Tool and Equipment Management at IMP Aerospace

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INTRODUCTION

IMP Aerospace is a subsidiary of IMP Group based in Goff's, Nova Scotia. They are one of the largest aircraft engineering and maintenance operations in Canada, and they specialize in aircraft maintenance and modifications for military, government, and commercial operations.

Acronyms
TCP: Tool Crib Personnel
PP: Production Personnel
GSE: Ground Support Equipment
RFID: Radio Frequency Identification
FOD: Foreign Object Debris

OBJECTIVE

Improve tool and equipment management by increasing automation, improving data collection, and utilizing resources more efficiently.

CONCLUSIONS

Deliverables

- Pilot project for scanning out all tools and removing redundant sign out processes
- Implementation plan to achieve expected state in tool crib (continuation of 5S, proposed layout, and self-serve tool crib training)
- Microsoft Power BI Dashboard for better tool and equipment data management
- Microsoft Power App for standardizing the request process between hangars
- Implementation plan for recommended RFID tracking solution (vendor, setup, timeline)

The deliverables will result in a significant improvement in the accuracy and consistency of data collection, making tool and equipment usage and locations easily accessible. Furthermore, by standardizing processes, a self-serve tool crib will be achievable for IMP.

Self-Serve Tool Crib: $75,260 savings/year

**RFID GSE Tracking: $33,450 savings/year
ROI of ~6 years**

1. TOOL CRIB SOLUTION

Problem Description

- TCP sign in/out tools to PP; inefficient use of resources
- Inconsistent processes followed; time consuming and redundant
- Only calibrated items are scanned in/out; leads to lack of data
- Reliant on TCP's years of experience; risk of retirement
- Disorganized due to lack of space; quality standards not met

Design Process

- Conducted a work sample and survey to determine roles of TCP, pain points, and to collect data on queue/service times
- Conducted a pilot project to test scanning out all tools for increased data collection and to audit the data entries which will determine if redundant processes could be removed

Self-Serve Tool Crib

Expected State

- PP enter tool crib to retrieve tools
- All tools scanned out of tool crib
- Not reliant on the TCP to operate
- Security cameras and ID badge readers for accountability

To Achieve Expected State

a. 5S action plan in Hangar 1 tool crib
   i. Red-tagging event to create space
   ii. New layout to meet quality standards
b. Standardize processes to remove redundant tasks
c. Scanner script modifications for increased efficiency with sign in/outs

— Benefits —

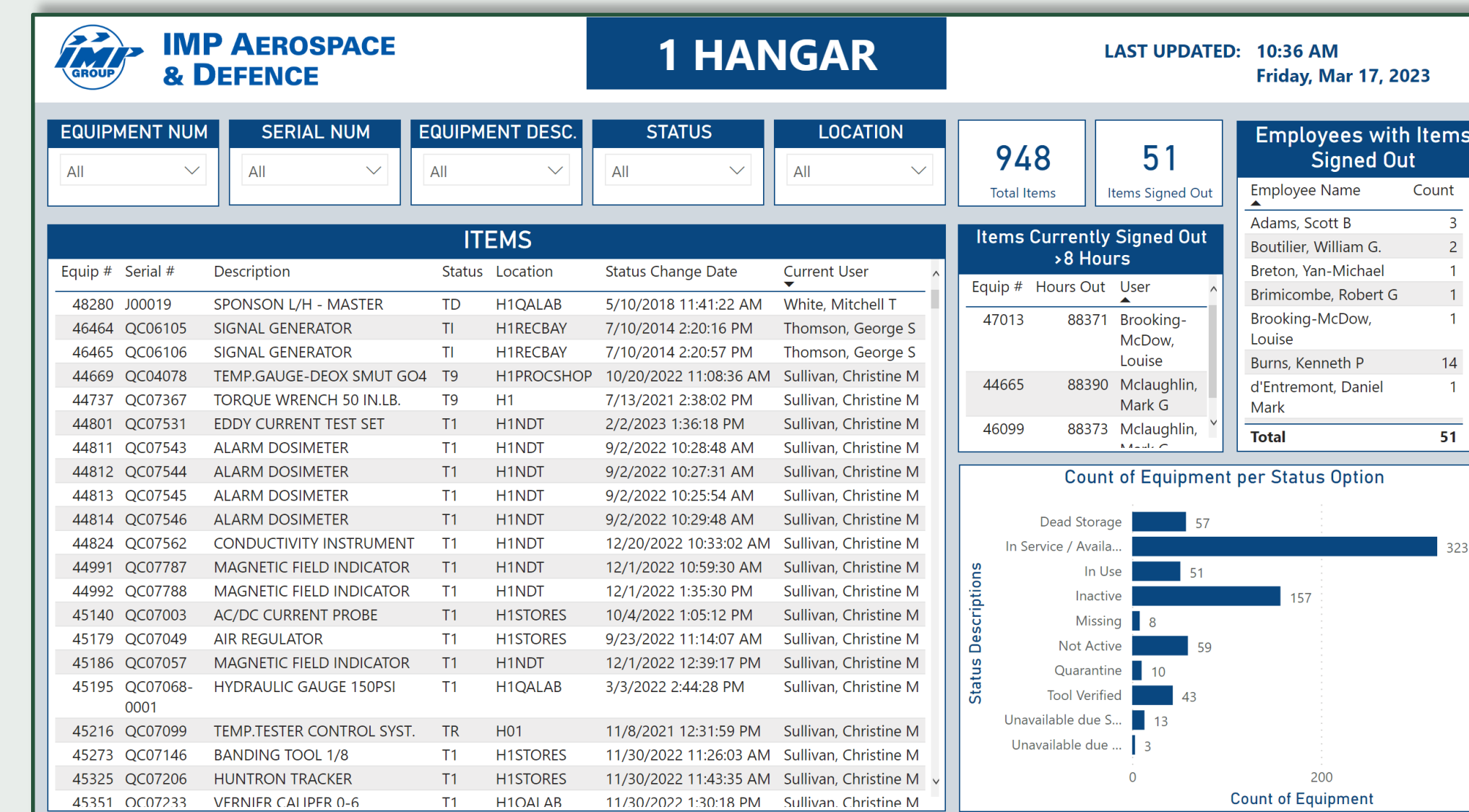|	
Additional tools tracked	93%
Eliminated queue time	100%
Hours saved / yr (TCP + PP)	2346
Sign out methods eliminated	5

MS Power BI

- Dashboard to allow users to easily access data, as opposed to the existing system
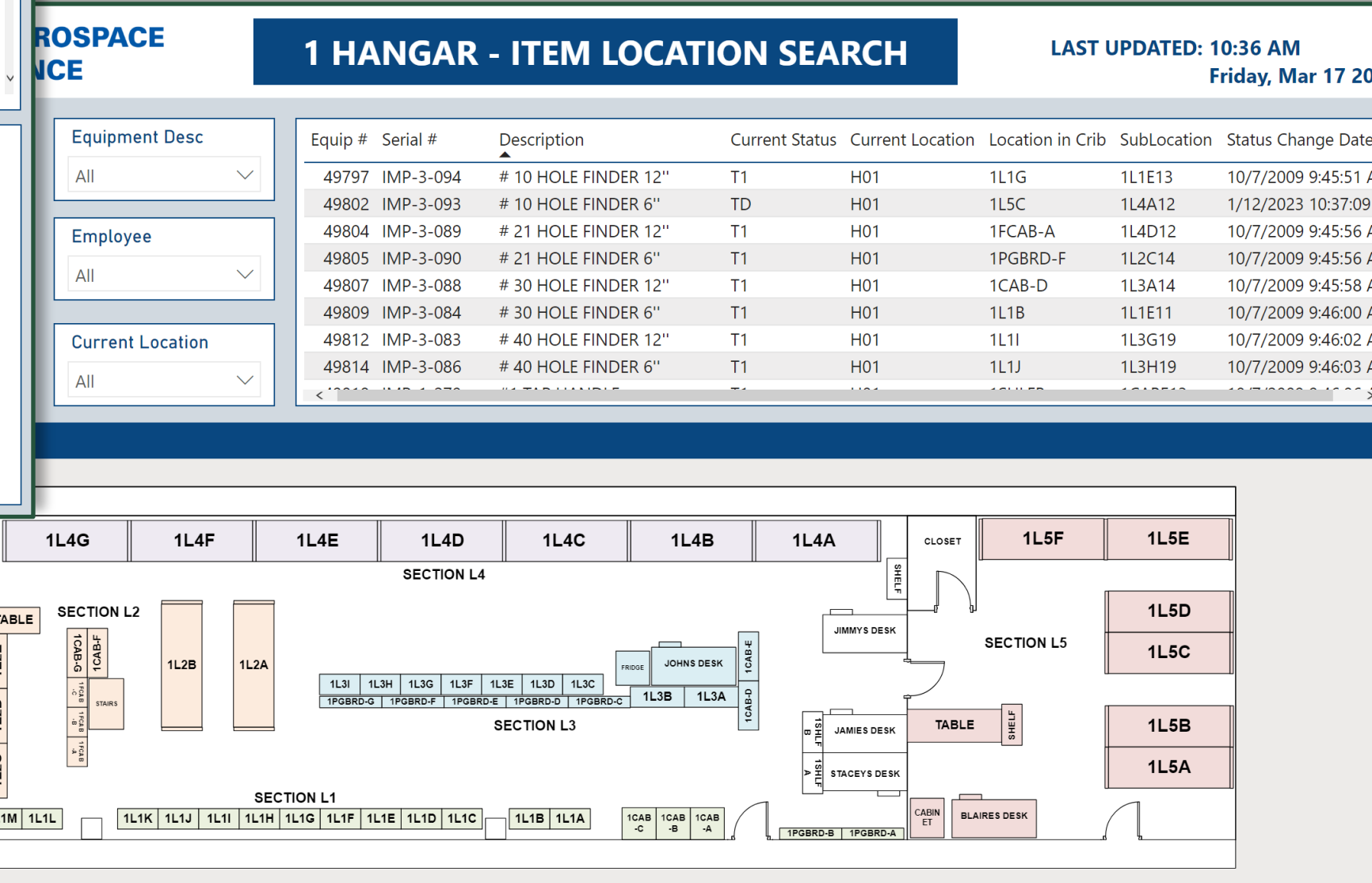- Increases tool control and decreases risk of FOD

Capabilities:

- Interactive layout to display tool locations in tool crib
- Shows employees with signed out tools
- Provides filterable and insightful summary data

— Benefits —

- Efficiently manage & locate tools
- Metrics that drive action

Power BI

MS Power App

- Application to standardize methods for submitting and managing requests
- Manges consumables, tools, and part requests between 3 different hangars (1, 6, and 9)

Capabilities:

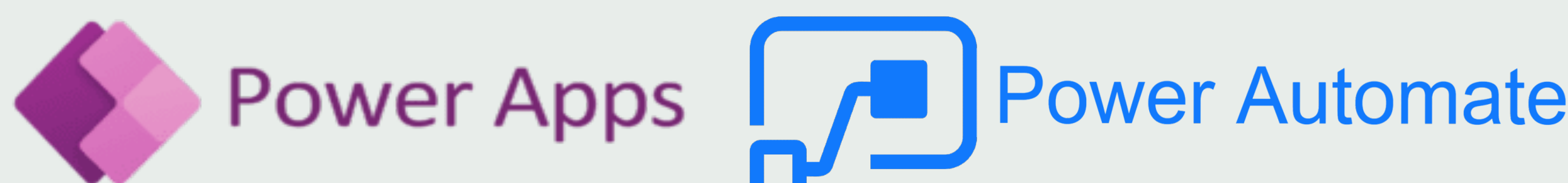- Submit, review, action, and view status of requests
- Automatic email notifications using MS Power Automate

New Consumable Request

Power Apps   Power Automate

— Benefits —

|	
Requesting methods eliminated	2
Cost integration w/ current system	$0
Central request processing system	
Reduction in processing errors	

2. GSE SOLUTION

Problem Description

- GSE is shared between 4 hangars, spanning ~1km (see map below); time consuming to locate
- GSE movement is not tracked; lack of visibility
- GSE is expensive and critical to production; seizes resources to locate and causes schedule delays

Design Process

- Conducted a survey to gain feedback from PP
- Explored industry standard GSE tracking solutions through research and vendor meetings
- Determined RFID technology is the best option for level of visibility desired by IMP

RFID TRACKING

- Passive ultra-high frequency RFID system
- Tags to be added to all GSE to track location
- Requires specialized tags to avoid interruption with metal equipment
- Threshold RFID reader setup at each hangar bay door
- A → B or B → A configuration to recognize when GSE leaves or enters a hangar
- Dedicated storage area on hangar floor to store GSE

A   B

RFID

Exit
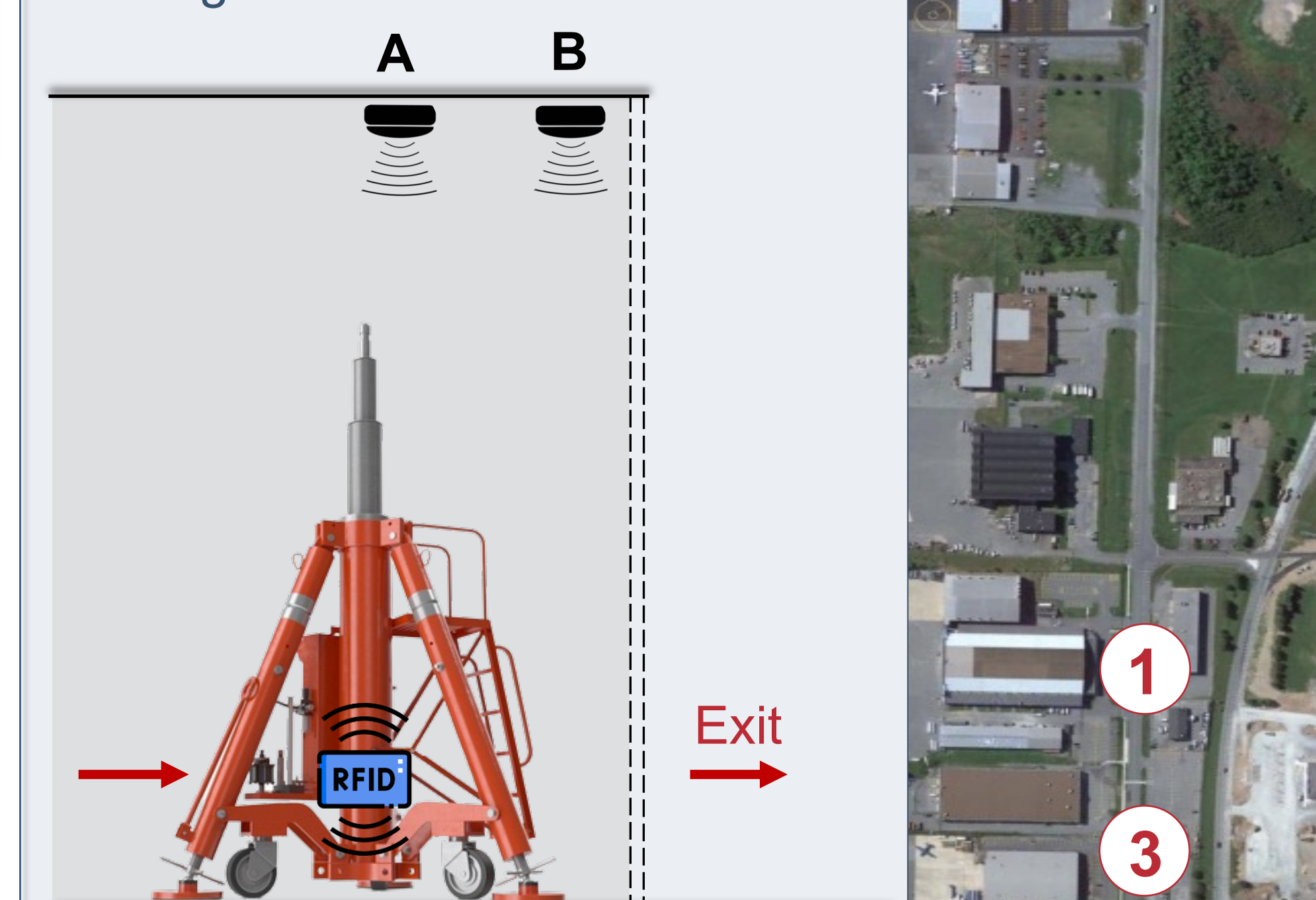
— Benefits —

Hours saved / yr locating GSE	670
GSE movement data collection	100%
Removes human reliance to track	
Location visibility on costly assets	