ▾
% Needing Medical Evaluation	10 ▾	10 ▾
Arrival Distribution	uniform	uniform

Comparison Summary Outputs

Our original scenario is displayed in a lighter blue color with overall POD data located on the top row of the Summary Output Screen (see below). In the Station Averages tables, the original scenario is represented by the bars on the left in each bar graph pairing. The new estimate is represented by the darker-colored blue box and in the station averages by the bars on the right in each bar graph pairing. For reference, the original estimate will be labelled “Original,” and the new scenario will be labelled “Comparison” in the POD Summary Output Page below.

Average Hourly Throughput (Individuals)	78	Average Time Spent at POD (hh:mm)	02:58	INPUTS - Original Setup: 2 Greeting: 1 Method: walk in Form Dist: 7 Delivery: Vaccine Briefing: 25 Population: 1500 Triage/Screening: 3 % Assist: 25 Medical Eval: 1 % Medical Eval: 10 Express Administration: 5 Arrival Dist: uniform Assisted Administration: 5 % Pre-Register: 9 Observation: 50 Open Hours: 12 Form Collection: 3
Total Throughput (Individuals)	937	Extended Open Hours (hh:mm)	07:19	
Average Hourly Throughput (Individuals)	93	Average Time Spent at POD (hh:mm)	02:02	INPUTS - Comparison Setup: 2 Greeting: 1 Method: walk in Form Dist: 7 Delivery: Vaccine Briefing: 25 Population: 1500 Triage/Screening: 3 % Assist: 25 Medical Eval: 1 % Medical Eval: 10 Express Administration: 5 Arrival Dist: uniform Assisted Administration: 5 % Pre-Register: 50 Observation: 50 Open Hours: 12 Form Collection: 3
Total Throughput at Shift End (Individuals)	1117	Extended Time Past Shift (hh:mm)	04:06	

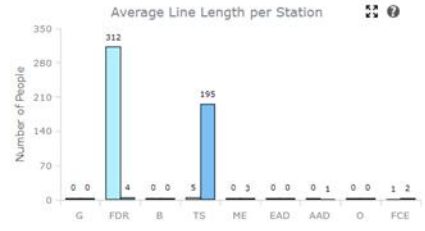
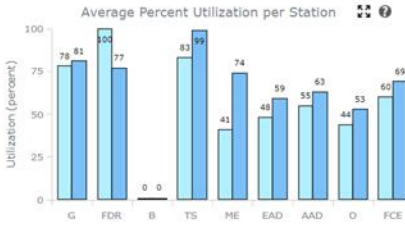
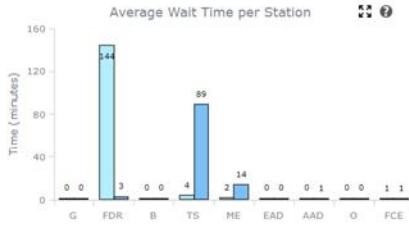
Station Averages During Hours of Operation

STATION ABBREVIATIONS

G = Greeting
 EAD = Drug Dispensing
 AAD = Assisted Drug Dispensing

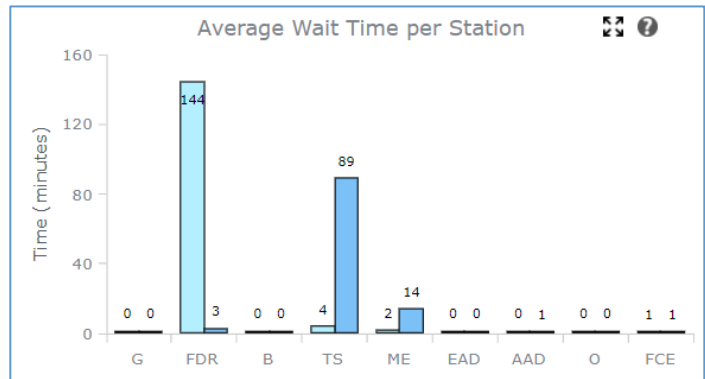
FDR = Form Distribution
 B = Briefing
 O = Waiting
 FCE = Form Collection

TS = Triage
 ME = Medical Evaluation

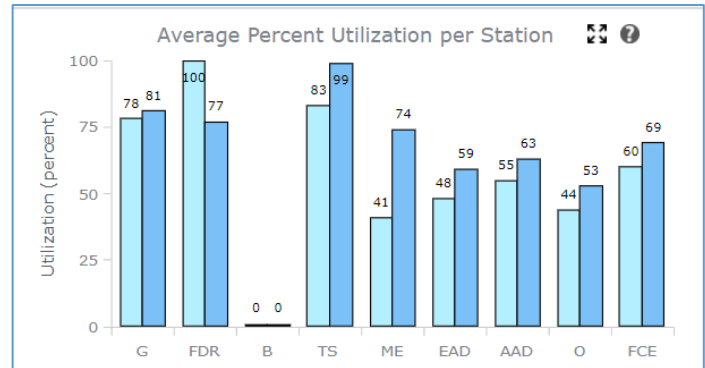


By having 50% of the population preregister prior to arriving at the POD, we have increased our total throughput during the hours of operation to 1117 individuals, a 20% increase from our original POD set up. The average time spent at the POD by an individual has been reduced by almost an hour and is now a little over 2 hours. We now only need to stay open an additional 4 hours to finish processing individuals as opposed to the 7–8 hours.

Comparing the average wait times per station for registration, we notice that we have decreased the wait time from over 2 hours to a 3-minute wait. As predicted, the bottleneck has moved to the Triage/Screening Station. We will attempt to reduce this wait time even more in the next POD SimPLER estimate.



The average utilization for registration has decreased from 100% to 77% while average utilization for triage/screening has increased from 83% to 99%. While maintaining the number of available stations for registration is clearly important, we can possibly change how we have assigned Registration Station staff members such that we can move a few staff members to the Triage/Screening Station.



POD Estimate with Preregistration and Staff Rearrangement

In addition to implementing preregistration, we will set up stations where people arriving at the POD can fill out their own registration information instead of requiring staff members to work with each person to fill out the form. We will assign registration staff to stand by and help answer questions or give assistance when needed. This change means that we can move a few of the Registration Station staff members to other stations. Using the Toggle Comparison Tool, we will add this new scenario to our previous scenario (only adding preregistration), which will allow us to do a side-by-side comparison.

Given Inputs for Input Screen

All inputs for the first three sections on the input screen will be the same. Remember to keep “% preregistered” at 50%. We will use the Assign Staff per Lane Button to change the number of staff members that we will assign to each lane. At “Form Distribution/Registration,” you will assign one staff member to monitor and assist with two registration lanes. All other staffing defaults will remain the same.

Enter the number of staff you will assign to each lane at a station

Greeting	1	Per	1	Lanes
Form Distribution/Registration	1	Per	2	Lanes

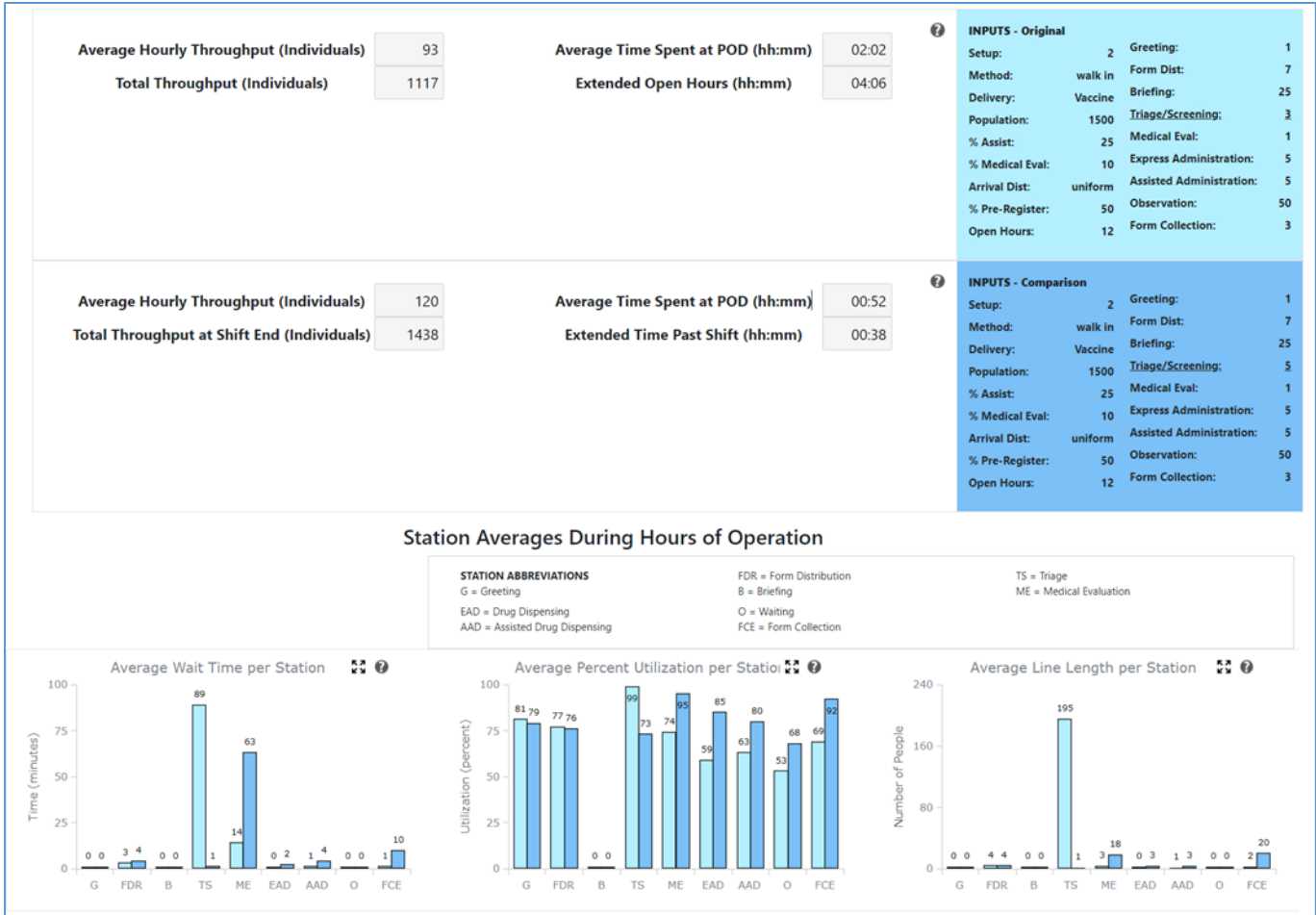
Now that you have 2–3 more staff members to use at other stations, you decide to add two to the Triage/Screening Station which allows you to have five total lanes.

	Minimum Staff	Minimum Staff
Greeting	1	1
Form Distribution/Registration	7	4
Briefing	1	1
Triage/Screening	3	5
Medical Evaluation	1	1
Express Administration	5	5
Assisted Administration	5	5
Observation Area	2	2
Form Collection/Education	3	3
Total	28	27

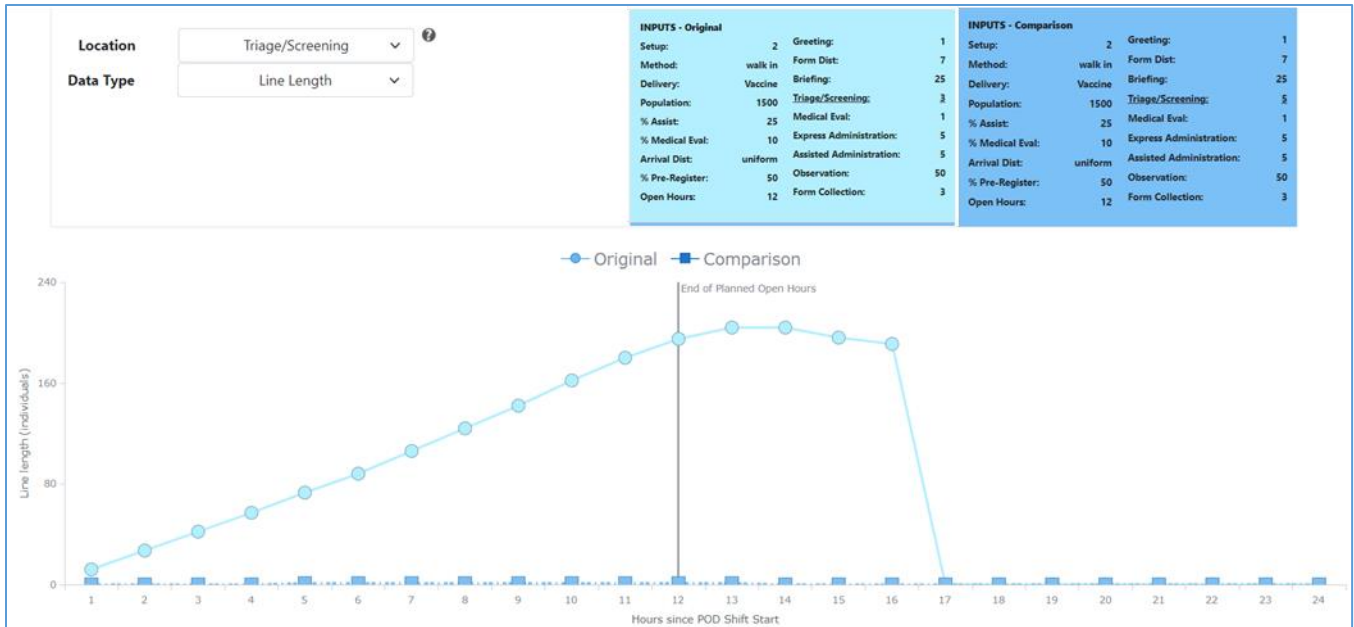
Comparison Summary Outputs

The new POD scenario is represented by the darker-colored bar graphs on the right in each bar graph pairing. Overall POD outputs are located below the original POD outputs. In the snippet of the POD Summary Output Page below, the previous estimate (preregistration only) is labelled “Original,” and the new estimate (preregistration and staffing rearrangement) is labelled “Comparison.” Below, the box with the green dotted border shows the POD SimPLER estimates from the first part of the scenario in which staffing was decreased and the preregistration option was not available.

Average Hourly Throughput (Individuals)	78	Average Time Spent at POD (hh:mm)	02:58
Total Throughput (Individuals)	937	Extended Open Hours (hh:mm)	07:19



By increasing the available lanes at the Triage/Screening Station from three to five, we have increased our total throughput to 1,438 individuals, a 50% increase from our original POD scenario. We are now well within 5–10% of our total throughput goal of 1,500. The average time spent at the POD by an individual has been reduced to a little under an hour, which is one third of the original value of 2 hours and 58 minutes. We now only need to stay open an additional hour to finish processing individuals, as opposed to the 8 hours in the original estimate or 4 hours in the estimate where we first implemented preregistration.



In the above, a 24-hour view of line length at the Triage/Screening Station is displayed for two of our scenarios. The line with circles represents the 50% preregistration-only scenario while the line with squares represents the new POD setup with two additional lanes of triage/screening. We can see how adding lanes for triage/screening not only decreased the total amount of time we would need to stay open to process all individuals from 16 hours to 13 hours, but also greatly decreased the size of the line that would be at the Triage/Screening Station. Our largest line length at the Triage/Screening Station was over 200 individuals and remained high until a few hours beyond the planned operational hours. With the addition of two triage/screening lanes, we bring the maximum line length down to almost no line at all. This new POD setup—which combines online preregistration, self-registration on site with fewer staff members to monitor and assist at registration, and five lanes of triage/screening—allows us to fall within our space and throughput constraints for the POD location.

Scenario 3

This scenario shows how to remove stations from the POD station setup for the same scenario we have been working through. We will also use the Optimization Tab to find an optimum scenario for our POD.

Topics Covered:

- Removing stations
- Optimization Tab

Narrative

The Joint Information Center (JIC) has been pushing out notifications to the jurisdiction of where and when the POD will open and how to preregister. They have also been successfully sending out educational messages about the vaccine and addressing key concerns that the population might have about receiving the vaccine. Since you anticipate that people will be eager to move through the process as quickly as possible, you believe that at least 50% of the population will preregister prior to arriving at the POD. While planning for tomorrow’s POD opening, you are asked by a senior official if you can process more people through your POD, especially since you now have an online system to make the registration process smoother, and if you can reduce your hours of operation. You want to evaluate your current resources and the impact shorter hours of operation will have on your throughput. You are expecting 2,000 individuals to arrive, and your hours of operation will now cover 8 hours. Will your current scenario be able to handle the new population over a shorter period? If not, which stations can you do without or modify so that you can use those staff members elsewhere?

Given Inputs for Input Screen:

All inputs will be the same from the previous scenario where the percent preregistration was 50% except for population and hours of operation. You will assume 2,000 individuals will arrive at your POD during your 8 hours of operation. You will use previous staffing assignments per lane.

Select information about the population arriving at your POD:

Shift length: 8 hours	Estimated arriving population: 2000
# of people Arriving: 2000	% Pre-Registered: 1500
Percent Pre-registered: 50%	% Needing Assistance: 2000
Percent Needing Assistance: 25%	% Needing Medical Evaluation: 4000
Percent Needing Medical Eval: 10%	Arrival Distribution: uniform
Arrival Distribution: Uniform	
Number of Stations:	
Greeting: 1	
Form Distribution/Registration: 7	
Briefing: 25	
Triage/Screening: 5	

Hours of Operation (per day): 8

Summary Output Screen

This example will focus on comparing how different hours of operation and reducing stations may affect throughput.



Takeaways from Summary Outputs

Looking at the summary outputs, we notice that the overall **total throughput** is approximately 1,000 or half of our goal. **Extended open hours** total 8 hours and 37 minutes. The station averages for each station show that the Greeting and Medical Evaluation stations are bottlenecks. We predict once we alleviate the bottleneck at the Greeting Station, other stations will become backlogged. We might be able to request additional medical personnel, but first we will see if we can decrease some bottlenecks by eliminating stations and consolidating the staff.

Suggested Actions

We know that due to the increase in individuals arriving at the POD over a shorter timeframe and our staffing shortages, we now have several bottlenecks. Since our JIC has been promoting educational messages about the vaccine and alleviating vaccine concerns, you feel that it is possible to eliminate both the Briefing Station and the Education Station. We will attempt to alleviate bottlenecks with additional POD SimPLER estimates. We also want to know where the additional medical personnel we will request might be most useful, so we will use the Optimization Tab to try to further increase throughput.

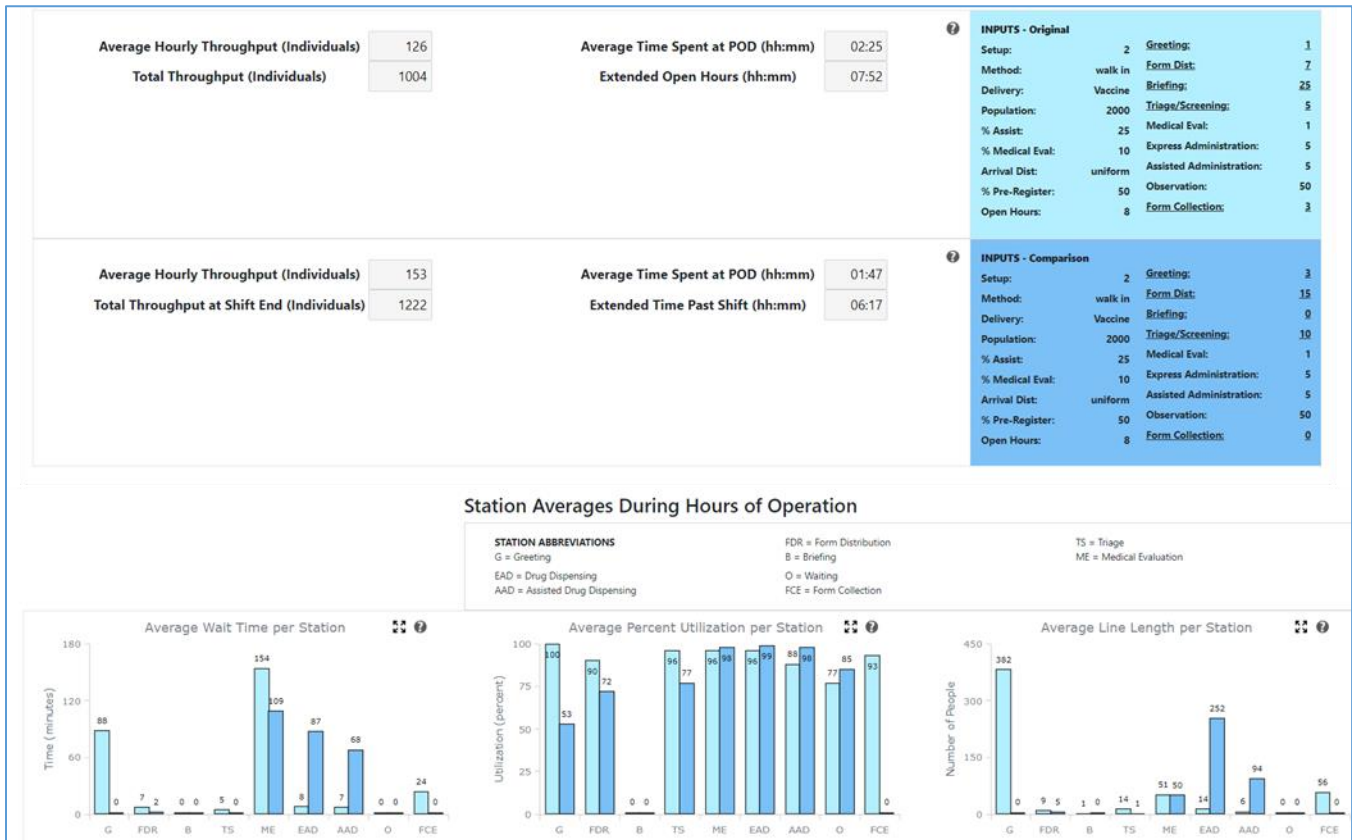
POD Estimate with the Elimination of Briefing and Form/Collection Stations – Staff Moved

Given Inputs for Input Screen:

As a comparison, you will look to see if eliminating the Briefing and Education stations will improve your throughput. Instead of asking people to watch a 5-minute video in groups prior to receiving their vaccine, the video will be playing on a loop so they can hear it while waiting in line. You will also ask all vaccine administrators to collect any forms at the Express and Assisted Administration stations and to

Comparison Summary Outputs

The original estimate for this scenario is shown in the lighter-colored bars and labeled “Original.” The new estimate is shown in the darker-colored bars on the right and labeled “Comparison.”



By eliminating the Briefing and Education stations along with our staff rearrangement, we have increased our total throughput at the end of our planned hours of operation to 1,222 individuals, a 22% increase from our original POD set up. The average time spent at the POD by an individual has been reduced by approximately half an hour. We now need to stay open an additional 6 hours to finish processing individuals as opposed to 9 hours. The stations where medical personnel are working (Medical Evaluation, Express Administration, and Assisted Administration) have now become bottlenecks. Since we have been asked to process more people, we will request additional medical personnel. We have been asked to request the least number of additional staff members possible to achieve our desired throughput of 2,000. In the next POD SimPLER estimate, we will see where additional medical personnel may have the most impact our POD throughput.

It is important to see the impacts that alleviating one bottleneck might have on the rest of the POD process.

POD Estimate Using Optimization Tab

Given Inputs for Input Screen:

Even though we have eliminated stations and added lanes to bottlenecked stations, we have discovered new bottlenecks at the stations with medical personnel. This is likely because we have unclogged bottlenecks upstream or at the beginning of our process, so now all individuals are getting stuck at later stations. Let us examine how increasing lanes at the Medical Evaluation, Express Administration, and Assisted Administration stations might affect our throughput and where placing medical personnel will have the most impact. We will use the Optimization Tab to find our top three POD scenarios within our selected resource and operational constraints and examine each scenario to determine how many medical personnel we should request and where they should be placed.

We will adjust our resource limits for our POD to include potential to add staff members and lanes at the Medical Evaluation, Express Administration, and Assisted Administration stations. We will set our limit for the Medical Evaluation station to be two lanes, while we will set our limits for the Express Administration and Assisted Administration stations to 10. We will also increase the number of seats available for the observation area to 75 seats, just to see what happens. All other stations will remain constant.

POD Constraints	
Select the Resource limits for your POD	
Greeting Stations	3
Form Distribution Stations	15
Briefing Stations	25
Triage Stations	10
Medical Evaluation Stations	2
Express Drug Dispensing Stations	10
Assisted Drug Dispensing Stations	10
Waiting Stations	75
Form Collection Stations	3

Greeting:	3
Form Distribution/Registration:	15
Briefing:	25
Triage/Screening:	10
Medical Eval:	2 (+1)
Express Administration:	10 (+5)
Assisted Administration:	10 (+5)
Observation Area (seats):	75 (+25)
Form Collection/Education:	3

We don't want people spending long amounts of time at the POD so we will set our maximum time spent at the POD to one hour. Since we saw extremely long wait times previously, we will set our maximum wait time to be 45 minutes. We will leave the maximum line length unselected just to see what estimates we get.

Select the Operational limits for your POD	
Max time spent at POD (hh:mm) <input checked="" type="checkbox"/>	1:00
Max wait time (Minutes) per station (mm) <input checked="" type="checkbox"/>	45
Max Line Length per Station <input type="checkbox"/>	96

Note: If you run an optimization scenario and do not receive any outputs, you likely need to adjust your constraints and increase them.

Optimization Outputs:

Optimization Results									
Stations	Resources	Additional Resources	Total Staff	Max Line	Max Wait (mm)	Max Indiv Time Spent at POD (hh:mm)	Extended Time Past Shift (hh:mm)	Hourly Throughput	Total Throughput
ORIGINAL INPUTS									
> Greeting	1	0							
> Form Distribution	7	0							
Briefing	25	0							
Triage	5	0							
Medical Evaluation	1	0	107	382	154	02:25	07:52	126	1004
Drug Dispensing	5	0							
Assisted Drug Dispensing	5	0							
Waiting	50	0							
Form Collection	3	0							
Greeting	3	0							
Form Distribution	15	0							
Briefing	0	0							
Triage	10	0							
Medical Evaluation	2	0	132	62	40	00:42	00:31	241	1931
Drug Dispensing	10	0							
Assisted Drug Dispensing	7	0							
Waiting	75	0							
Form Collection	0	0							
Greeting	3	0							
Form Distribution	15	0							
Briefing	0	0							
Triage	10	0							
Medical Evaluation	2	0	135	18	33	00:32	00:37	241	1926
Drug Dispensing	10	0							
Assisted Drug Dispensing	10	0							
Waiting	75	0							
Form Collection	0	0							
Greeting	3	0							
Form Distribution	15	0							
Briefing	0	0							
Triage	10	0							
Medical Evaluation	2	0	132	99	33	00:45	02:17	211	1691
Drug Dispensing	7	0							
Assisted Drug Dispensing	10	0							
Waiting	75	0							
Form Collection	0	0							

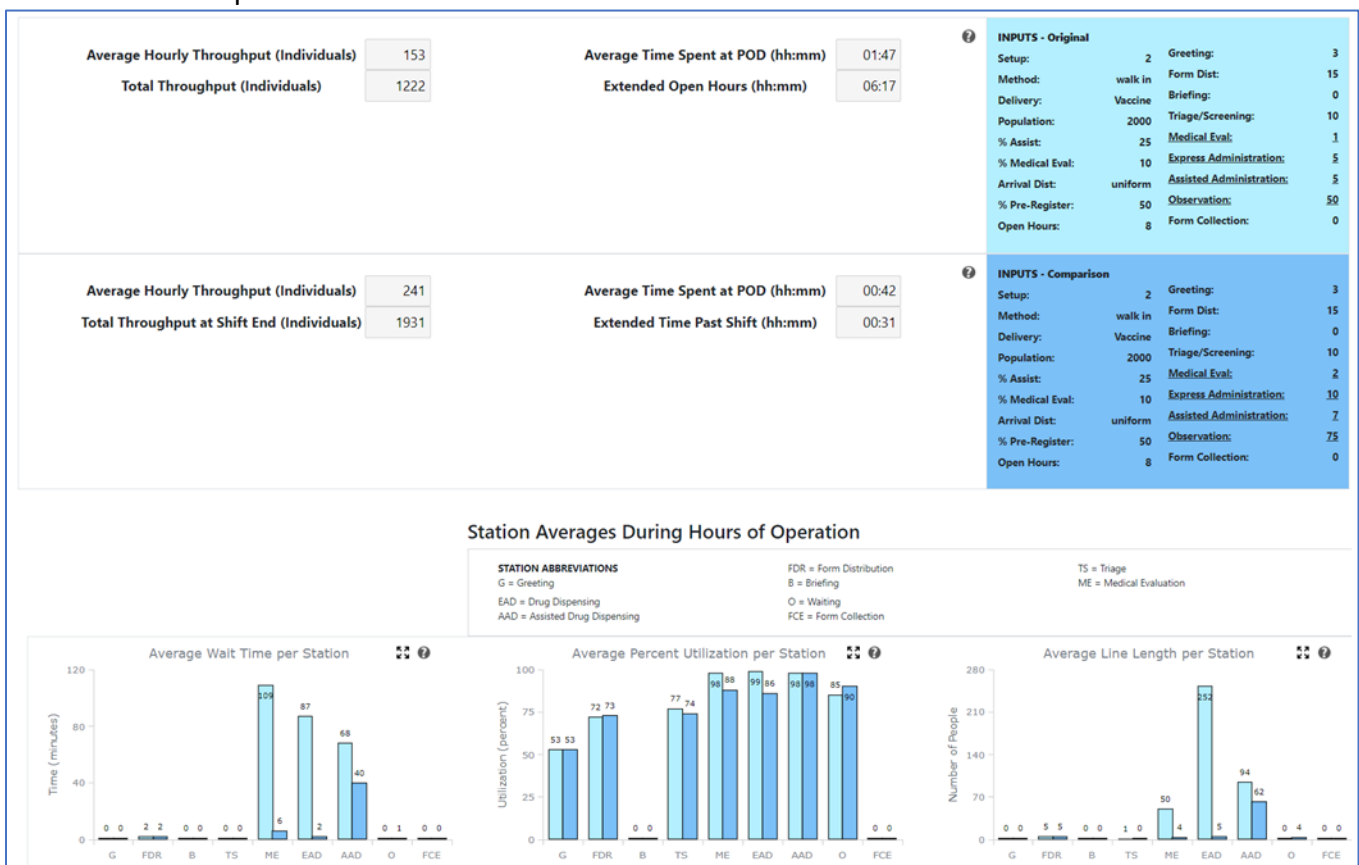
All our optimized scenarios show improvement from our original POD setup, which was only able to process 1,222 individuals within the hours of operation. Now we will take a closer look to see the level of improvement and which setup will best help us achieve our throughput goals.

First Choice

Optimization Results									
Stations	Resources	Additional Resources	Total Staff	Max Line	Max Wait (mm)	Max Indiv Time Spent at POD (hh:mm)	Extended Time Past Shift (hh:mm)	Hourly Throughput	Total Throughput
Greeting	3	0							
Form Distribution	15	0							
Briefing	0	0							
Triage	10	0							
Medical Evaluation	2	0	132	62	40	00:42	00:31	241	1931
Drug Dispensing	10	0							
Assisted Drug Dispensing	7	0							
Waiting	75	0							
Form Collection	0	0							

Our top optimized scenario has a maximum time spent at the POD of 42 minutes, a maximum wait time of 40 minutes, and a total throughput of 1,931 individuals. This is a 58% increase in total throughput, placing this within 5–10% of our throughput goal of 2,000. The maximum line length is 62 individuals. This is still a little higher than we would like, but much lower than the previous setup. We note that one additional lane has been added to the Medical Evaluation Station, five lanes for the Express Administration Station, and two lanes for the Assisted Administration Station. That would mean requesting an additional eight medical personnel. Twenty-five additional seats have been added to the Observation Area as well.

We want to take a closer look and do a side-by-side comparison, so we will select “Add to Comparison.” This takes us to the Summary Output Tab, where we can see the new optimized scenario added to the comparison view.



From this tab it is clear that adding additional lanes and corresponding staff members has led to dramatic improvements. We want to compare all three options so we will look at the other two choices and weigh them against our goals.

Second Choice

Optimization Results									
Stations	Resources	Additional Resources	Total Staff	Max Line	Max Wait (mm)	Max Indiv Time Spent at POD (hh:mm)	Extended Time Past Shift (hh:mm)	Hourly Throughput	Total Throughput
Greeting	3	0							
Form Distribution	15	0							
Briefing	0	0							
Triage	10	0							
Medical Evaluation	2	0	135	18	33	00:32	00:37	241	1926
Drug Dispensing	10	0							
Assisted Drug Dispensing	10	0							
Waiting	75	0							
Form Collection	0	0							

Our second optimized scenario has a maximum time spent at the POD of 32 minutes, a maximum wait time of 33 minutes, and a total throughput of 1,926 individuals. This is a 56% increase in total throughput. We are now within 5–10% of our throughput goal of 2000.

Note that since SIMPLER is a simulation tool, these values are estimates with a level of uncertainty and standard deviation. This means that the result of 1,926 as opposed to the previous 1,930 is essentially the same value.

The maximum line length is 18 individuals, a considerable decrease from our first optimized choice, which had a maximum line length of 62 individuals. We note that one additional lane has been added to the Medical Evaluation Station, five lanes for the Express Administration Station, and five lanes for the Assisted Administration Station. That would mean requesting an additional 11 medical personnel. Twenty-five additional seats have been added to the Observation Area as well.

A planner would need to evaluate what is most important and feasible for their jurisdiction. It may be that you are unable to justify the additional three staff members required by this setup and since the total throughput numbers do not vary greatly, you decide to stay with the first choice. On the other hand, you may also decide that requesting more staff members is justifiable if you can greatly reduce your line length and keep time spent at the POD to around half an hour.

Third Choice

Optimization Results									
Stations	Resources	Additional Resources	Total Staff	Max Line	Max Wait (mm)	Max Indiv Time Spent at POD (hh:mm)	Extended Time Past Shift (hh:mm)	Hourly Throughput	Total Throughput
Greeting	3	0							
Form Distribution	15	0							
Briefing	0	0							
Triage	10	0							
Medical Evaluation	2	0	132	99	33	00:45	02:17	211	1691
Drug Dispensing	7	0							
Assisted Drug Dispensing	10	0							
Waiting	75	0							
Form Collection	0	0							

Our third optimized scenario has a maximum time spent at the POD of 47 minutes, a maximum wait time of 33 minutes, and a total throughput of 1,691 individuals. While the total throughput is lower than the previous two options, it is still a 38% increase in total throughput and 84% of your total throughput goal.

The maximum line length is 99 individuals, which is a little long, but our maximum wait time is still much lower than before. Since this option requires the least number of additional staff members, some planners may find it to be a good option. We note that one additional lane has been added to the Medical Evaluation Station, two lanes for the Express Administration Station, and two lanes for the Assisted Administration Station. That would mean requesting an additional seven medical personnel. Twenty-five additional seats have been added to the Observation Area as well.

A planner would need to evaluate what is most important and feasible for their jurisdiction. It may be that you can only request a handful of staff members and adding the lowest possible number of additional resources is more important than processing all 2,000 people in 8 hours. Based on your extended open hours, you will likely only need two additional hours to process everyone.

Summary

Each optimized scenario has its benefits and drawbacks. Planners can use POD SimPLER to visualize their different options, consider the facility that the POD will operate, and decide which optimized scenario is preferable considering their POD plans, goals, available staffing, and the particular POD location, configuration, layout, and square footage.

