

PATIENTS, PROCEDURES, + PEDAGOGY

RETOOLING FACILITIES FOR A VERY
DIFFERENT HEALTHCARE FUTURE

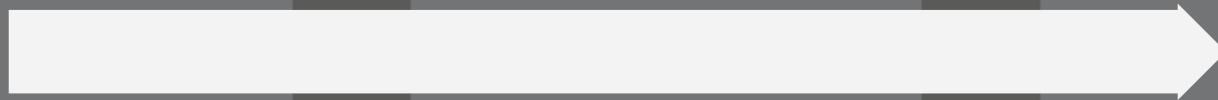
JEFFREY FRENCH, FAIA
LOUIS MEILINK, JR, AIA, ACHA
TODD DRAKE, AIA

B A L L I N G E R

RESEARCH

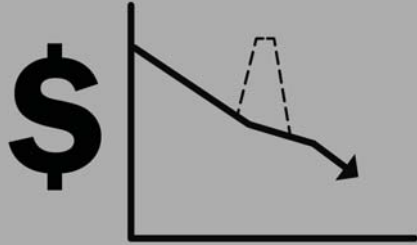
MEDICAL
EDUCATION

HEALTH
CARE



WHAT IS DRIVING CHANGE?

DECLINE IN NIH FUNDING



DECLINE IN NIH FUNDING



INCREASE IN
BIO-ENGINEERING \$

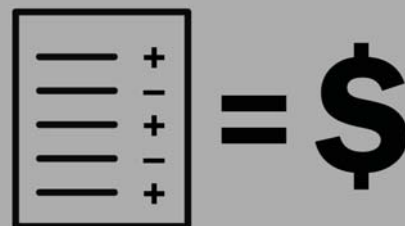


INCREASE IN
CORPORATE PARTNERSHIPS
(SEND MONEY PLEASE)

AFFORDABLE CARE ACT



PAY FOR SERVICE



PAY FOR PERFORMANCE



FOCUS ON HEALTH
+ PREVENTATIVE CARE



INCREASE IN
OUTPATIENT SERVICES

IN LESS THAN 10 YEARS...



FACEBOOK LAUNCHED IN 2005
(that's less than TEN years ago)

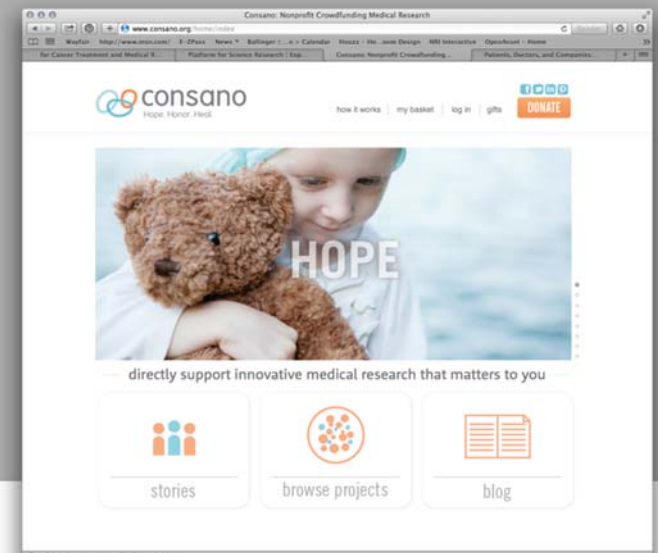
SOCIAL NETWORKING



CROWDFUNDING
RESEARCH

CROWDFUNDING

**KICK
STARTER**



DATA + INFORMATION SHARING



Google

SEEKING OUT INFORMATION

“As data access becomes universal, organizations will set themselves apart by what they do with that data”

HEALTH CARE ADVISORY BOARD



?



CROWDSOURCING

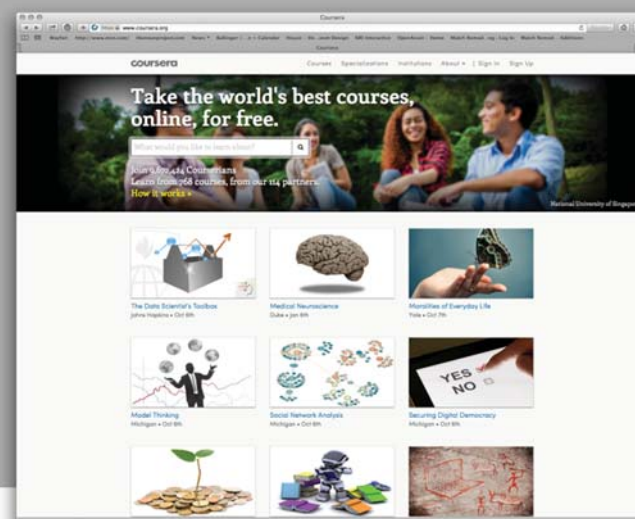


ACCESS TO SHARED DATA



BIG DATA

ONLINE EDUCATION



EVERYTHING ON-DEMAND



WEARABLE TECHNOLOGY



BIO-FABRICATION

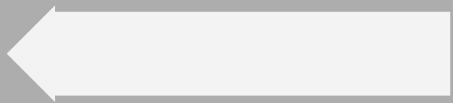
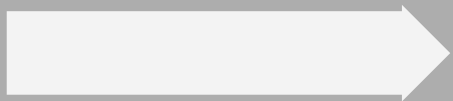
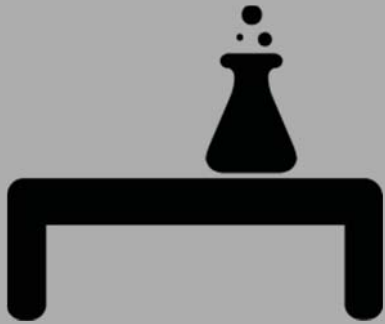


HEALTH TRACKING

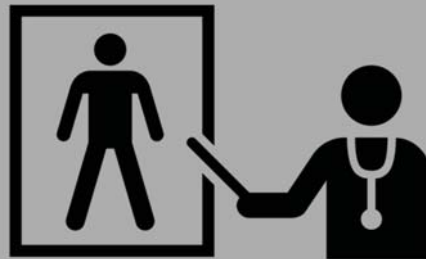


THE PATH

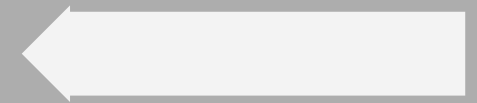
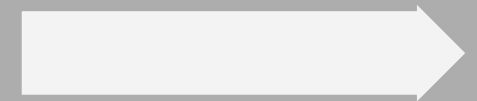
From BENCH



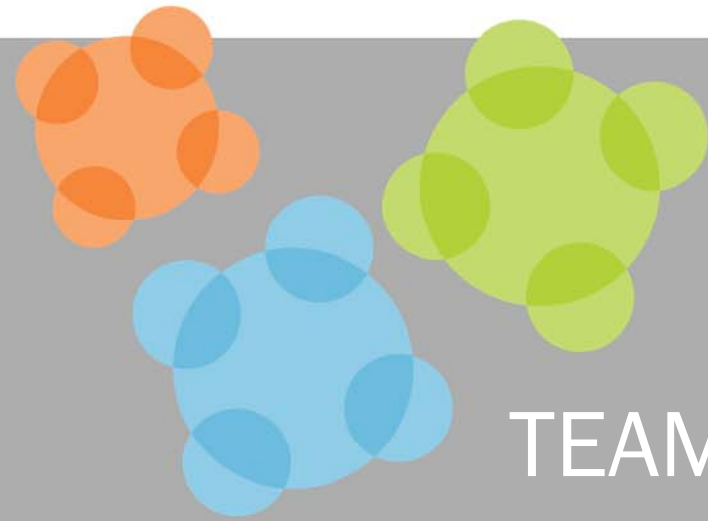
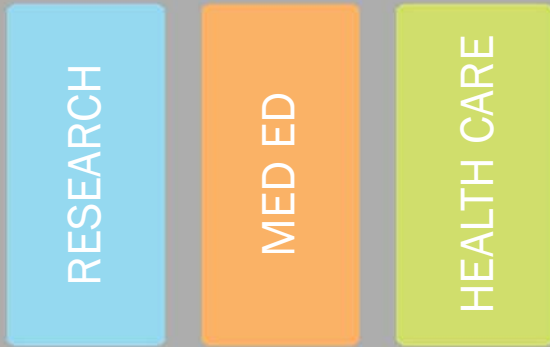
to TRAINING



to BEDSIDE



SILOS

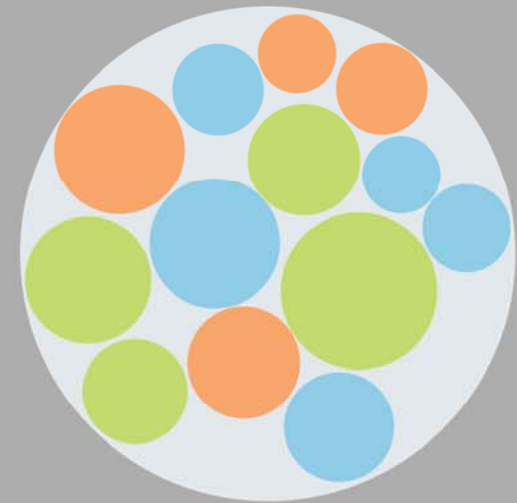


TEAMS

INTERDISCIPLINARY



EVERYBODY IN





SURVEY RESPONDENTS
WERE A SAMPLING
FROM
HEALTHCARE,
RESEARCH +
MEDICAL
EDUCATION FIELDS

[SURVEY PREVIEW MODE] Healthcare, Research + Education Survey

Wayfair http://www.msn.com/ thenounproject.com News Ballinger = .n > Calendar Houzz - Ho...oom Design NUI Interactive

SurveyMonkey Survey Summary - Healthcare, Research + Education [SURVEY PREVIEW MODE] Healthcare, Research + Education Survey

BALLINGER

Healthcare, Research + Education

84%

What technology advancements do you feel are transforming the profession the most?

Rank each category from 1 to 5, with 5 being Most Transformative.

	[1] Least Transformative	[2]	[3]	[4]	[5] Most Transformative
REGENERATIVE MEDICINE (ex. 3D Printing, Tissue Growth, Cell Transplants, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
POPULATION HEALTH MANAGEMENT TRACKING (ex. Care Coordination, Compliance Programs, Health Care Quality, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
PERSONALIZED MEDICINE (ex. pharmacogenomics, customized molecular analysis, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
BIG DATA (ex. crowd sourcing, Constant personal monitoring, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
WEARABLE TECHNOLOGY (ex. Google Glass, BlueTooth, Smart Watch, etc.)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
MOBILE TECHNOLOGY (ex. iPad, Smartphones, Mobile Diagnostics, etc)	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

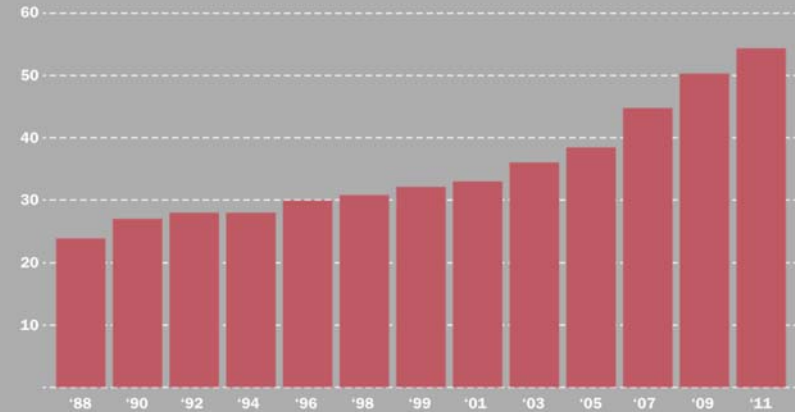
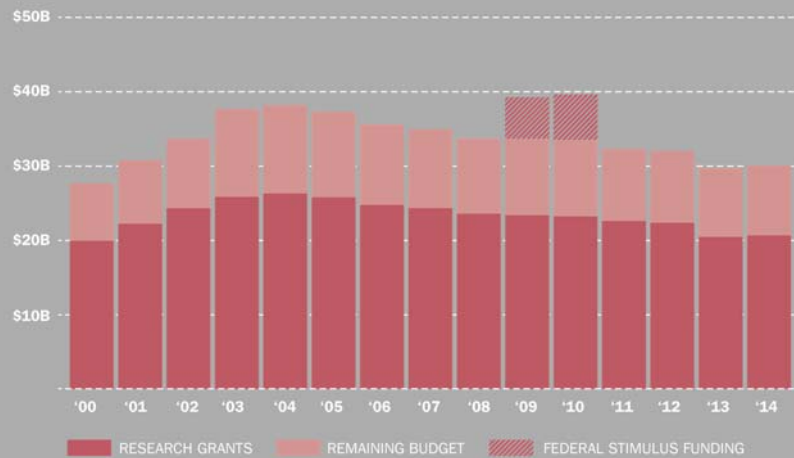
Other / Comments

Prev Next

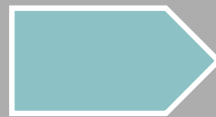
RESEARCH



DRIVERS FOR CHANGE



DECLINING
NIH FUNDING



INCREASE IN
AVAILABLE BIO-MED
RESEARCH SPACE

BIO-ENGINEERING?

DRIVERS FOR CHANGE: SPACE NEEDS

88%

PRIORITIZED TEAM
COLLABORATION SPACE

30%

RANKED SHARED
CORE SPACE
AS THE #1 BIGGEST CHANGE
IN SPACE NEED

9 OUT OF 10

IDENTIFIED IMAGING
AS HAVING A MAJOR IMPACT

EVOLUTION OF THE RESEARCH ENVIRONMENT

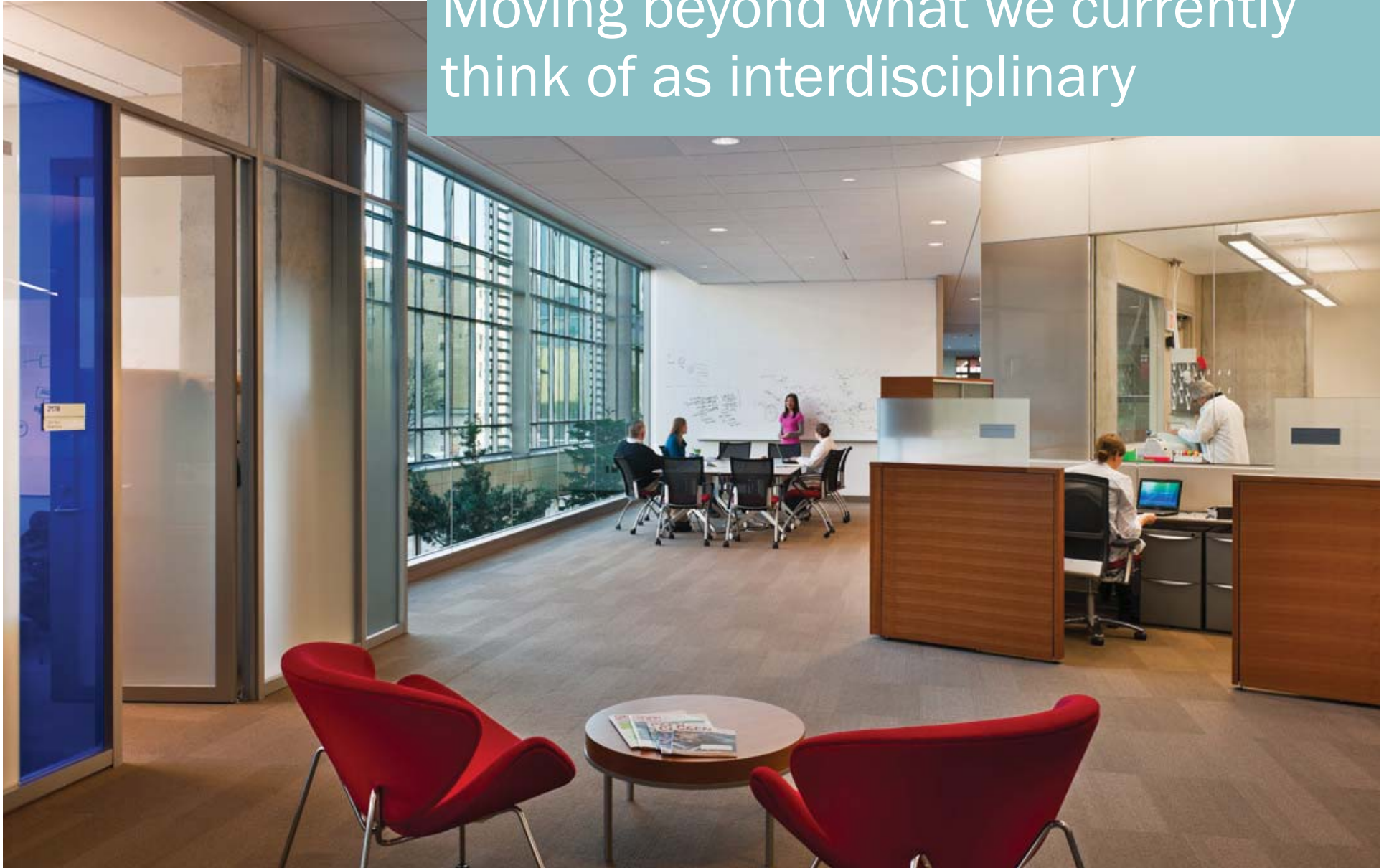
TRADITIONAL

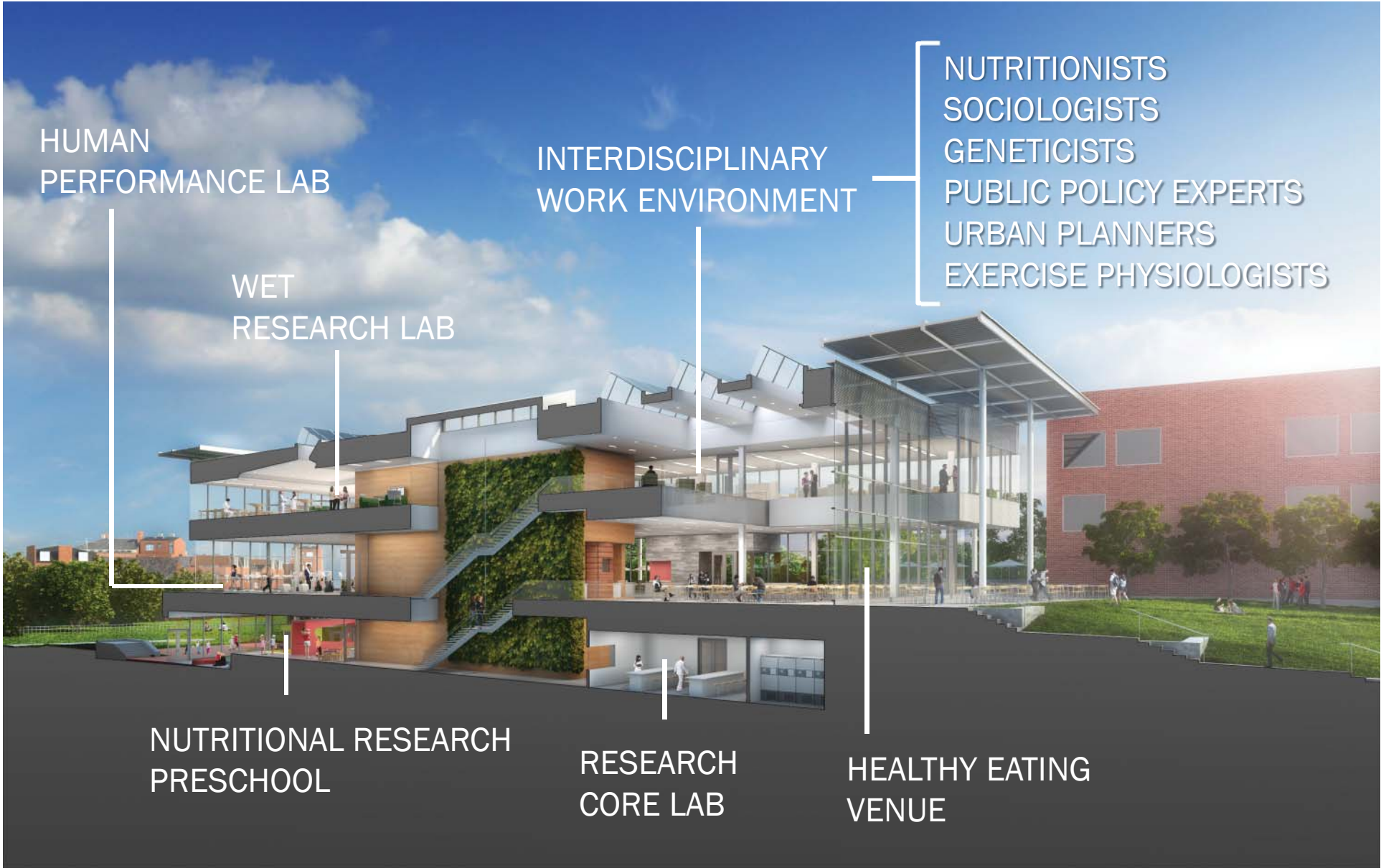
STATE OF THE ART

STATE OF THE FUTURE

INTERDISCIPLINARY ACROSS SCIENCES	COLLABORATION	BEYOND SCIENCES + ENGINEERING
NIH - DEPENDENT WITH PARTNERING	FINANCIAL SUPPORT	CROWD-FUNDING
INTEGRATED	TEACHING + RESEARCH	INDISTINGUISHABLE
WET, ANIMAL-INTENSIVE, OPEN	LABORATORY TOOLS	CO-LOCATED w/ TREATMENT, COMPUTATIONAL, SIMULATED
SEQUENTIAL	RESEARCH + FABRICATION	INTEGRATED, CO-LOCATED, NON-LINEAR
THERAPIES TARGETING CELLS	BREAKTHROUGHS	IMMUNOTHERAPY
RISK-AVERSE FDA	GLOBAL ACCESS	PATIENT COLLABORATION

Moving beyond what we currently think of as interdisciplinary





HUMAN
PERFORMANCE LAB

WET
RESEARCH LAB

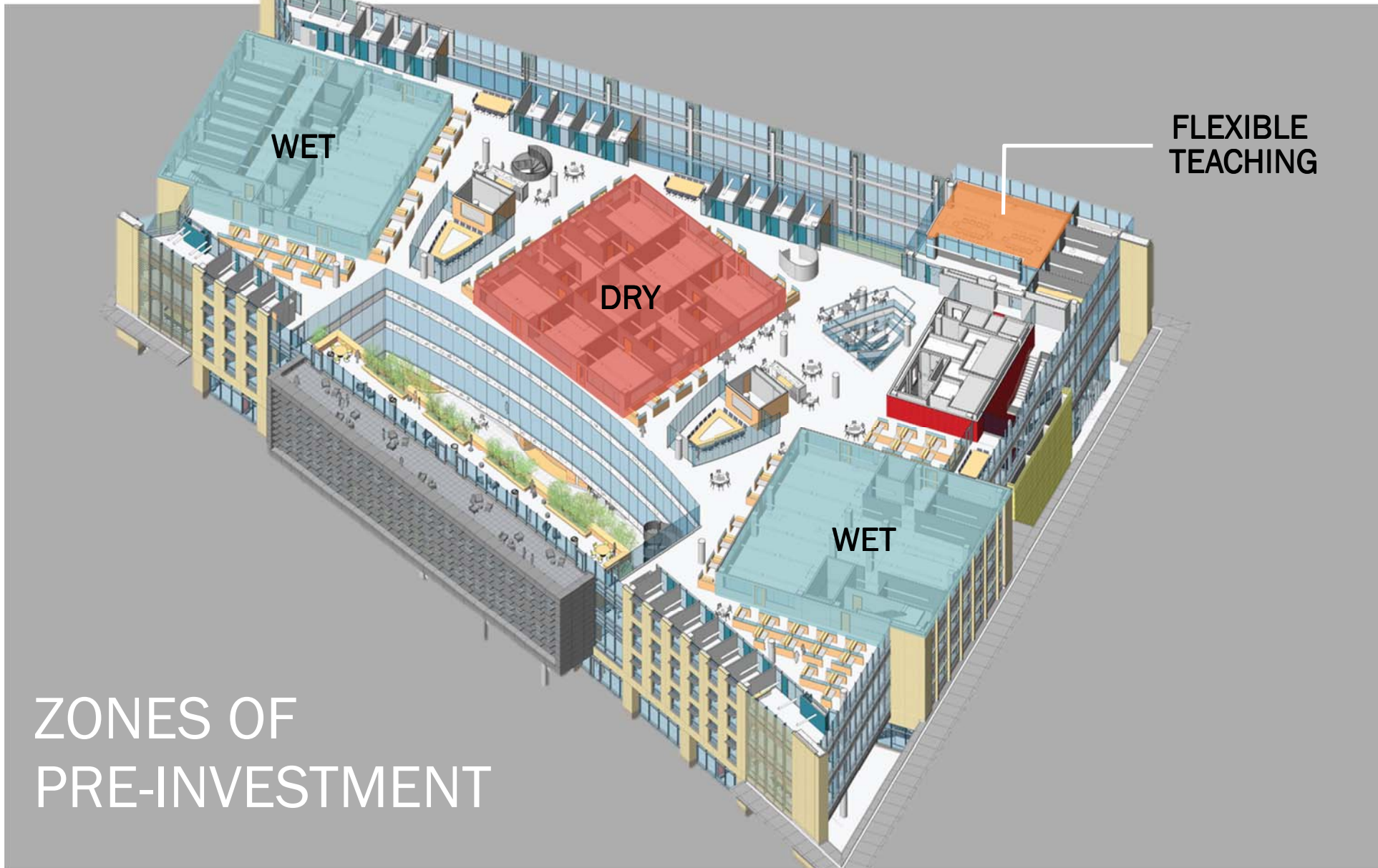
INTERDISCIPLINARY
WORK ENVIRONMENT

NUTRITIONISTS
SOCIOLOGISTS
GENETICISTS
PUBLIC POLICY EXPERTS
URBAN PLANNERS
EXERCISE PHYSIOLOGISTS

NUTRITIONAL RESEARCH
PRESCHOOL

RESEARCH
CORE LAB

HEALTHY EATING
VENUE



WET

DRY

WET

FLEXIBLE
TEACHING

ZONES OF
PRE-INVESTMENT



MAXIMUM FLEXIBILITY

Casework, Tables + Chairs

Utility Distribution

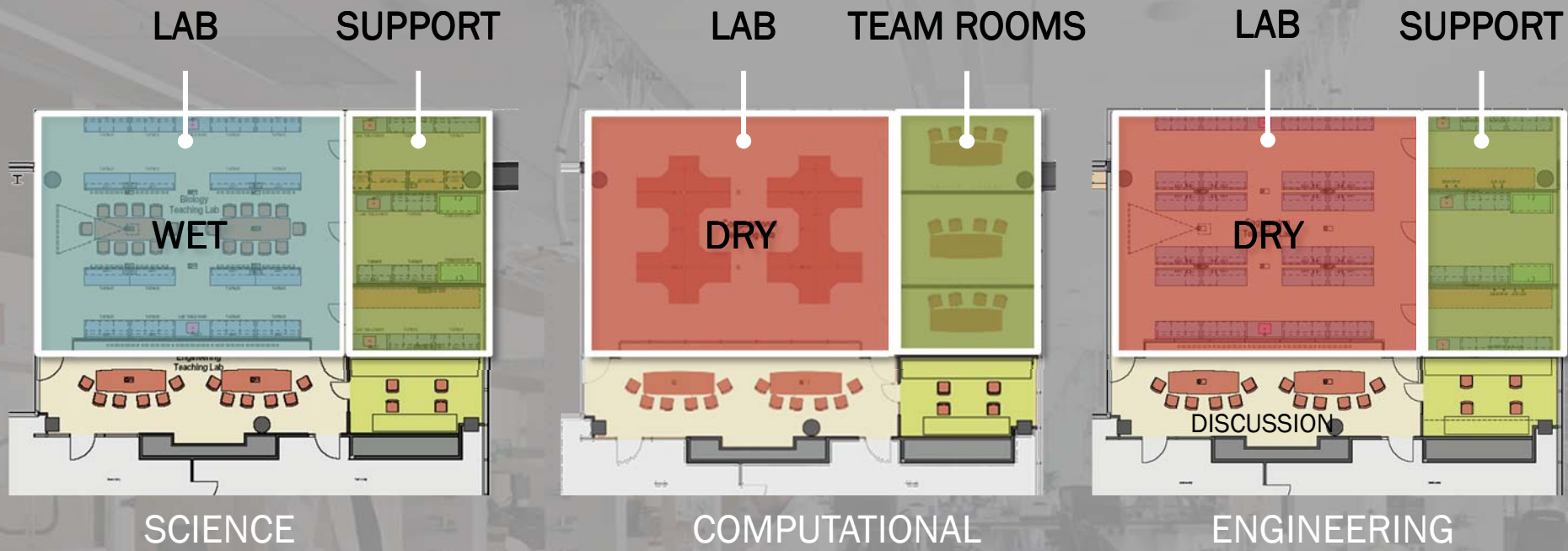
Technology

ALL Moveable / Height Adjustable

CIP / Floor Boxes

Multiple Screens / Wired & Wireless





MAXIMUM FLEXIBILITY

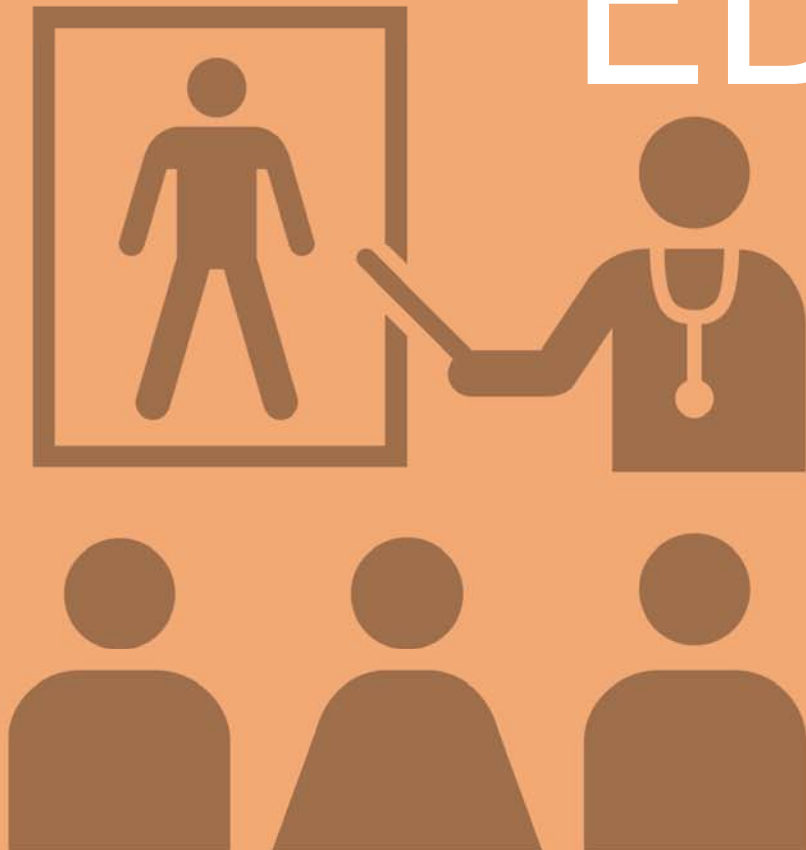
Casework, Tables + Chairs
 Utility Distribution
 Technology

ALL Moveable / Height Adjustable
 CIP / Floor Boxes
 Multiple Screens / Wired & Wireless





MEDICAL EDUCATION



DRIVERS FOR CHANGE: SPACE NEEDS

95%

SAW AN INCREASE IN
HEALTHCARE STAFF TRAINING
AND RECERTIFICATION NEEDS

1/2

RANKED
HUMAN
ANATOMY
LABS AS THE
#1 BIGGEST
CHANGE
IN SPACE
NEEDS

95%

ADDITIONAL ACTIVE LEARNING +
TEAM BASED CLASSROOMS
SPACES HAVE LESS IMPACT

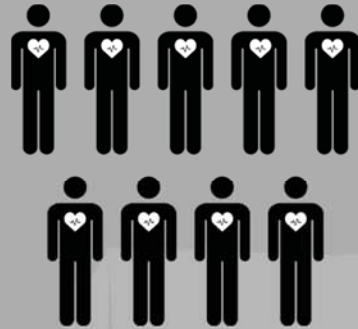
EVOLUTION OF MEDICAL EDUCATION

TRADITIONAL	STATE OF THE ART	STATE OF THE FUTURE
DISCIPLINE SILOS	TRAINING	HYBRID INTERPROFESSIONAL TEAMS
LARGE LECTURE	ENGAGEMENT	ACTIVE LEARNING
ILLNESS TO TREATMENT	LEARNING FOCUS	WELLNESS EDUCATION
HUMAN TISSUE MODELS	CASE MODELS	VIRTUAL ANATOMY
EXAMINATION	EVALUATION	COMPETENCE BASED CREDENTIALS
4 TH YEAR PATIENT OBSERVATION	FIELD WORK	1 ST YEAR PATIENT ENGAGEMENT
COMMUNITY HEALTH	HEALTH DISPARITIES	GLOBAL HEALTH
HOSPITAL PATIENT FILES	PERSONALIZED DATA	PERSONAL ON DEMAND RECORDS
CONFERENCES SEMINARS	LIFE LONG LEARNING	SIMULATION RE-CERTIFICATION CENTERS



HEALTH [R+D] EDUCATION

POPULATION
HEALTH



COLLABORATIVE
LEARNING



PROVIDE PATIENT
CENTERED CARE



PROMOTE
INQUIRY

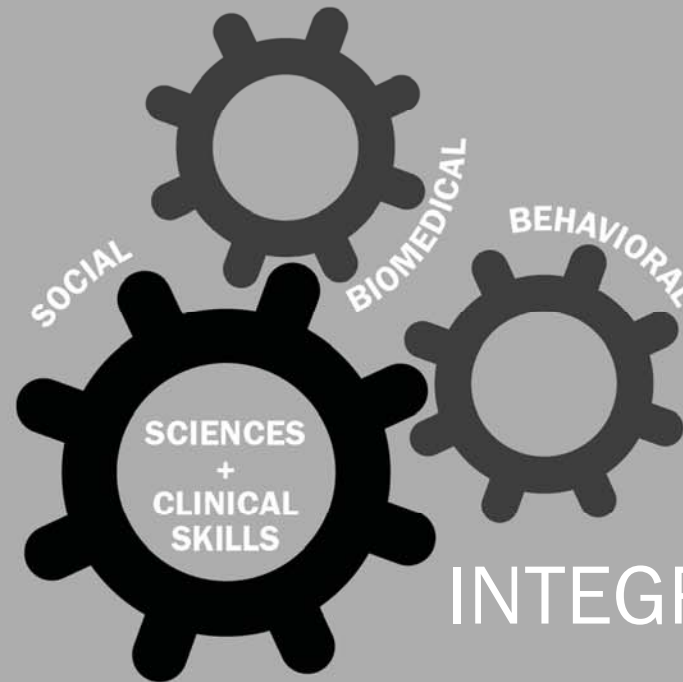
HEALTH PROFESSIONS EDUCATION

EARLY PATIENT EXPOSURE: LEARNING CONTEXT



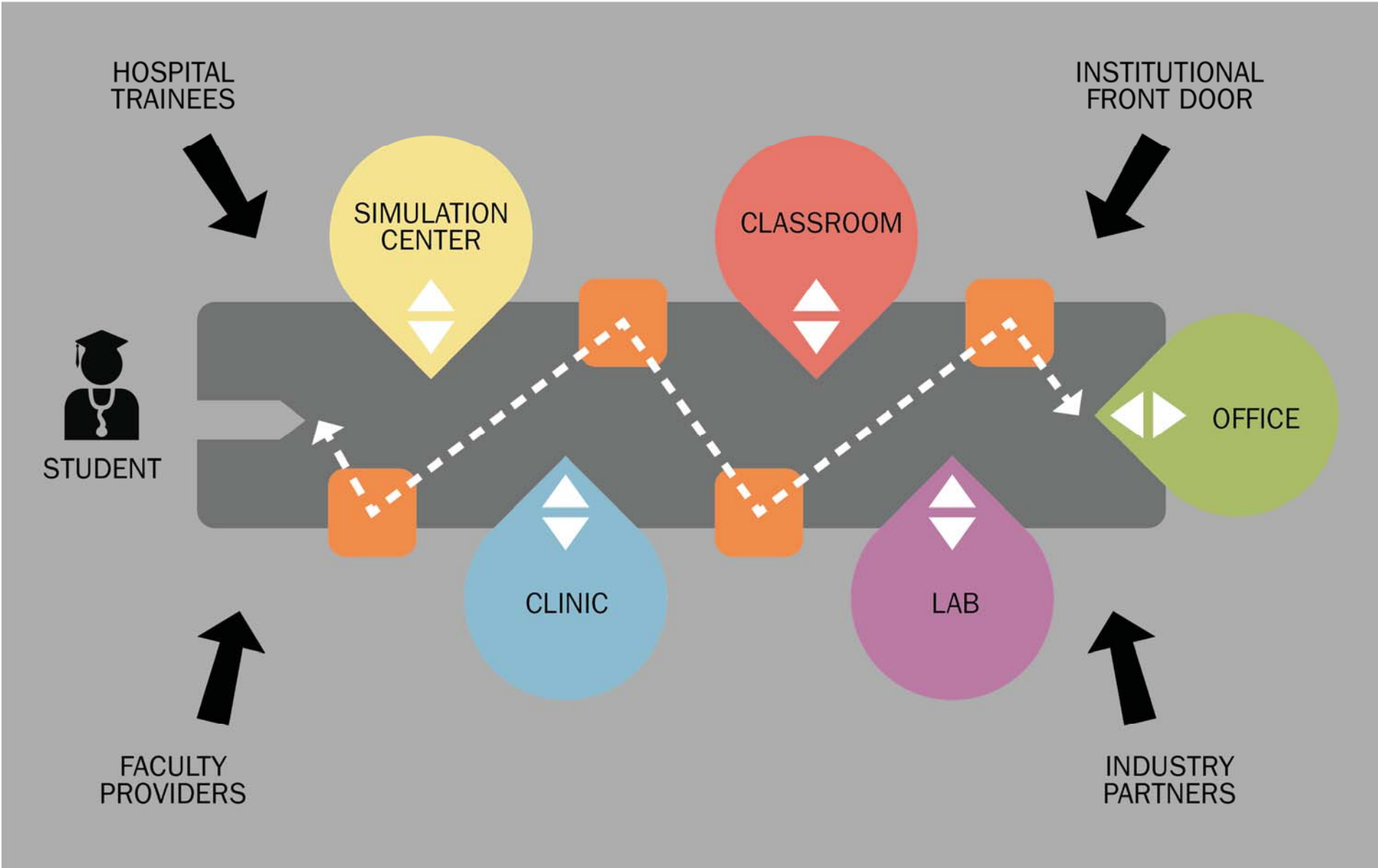
EMPHASIZE CRITICAL
THINKING SKILLS

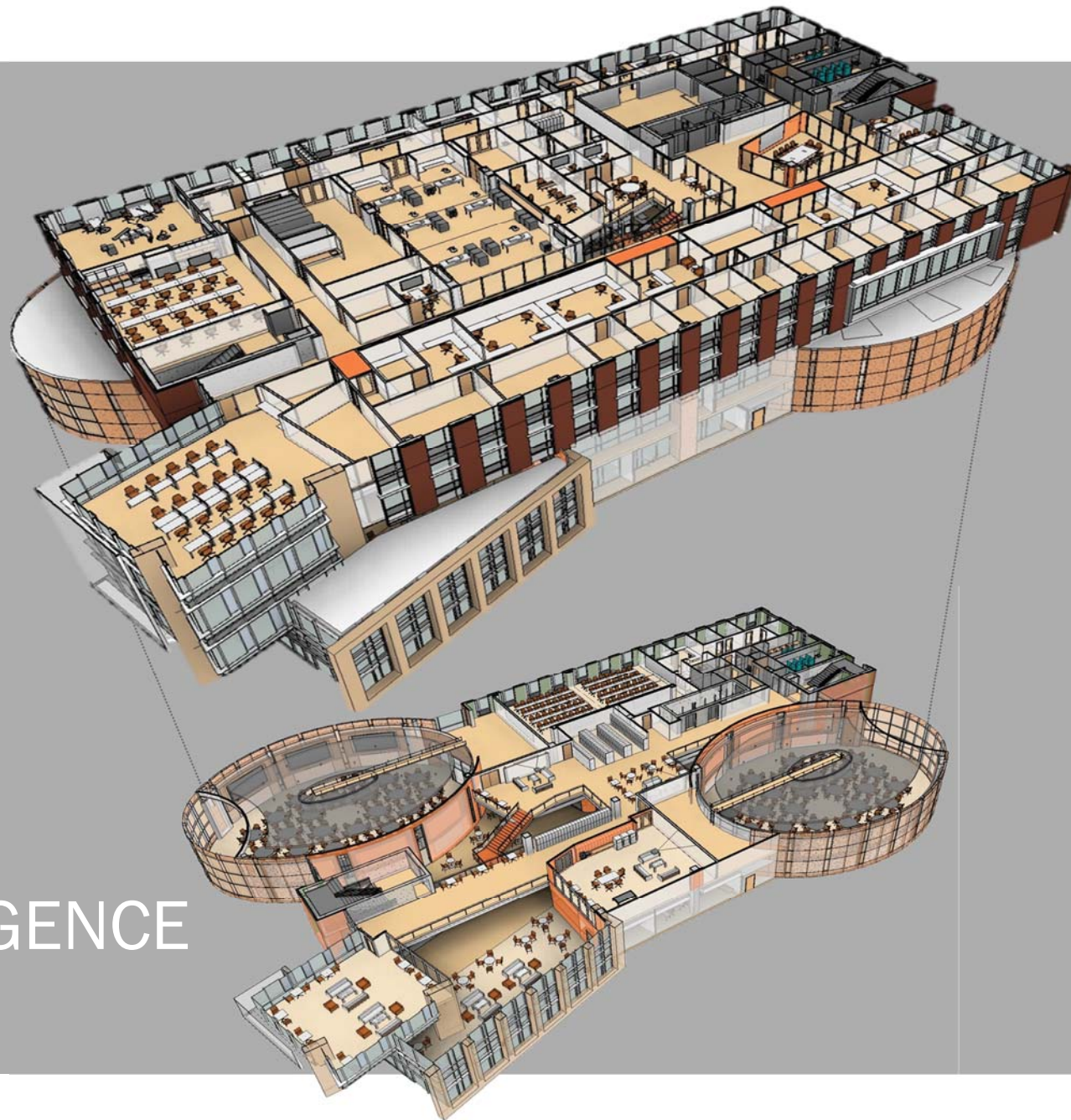
COLLABORATION +
TEAM WORK



INTEGRATION

CURRICULAR FACILITY RESPONSE





CONVERGENCE
OF USES



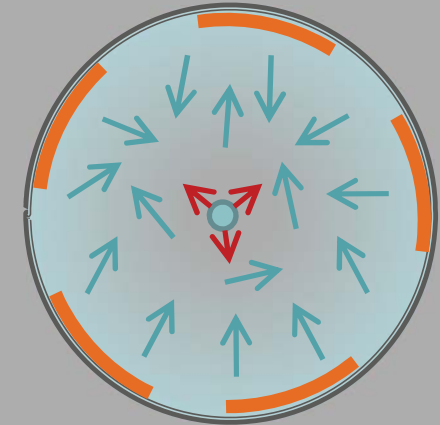
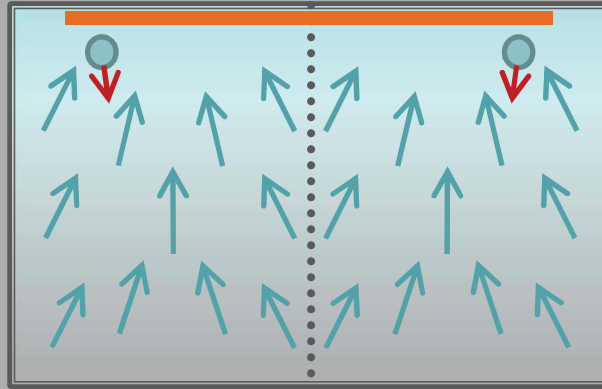
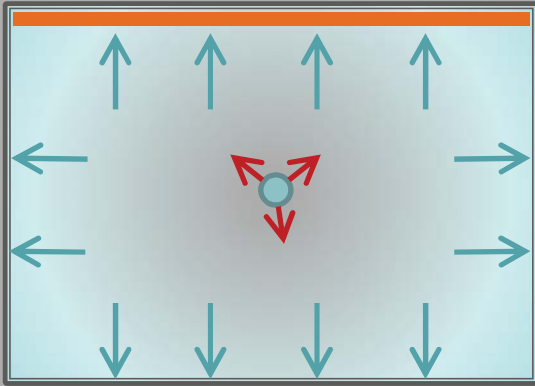
SMALL + LARGE
GROUP LEARNING

IMMERSIVE
LEARNING



FLEXIBILITY





PERIMETER FIXED

FORWARD FACING

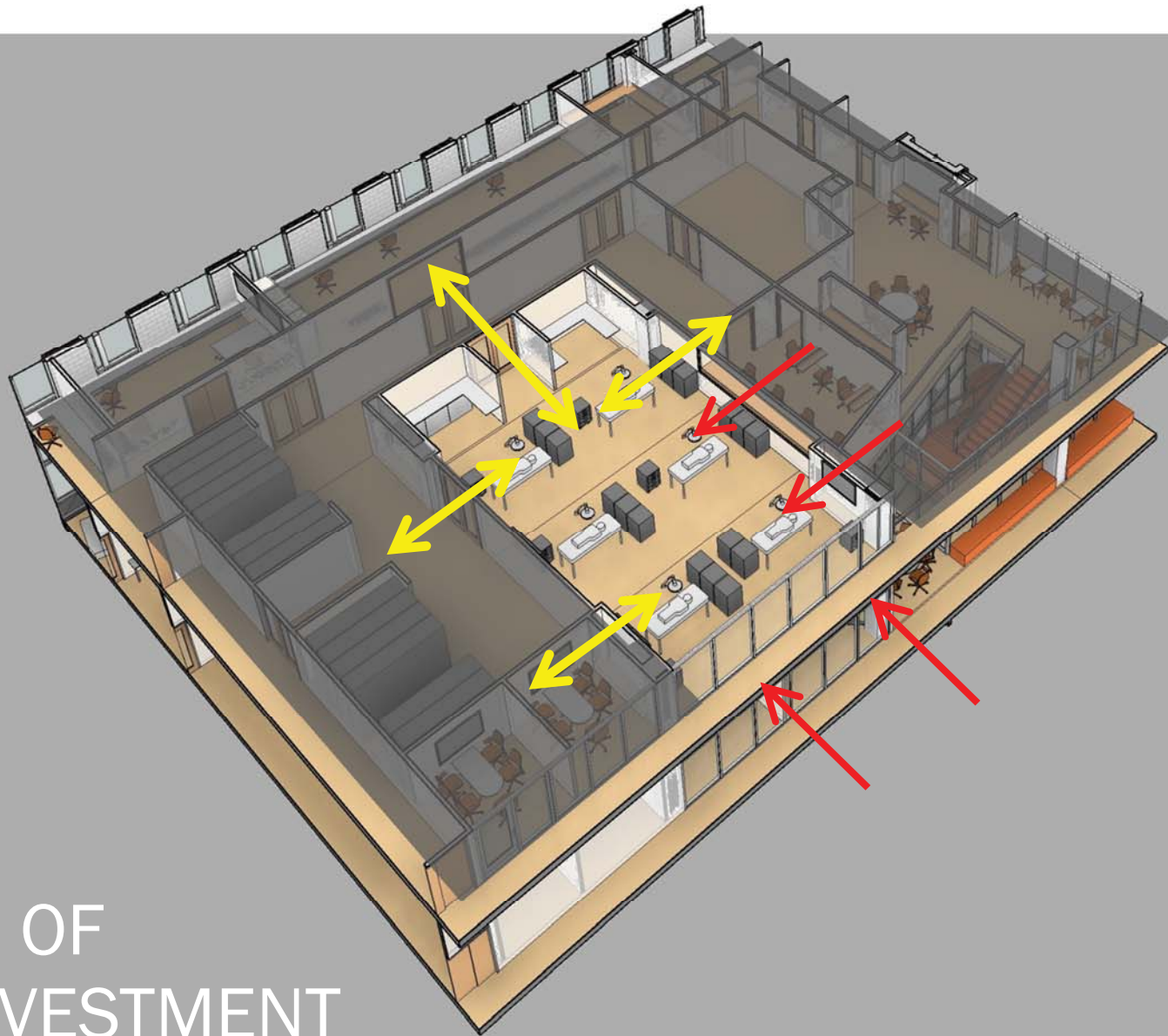
OMNI DIRECTIONAL

TEAM BASED LEARNING



DIVERSITY IN USE





ZONES OF
PRE-INVESTMENT



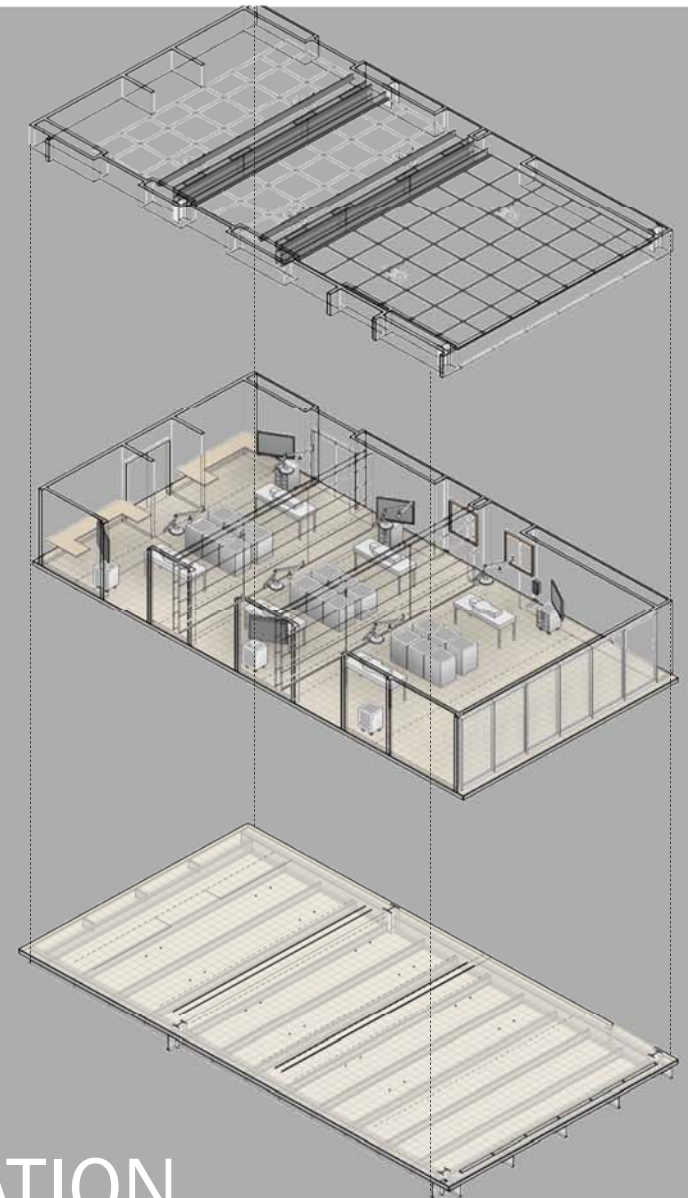
- TECHNICAL GRID
- BOOMS W/ EQUIPMENT
- QUICK CONNECTS
- MOTION CAPTURE



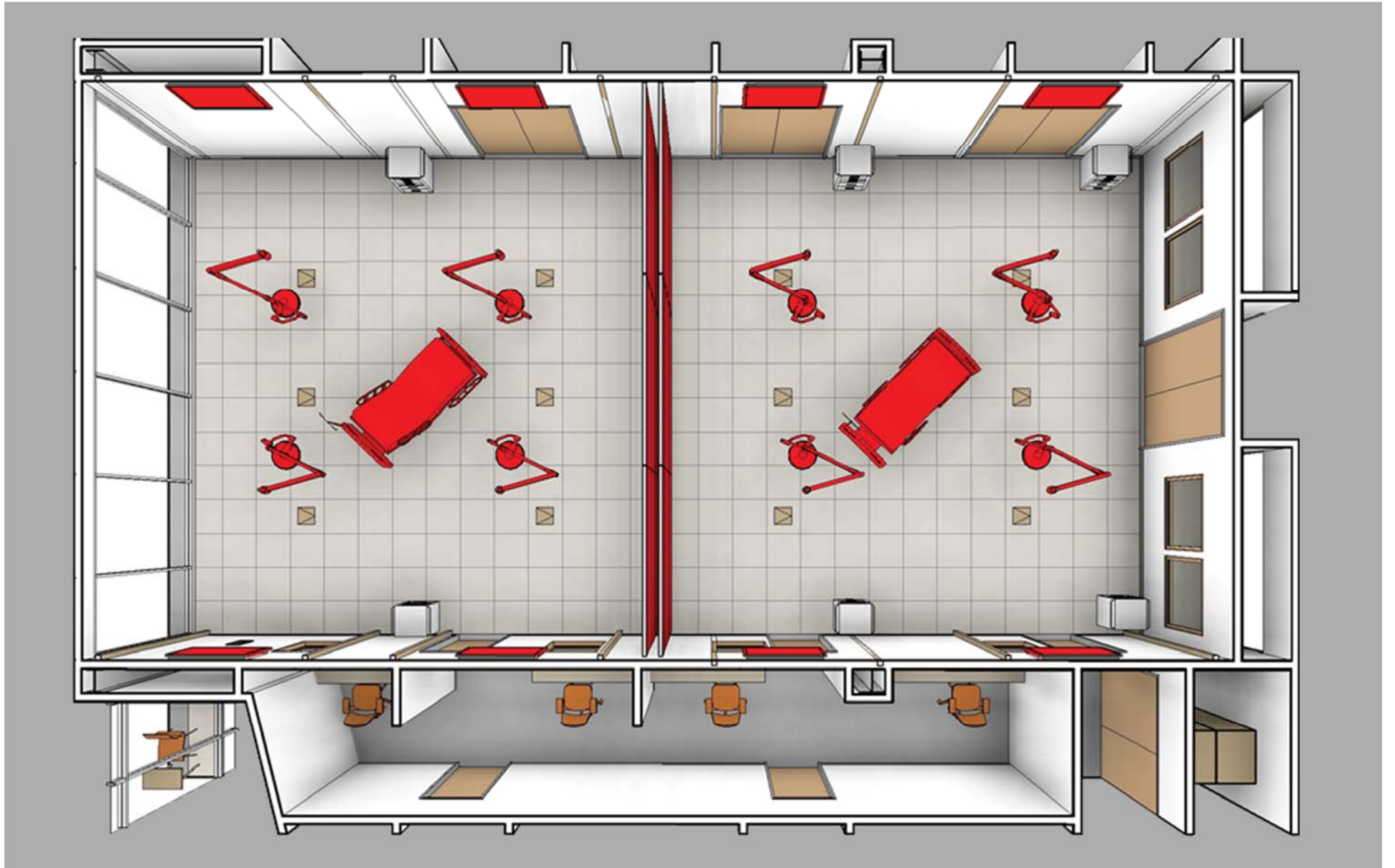
- MOBILE EQUIPMENT
- SKYFOLD WALLS
- THEATRE SETS
- HIGH DENSITY STORAGE

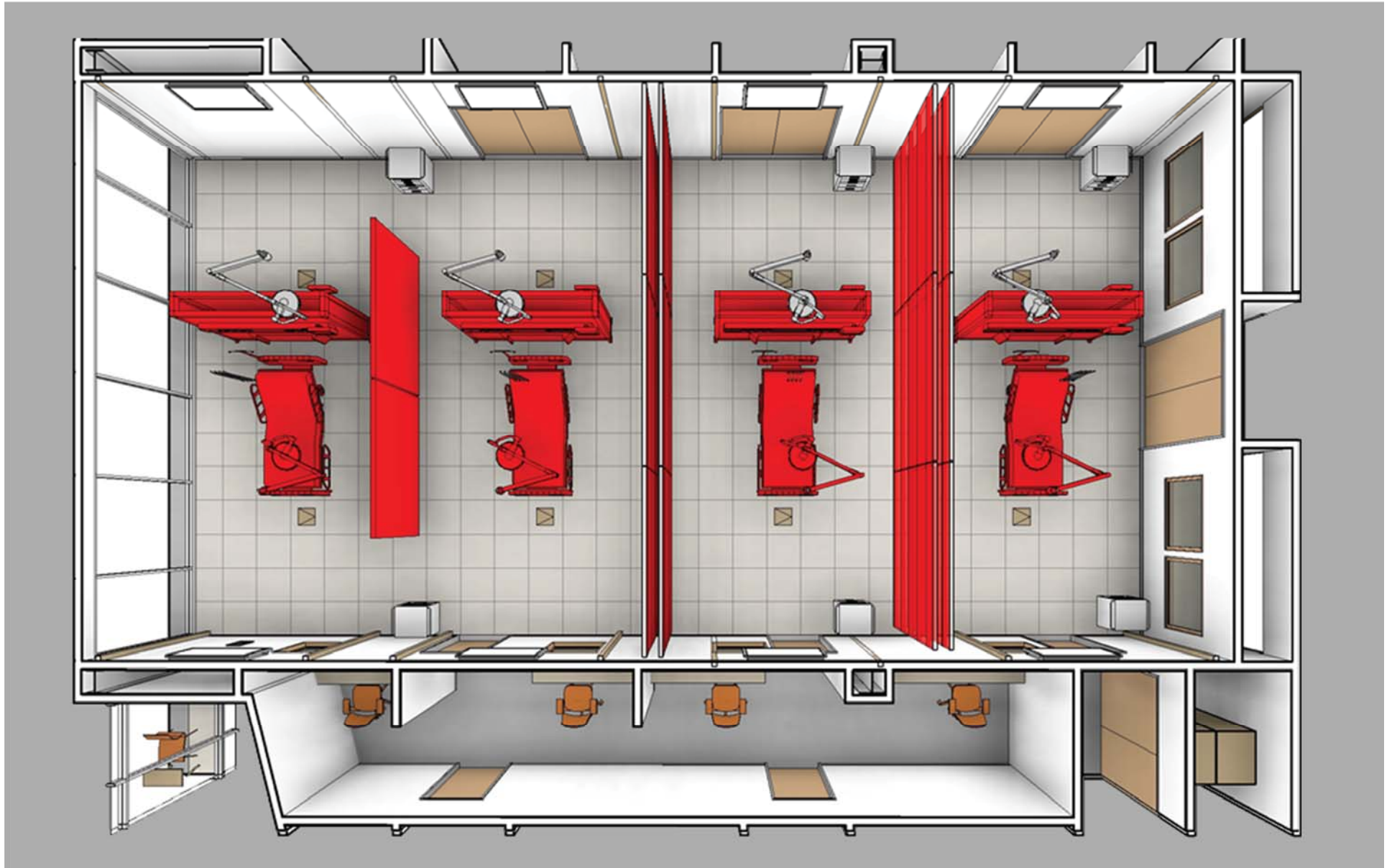


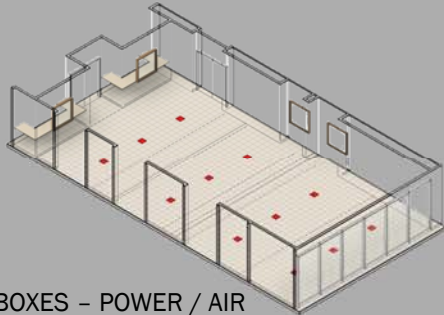
- RAISED FLOOR
- ELECTRICAL ACCESS
- MECHANICAL ACCESS
- EQUIPMENT UMBILICAL



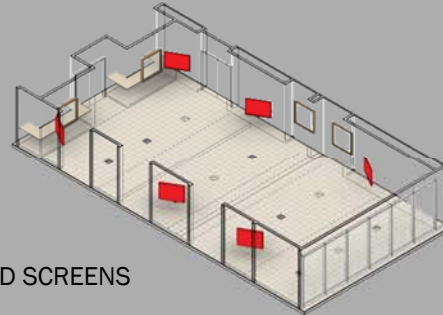
SYSTEMS INTEGRATION



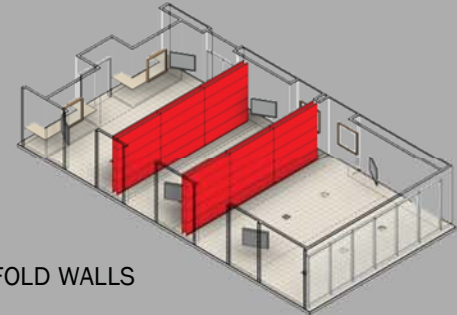




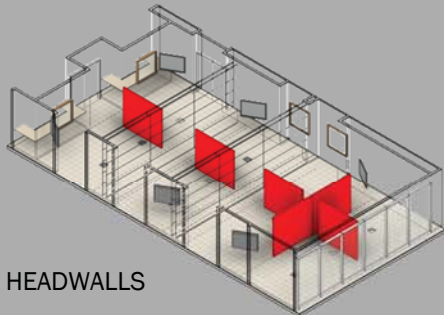
FLOOR BOXES - POWER / AIR



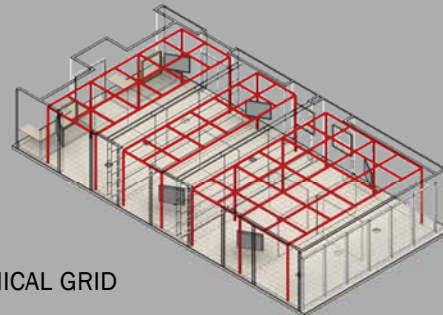
AV+LCD SCREENS



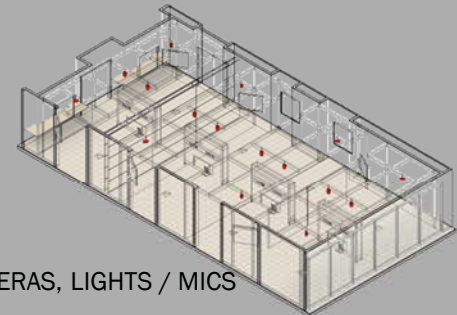
SKYFOLD WALLS



MOBILE HEADWALLS



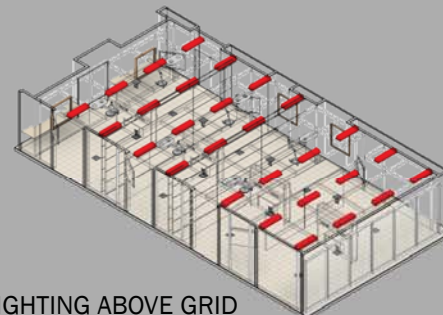
TECHNICAL GRID



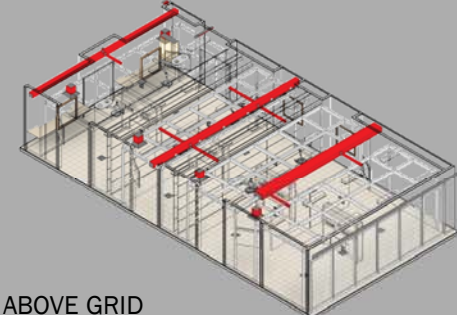
CAMERAS, LIGHTS / MICS



SURGICAL LIGHTS, MEDGAS



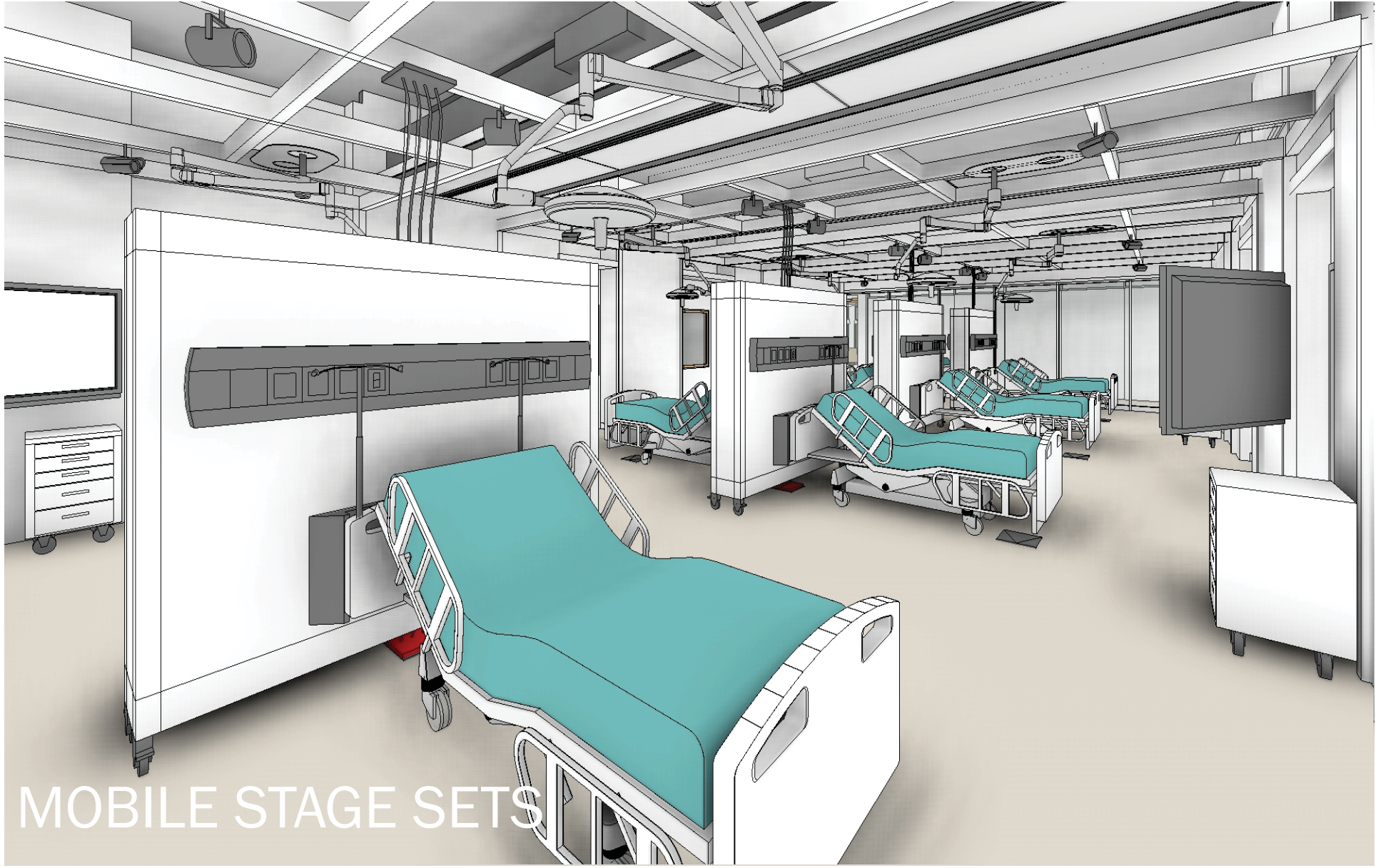
GEN LIGHTING ABOVE GRID



MEP ABOVE GRID



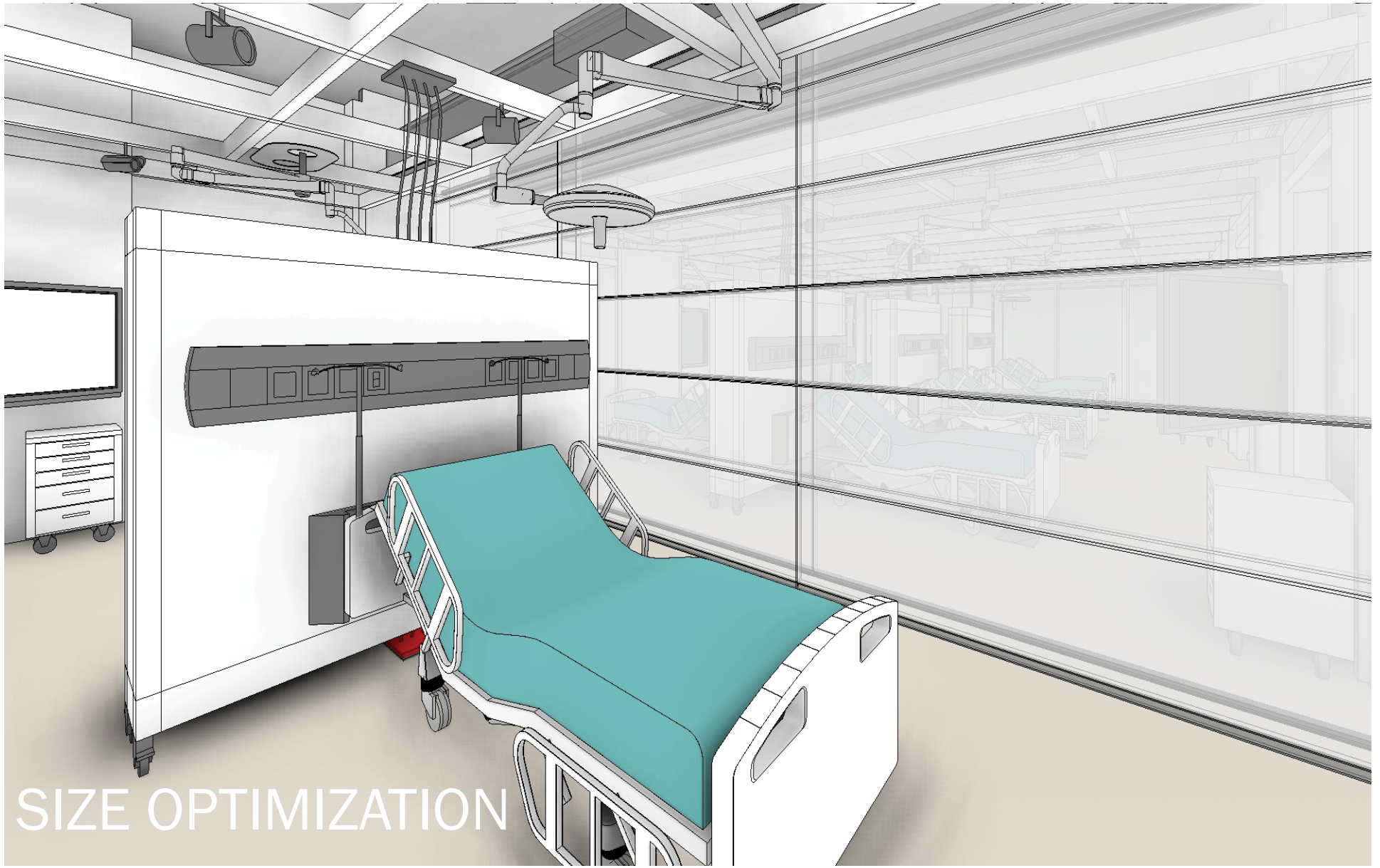
SYSTEMS INTEGRATION



MOBILE STAGE SETS



SPACE DIVISION



SIZE OPTIMIZATION

HEALTHCARE



DRIVERS FOR CHANGE: SPACE NEEDS

80%

SAW AN INCREASE IN
OUTPATIENT SPACE NEEDS

1/2

RANKED
OUTPATIENT
SPACE NEEDS
AS NUMBER
#1 PRIORITY

60%

RANKED THE
EMERGENCY DEPARTMENT
AS STABLE OR DECREASING
IN NEED

90%

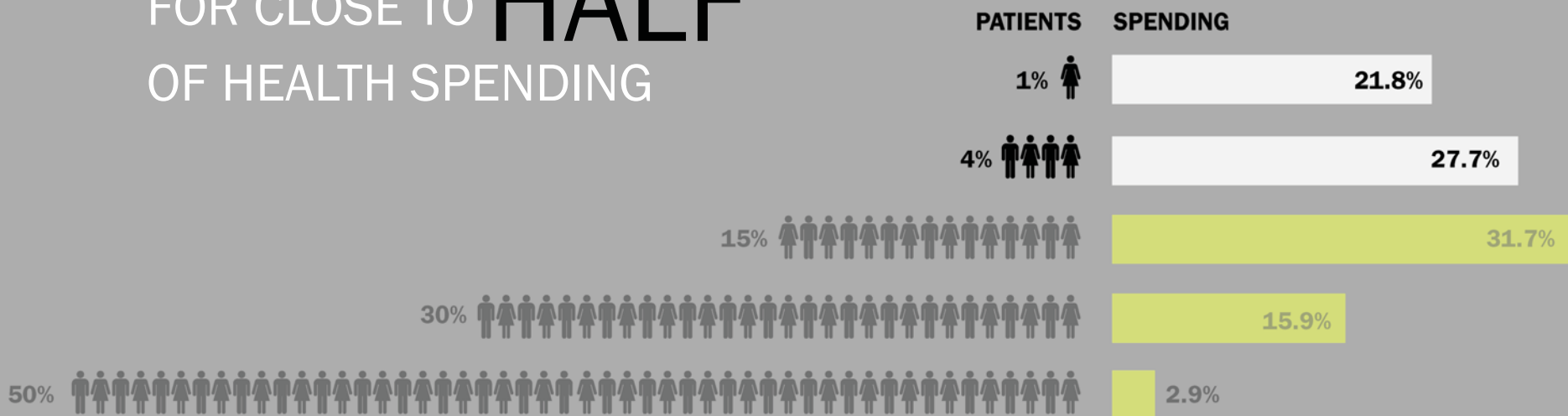
PRIORITIZED
PUBLIC AMENITIES

EVOLUTION OF HEALTHCARE

TRADITIONAL	STATE OF THE ART	STATE OF THE FUTURE
FRAGMENTED	INTEGRATED	AUTOMATED
INVASIVE	MINIMALLY INVASIVE	LESS INVASIVE, PREVENTATIVE
PROVIDER CENTRIC	PATIENT CENTRIC	OMNI CENTRIC
CENTRALIZED-HOSPITAL	DECENTRALIZED – SHIFT TO COMMUNITY	DECENTRALIZED – WITHIN THE HOME
ONE SIZE FITS ALL	LIMITED MENU	PERSONALIZED MEDICINE
THERAPEUTICS / DIAGNOSTICS / DEVICES	DIAGNOSE THEN TREAT	THERANOSTICS
TREATING SICKNESS	UNDERSTANDING WELLNESS	PROMOTING WELLNESS
FEE FOR SERVICE	PAY FOR QUALITY	REWARDING AFFORDABILITY
AGED AND SEDATE	AGING IN MOTION	MINIMIZE AGING

5%

OF THE POPULATION ACCOUNTS
FOR CLOSE TO **HALF**
OF HEALTH SPENDING



SOURCE: MIT TECHNOLOGY REVIEW

NEARLY $\frac{1}{2}$ OF ALL AMERICANS SUFFER FROM AT LEAST ONE

CHRONIC DISEASE

CHRONIC DISEASES

ACCOUNT FOR $\$3$ OF EVERY $\$4$ SPENT ON HEALTHCARE



OF **ALL DEATHS** ARE CAUSED BY ONE OR MORE OF 5 CHRONIC DISEASES:

- HEART DISEASE
- CANCER
- STROKE
- CHRONIC OBSTRUCTIVE PULMONARY DISEASE
- DIABETES

PREVENTATIVE CARE



COMPREHENSIVE CARE MANAGEMENT

EIGHT IN TEN



PHYSICIANS USE A MOBILE DEVICE
TO DELIVER PATIENT CARE



SOURCE: PricewaterhouseCoopers



DEVICES INCLUDE:

- STETHOSCOPE
- OTOSCOPE
- THERMOMETER
- DERMASCOPE
- PULSE OXIMETER
- SCALE
- BLOOD PRESSURE CUFF



FACETIME APPLICATIONS

EXISTING FACILITIES



Ambulatory Care Center
240 E. 38 Street

NYU Langone Medical
Center Campus

MEP

ENDOSCOPY

MOLECULAR PATHOLOGY LAB

MEP

NEUROLOGY

CANCER CENTER

CANCER CENTER

RUSK REHABILITATION

RUSK REHABILITATION

RUSK REHABILITATION

PAIN SERVICES

WOUND CARE

DERMATOLOGY

DERMATOLOGY

AMBULATORY SURGERY

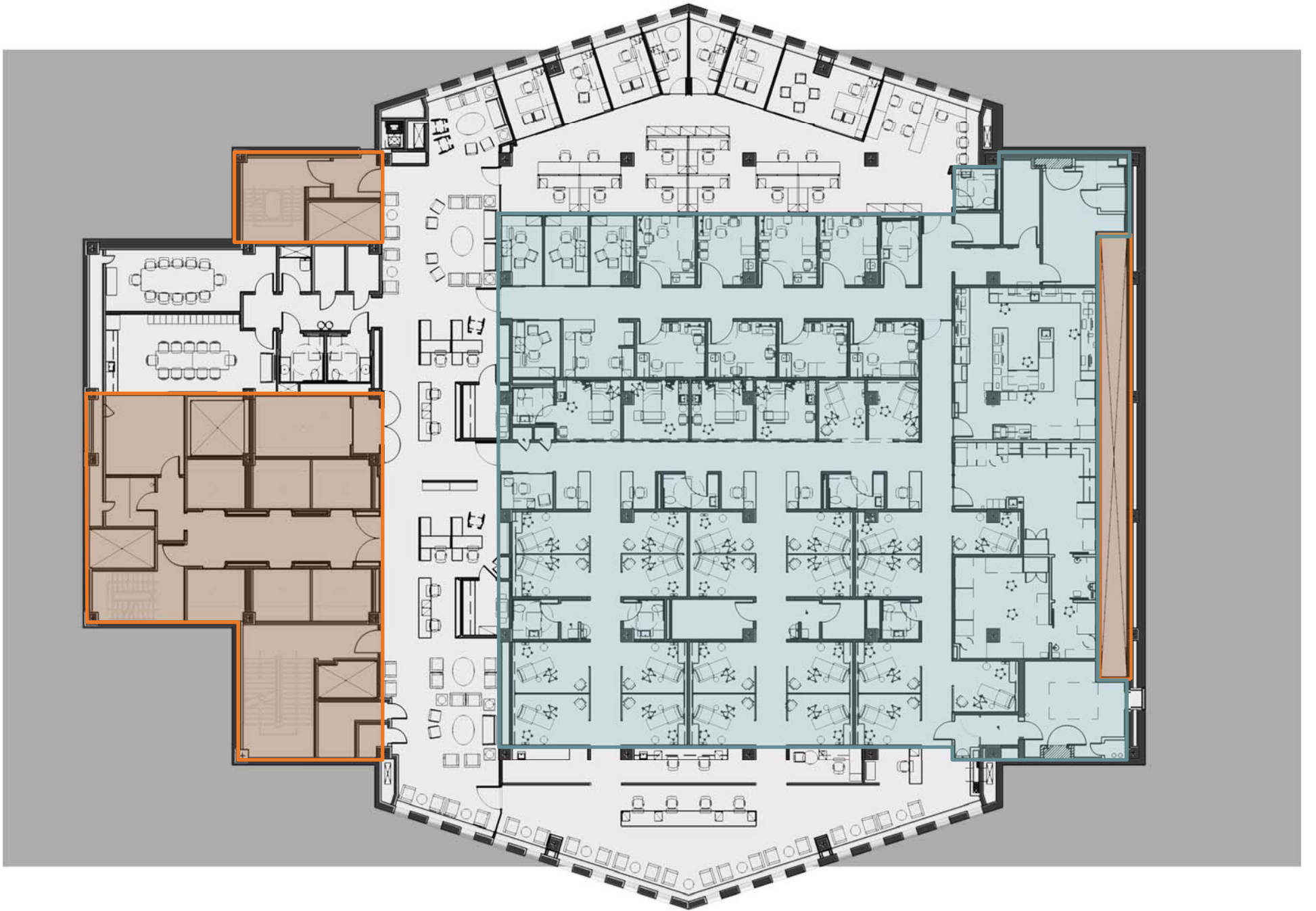
MEP

PRE-ADMISSION TESTING

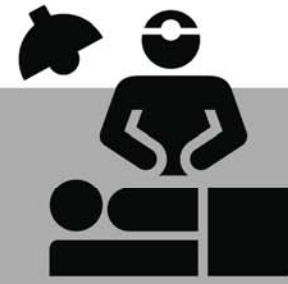
COMMON FACILITIES

MEP



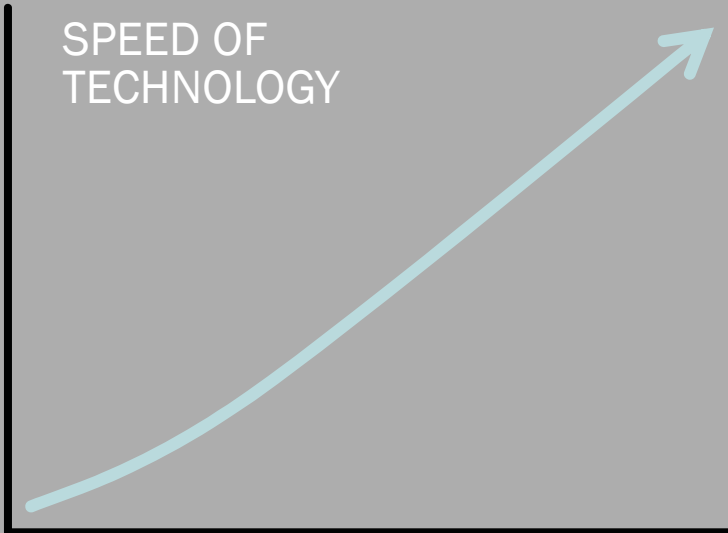


ESSENTIALLY
EVERY TREATMENT
TECHNIQUE TAUGHT **25** YEARS AGO
HAS BEEN ABANDONED + REPLACED

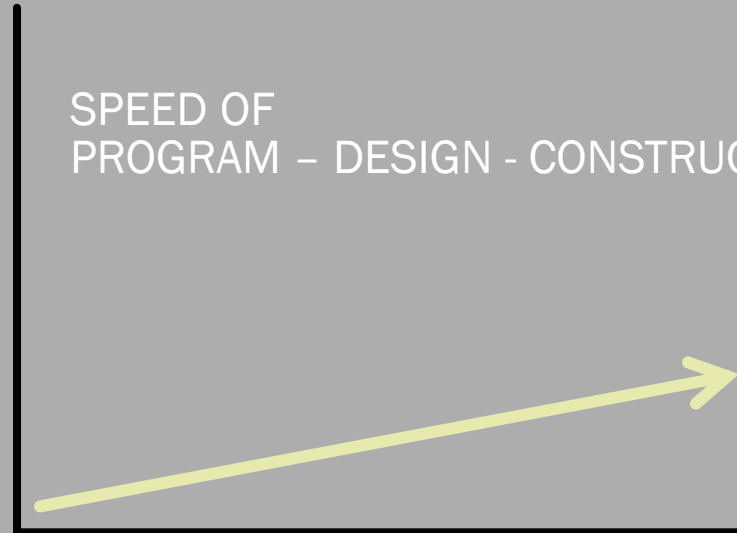


Ralph Blasier, "The Problem of the Aging Surgeon"

SPEED OF
TECHNOLOGY



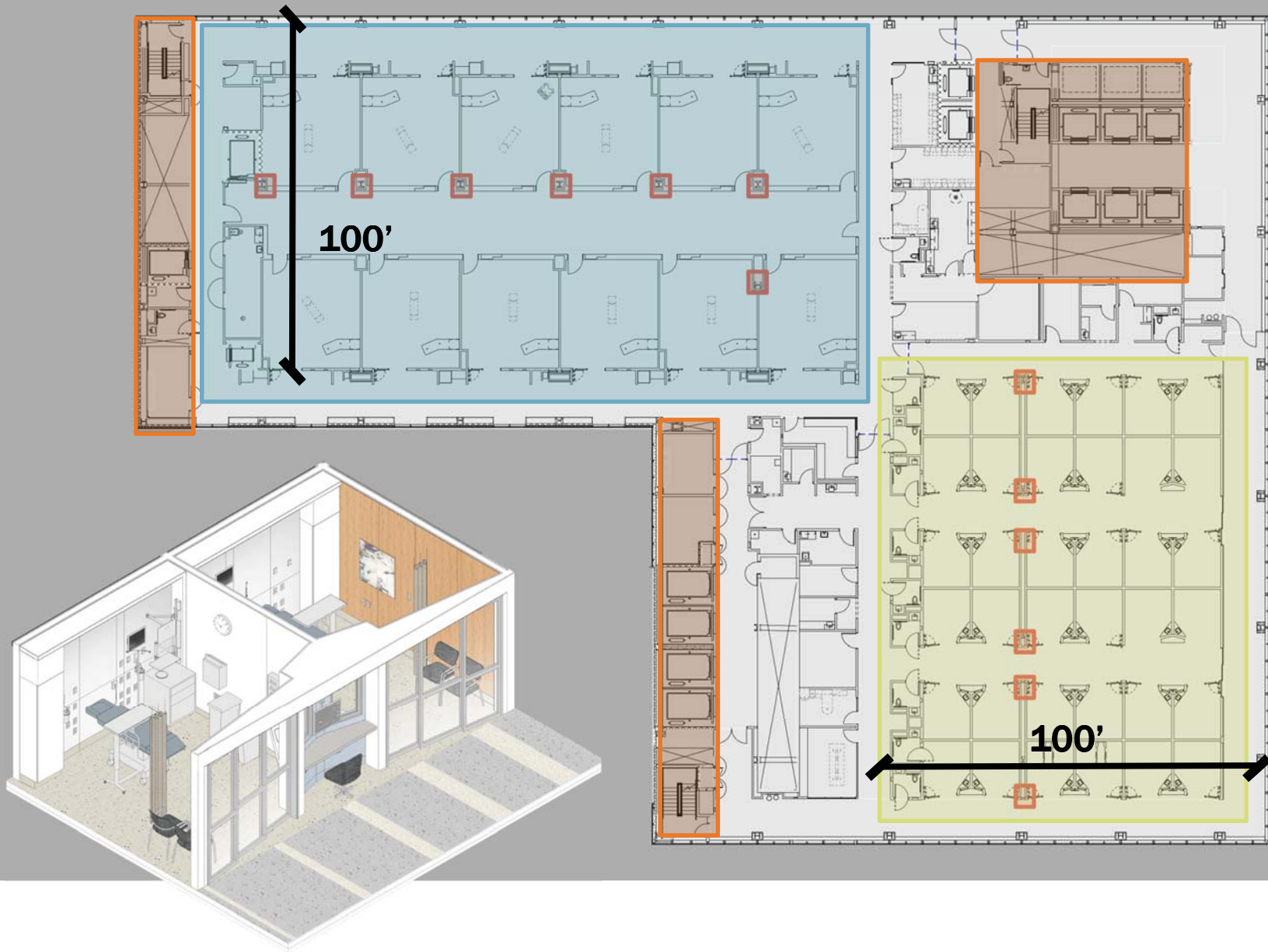
SPEED OF
PROGRAM - DESIGN - CONSTRUCTION

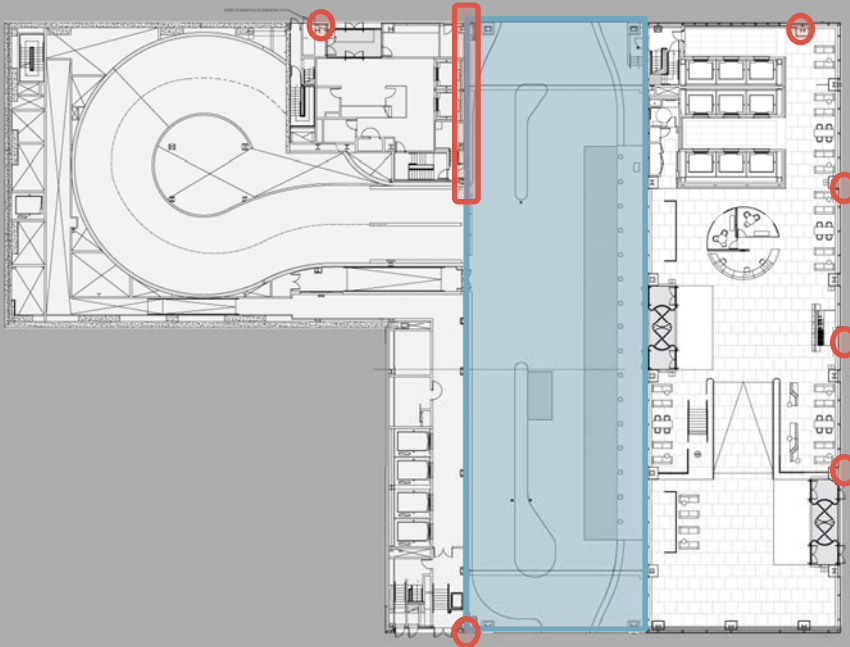


MAXIMUM PLANNING FLEXIBILITY



MAXIMUM PLANNING FLEXIBILITY





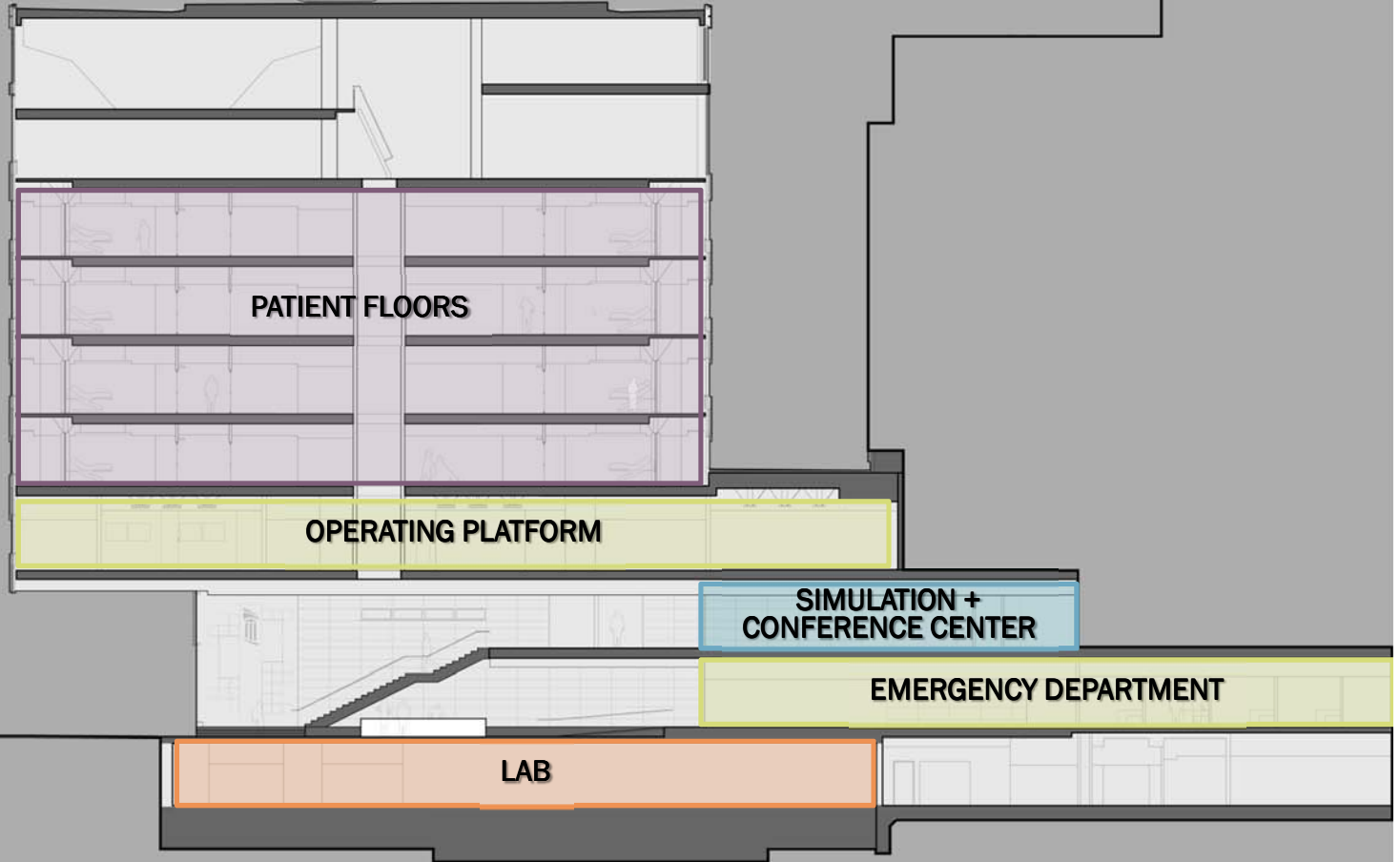
FLEXIBLE FOR DISASTER



Embedded Training Space in Clinical Care



U.S. AIR FORCE



PATIENT FLOORS

OPERATING PLATFORM

**SIMULATION +
CONFERENCE CENTER**

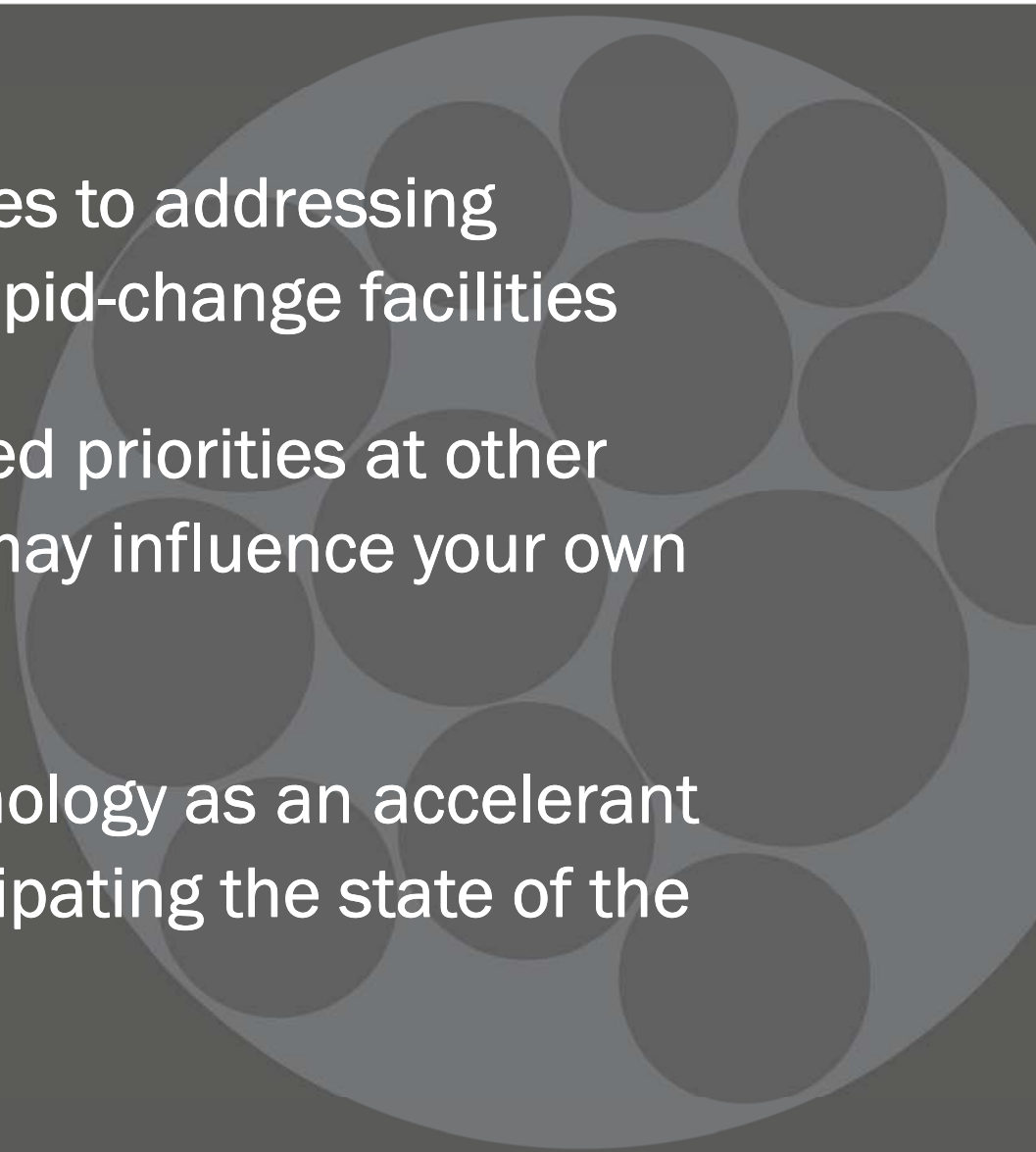
EMERGENCY DEPARTMENT

LAB

COORDINATED CARE:
QUALITY CARE AT THE
RIGHT TIME, RIGHT PLACE,
RIGHT PRICE



ARE TODAY'S MEASURES OF SUCCESS
THE SAME ONES THAT WILL INDICATE
STRENGTH IN THE FUTURE?

- 
- The background of the slide features a dark grey field with a large, semi-transparent, light grey circle on the right side. Inside this circle, there are several smaller, overlapping circles of varying shades of grey, creating a pattern reminiscent of a molecular structure or a cluster of atoms.
1. Innovative approaches to addressing “Forward-Flexible” rapid-change facilities
 2. Insight to space based priorities at other institutions, as this may influence your own decisions
 3. Understanding technology as an accelerant of change, and anticipating the state of the facility future

