

Problem Definition

- Sub-optimal wait times and queues for check-in and pre-board screening at YHZ.
- Increasing passenger demand.
- Need for improved passenger flow through:
 - Dynamic airline-counter sharing.
 - Long-term resource requirement understanding.

Project Scope & Approach

Provide recommendations to reduce wait times at YHZ.



Conclusion & Recommendations

- **Conclusion #1:** Dynamic check-in counter scheduling improves processing capabilities in the Check-In Hall, resulting in reduced wait times and more available space in queues.
- Implementation plan provided for integration of the presented method to software used by HIAA.

Optimized Airline Resource Allocation



Hour of the Day	Counter Number																	
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18
1																		
2																		
3																		
4												WS	WS	WS	WS			
5												WS	WS	WS	WS			
6	PD	PD										WS	WS	WS	WS			
7	PD	PD										WS	WS	WS	WS			
8	PD	PD										WS	WS	WS	WS			
9	PD	PD										WS	WS	WS	WS			
10	PD	PD										WS	WS	WS	WS			
11	PD	PD										WS	WS	WS	WS			
12	PD	PD										WS	WS	WS	WS			
13	PD	PD										WS	WS	WS	WS			
14	PD	PD										WS	WS	WS	WS			
15	PD	PD										WS	WS	WS	WS			
16	PD	PD										WS	WS	WS	WS			
17	PD	PD										WS	WS	WS	WS			
18	PD	PD										WS	WS	WS	WS			
19	PD	PD										WS	WS	WS	WS			
20	PD	PD										WS	WS	WS	WS			
21	PD	PD										WS	WS	WS	WS			
22	PD	PD										WS	WS	WS	WS			
23	PD	PD										WS	WS	WS	WS			
24	PD	PD										WS	WS	WS	WS			

Objective: Minimize resource shortages to reduce wait times and congestion.
Constraints: Physical layout, shortage & surplus, shift lengths, staffing, priorities.

Summer Peak Results

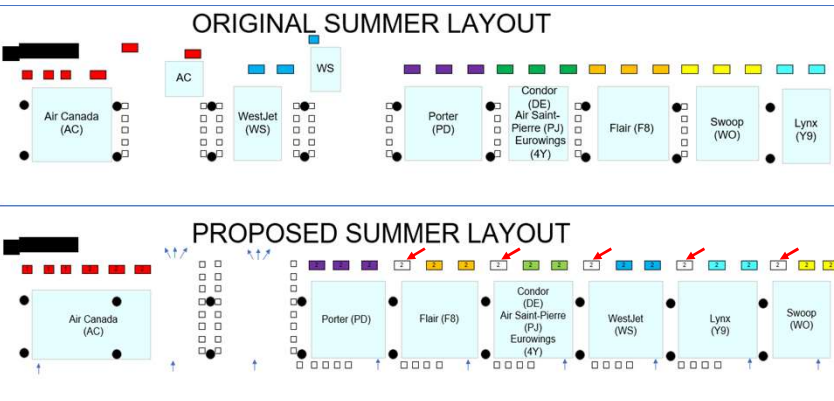
Metric	Baseline	Solution	Improvement
Maximum Wait Time (mins)	26.0	20.2	+ 22%
Space Available (m ² /PAX)	2.6	4.7	+ 81%
Server Utilization	25.7%	24.6%	- 4%

Winter Peak Results

Metric	Baseline	Solution	Improvement
Maximum Wait Time (mins)	30.2	22.9	+ 24%
Space Available (m ² /PAX)	1.7	5.7	+ 230%
Server Utilization	26.4%	25.3%	- 1%

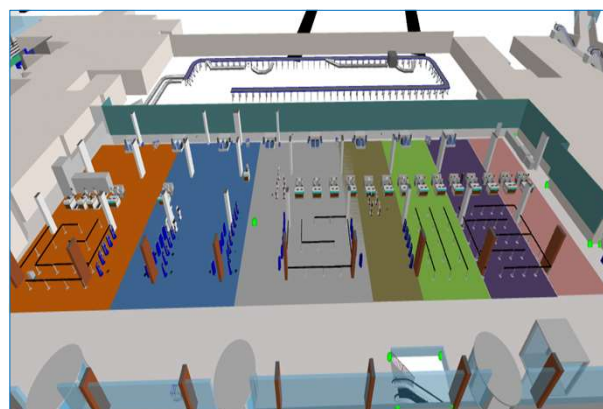
Layout Reconfiguration

- Layouts provided for Winter and Summer seasons.
- Introducing counter sharing: counters shared by multiple airlines, as needed.
- Travelling Salesperson Problem (TSP) used to sequence airlines.



Simulation-Based Validation

- Simio model used to test efficiency of shared counters while considering system randomness.
- Model parameters were validated to ensure accuracy.



- **Conclusion #2:** A substantial capacity increase is needed by 2031. HIAA should consider exploring alternative layouts or expanding facilities.
 - Rotate check-in counters for improved space utilization.
 - Common-use check-in counters.

