Australian Government
Department of Agriculture, Fisheries and Forestry

Biosecurity Operations – Detection Tools and Technology

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VS

Detection Capability

Dogs

Biosecurity Detector Dog Capability

Detection Technologies

X-Ray

New Technologies

Emerging Technology Program

National Detector Dog Program Overview

Bolstering Australia's Biosecurity System – Detector Dog Capability Increase

- Announced in the 2023 October budget.
- Provides $11.7million to increase and sustain the workforce by 20 additional detector dogs and 20 additional handlers
- To date 8 additional detector dogs have graduated under the budget measure (below)

Quick Stats

- 53 Operational dogs
- 50 Handlers
- 9 Technical supervisors
- 8 Training and Capability team

Mail 2022 calendar Year (approx.)

- ~6.2M mail articles K9 screened
- ~10,700 mail article K9 interceptions

Travellers 2022 calendar Year (approx.)

- ~920,000 travellers K9 screened
- ~10,100 traveller K9 interceptions

20,800 Total K9 interceptions (2022 calendar year - approx.)

KEY

Current Numbers

Airport Screening

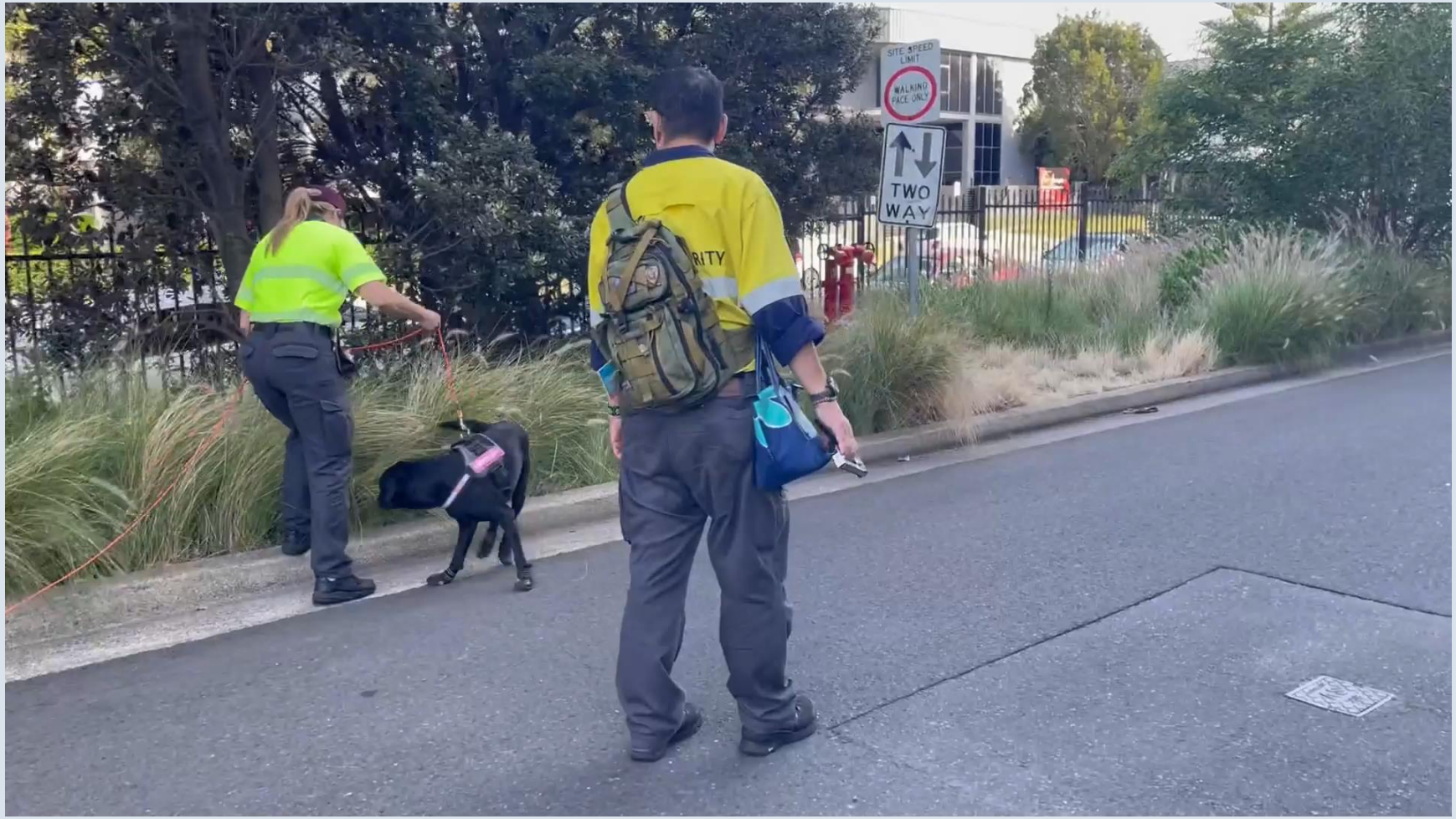
Mail Screening

The First BMSB Found By a Detector Dog

- In 2018 we began an innovative project with the University of New England to train our detector dog fleet to sniff out Brown Marmorated Stink Bug (BMSB).
- In November 2021 Velvet was the first detector dog to find a live BMSB.
- During a cargo inspection of over 800 vehicles and over 150 bulk break items Velvet sniffed out a single live BMSB on an off highway Caterpillar Truck.
- This live sample was confirmed as a BMSB and subsequently used to train and test the entire Brisbane detector dog fleet.

Port Botany BMSB Deployment

- Deployed to Port Botany in response to a positive detection of BMSB at an approved arrangement.
- After finding several bugs in relation to an incoming container, no further detections have been made since January.



BMSB in the Traveller Pathway

- Whilst screening passengers off a flight from Taipei, detector dog Petal responded to a duffle bag (cabin luggage).
- Single live BMSB was found upon inspection.
- The passenger had started their journey in Serbia, connecting through Istanbul and Taiwan.

Re-introducing Bees as a target odour

- Re-introduced queen bees as a target odour across the entire biosecurity detector dog fleet.
- Quick process to imprint a detector dog:
  - All dogs provided a conditioned response within 3-5 exercises
  - The entire process for all eight dogs based in Brisbane completed in two days.

X-Ray Technology

Our Investment in New 3D X-ray Technology

Technology Investment

3D Real Time Tomography (RTT) X-ray Unit

Decrease in threats entering Aust.

Detection of biosecurity risk items with 3D x-ray screening

Unlocking the potential

Automated detection algorithms for fruit, meat, seafood, plants and vegetables

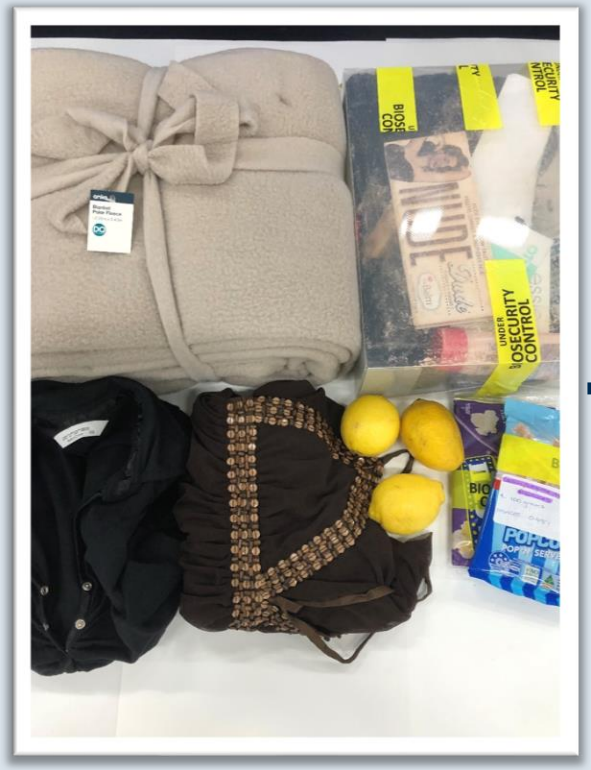
Rapiscan systems
An OSI Systems Company

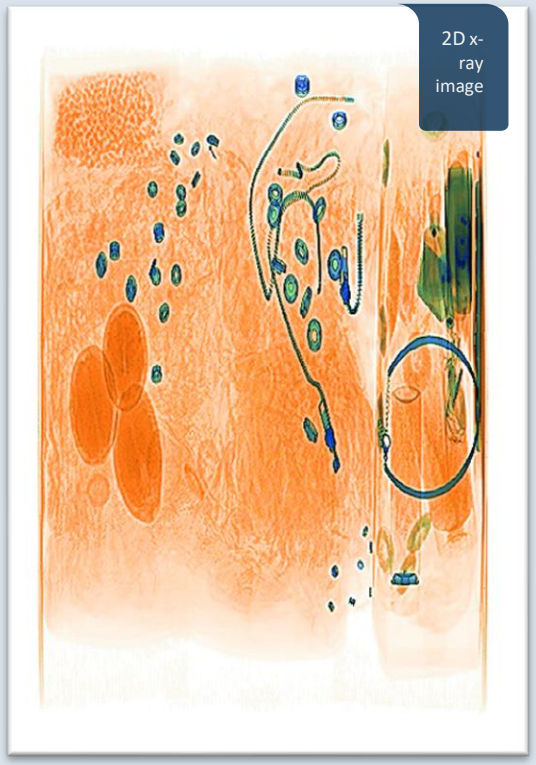
Our delivery partners

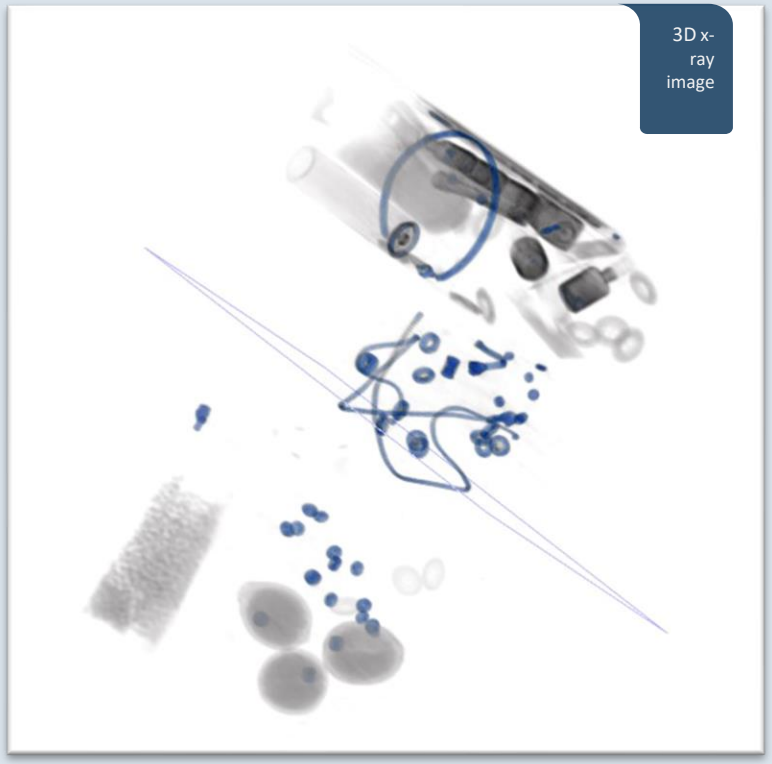
Ministry for Primary Industries
Manatū Ahu Matua

smiths detection
THE UNIVERSITY OF MELBOURNE
TARONGA CONSERVATION SOCIETY AUSTRALIA
Australia Post
BNE it all begins here
Australian BORDER FORCE
Synergy
MELBOURNE AIRPORT
AIRSIDE PROJECTS
ALSTEF GROUP

2D X-Ray vs 3D X-Ray







Rapiscan systems
An OSI Systems Company

BHS:

IATA: 0000000000

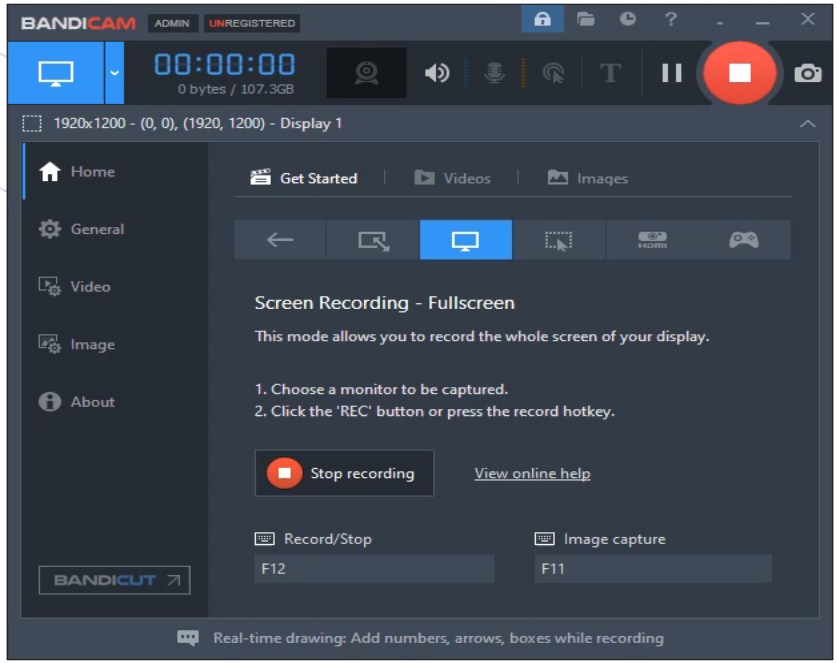
Scanner: 111170707

Operator: 1234

26/10/2021 10:12:20

0

3D View



Top
Front
Left

Image | File | Admin | Configure | View | Comments

F:/Fruit Scans/DAWE_MJB_Scans/Fruit/0090196058.bag loading: 0s, rendering: 0s, requested algo: 100

Decision

Alarm

Type

ENG

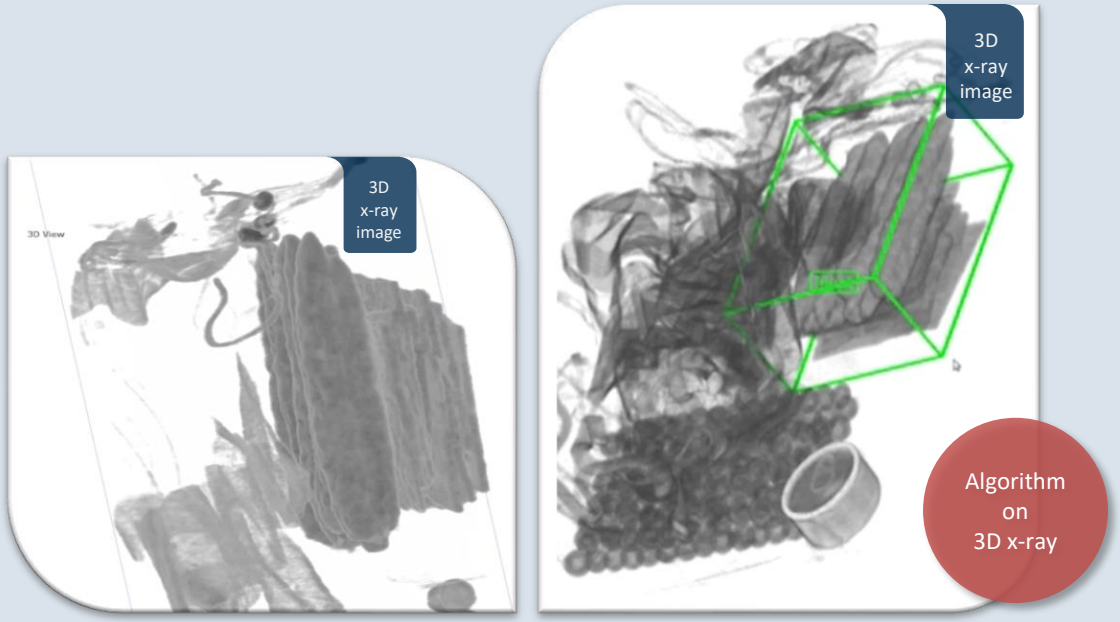
10:12 AM
26/10/2021

Algorithm Development

3D X-Ray Algorithm Development

In partnership with NZMPI and Rapiscan we have developed algorithms to automatically detect biosecurity risks for:

Meat **Fruit** **Vegetables** **Seafood**



Preliminary algorithms have also been developed to allow automated detection of wildlife and trafficable animal parts such as:

Lizards **Snakes** **Ivory**

Rhino horn **Turtle shell** **Tortoise Shell**

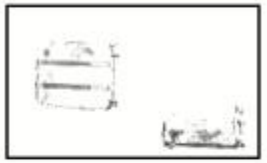
Activities Firefox Web Browser Thu 09:41

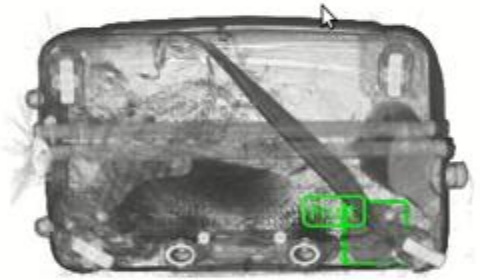
Malibu

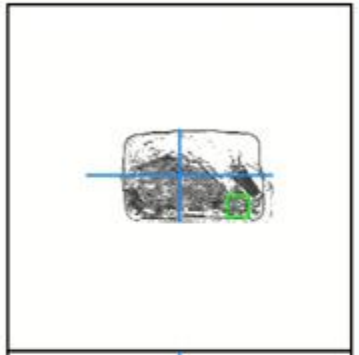
https://localhost:8081/malibu-web/#/apps

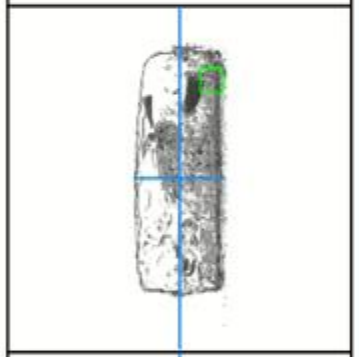
Getting Started cQWER7890-

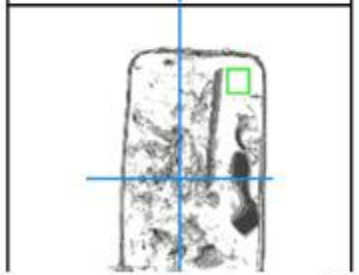
Rapiscan systems | 29/10/2020 | 09:41:29 | 11:06:35 | 1 | Operator | operator











BACK

Library | Meat

False Alarm

Box 1

Swap | Background | Oblique Orientation | Go To Center | Reset to Full Volume

Bag ID: 0090189220

Bag ID

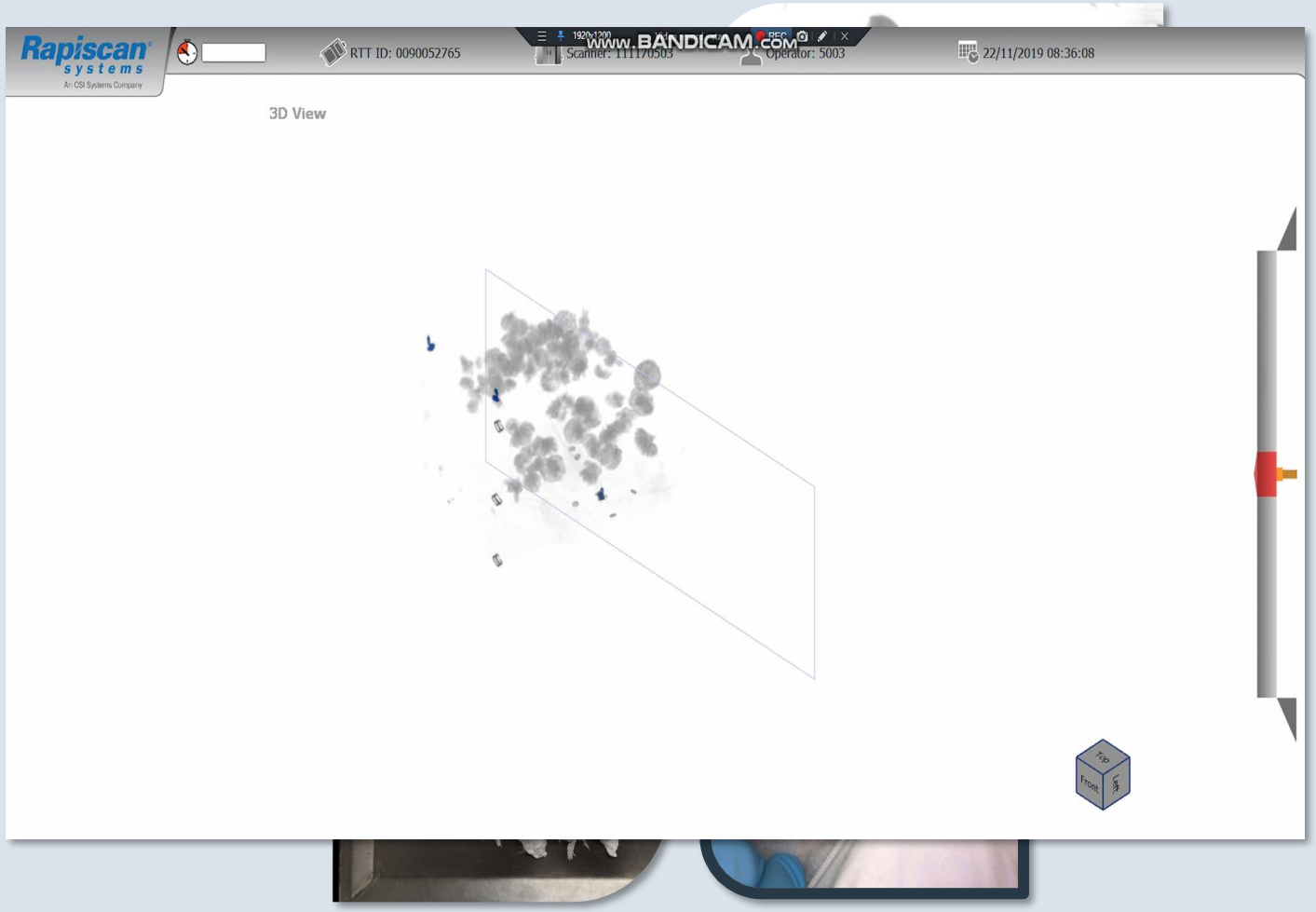
No bags to process.

Enter

Concealed Succulents

Power of a 3D X-Ray

- 3D x-ray screened a parcel arriving from China labelled as ‘Clothes’.
- Following the initial 3D X-Ray scan the parcel was inspected and found to have 83 succulents concealed within decorative cushions.



2D X-Ray Algorithm Development

As well as our successful work on 3D x-ray, we continue to trial our 2D x-ray automated detection algorithms at our dog facility in Brisbane. The department is partnering with both Rapiscan and Smiths to inform our future 2D hardware and software strategy.

Rapiscan 927 DX 2D x-ray unit

- Trial commenced in 2021
- Building meat image library to provide data to inform algorithm development
- Meat detection algorithm is soon to be deployed on to the Rapiscan 2D x-ray unit.

Smiths 100 100 V-2IS 2D x-ray unit

- The trial for the Smith's unit is in early stages of data gathering and validation
- Focus is on validating algorithms and building the image library
- First live trial of meat algorithm expected in mid-2023.

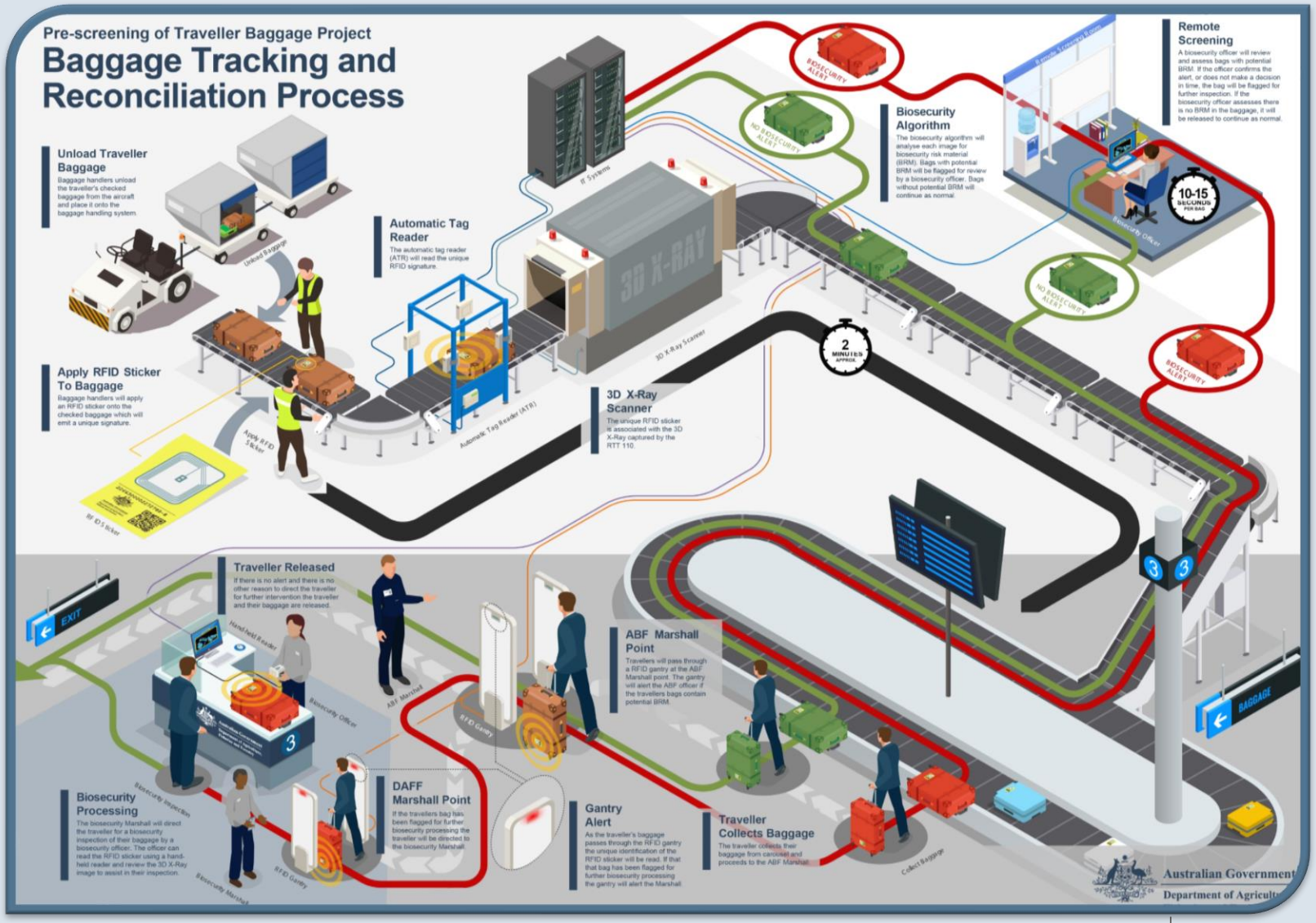
Seed Algorithm Development

- In peak periods seeds comprised up to 70% of all seizures in the mail pathway.
- Current 2D or 3D x-rays are too high energy resulting in them not detecting small seeds.
- Low energy, high resolution x-ray technology was used to develop a seed detection algorithm.

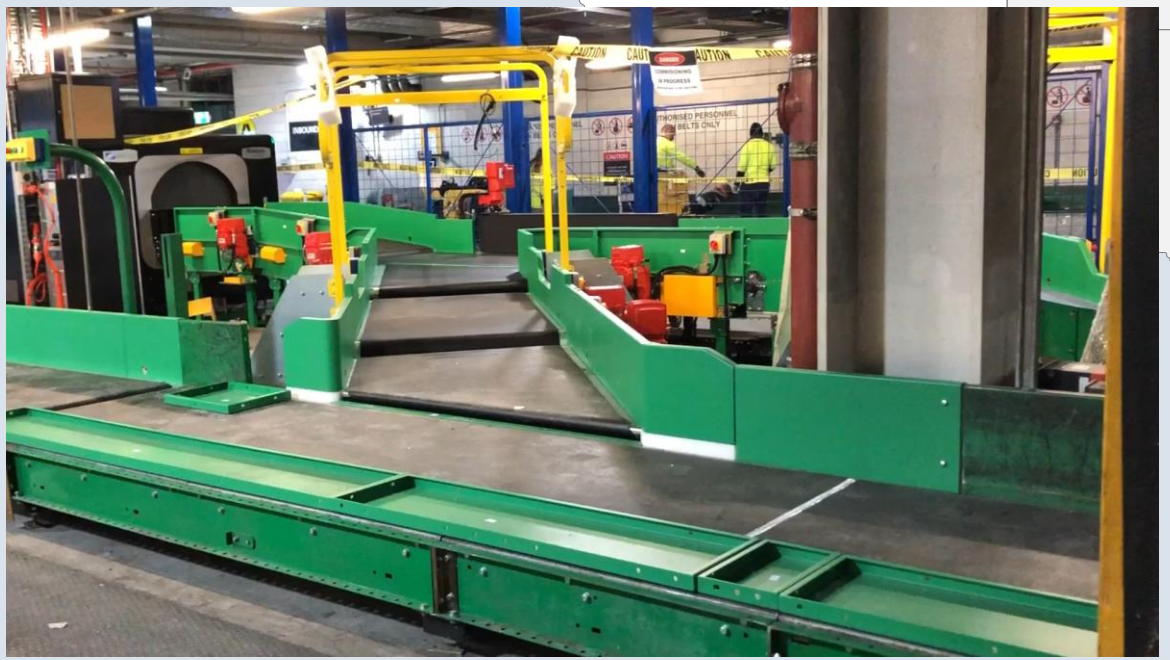
Pre-Screening of Passenger Baggage Trial

Pre-Screening of Passenger Baggage Trial

- Test operations in 2 international airport locations
- The trial will screen hold baggage after arrival but prior to the passenger collecting their baggage
- As bags are unloaded onto the baggage handling system they will be scanned by the 3D x-ray unit
- 3D x-ray images will be sent to a control room where biosecurity officers will assess the contents for biosecurity risk material.



Our Investment in New 3D X-ray Technology



Questions?