# Transport Canada

Aviation Security

# Pre-load Air Cargo Targeting and Artificial Intelligence

# Pre-load Air Cargo Targeting (PACT) Pilot

- The PACT pilot began as a joint initiative between Transport Canada (TC) and the Canada Border Services Agency (CBSA), launched in October 2012.
- It was part of the Beyond the Border (BTB) initiative, one of several pilots under the Integrated Cargo Security Strategy.
- PACT was established to test the capability of using pre-load air cargo information (PLACI) to identify high risk air cargo and potential “bomb in the box” scenarios.
- PACT risk assesses data elements of shipment data at the earliest point possible to target high risk cargo shipments and work with the air carrier to mitigate before loading overseas.
- PACT is currently being explored for operational implementation as a type of enhanced screening measure and/or additional security measure against specific last points of departure.

# PACT Pilot, Why?

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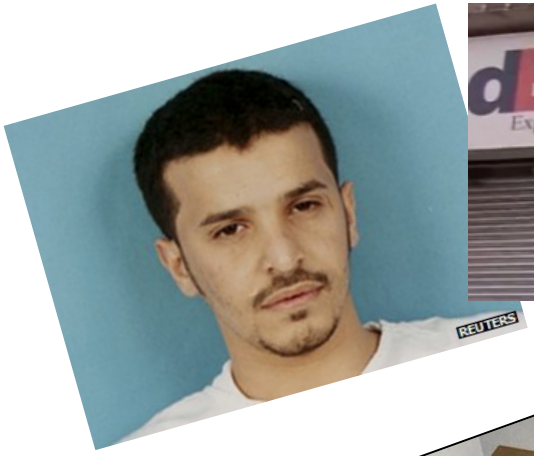
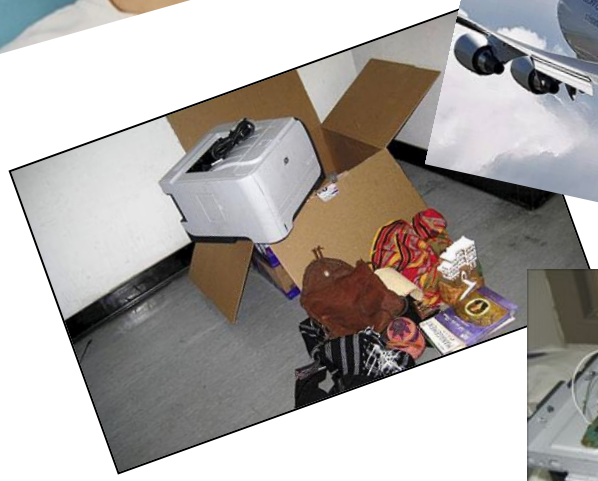






# PACT Pilot – Key Challenges

- Automated Targeting System
  - Manual targeting vs. assisted tool vs. HIGH volume of data
  - Cost of development vs. adapting current systems
- Information and Data Sharing
  - Sharing of tactical information to mitigate specific entities and/or individual names in shipment data
- Commitment of resources and FTEs
  - Ongoing cost of pilot and future program
  - Cost of FTEs + system development vs. pushing activity to another department
- Scope of Program vs. Deliberate Security Measure
  - Conflict of what is best approach vs. resources available

# PACT - Today

- Transport Canada stands out as the only Aviation Authority lead amongst countries with pre-loading air cargo information (PLACI) pilots
  - United States, European Union, United Kingdom, France
- PACT is an additional screening method that has been rolled out as part of the Special Location Security Measure #16
  - Able to track and monitor compliance by using cargo data
  - Training TCSC Operations Officers for overnight targeting

# PACT numbers…to date

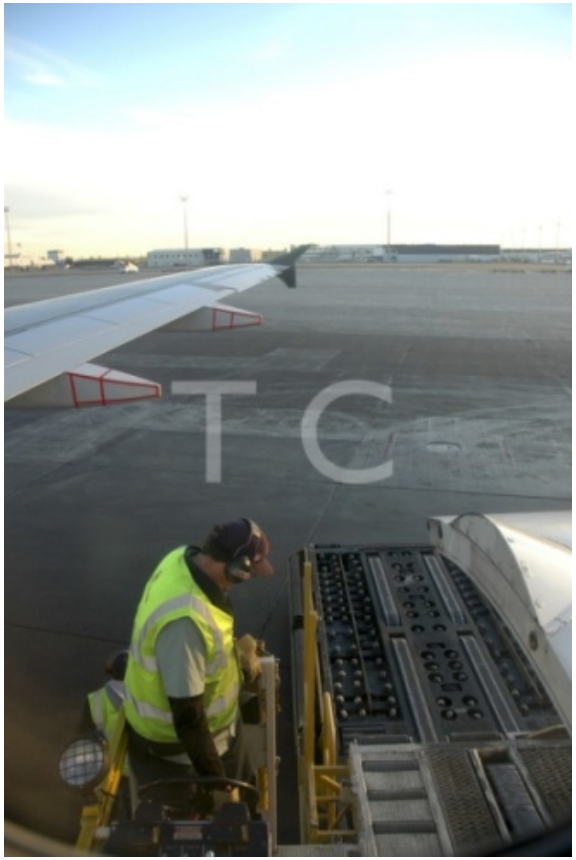
| | Emails Received | Emails Risk Assessed | Mitigation Level 1 | Mitigation Level 1+ |
|---|---|---|---|---|
| 01 Mar to 30 Dec 2013 | 459,019 | 49,220 | 20 | 1 |
| 01 Jan to 31 Dec 2014 | 811,270 | 29,957 | 46 | 2 |
| 01 Jan to 31 Dec 2015 | 1,411,383 | 425,084 | 53 | 0 |
| 01 Jan to 31 Dec 2016 | 862,343 | 50,965 | 43 | 0 |
| 01 Jan to 31 Dec 2017 | 669,472 | 41,902 | 22 | 0 |
| 01 Jan to 31 May 2018 | 288,992 | 27,034 | 10 | 1 |
| Totals: | **4,502,479** | **624,162** | **194** | **4** |

- "Tsunami" of air cargo information
  - Manually targeted
  - Unable to assess 100%
  - Using filters and risk products to reduce message workload
  - This represents PACT participants data only

*Artificial Intelligence (AI) technology*
*Makes this more efficient and make 100% achievable*

# PACT's Tomorrow – includes AI

- PACT was chosen as the test scenario for the development and proof of concept for TC's AI initiative
- Using machine learning, natural language processes, supervised and unsupervised learning processes to create risk algorithm for use as an operational and tactical risk assessment tool
- Very positive proof of concept; next step is finalize RFP for competition for further development of minimum viable product. Estimated 16 week development period
- AI has the potential to significantly increase the capacity of PACT targeters to risk assess individual shipments.



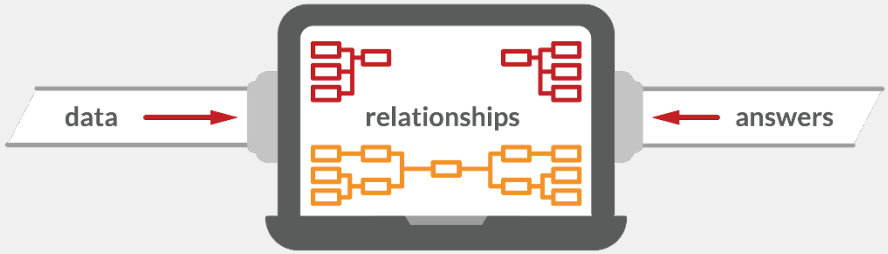
# Artificial Intelligence Initiative

- The AI Pilot is an experiment with a disruptive technology to solve a common problem – improving risk-based oversight
- Collaboration between Transport Canada (TC) and Ottawa-based companies to experiment with the use of AI
- First disruptive technology experiment to go through TC's IM/IT Digital Research Lab
- Can we use AI to improve our ability to conduct risk-based oversight? How can we improve our effectiveness and efficiency when assessing risk in air cargo shipments?

# MACHINE LEARNING PARADIGMS

## Supervised Learning

We are trying to learn the relationship between inputs and output

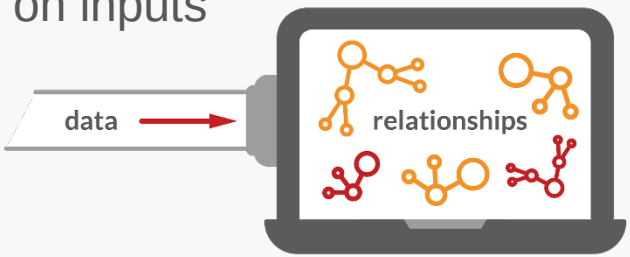



Requires a minimum number of positive cases (RFIs)

- We have only 25

## Unsupervised Learning

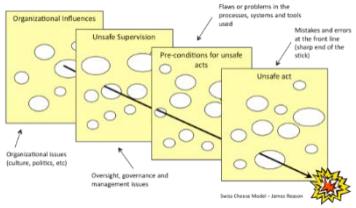
We are trying to learn relationships between cases based solely on inputs




- Blind ourselves to RFI status
- Score each shipment based on the rarity of that feature
- Repeat for all features
- Combine the scores & visualize
- Look for ‘rare’ or unlikely shipments

# WHY a PACT Program Tomorrow

- Pre-Loading Air Cargo Information (PLACI) is gaining momentum on the global stage amongst member states of ICAO and World Customs Organizations
  - TC's PACT has been at the forefront since 2012; Transport Canada is a leader in the field of defining and employing PLACI as an aviation security method
- TC will be able to better harmonize global practices to limit impacts on Canadian industry and facilitate the movement of cargo in the supply chain
- The PACT pilot has proven the security value and utility of advance cargo data
- PACT as a program gives TC an additional screening method and security tool to deploy globally to LPDs and can encompass multiple Aircraft Operator models
- A PACT program assisted by AI technology will allow flexibility in adapting TC's response to an ever evolving global threat and risk environment; proactive instead of responsive; with an efficient use of resources
- PACT as a program fully supports a risk based approach to cargo screening




# Challenges for Legislative & Regulatory frameworks…

- For a Program that 'just' targets:
  - Aeronautics Act
  - Canadian Aviation Security Regulations
  - Air Carrier Security Measures
  - Security Measures Respecting Air Cargo?

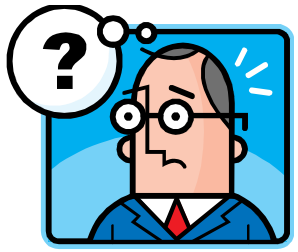
- For a Program that targets…with AI:
  - We need to answer, how far out of the decision chain do we want to push ourselves?
  - For decision making, need to recognize AI as a sanctioned decision making tool/process
  - For decision assisting, need to ensure oversight of AI learning…but what else?

- Regardless, the GoC is at the threshold of processing the ramifications…there are no 'canned' answers yet…

"Flexibility is the key to airpower"
*- Gen Giulio Douhet -*

# Questions?

"Anything, Anytime, Anywhere, Professionally"
*- Air America -*




"When it absolutely positively has to be there overnight"
*- Federal Express -*