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HALIFAX STANFIELD INTERNATIONAL AIRPORT

HALIFAX INTERNATIONAL AIRPORT AUTHORITY

Halifax Airport Departures Hall Optimal Resource Allocation

Problem Definition

The Halifax International Airport Authority (HIAA) have invested extensive resources to become the pioneer in the implementation of self-serve check-in kiosks and bag-drops in North America. The utilization and allocation of these resources are critical to the operations of the airport, in order to satisfy passenger demand volumes and maximize the efficient usage of the significant capital investment in these assets.

Project Scope

- The study aims at addressing the two target peak periods throughout the year, these two periods involve the late August peak period and the mid-March 'sunflight' season period.
- Allocating resources between the three major domestic airlines; Air Canada, WestJet and Porter.
- Assessing the future operations and capacity requirements aligned with forecasted passenger growth.

Conclusion & Recommendations

Resource Allocation				
	Current State	Minimal Allocation	Potential Savings (CAD)	Optimal Allocation*
Air Canada	20	8	$300,000	13
WestJet	14	12	$50,000	21
Porter	5	3	$50,000	5

Table 1 – Allocation of kiosks in multiple scenarios
*given current available resources

- Current State: Present allocation of resources
- Minimal Allocation: Least amount of kiosks required in order to accommodate queue times of 2 minutes or less
- Potential savings: Cost of resources not fully utilized
- Optimal Allocation: Most efficient allocation of current resource pool

Removal of Air Canada Gate Keeper		
Baggage Queue with Gatekeeper (s)	Baggage Queue without Gatekeeper (s)	Time Saved (s)
57	8	49

Table 2 – Baggage drop queues before and after removal of Air Canada "Gatekeeper"

Addition of Sunwing Kiosks		
Queue without Kiosks (s)	Queue with Kiosks (s)	Time Saved (s)
238	45	193

Table 3 – Forecasted impact if Sunwing implements kiosk system,

Forecasted Growth				
Year	2019	2022	2027	Change*
Estimated Total Travellers	4,648,000	5,006,875	5,605,000	957,000
Percentage Increase since 2019	-	7.72%	20.59%	20.59%
Maximum Waiting Time AC (s)	0.00	0.00	0.00	0.00
Maximum Waiting Time WS (s)	46.95	53.42	164.39	117.44
Maximum Waiting Time PD (s)	22.85	58.72	74.52	51.67

Table 4 – Forecasted Growth of Airport Passengers
*change from 2019 to 2027

Data Analysis – Excel Tool

Flight schedule information was entered into an Excel tool created by the group to identify the busiest day for the August and March peak periods, the data was then used for the simulation:
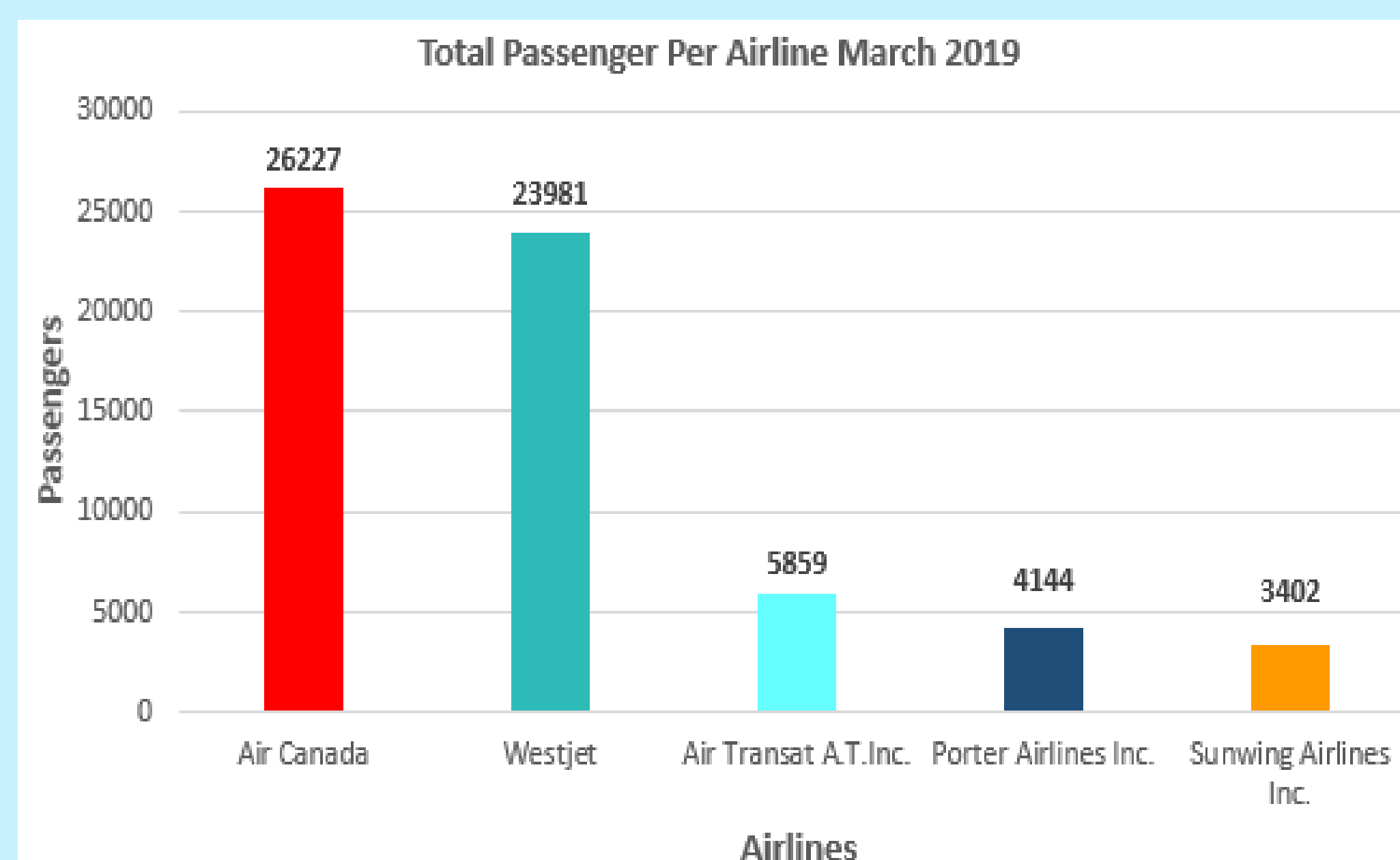August 24th (August Peak)
March 19th (March Peak)

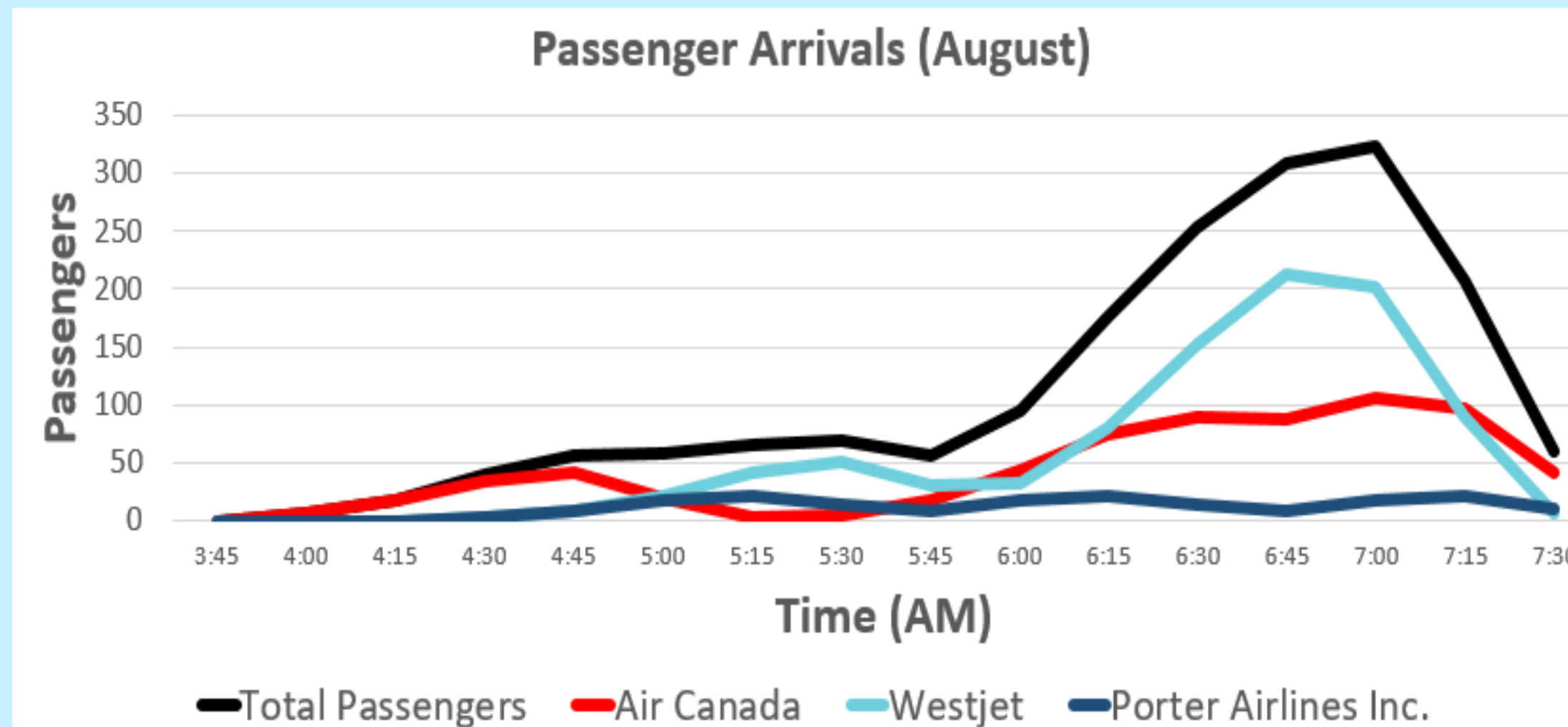Figure 1 – Passengers Per Airline for Sunflight Season
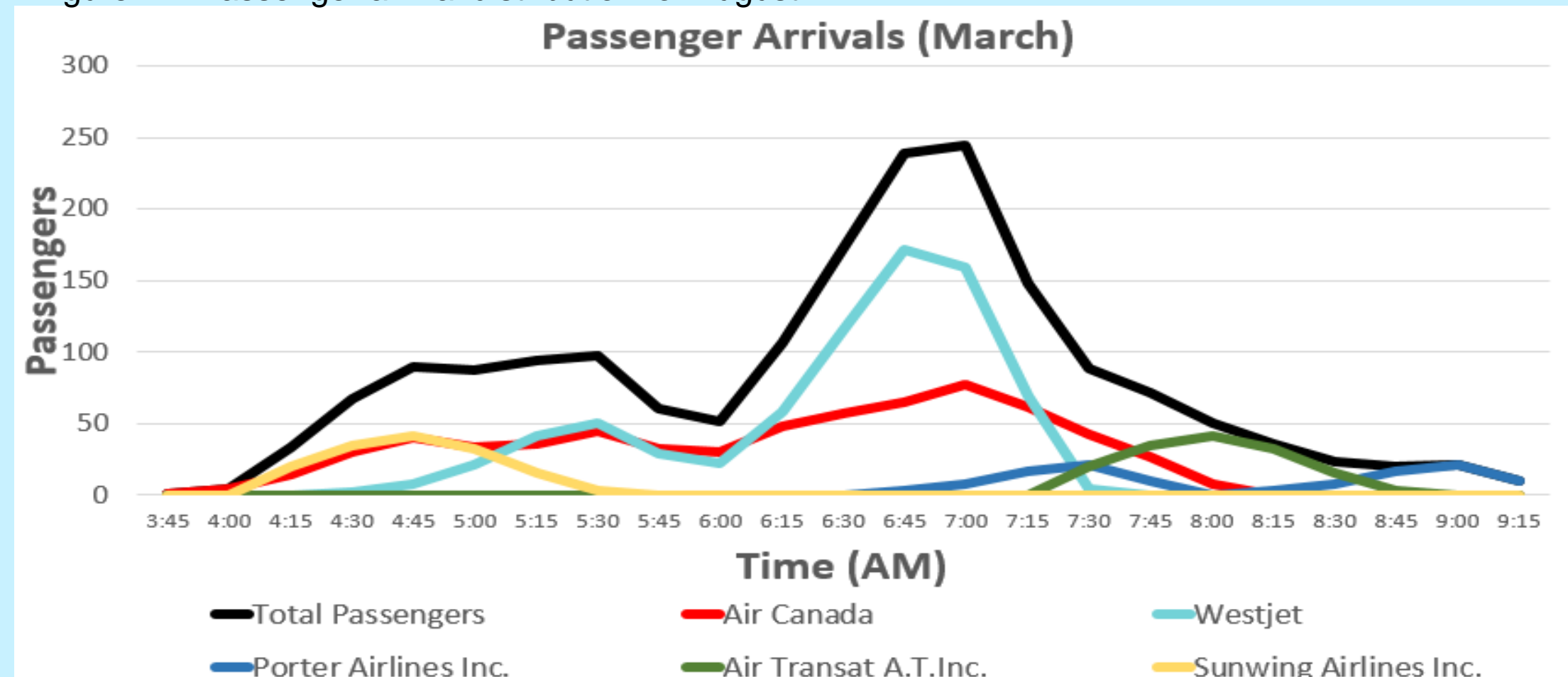

Figure 2 – Passenger arrival distribution for August

Figure 3 – Passenger arrival distribution for March
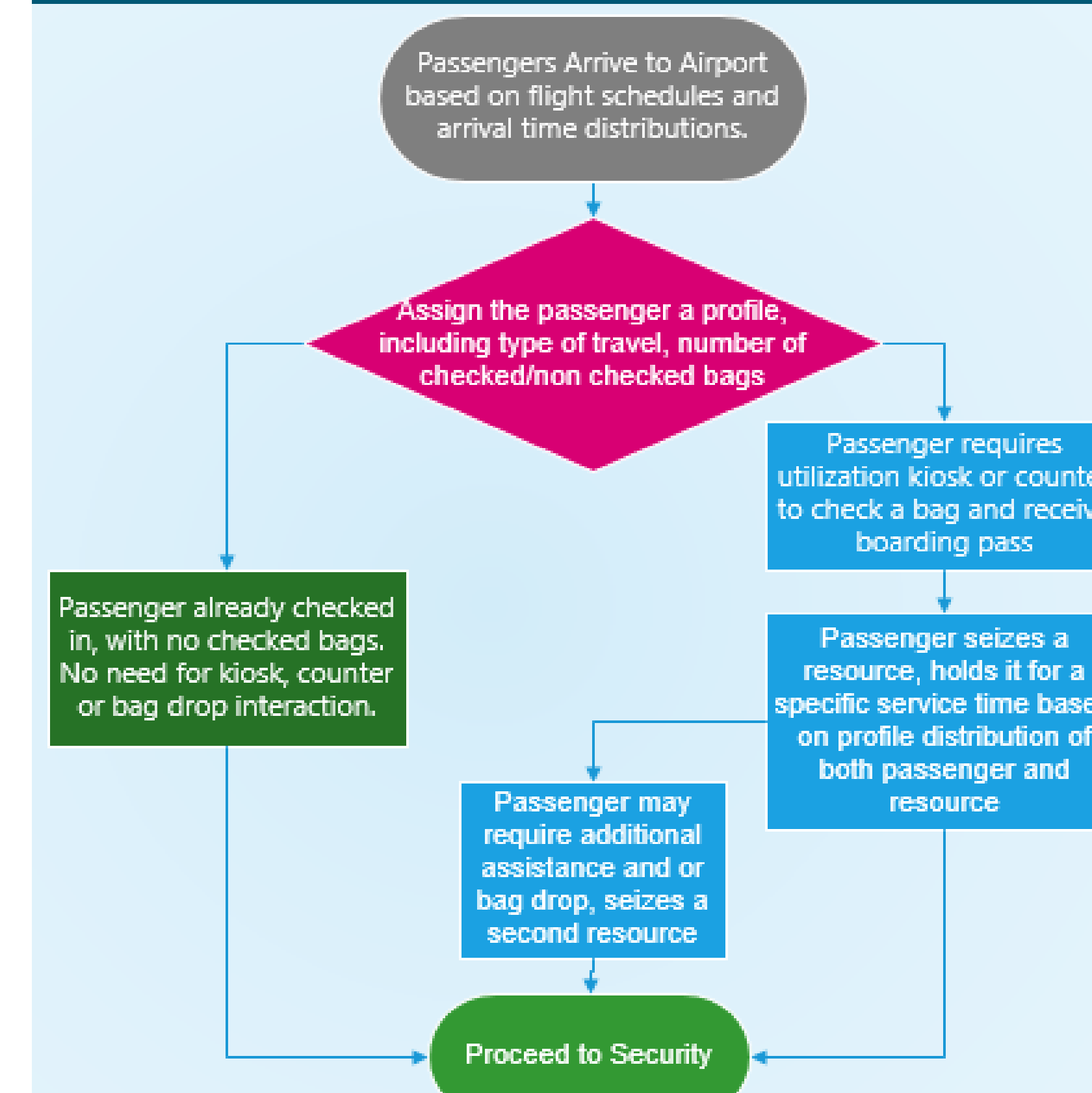
Simulation

Figure 4 – Simulation Process

The flowchart depicts the simulation processes. The nature of each airline's check-in process may differ slightly. Some methods and sources used to support the simulation:

- Time studies on site
- HIAA Master Plan
- Consulting study performed by Airbiz:
  - Service time distributions
  - Load factor
  - Bag allocation distribution
  - Key kiosk metrics

Layout Design

Several changes were made to the existing layout in order to achieve an optimal layout:
- Reduction in number of kiosks for AC, WS and PD.
- Increased spacing between kiosks.
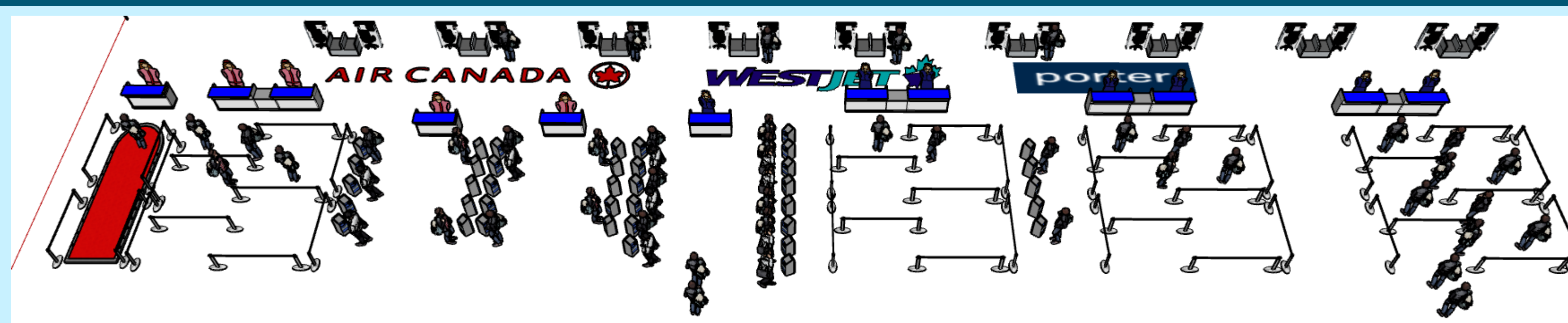- Added space for shared kiosks and seasonal airlines.
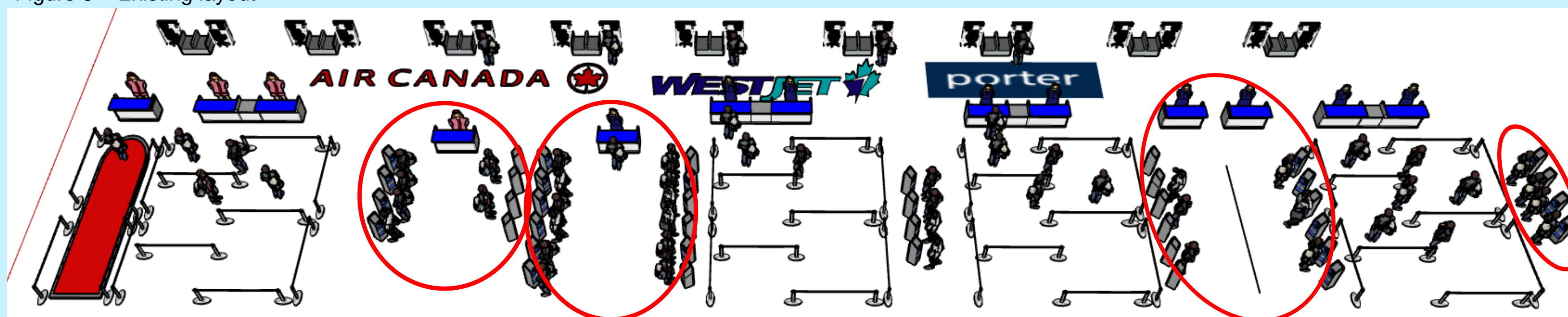

Figure 5 – Existing layout

Figure 6 – Proposed layout with red circles indicating key changes

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- Halifax Stanfield International Airport
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