



Humber River Hospital

DIGITALISATION DRIVES A NEW STANDARD FOR
HEALTH CARE FACILITY DESIGN & OPERATION

Dr. Rueben Devlin

MD, FRCSC

President & Chief Executive Officer
Humber River Hospital

Jerry J. Jeter

AIA, EDAC, LEED AP BD+C

Vice President & Healthcare Principal
HDR Architecture, Inc.

27 June 2016

EUROPEAN HEALTHCARE DESIGN CONGRESS & EXHIBITION

Royal College of Physicians - London, Great Britain

Humber River Regional Hospital - 1997



Humber Memorial Hospital
1949



Northwestern General Hospital
1954



York-Finch General Hospital
1967



Humber River Hospital - 2015



The background image shows a modern, multi-story hospital building with large glass windows and a courtyard area. The sky is a mix of orange, pink, and blue, indicating sunset. In the foreground, there is a paved walkway with benches and some landscaping. Two people are sitting on a bench in the lower right, and another person is walking in the distance. The overall scene is a blend of urban architecture and natural elements.

Redevelopment Plan

One full service acute care facility to support the patient volumes needed to create Centres of Excellence promoting the delivery of patient-centred care



LEAN GREEN DIGITAL



▶ **850,000**
RESIDENTS

▶ **656**
BED FACILITY

▶ **45**
CLINICAL & SUPPORT
DEPARTMENTS



▶ 130,000

EMERGENCY PATIENTS

▶ 6,000

NEWBORNS

▶ 42,700

INPATIENT SURGERIES

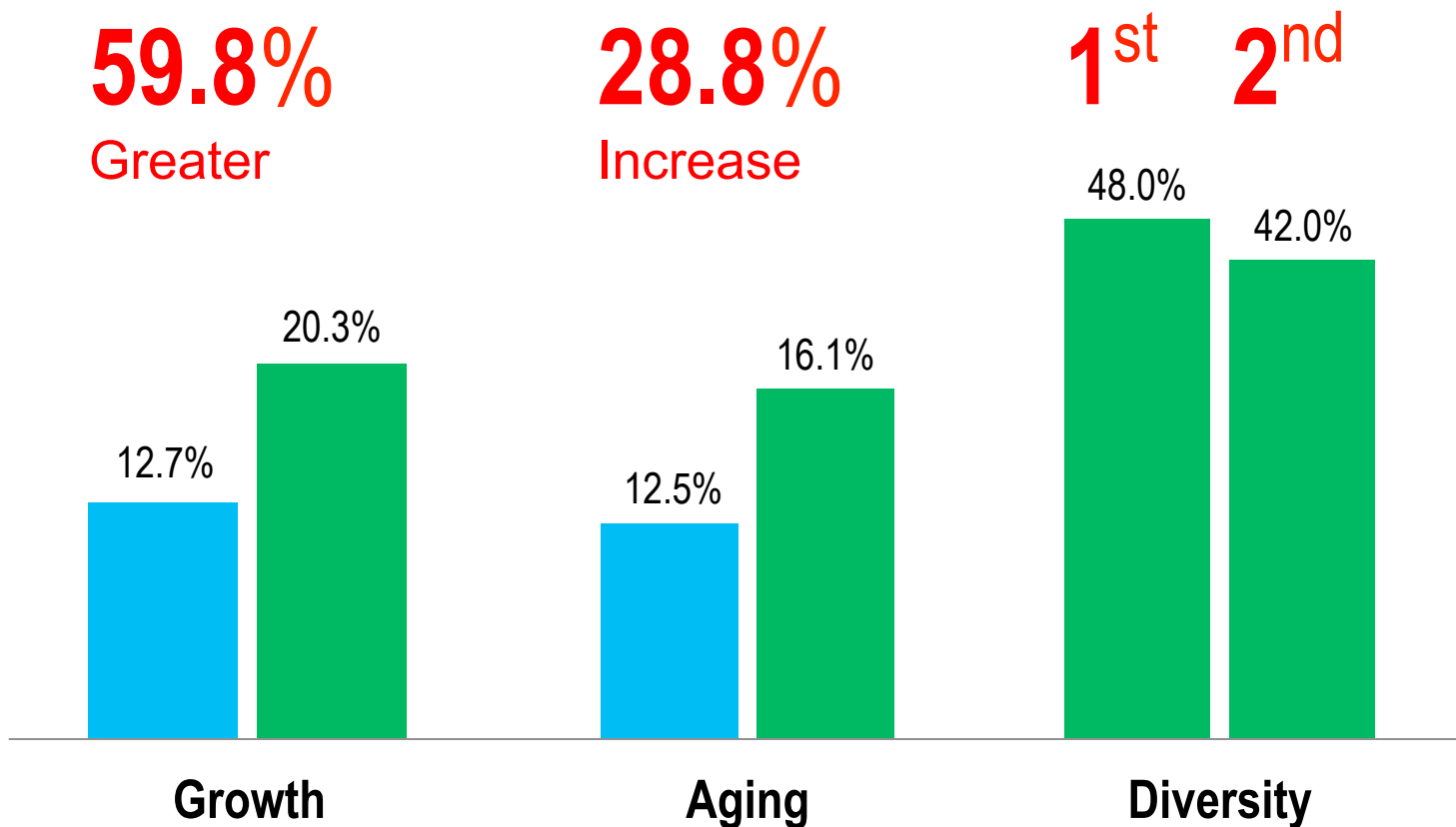
▶ 30,000

OUTPATIENT SURGERIES

▶ 450,000

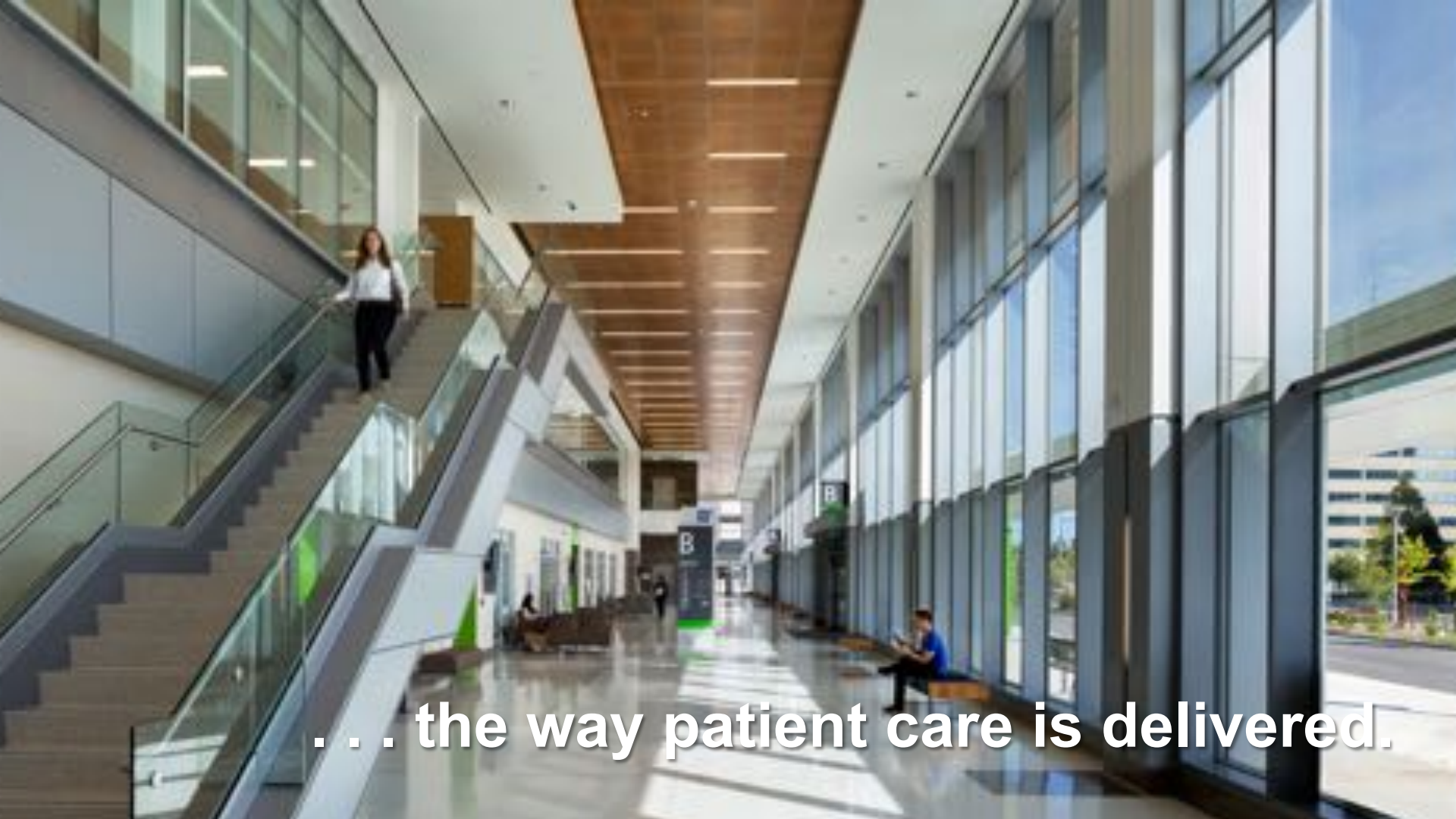
ON-SITE CLINIC VISITS

Population-Based Trends





Reimagine hospital design and . . .



... the way patient care is delivered.



CHALLENGE NO. 1

Integrate three separate and outdated legacy sites into one new facility.



CHALLENGE NO. 2

Seamlessly integrate
technology with design.

North America's First Fully Digital Hospital

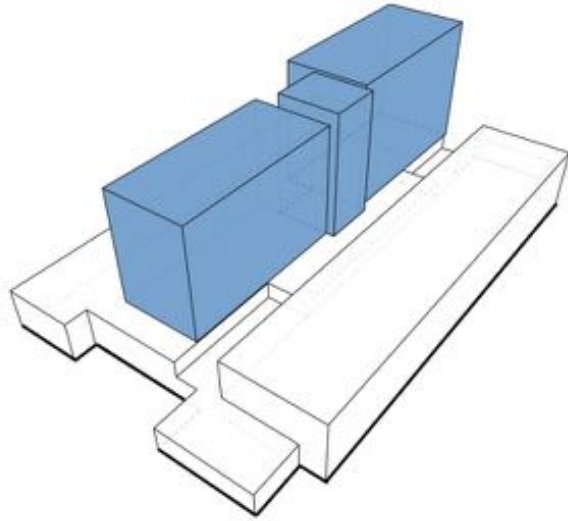


Wilson Avenue

Highway 401

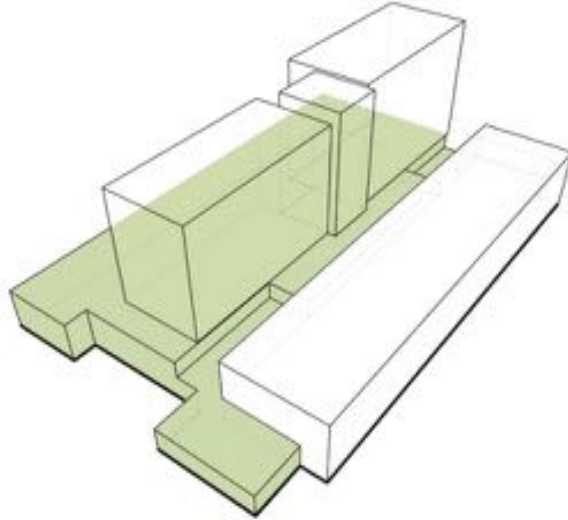
Keele Street





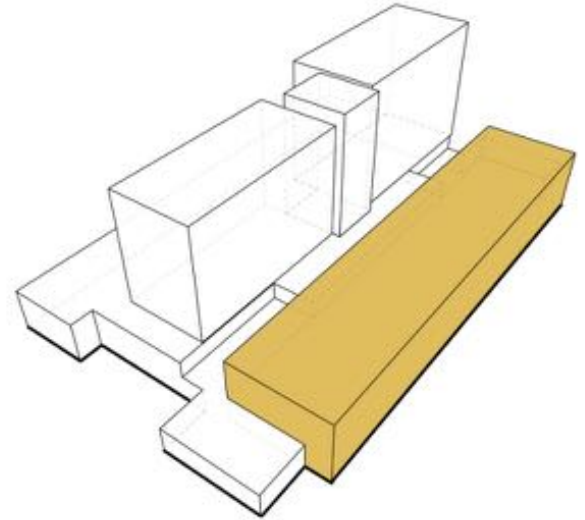
Inpatient

991,487 SF
54.2%



D+T

338,245 SF
18.5%



Ambulatory

498,551 SF
27.3%





Technology as a Tool . . .





LEAN GREEN DIGITAL

Initial STATE



Final STATE



76,590 SF

(7,115 m²)



1,828,282 SF

(169,853 m²)

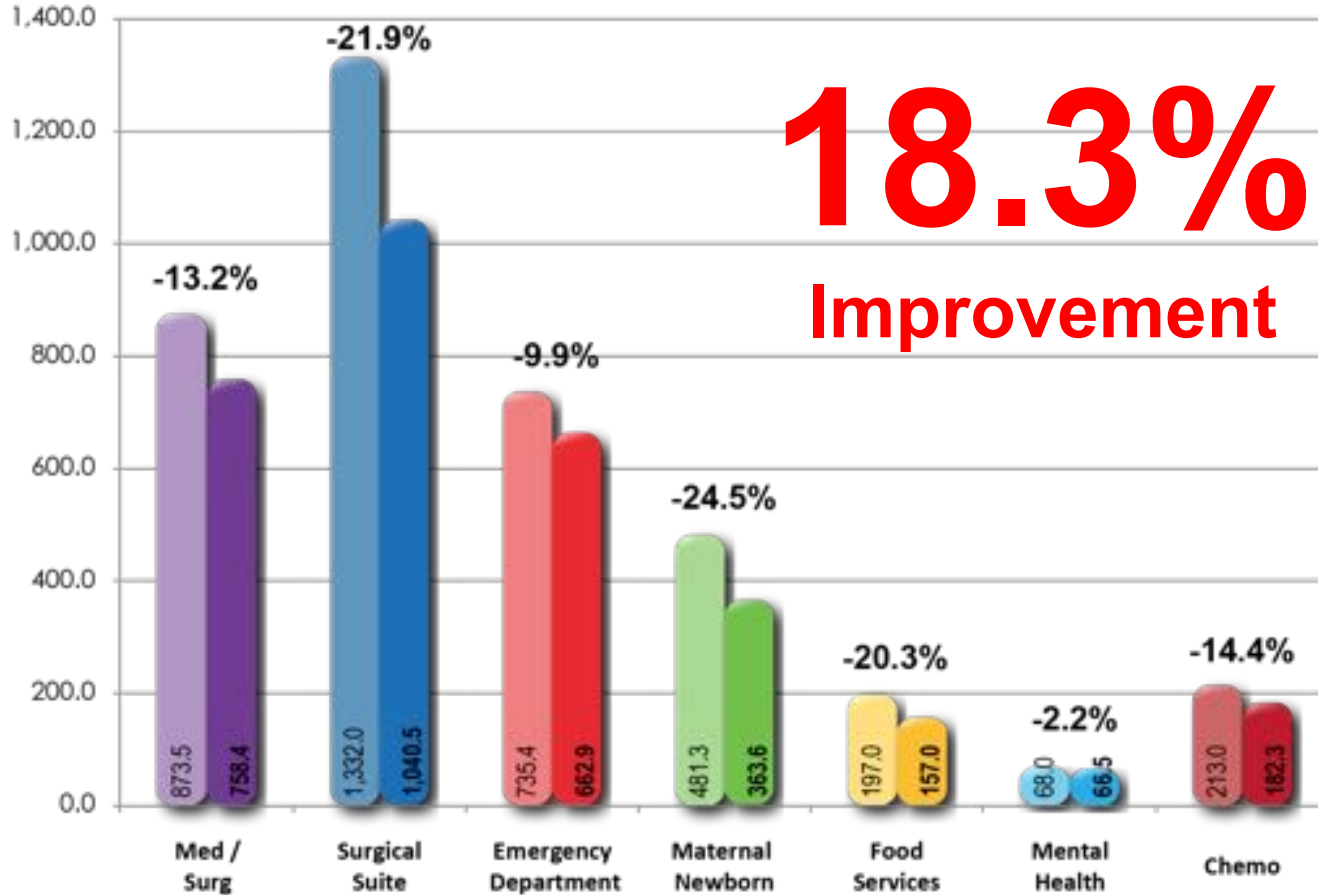
Travel Distance - 'Sneaker Time'

930,000 SF
1,828,282 SF
Building Area

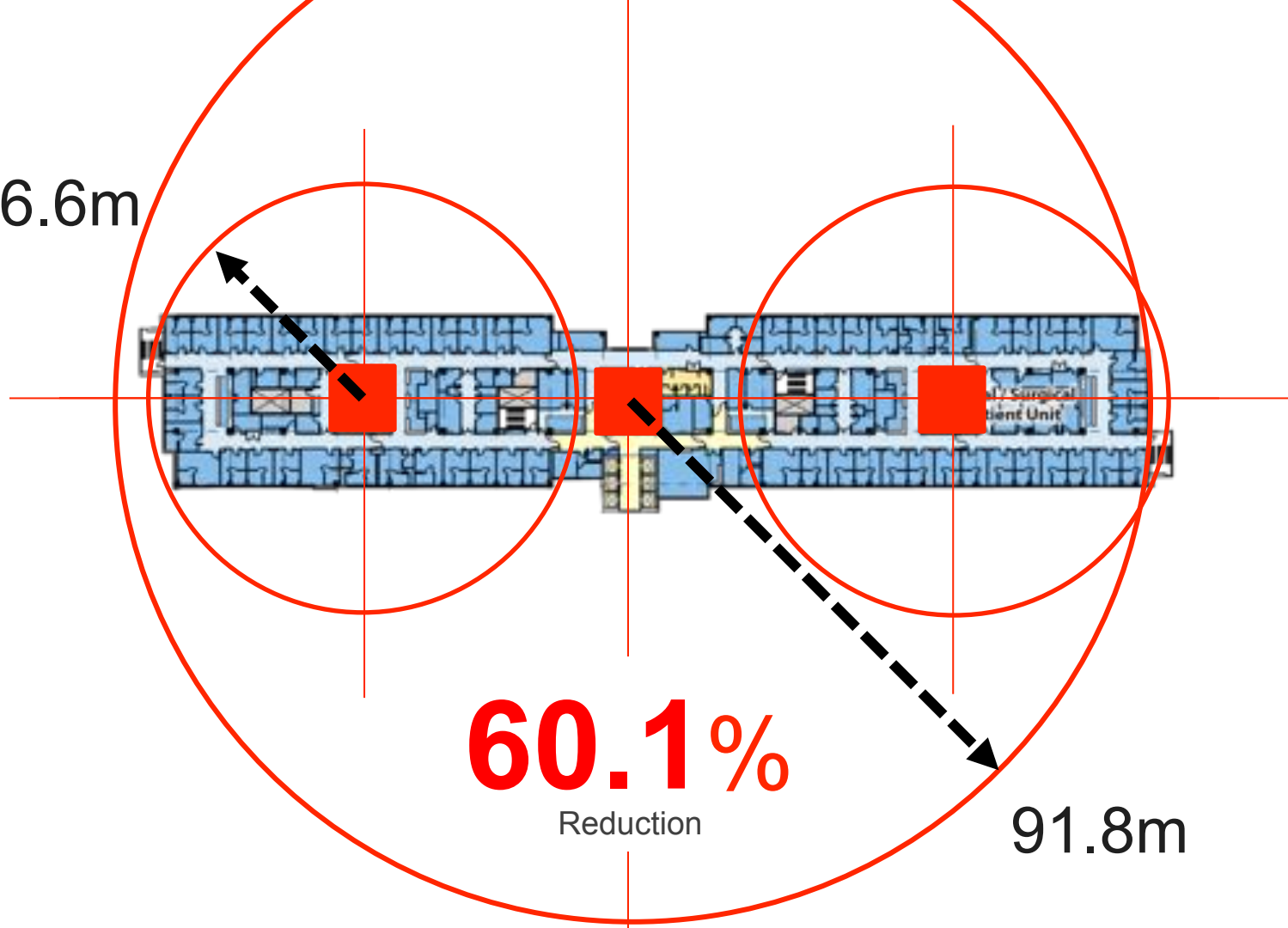
5.4 km
11.6 km
12-Hour Shift

Source: GE Hospital of the Future Study

20 Travel Distance Scenarios



36.6m



60.1%

Reduction

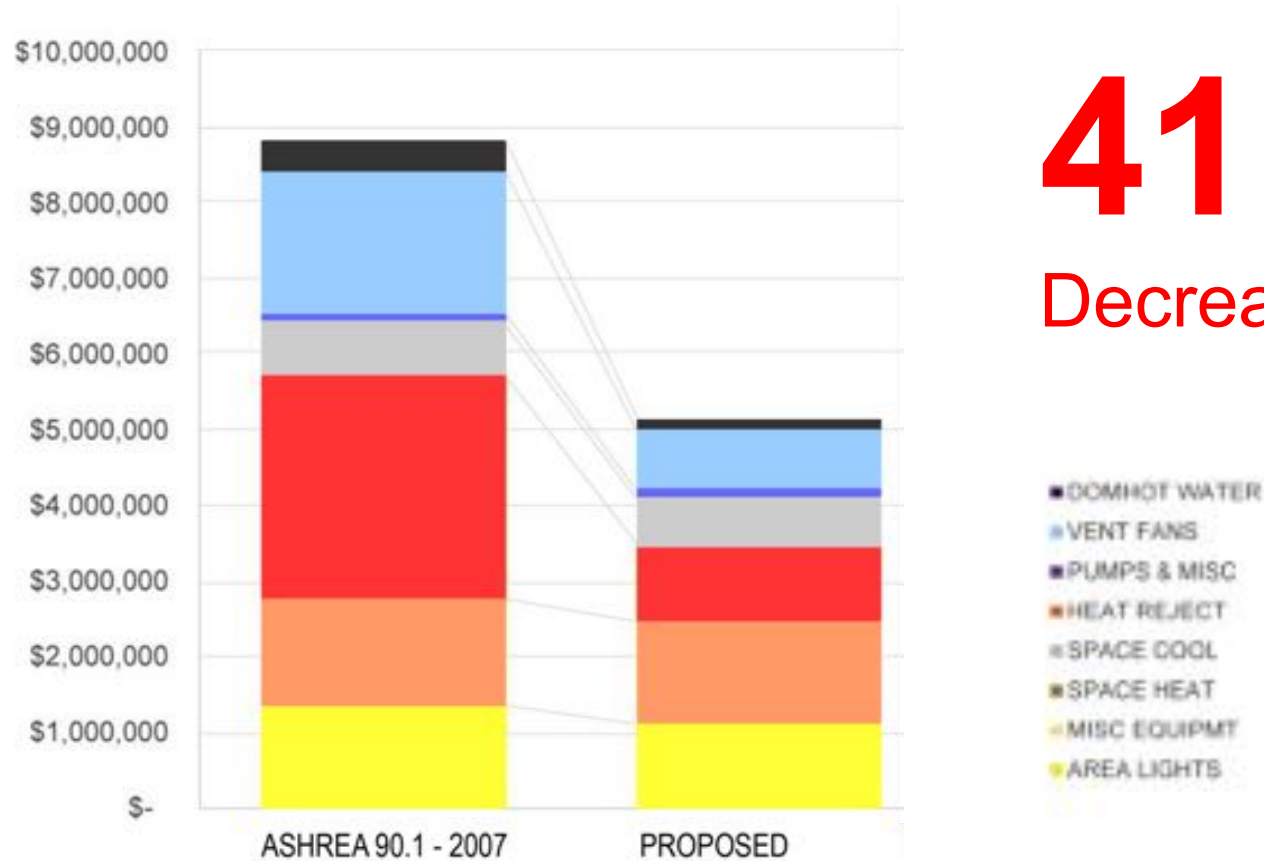
91.8m



GREEN

Sustainability & Energy Efficiency

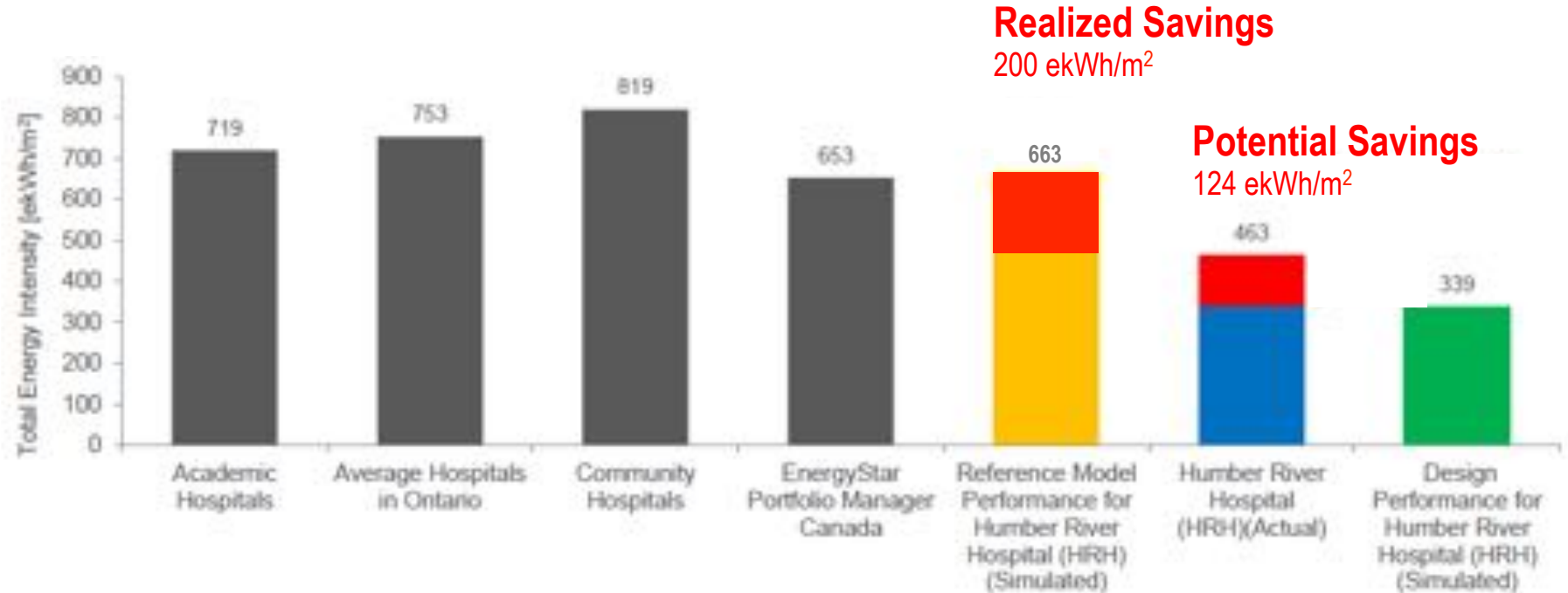
Energy Cost by End Use



41.8%

Decrease

Energy Performance Comparison / Q2





A microscopic image of several neurons. The cell bodies (soma) are stained a bright cyan color, and the nuclei are highlighted with a glowing red-orange hue. The neurons are interconnected by a dense network of fine, branching processes (dendrites and axons) that fill the background.

DIGITAL

Systems Integration & Interoperability





HOW DOES THE TRANSVAC SYSTEM WORK?

- 1 Soiled linen, waste, and recyclable material is loaded for transport on any floor.
- 2 Dirty material is then transported in a dedicated sealed path.
- 3 Material can be transported vertically and horizontally to more than a mile away.
- 4 Material is prepared for hauling at a final collection point.

FTE Transport Reduction

74.2%
Automation

AGV

49.6%/12.7 FTE



A horizontal bar chart with three bars. The top bar is dark blue and represents AGV with a value of 49.6%/12.7 FTE. The middle bar is a medium blue and represents Chute with a value of 24.6%/6.3 FTE. The bottom bar is a light blue and represents Other with a value of 25.8%/6.6 FTE. The bars are arranged vertically and their lengths correspond to the percentage values.

Category	Reduction (%)	FTE
AGV	49.6%	12.7
Chute	24.6%	6.3
Other	25.8%	6.6

Chute

24.6%/6.3 FTE

Other

25.8%/6.6 FTE

FTE Transport Reduction

74.2%
Automation

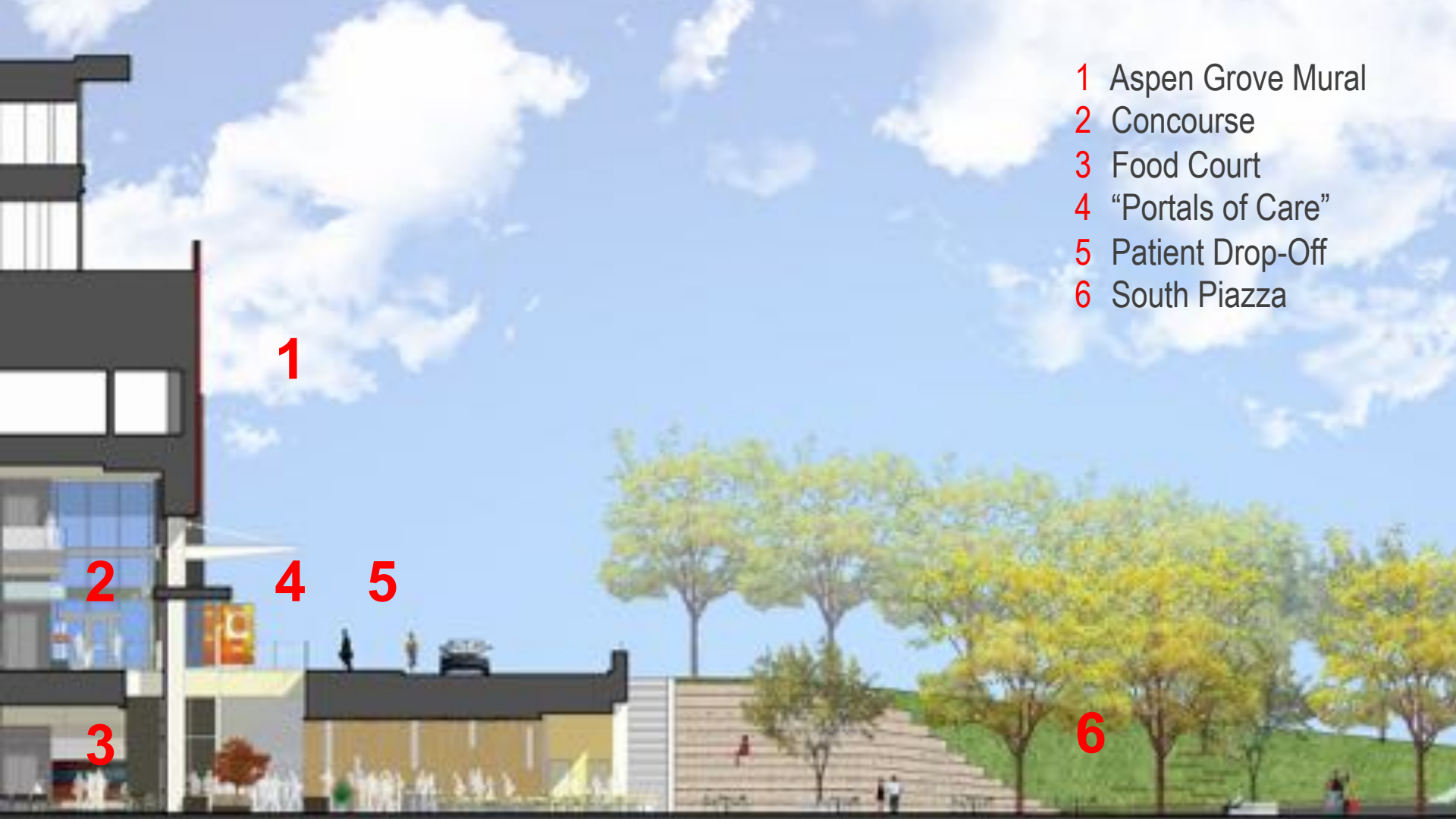
164.8
km/day
(102.4 miles/day)





- 1 "Portals of Care"
- 2 South Entry
- 3 Concourse
- 4 Allée
- 5 North Entry
- 6 Public Elevators
- 7 Service Core
- 8 Clinics





- 1 Aspen Grove Mural
- 2 Concourse
- 3 Food Court
- 4 "Portals of Care"
- 5 Patient Drop-Off
- 6 South Piazza

1

2

4

5

3

6



Hospital
Information



Cardiology



Why Digital?





Integrated Bedside Terminal

Rugged Handheld Phones

We provide rugged PDAs from Ascom to the following staff:

- Nursing
- Code Team Members
- Lab Techs
- Porters

These phones are more than a phone ,
they are an important tool

- Nurse assist application
- Code call application
- Alarms & alerts application
- Critical lab results
- Integrated with notification engine
- Barcode scanner
- Camera

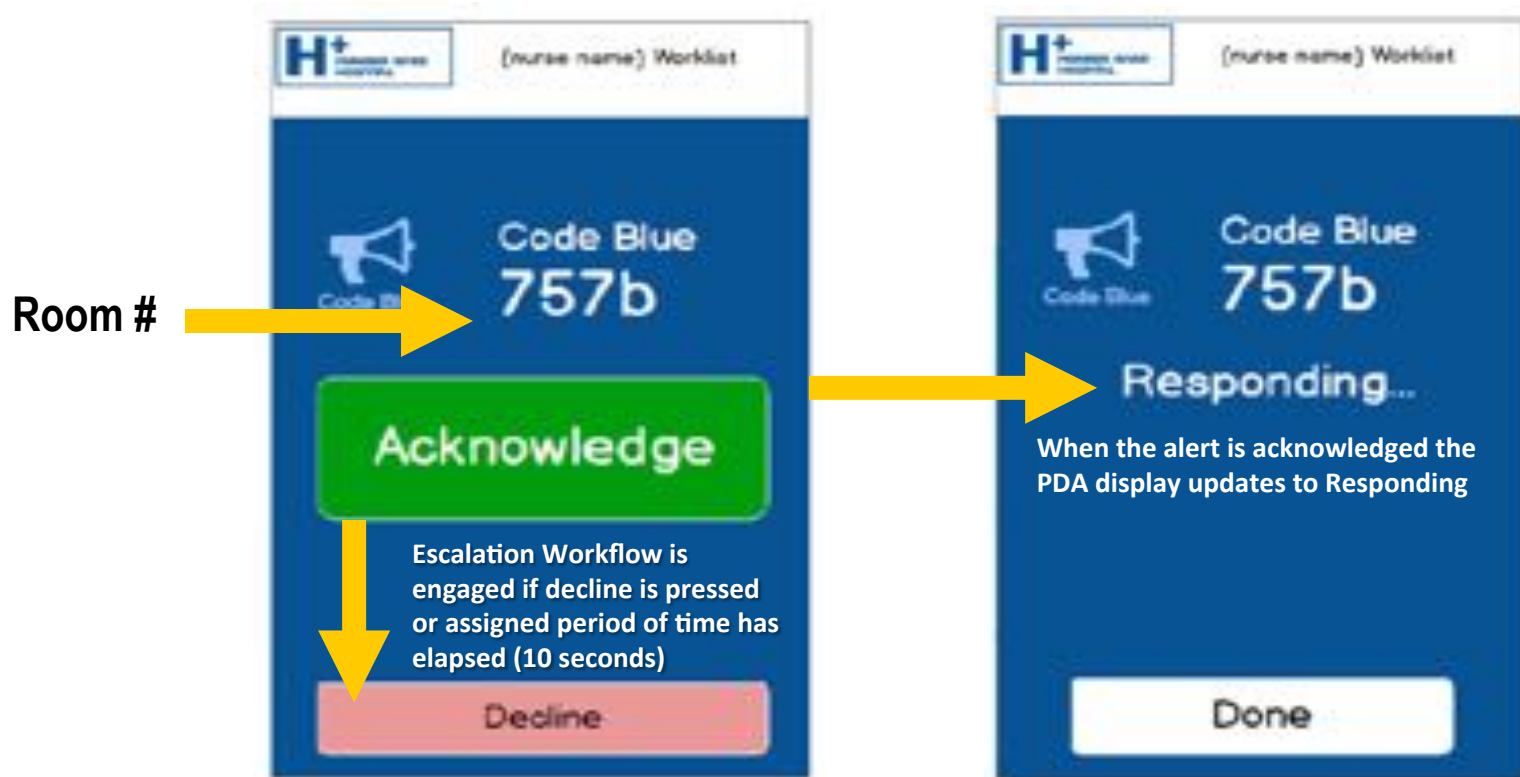


Cardiac Rhythm Strips on Hand Held

Improved Productivity



Hand Held Code Alerts Improve Productivity



Real-Time Location Systems

We have deployed an RTLS that supports:

- Tracking of patients for:
 - Patient Wandering
 - Infant Abduction
 - ED tracking
 - OR Management
- Tracking of staff for various productivity gains
- Tracking of assets to simplify searching

The RTLS provides:

- 100% coverage
- Location to the nearest 1m



Perioperative Workflow Management Software

Real Time Communication of Important Events



OR Management and Control Desk Updates



Physician Schedule, Auto Notifications



Patient Family Updates



< Messages

PeriopSteris@hrh.ca

Details

(Subject:Family Message Update for Cas...) Update: Procedure is now in progress
Update At: 04-Feb-2016 11:11:11

The information transmit

Yesterday 1:41 PM

(Subject:Family Message Update for Cas...) Update: Patient has entered the Recovery Unit, you will be notified when visitors are permitted

< Messages

PeriopSteris@hrh.ca

Details

(Subject:Family Message Update for Cas...) Update: One visitor is permitted, please see registration clerk.
Update At: 04-Feb-2016 16:49:

(Subject:Family Message Update for Cas...) Update: Patient is resting comfortably in SDC. Family can come in to visit patient
Update At:

Yesterday 7:02 PM

(Subject:Family Message Update for Cas...) Update: Patient has left the Surgical Services area
Update At: 04-Feb-2016 19:00:30



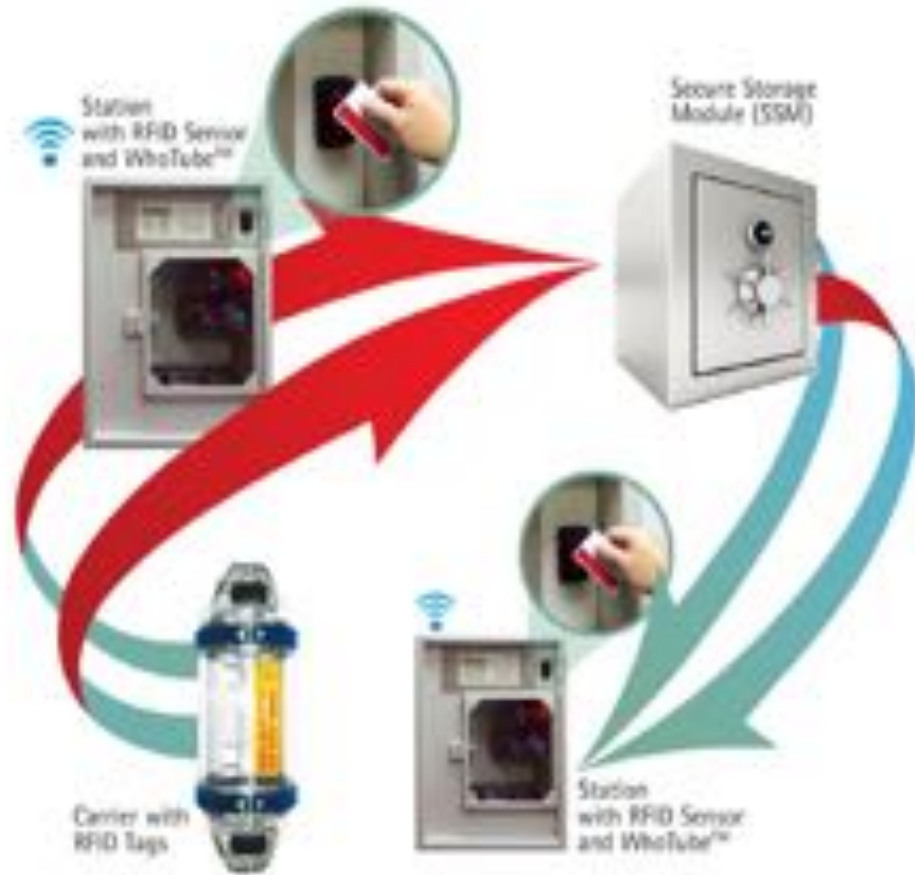
Text Message

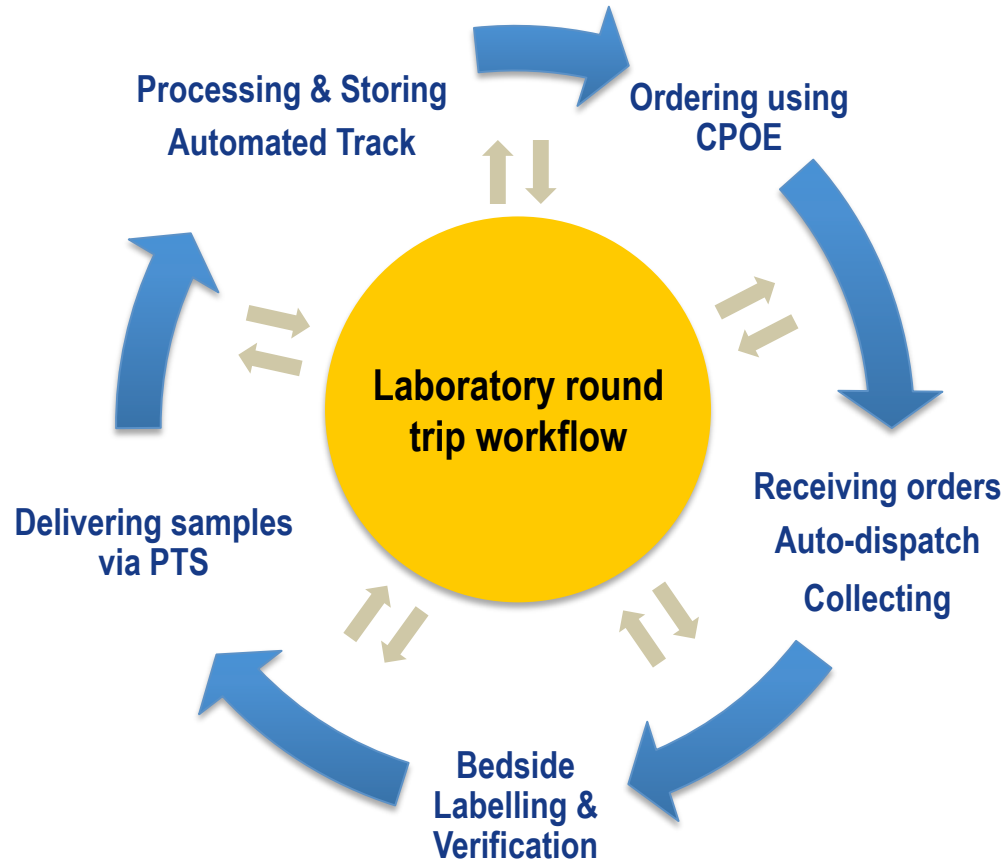
Send

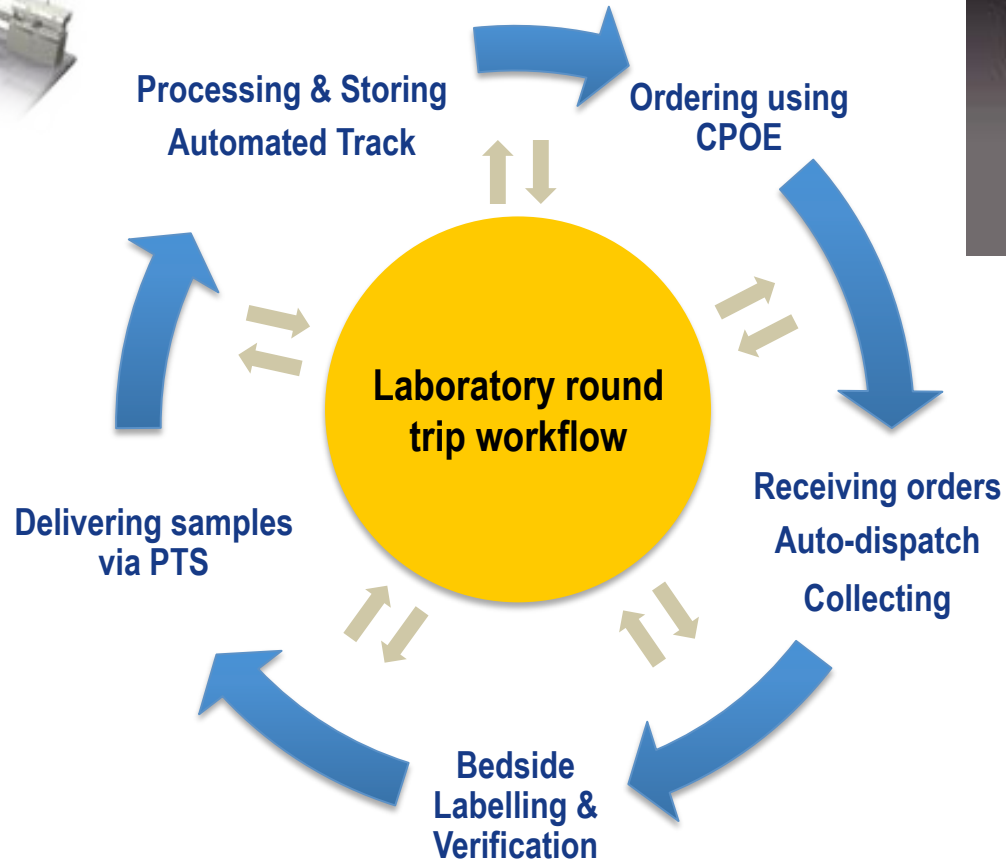
Automated Guided Vehicles

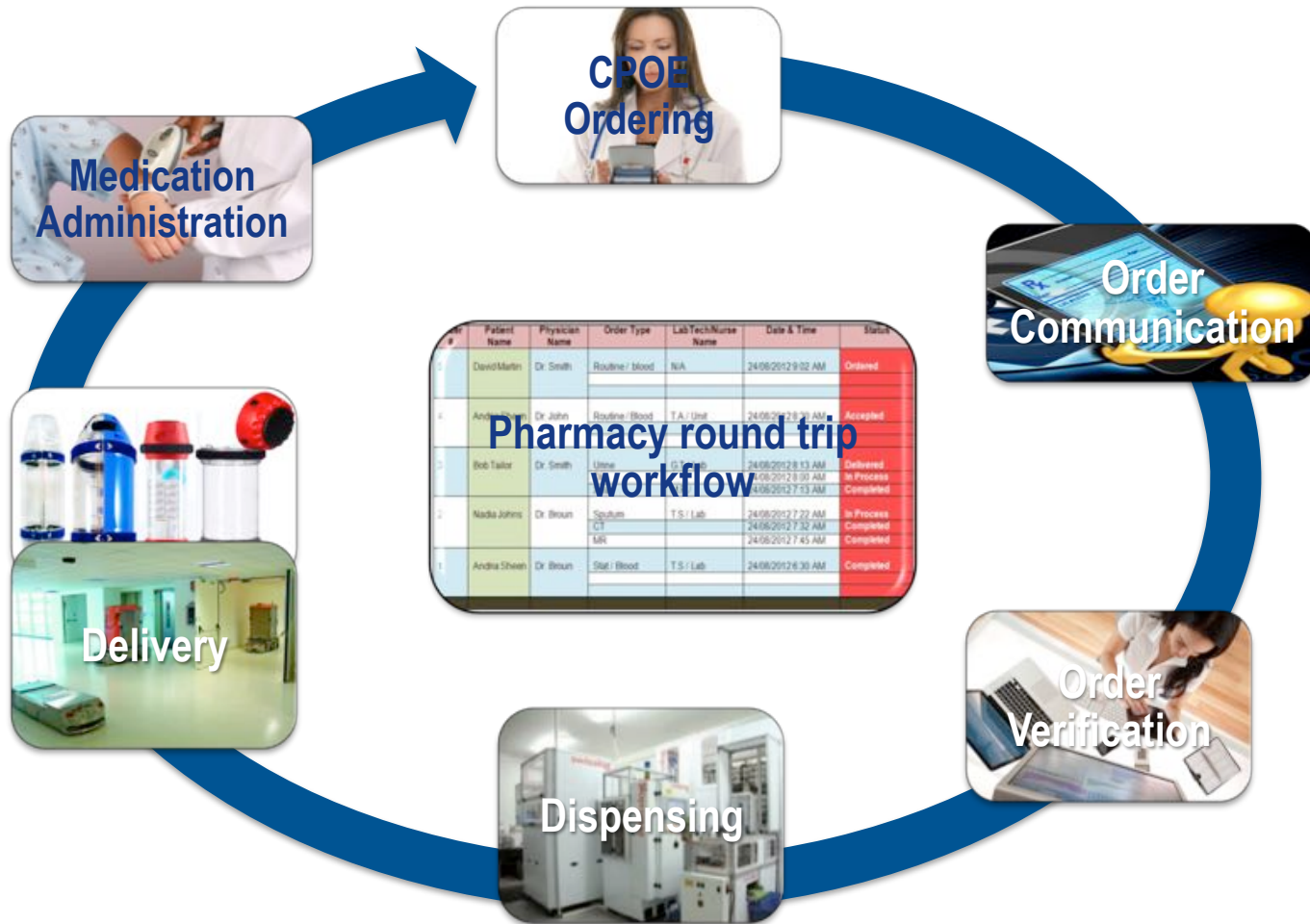


Automation | Efficiency









Automation | Efficiency



Next Steps . . .

- Lean process review of all new technology to maximize benefit & process flows;
- Continue Super Users support to maximize technology adoption;
- Establish the Centre of Excellence;
- Black Box Technology in Ors
- Command Centre



