

Department of Industrial Engineering

Rehab Equipment Space & Inventory Assessment

Problem Definition

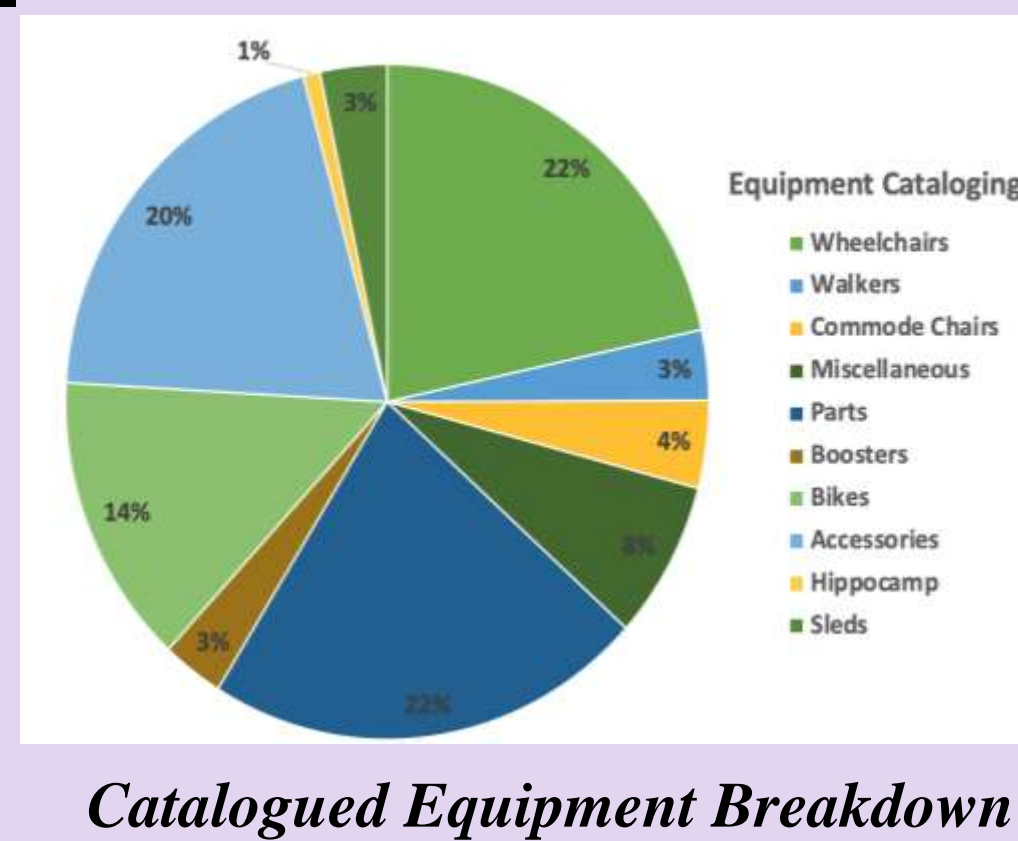
- The IWK facility is limited in space available for daily operations. The Redevelopment, Space and Leasing team (RDSL) have requested a dilated assessment of 5 storage areas used by Rehab Entities for equipment storage.
- There is currently no standard equipment storage & tracking system in place to identify what equipment is available and where it's stored.

Objectives

- Space Improvement:** Improve space usage, ensuring compliance with safety regulations and improving functionality.
- Inventory Management:** Analyze current inventory, conduct a 5S red tagging trial to equipment assess usage, and improve storage methods.
- Standardization:** Establish consistent procedures for equipment storage, labeling, shelving and tracking.
- Operational Efficiency:** Streamline access to equipment, enhance storage systems, and improve equipment tracking processes.
- Cost Analysis:** Evaluate financial implications of solution prototypes.

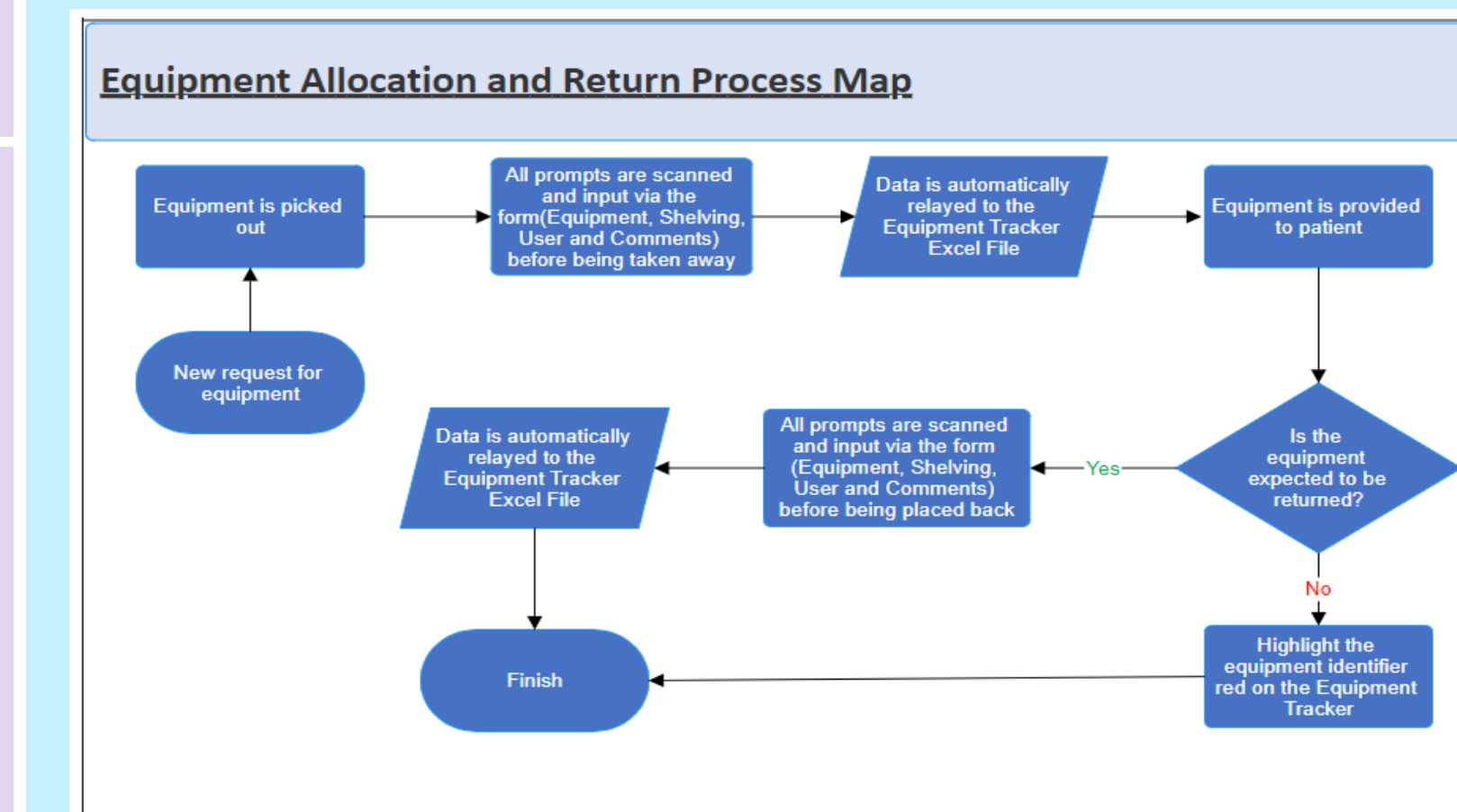
Approach

- Equipment Cataloguing**
- Equipment is catalogued, measuring its dimensions to understand storage and shelving requirements.
 - Measure the length, width & height of all equipment in storage areas
 - Create unique nomenclature for all equipment to implement tracking methods.
- Nomenclature & Barcoding**
- Equipment is organized into distinct categories.
 - Implementation of an iterative numbering system.
 - Adopted similar naming system for proposed shelving areas.
 - Aimed for easy identification of shelving areas.
 - Barcoded each equipment and shelving area.
 - Integrated into the tracking system for improved utilization.



Tracking System

- User input form created via an external application that relays and logs equipment information to Excel file.
- A flat file is created where the log is filtered to show the most recent information of the equipment.
- Slicers and filters are utilized to create an effective and user-friendly interface via Power BI.

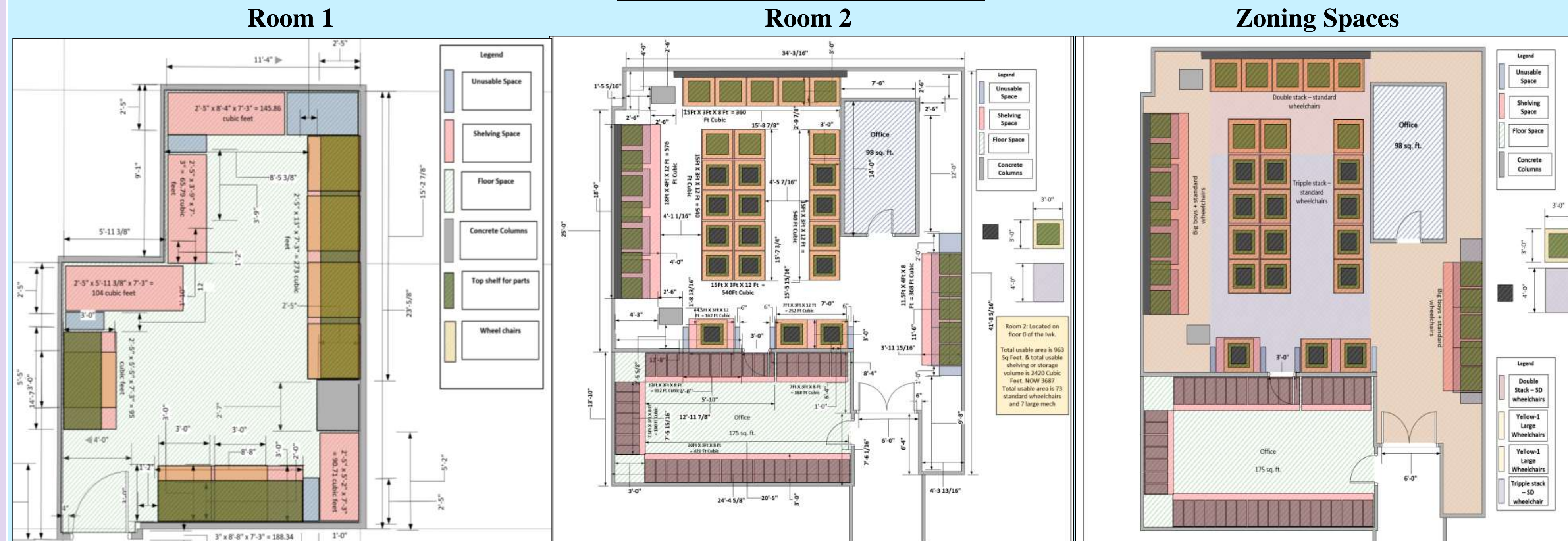


Equipment ID	Shelving	Availability	Last User	Comments	Last used	Room	Type
WC 001	RM1SH 003	Not Available	Adi	Rehab dept	2024-01-26	Room 1	Wheelchair
WC 002	RM1SH 004	Not Available	Adi	Rehab dept	2024-01-26	Room 1	Wheelchair
WC 003	RM1SH 003	Not Available	Abdullah	Rehab dept	2024-01-26	Room 1	Wheelchair
WC 004	RM1SH 004	Not Available	Abdullah	Rehab dept	2024-01-26	Room 2	Wheelchair
WC 005	RM1SH 003	Not Available	Adi	rec	2024-01-30	Room 1	Wheelchair
WC 006	RM1SH 004	Not Available	Adi	Rehab	2024-01-30	Room 1	Wheelchair
WC 007	RM1SH 003	Not Available	Adi	Rehab	2024-01-30	Room 1	Wheelchair

Tracking Flat File

Power BI User Interface

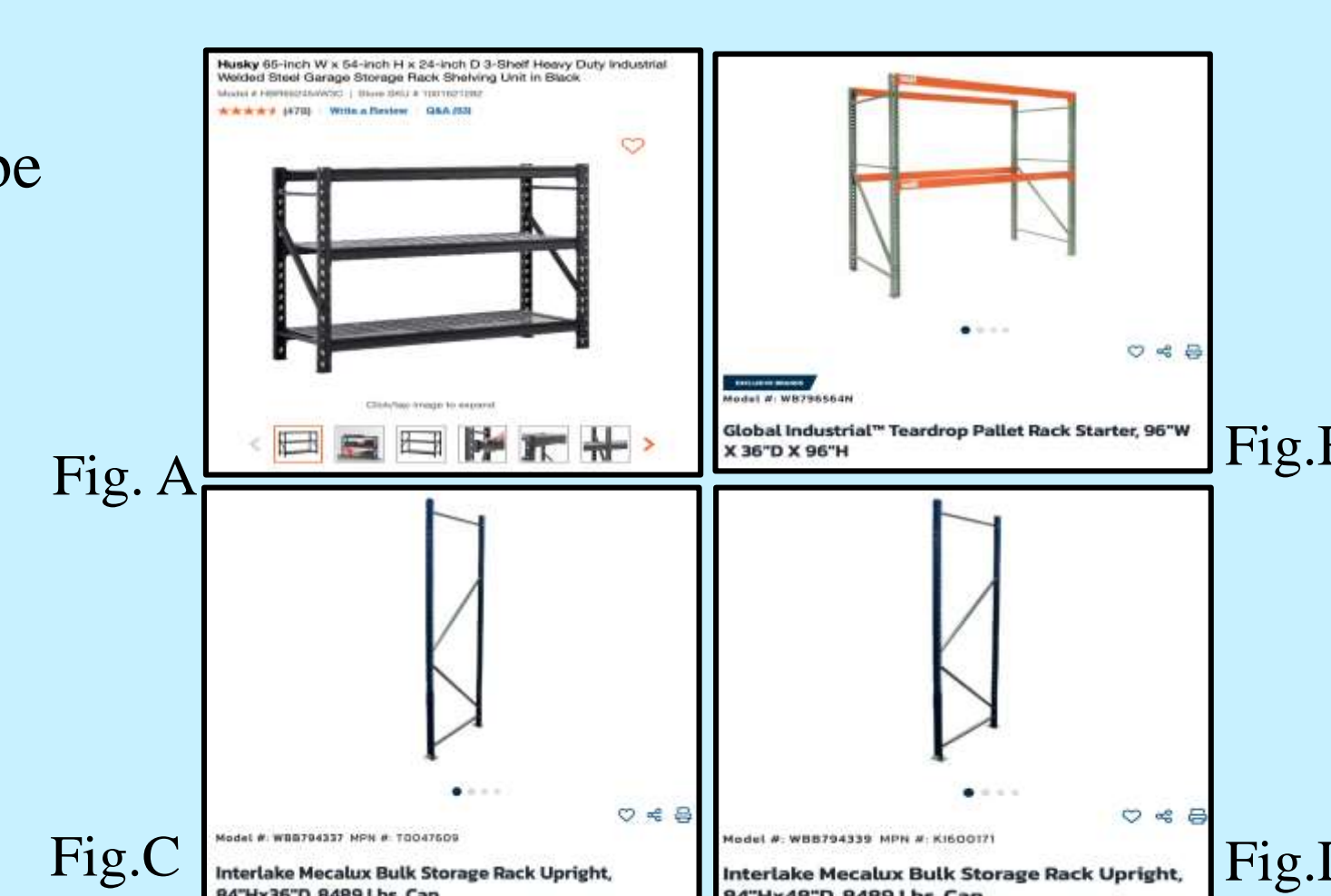
Room Layout & Shelving



- This room design accommodates a total of 810 cubic feet of storage Space.
- This design allocates areas for both wheelchairs and parts.
- Wheelchair space is 190 cubic feet.
- The area for Parts is 620 cubic feet
- Located on the first floor, equipment used daily will be stored in this location
- This room design accommodates a 3687 cubic feet of storage with majority of equipment stored here.
- Multi-leveling shelving designed to store various equipment and parts in color-coded areas.
- This design is a balance between viability and organized & space allocation for equipment.
- Yellow Zone:** Reserved for large wheelchairs and a secondary level for standard wheelchairs.
- Purple Zone:** Designated for the triple stack of standard wheelchairs.
- Pink Zone:** Intended for the double stack of standard wheelchairs.
- A total of 8 shelving units are used for equipment, organized by levels.

Room 1

- All accessories and parts will be stored in bins on the shelves shown in Figure A.
- The first two shelves will be removed to accommodate wheelchairs underneath.
- 7 wheelchairs can be stored in room 1 on the ground underneath the shelves.



TOTAL COST: \$1,200

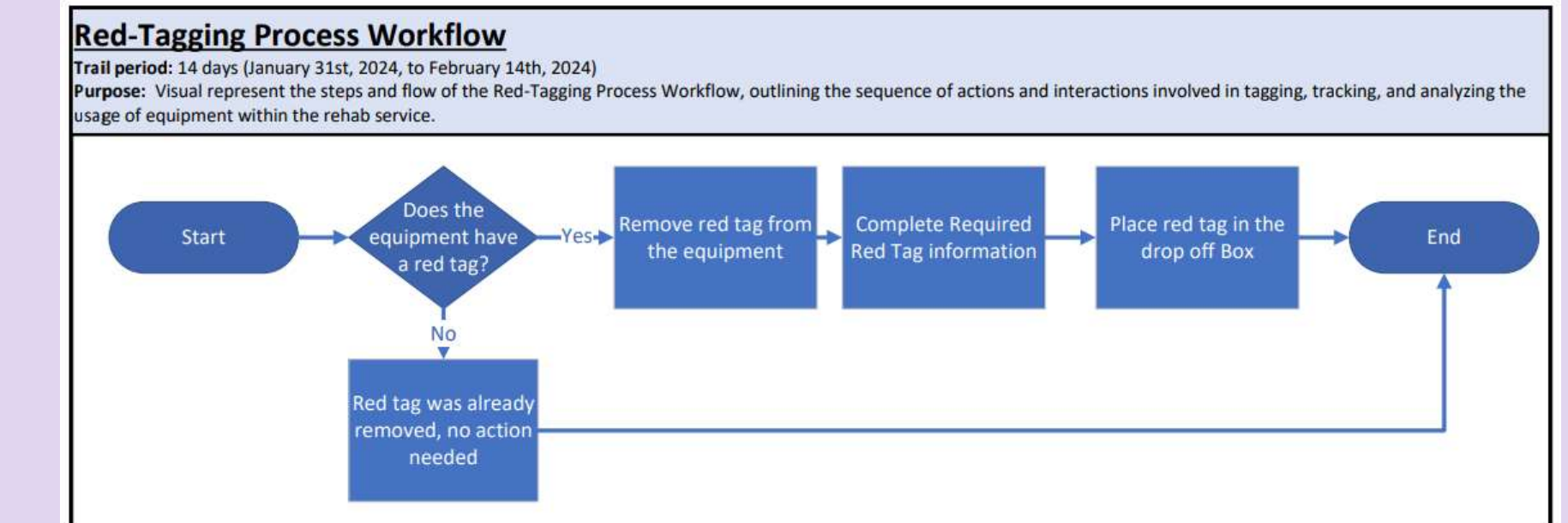
Room 2

- Bigger equipment (maximum 4ft in depth) will be double stacked with medium; sized equipment on top using the shelves shown in Figure B.
- Medium-sized equipment (maximum 3ft in depth) will be double stacked using the shelves shown in Figure C.
- Smaller equipment (smaller than 3ft in depth) will be triple stacked using the shelves in Figure D.

TOTAL COST: \$4,150

5S System

- Background:** 5S is a methodology aimed at organizing an area to enhance efficiency and operations.
- Benefits:** Successful implementation leads to increased visual management, improved operational standards, and reduced operational waste.
- Equipment Red Tagging Trail:** The purpose of the red-tagging trial is to assess equipment usage, identify deadstock items and improve storage space within the Rehab Services storage area.
- Methods:** Applied red tags to all equipment in Room 2. Established a drop box, process maps and checklists to communicate steps with frontline workers for a trial period of 14 days.

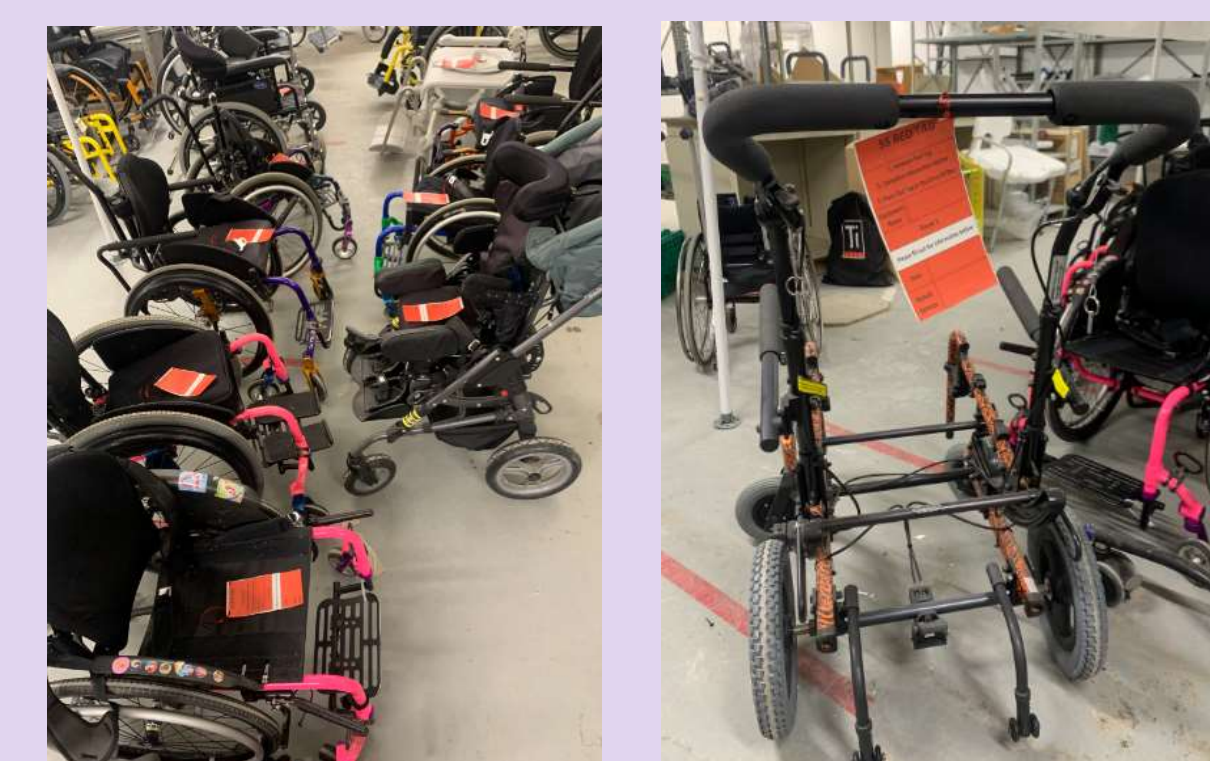


Results:

- Out of 50 red-tagged items, only 10 were used during the 14-day trial period indicating a 20% utilization rate.
- Poisson distribution with an average of rate of $(\lambda) 0.714$ equipment uses per day.
- Projected an expected 21 equipment uses over a 30-day period using a Poisson distribution.
- Estimated that 57% of equipment as unused (deadstock), occupying 620 cubic feet of space.



Red Tag Used



Example of Red Tagged equipment

Effectiveness

- Identified and quantified deadstock within the storage area, freeing up 620 cubic feet of space.
- Provided valuable estimation of equipment usage for informed decision-making.
- Streamlined equipment tracking methods & organization of equipment.
- Proposed layouts that enable improvement of storage space and resource allocation, using a variety of shelving types.
- Saved \$37,648 worth of funds for the client through Newly Designed layouts and freed up floor space.

References

All references can be found by scanning the QR code here:

