

IQC o6

Project Description

“What if the only valid model of the Universe
is the Universe itself?”

(unknown)

BASA

The Borealian Aeronautics Security Agency (BASA) runs **pre-board screening** (PBS) of passengers and crew for all flights departing the nation's class-A airfields:

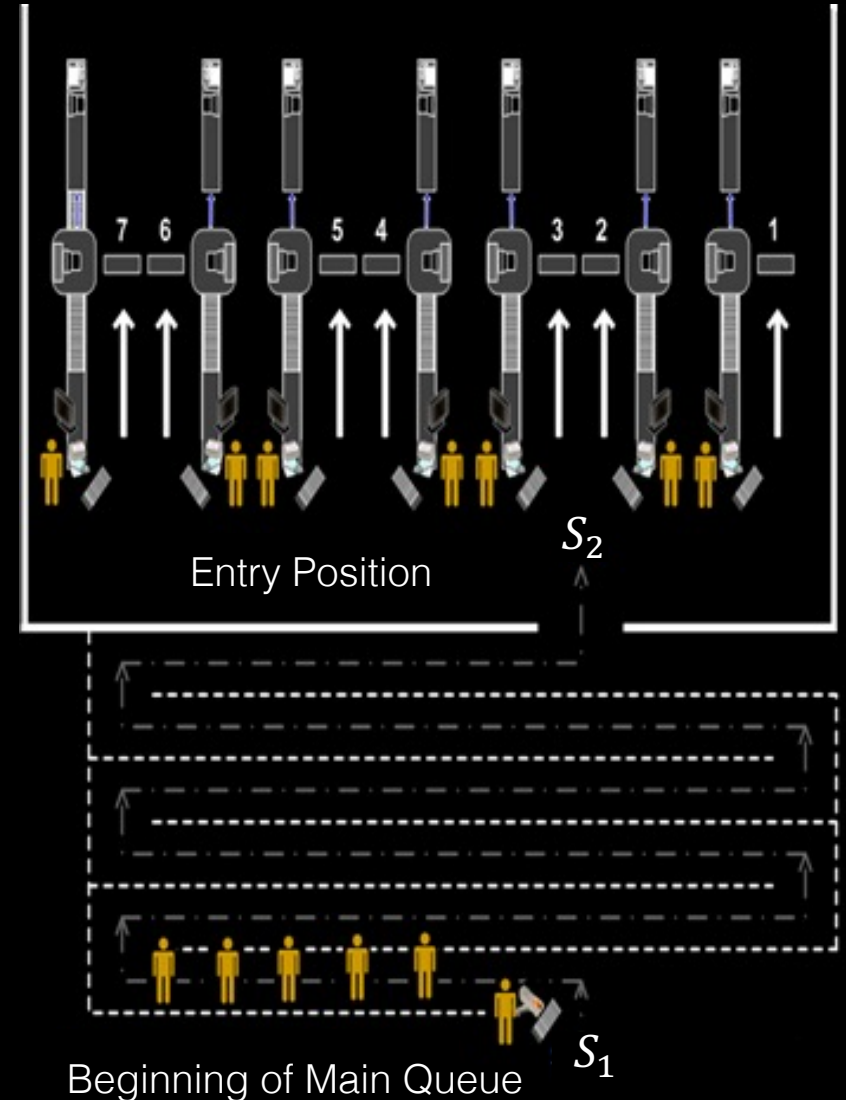
- Auckland (AUC)
- Chebucto (CWL)
- Queenston (QUE)
- Saint-François (SAF)



PBS Process

The screening process is structurally similar at each airfield:

1. Passengers arrive at the beginning of the main queue
2. Boarding passes may or may not be scanned at S_1
3. Passengers enter the main queue
4. Boarding passes are scanned at S_2
5. Passengers are directed to a server entry position
6. Passengers and carry-on luggage are screened by a server



Goals and Purposes

Some factors influence the PBS wait time, including:

- **schedule intensity** of departing flights
- **passenger volume** on these flights
- number of **servers** and **processing rates** at a given airfield, etc.

There might also be

- **yearly, seasonal, time-of-day, day-of-week interaction effects** (among others) depending on the airfield, the flight destination, etc.
- trend **level shifts** in the number of passengers, flights, destinations, etc.

BASA Data

BASA can provide the following data elements, from 20X6 to 20X8:

- Checkpoint
- Passenger ID
- Scan at S_2
- Wait Time
- C_{start} : # servers at S_1
- C_0 : # servers at S_2
- C_{avg}
- Scheduled Departure
- Actual Departure
- Destination City and Country

Goals and Purposes

Ultimately, BASA is seeking an **in-depth understanding** of their data to help make Borealian airfields as **efficient** and **secure** as possible.

Basically, BASA is **seeking answers** to **questions** such as:

- *What do anomalous observations look like at the passenger, flight, and active server levels?
- *Is it possible to forecast passenger arrival patterns based on flight schedule?
- *Is it possible to predict queue waiting times given specific arrival patterns, flight schedule, etc? (Bayesian, Queueing Systems, ML)

BFO

The Borealian Foreign Office (BFO) is responsible for running Borealian consulates all over the planet.

These missions offer services to Borealian citizens that work or travel overseas, and to soon-to-be immigrants/visitors to Borealia.

Information about BFO mission employees is collected in the **PIMENTO** database.

It contains daily information about the number of cases on which these employees work, as well as the number of hours they spend on cases and various programs.

Goals and Purposes

Some factors influence the how busy the missions are, including:

- number of **employees**
- type of requested services, etc.

There might also be

- **yearly, seasonal, day-of-week interaction effects** (among others) depending on the mission, etc.
- trend **level shifts** in the number of requests, etc.

BFO Data

BFO can provide the following PIMENTO data elements, from 20X1-20X7:

- Region
- Mission
- Employee ID
- Date
- # hours spent on various programs
- # hours spent on various cases
- # of various types of cases

Goals and Purposes

Ultimately, BFO is seeking an **in-depth understanding** of their data to help make Borealian missions as **efficient** and **helpful** as possible.

Basically, BAFA is **seeking answers** to **questions** such as:

- *Are there any insights which could be gleaned by visualizing data?
- *What do anomalous observations look like at employee or mission levels?
- *Which mission are most alike?
- *Is it possible to forecast traffic patterns?

Informed Implementation and Action

Insight for the sake of insight might be sufficient for specific purposes, but data analysis is costly – if insights are not also **actionable**, is the process worth it for the client?

Can any of the insights be used by BASA/BFO to

- improve the data collection process (PBS scans/PIMENTO reports)?
- set server vacation policy?
- allocate PBS resources?
- set mission hiring policies?
- identify mission employees who need further training/disciplinary action?
- etc.