VIRTUAL INFRASTRUCTURE AND THE HEALTHCARE ECOSYSTEM

EUROPEAN HEALTH PROPERTY NETWORK
2018 WORKSHOP
Gothenburg, Sweden 25-27th September

The mission is: *"Health Planning"*

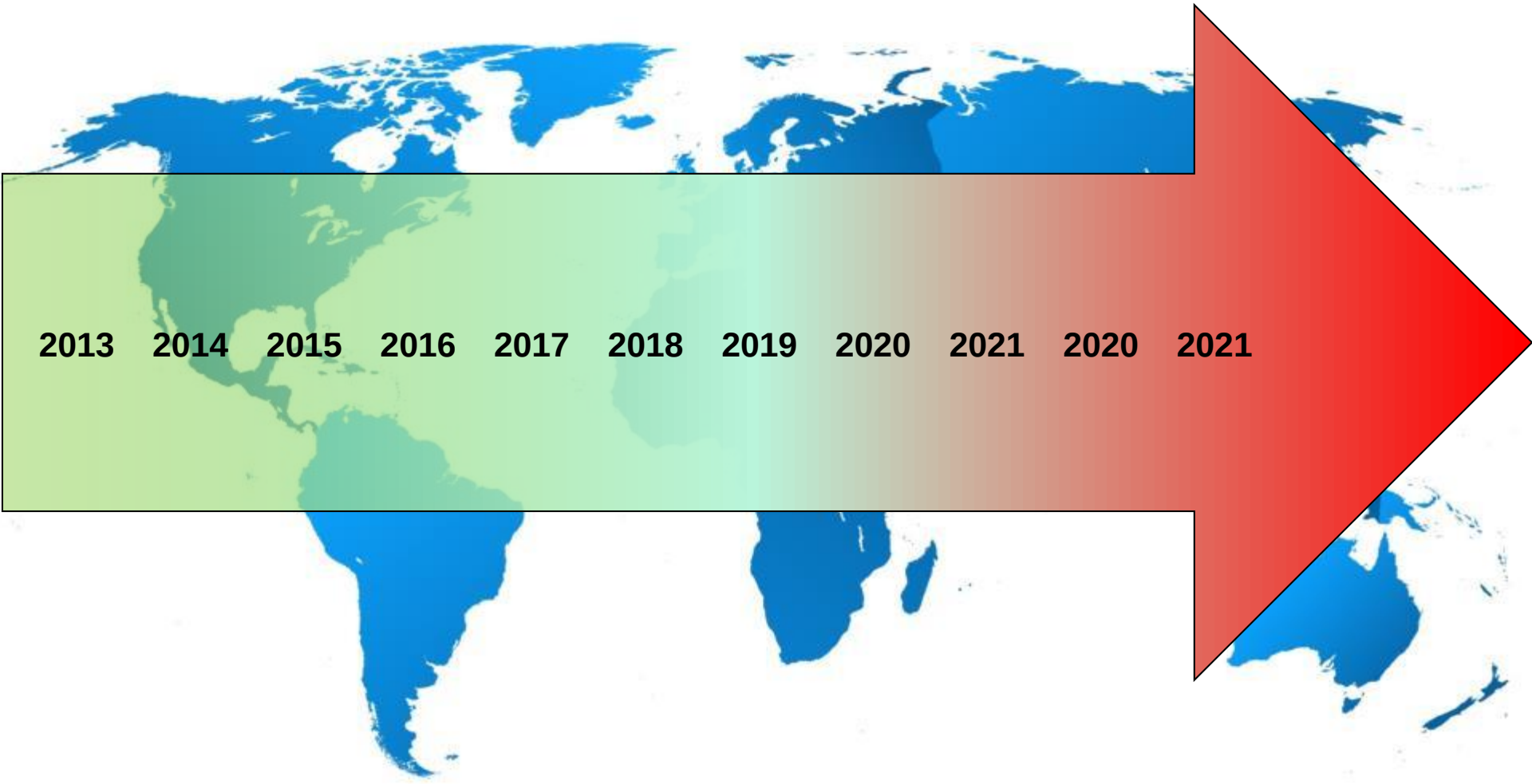
"Planning for the Health of People"

The reality of the current situation:

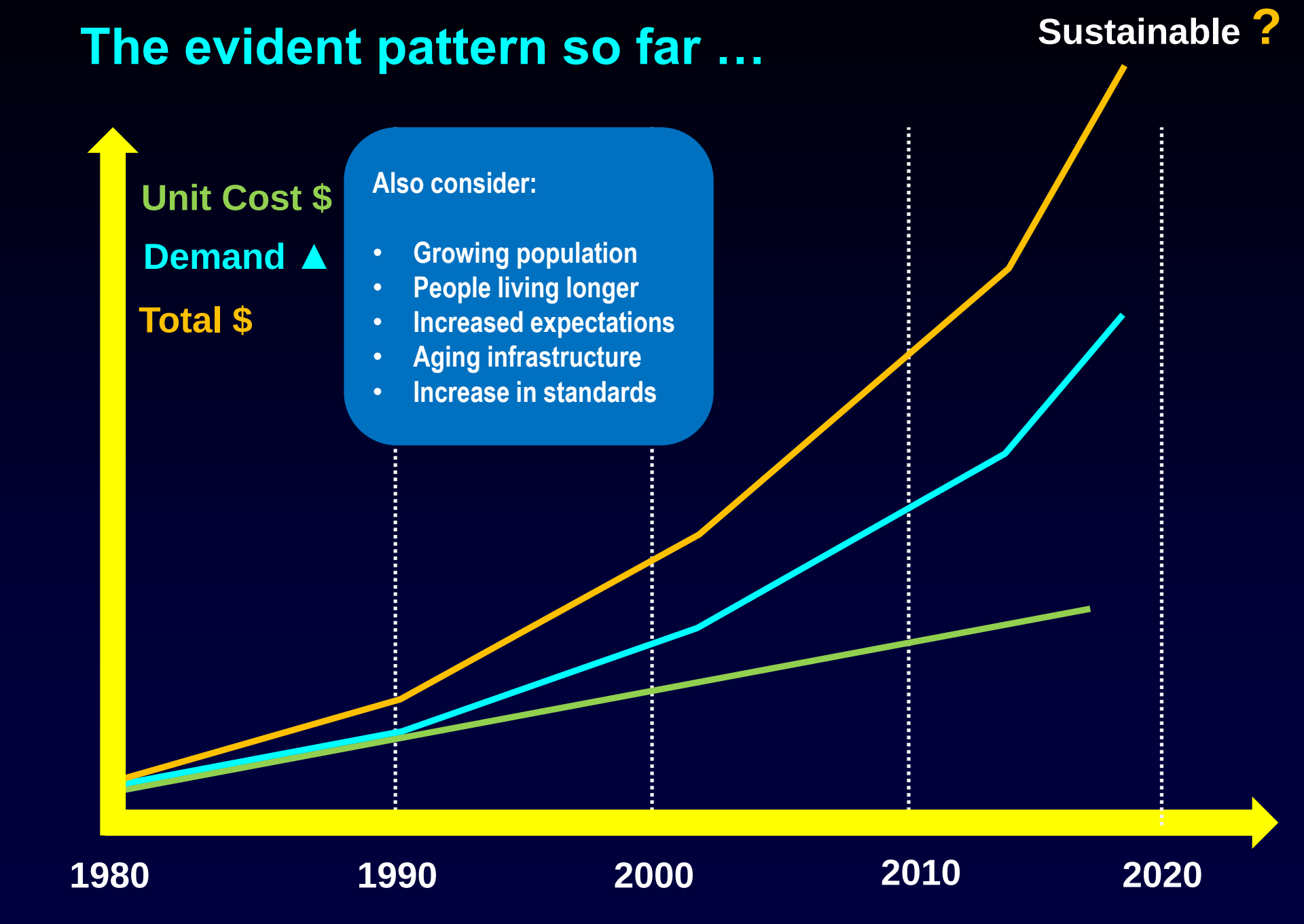
- **Healthcare facilities take too long to plan, design & build**
- **Healthcare delayed is healthcare denied**
- **Healthcare facilities are too expensive to build and run**
- **Healthcare takes an increasing portion of the economy**
- **The demand for healthcare is rising**
- **We need maximum efficiency to control healthcare costs and to keep it sustainable in the long term**
- **We need systematic, holistic *"Health Planning"***

A world-wide issue

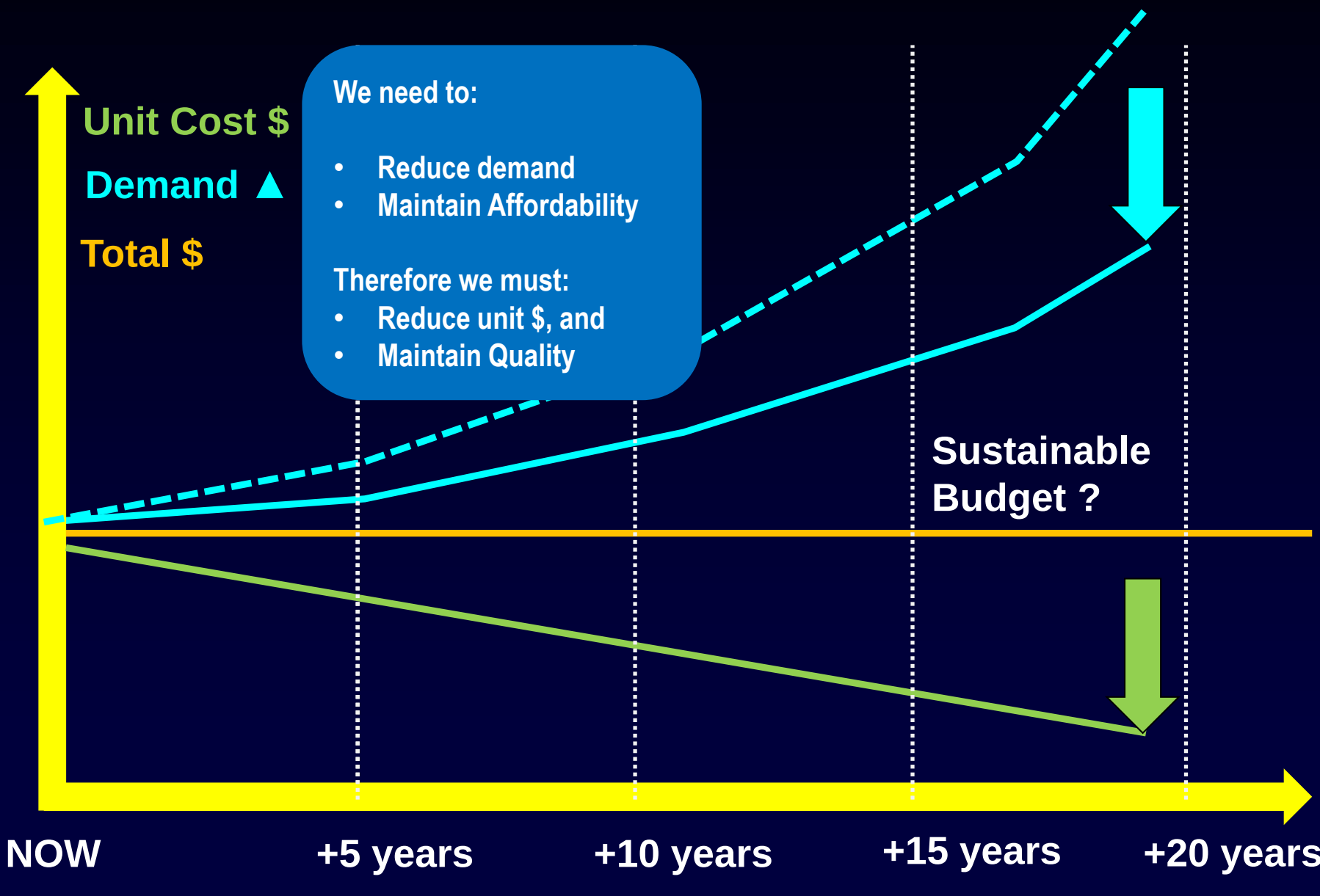
Is healthcare economically sustainable over the long term?



The evident pattern so far …



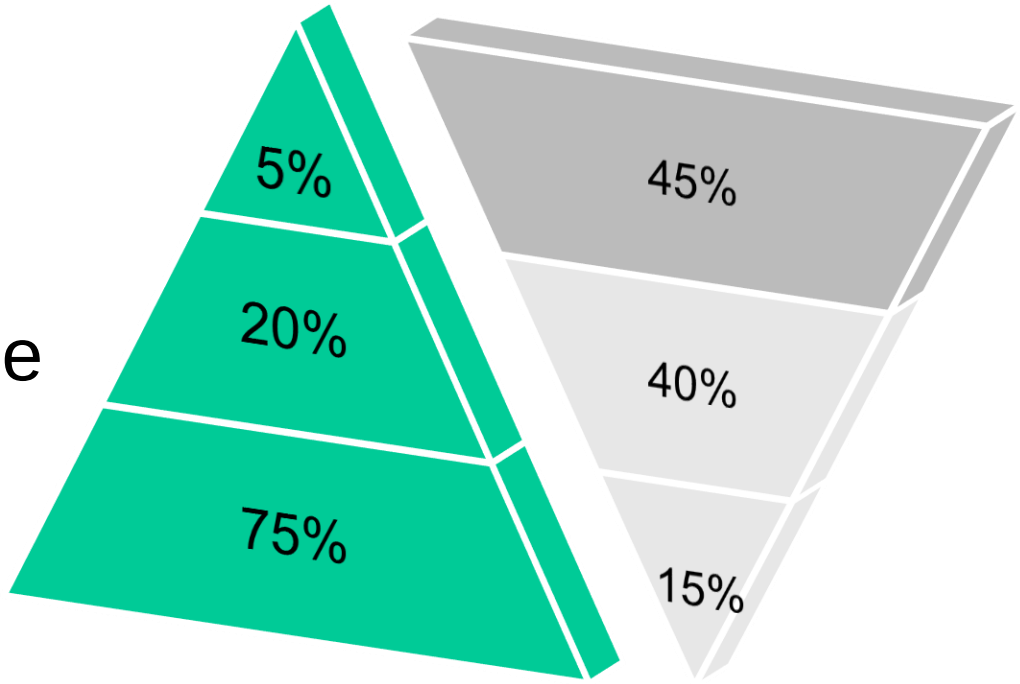
The pattern we need for the future …



Healthcare Expenditure

Older age

% of People

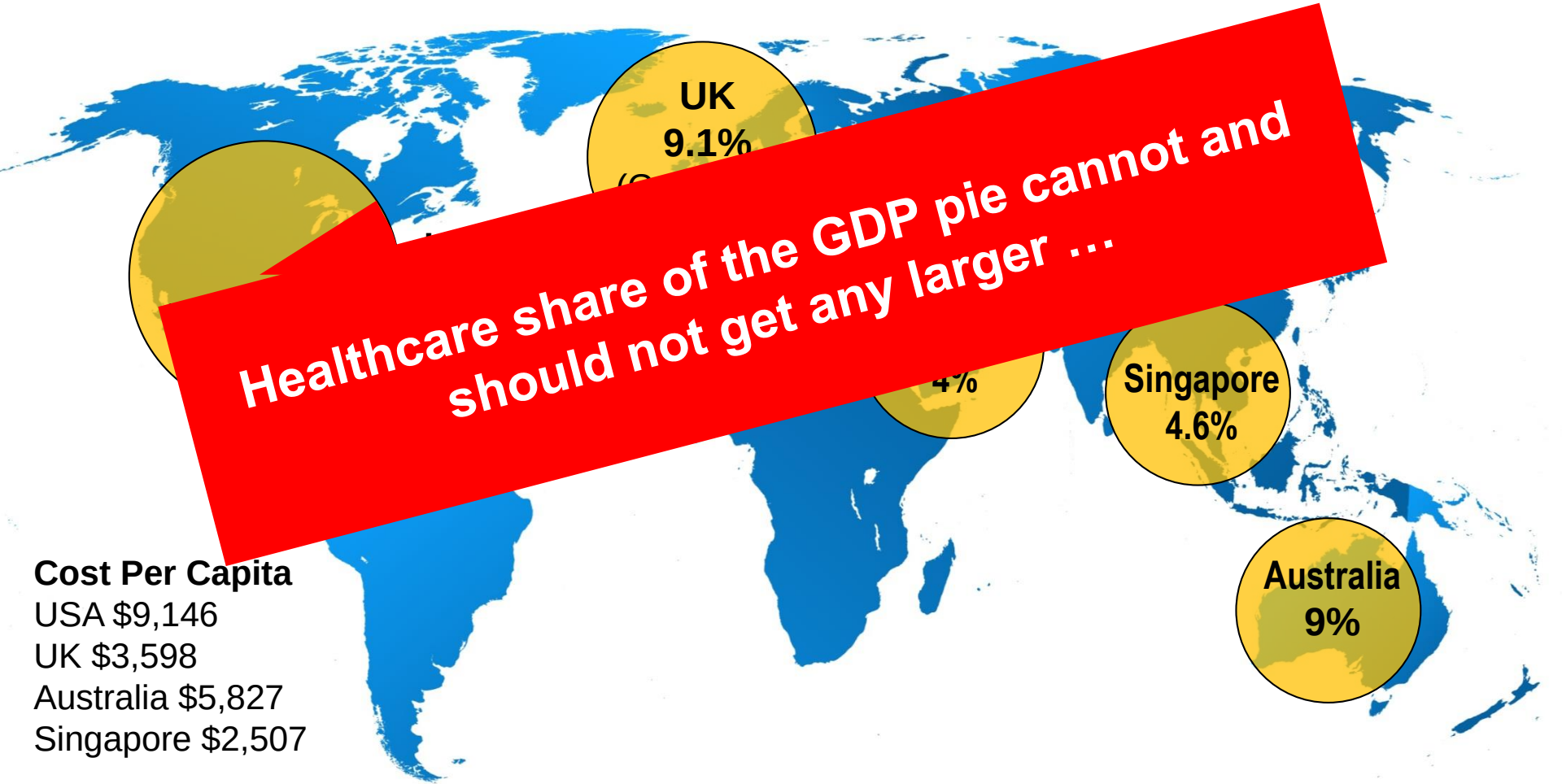


% of Healthcare Cost

Younger age

Healthcare Pie

“Healthcare costs can bankrupt Countries”



Cost Per Capita
USA $9,146
UK $3,598
Australia $5,827
Singapore $2,507

Race for greater expenditure on healthcare?

Here are the results:

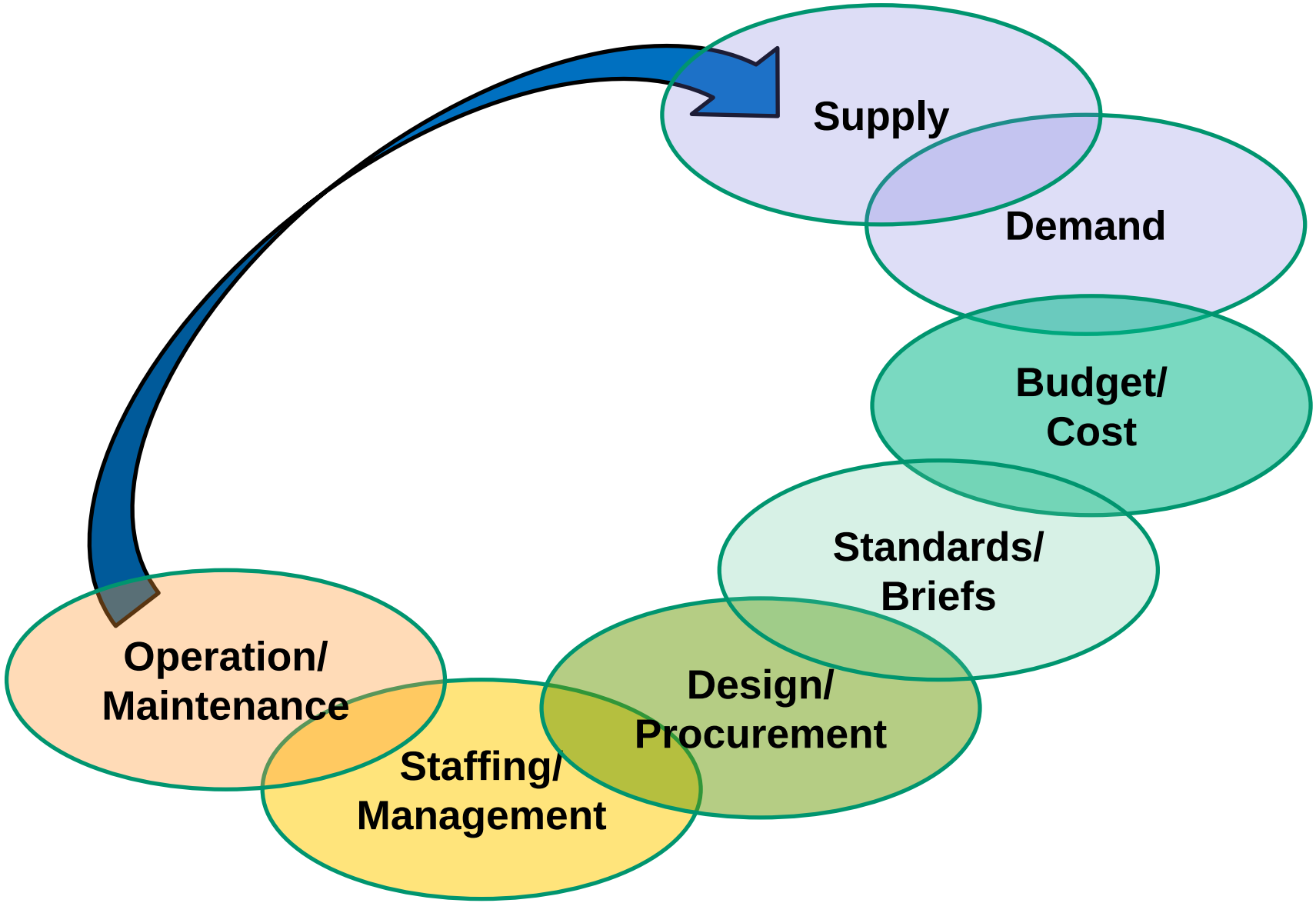
Highest expenditure > lowest ranking, 11 out of 11

COUNTRY RANKINGS

- Top 2*
- Middle
- Bottom 2*

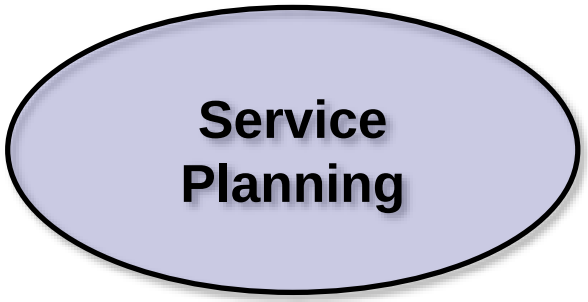
	AUS	CAN	FRA	GER	NETH	NZ	NOR	SWE	SWIZ	UK	US
OVERALL RANKING (2013)	4	10	9	5	5	7	7	3	2	1	11
Quality Care	2	9	8	7	5	4	11	10	3	1	5
Effective Care	4	7	9	6	5	2	11	10	8	1	3
Safe Care	3	10	2	6	7	9	11	5	4	1	7
Coordinated Care	4	8	9	10	5	2	7	11	3	1	6
Patient-Centered Care	5	8	10	7	3	6	11	9	2	1	4
Access	8	9	11	2	4	7	6	4	2	1	9
Cost-Related Problem	9	5	10	4	8	6	3	1	7	1	11
Timeliness of Care	6	11	10	4	2	7	8	9	1	3	5
Efficiency	4	10	8	9	7	3	4	2	6	1	11
Equity	5	9	7	4	8	10	6	1	2	2	11
Healthy Lives	4	8	1	7	5	9	6	2	3	10	11
Health Expenditures/Capita, 2011**	$3,800	$4,522	$4,118	$4,495	$5,099	$3,182	$5,669	$3,925	$5,643	$3,405	$8,508

Health Planning Eco-system



The challenge demands ….

that we leave no stone unturned



Health Service Plan determines

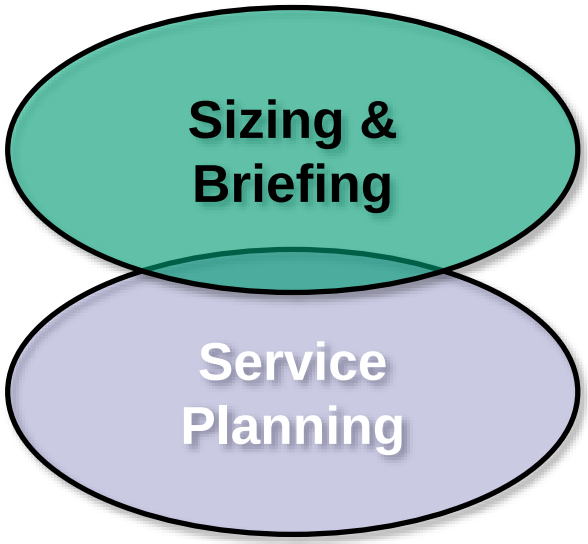
- **What, Where, When, How Many**

Many Service Plans

- **project the past into the future**
- **are often intuitive rather than scientific**
- **are Bed-centric**
- **are not linked to briefing**
- **are a mystery to many**
- **take too long to prepare & hard to update**

The challenge demands ….

that we leave no stone unturned



Sizing and Briefing

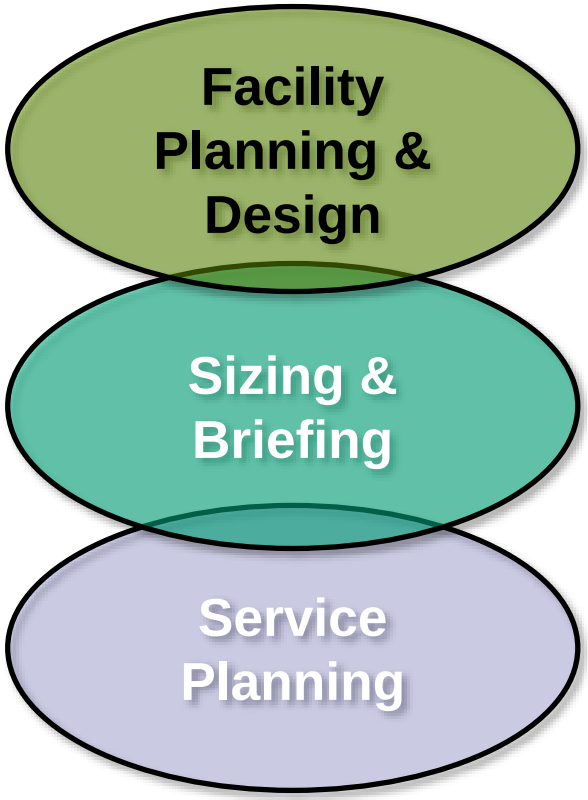
- **interpret the service plan**
- **fully scope, define and size projects**

However, Sizing and Briefing are

- **often opinion based & created on the run**
- **rarely shared between projects**
- **rediscovered by each project team at a great cost over a long period**
- **sometimes extracted from Design rather than derived from common guidelines!**

The challenge demands ….

that we leave no stone unturned



Facility Planning & Design define & visualise

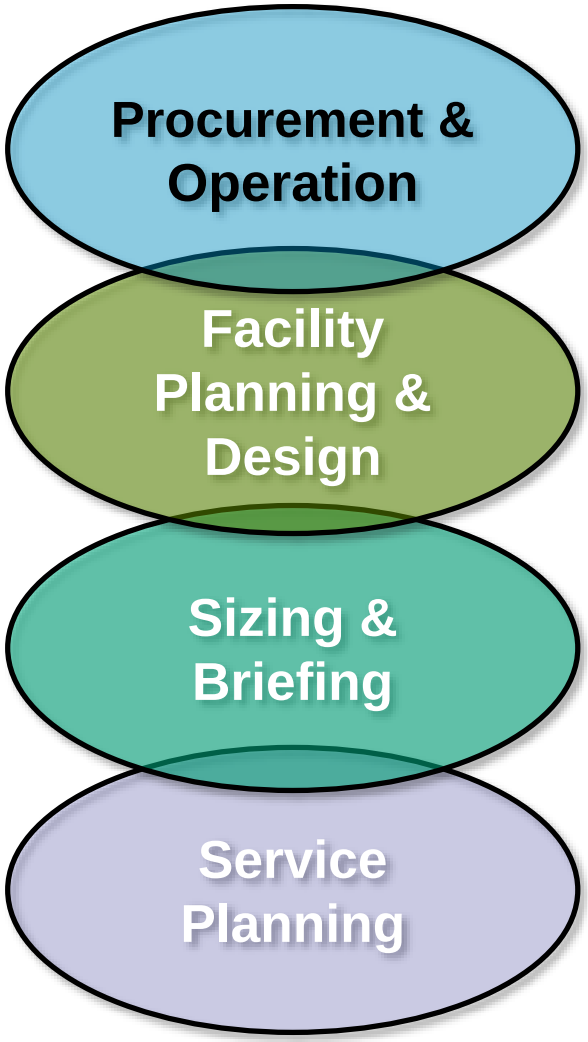
- **facilities which meet the brief**
- **have the right size and relationships; and**
- **are fit for purpose**

Often, Hospital Planning & Design

- **reinvents known solutions in the name of "Innovation";**
- **takes too long in the name of "Process";**
- **may still miss obvious requirements**
- **good results are hidden under"IP"**

The challenge demands ….

that we leave no stone unturned



Procurement

- **needs to keep costs down and quality up**

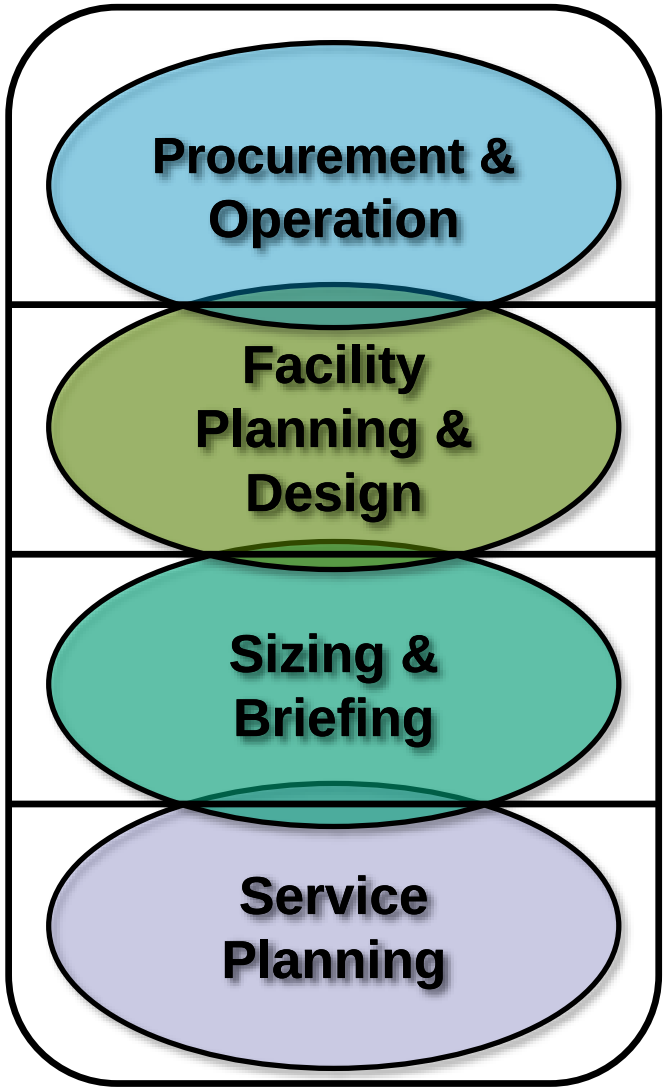
Operation

- **needs to do more with fewer resources**

In reality

- **hospitals are like hand-made cars**
- **are increasingly unaffordable**
- **lack commonly available components**
- **inefficiencies are solved by additional staff and greater resources at greater cost**

The case for robust, ready to use Guidelines

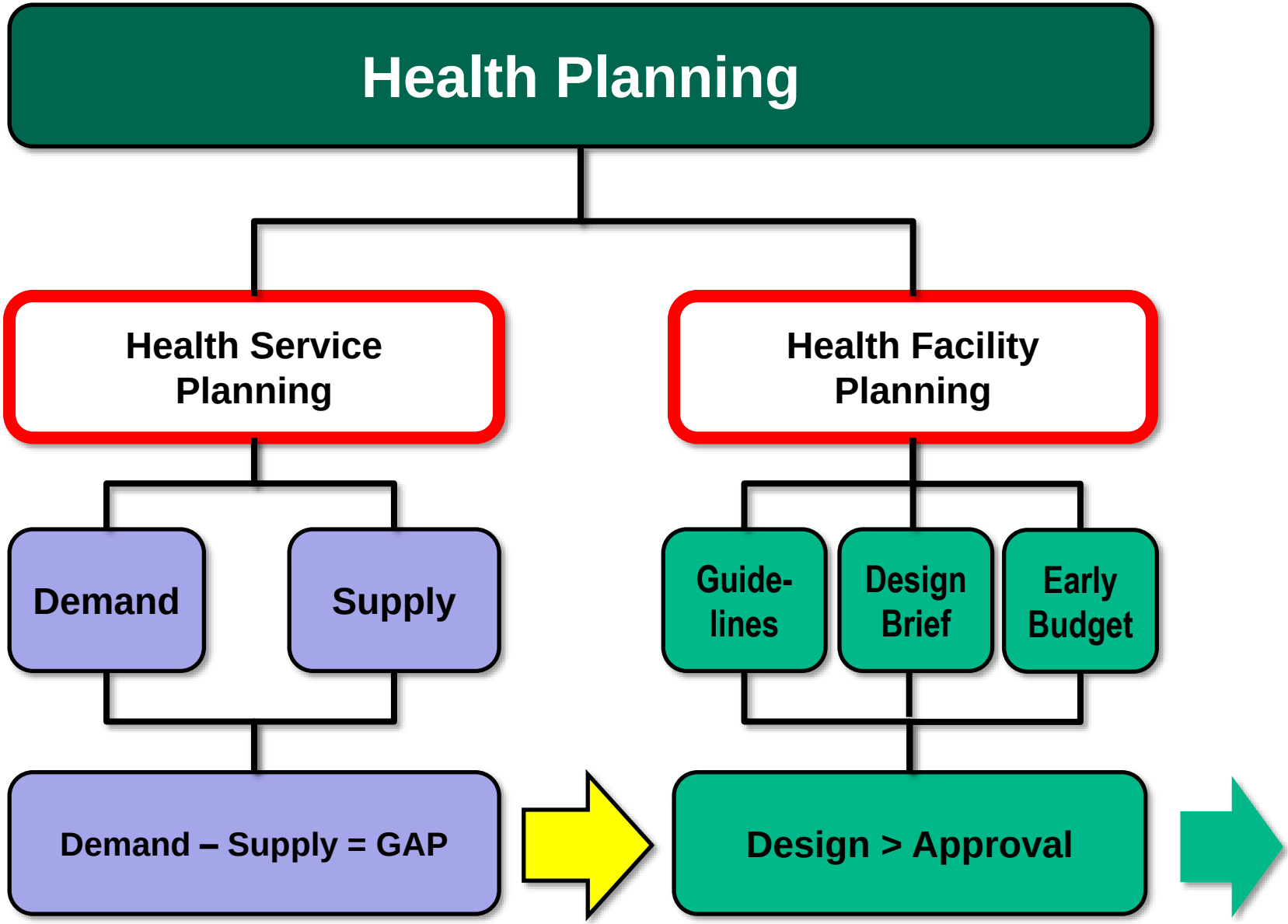


For High Quality, Sustainable Healthcare:

- **link Service Planning and Sizing**
- **enable quick, detailed briefing & SOA**
- **create clear guidelines for rapid facility planning & design**
- **create a growing pool of ready-to-use design components**
- **create a basis for modular construction**
- **enable knowledge sharing & transfer**

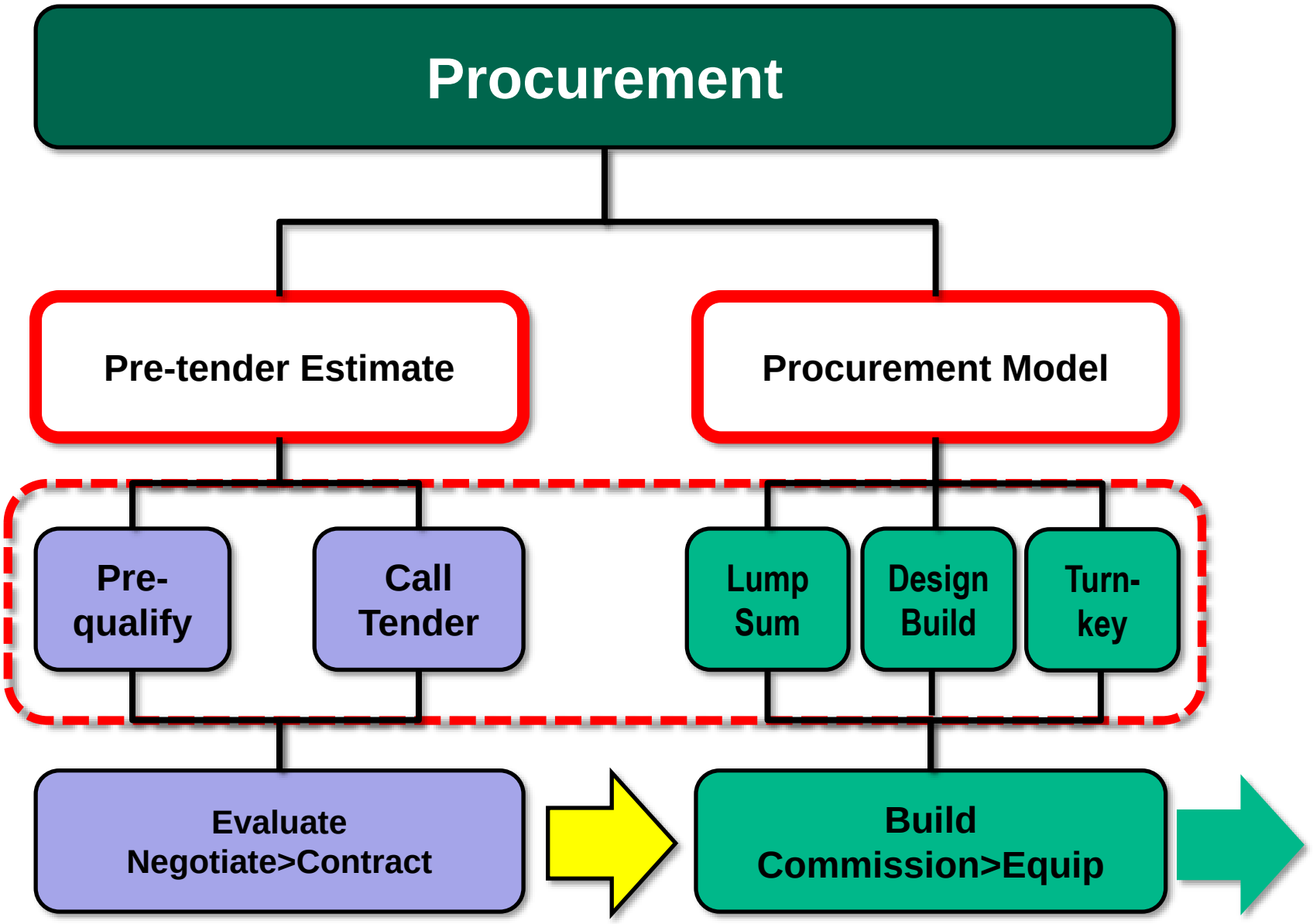
Create a Rational Framework

The Health Planning Discipline Framework

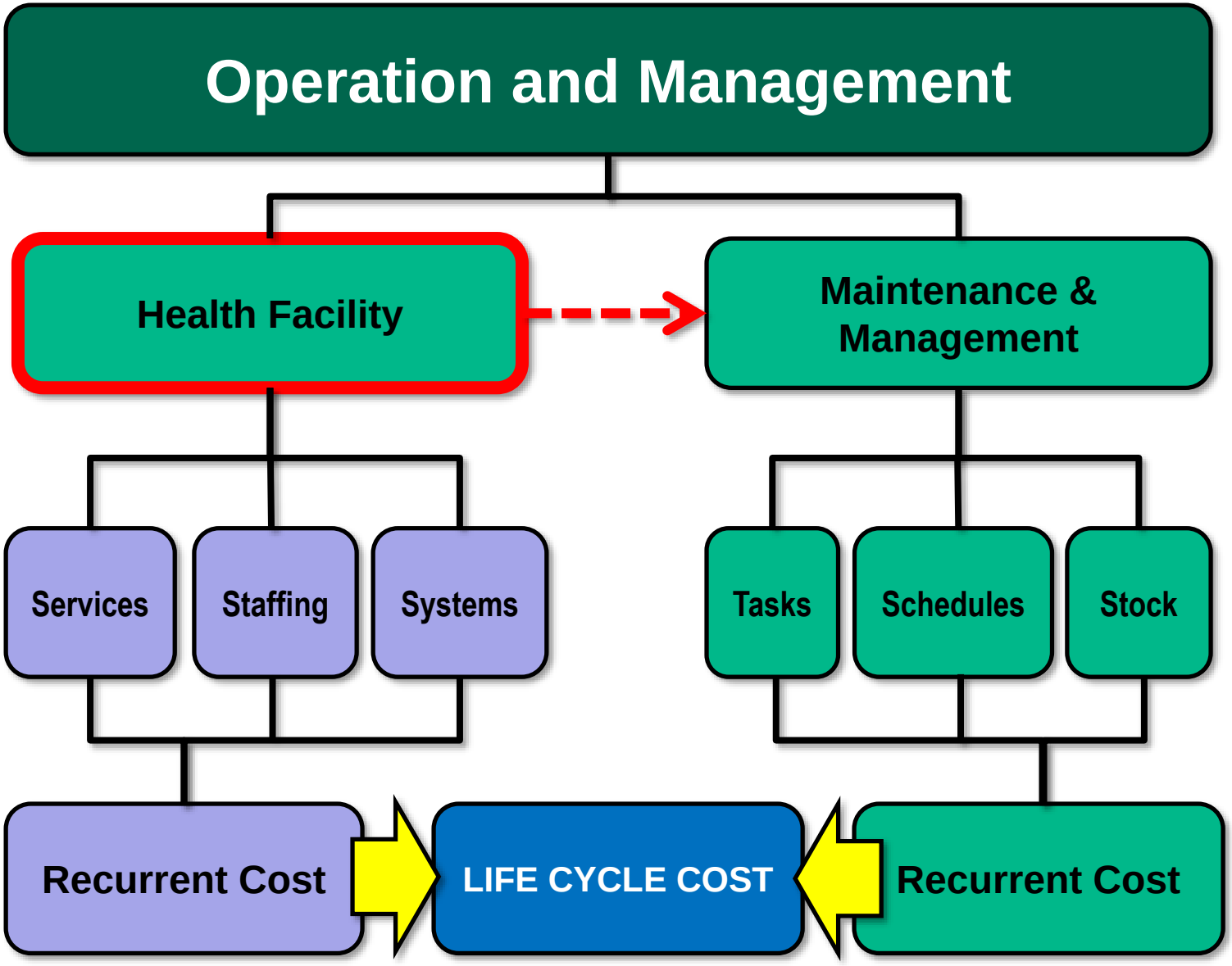


There are tools for every aspect of Health Planning

The Health Planning Discipline Framework Continued..



The Health Planning Discipline Framework Continued..

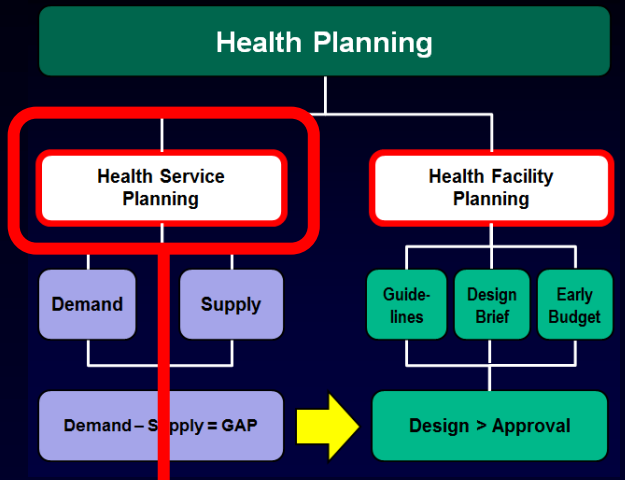


Service Planning
Guidelines
Briefing
Budgeting
FF&E
Design
Construction
HR and Recurrent
Maintenance

HFBS platform, joining the dots in health planning

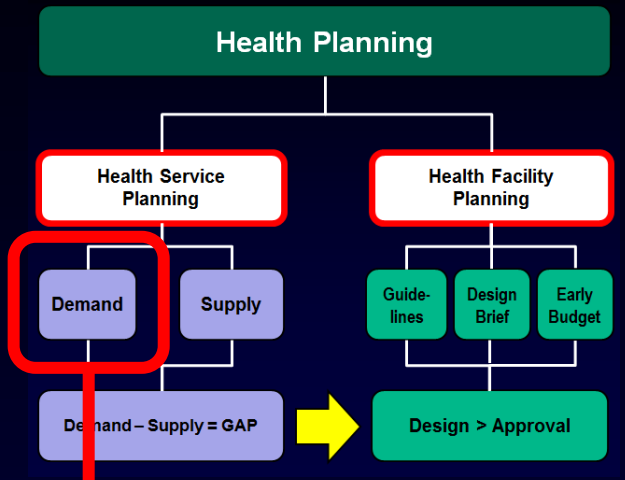
www.healthdesign.com.au

Service Planning | Guidelines | Briefing | Budgeting | FF&E | Design | Construction | HR and Recurrent | Maintenance



Health Service Planning

Determine	Service Demand
	Service Supply
	Key Planning Units (KPU's)
	Demand – Supply = Gap
Prepare	Clinical Services Plan (CSP)
	Business Case



Health Service Demand

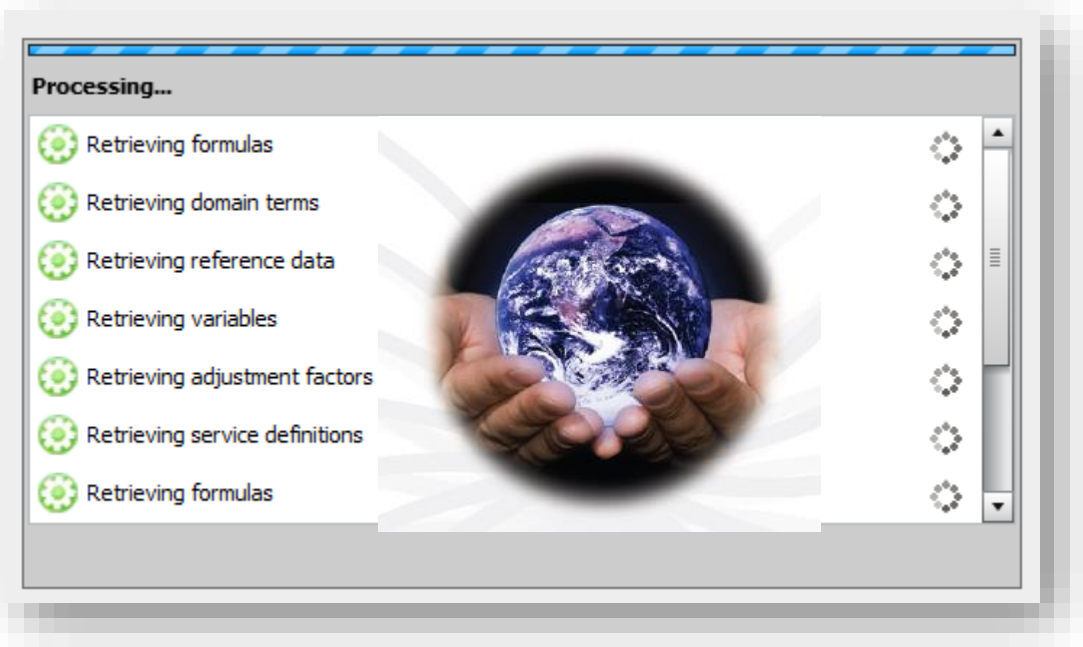
Define Population Catchment
Define Services to be Studied
Create Scenarios and Adjust Settings
Determine Raw Demand
Calculate Key Planning Units (KPU's)

HFBS 5 Service Planning Demand Module simulate the world

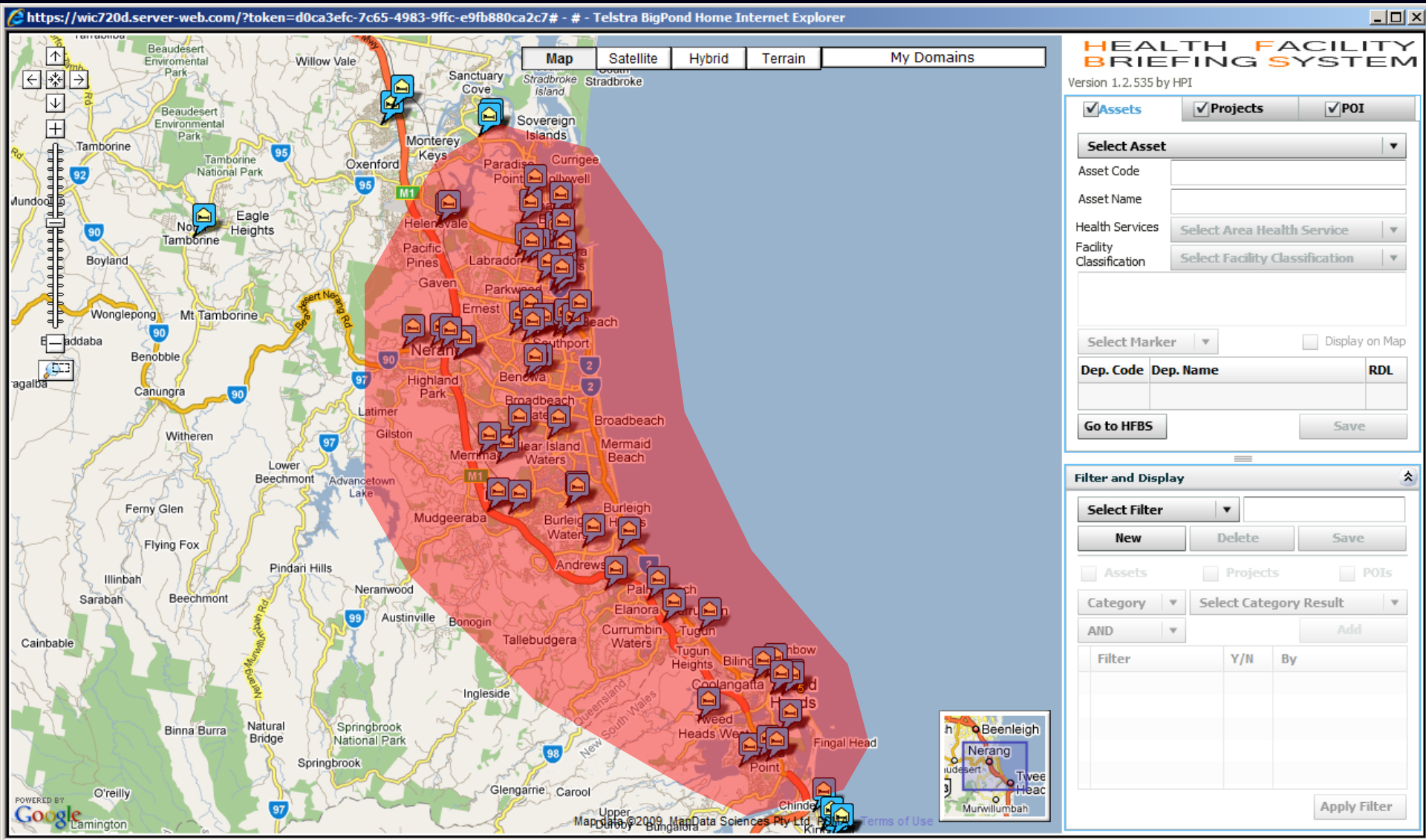
Key Tasks

- Use Reference Data
- Use Population Data
- Define catchments
- Define services
- Create scenarios
- Adjust provision factors
- Run formulas
- Calculate raw demand
- Calculate KPU's

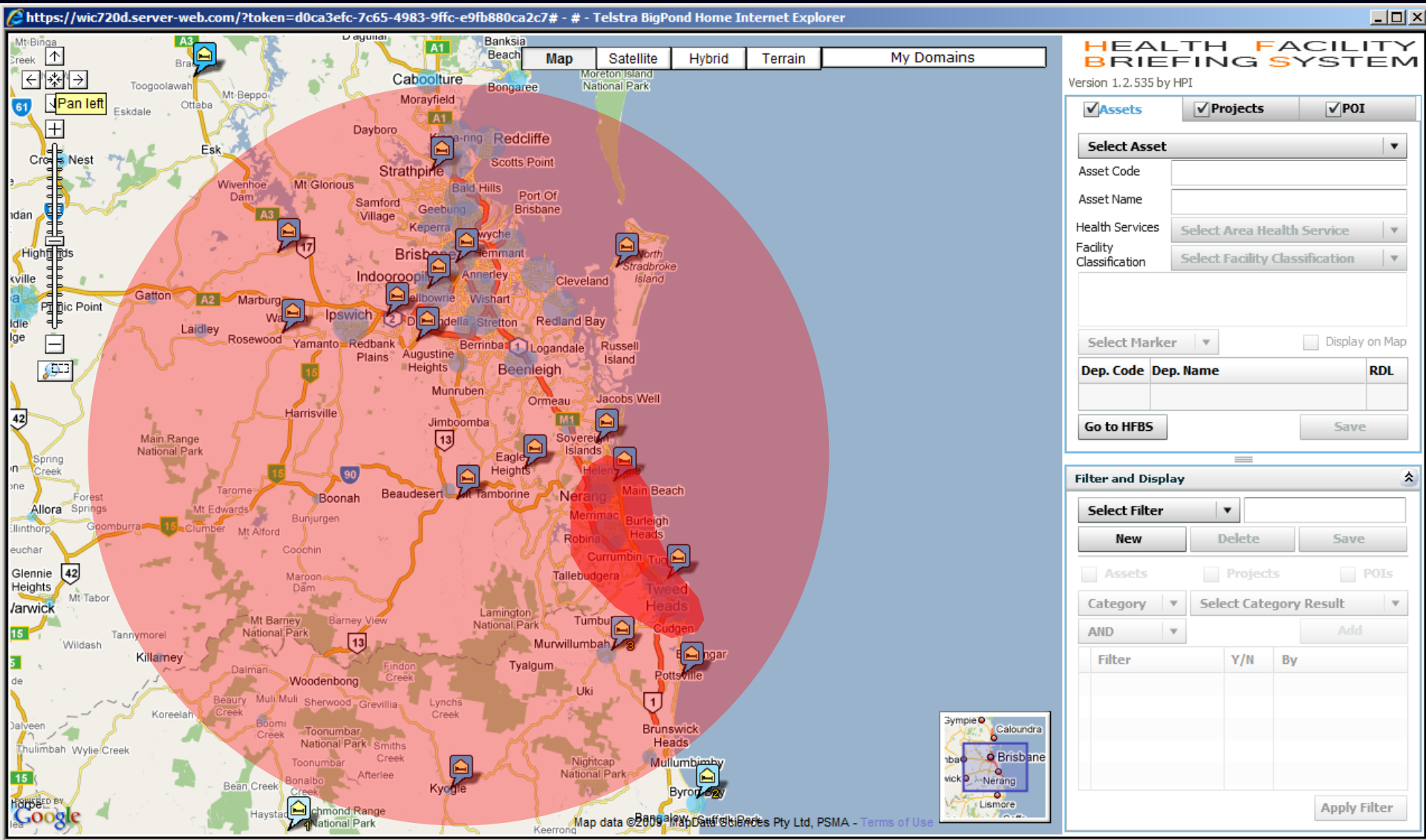
Create a Virtual World Population



Select Primary Catchment

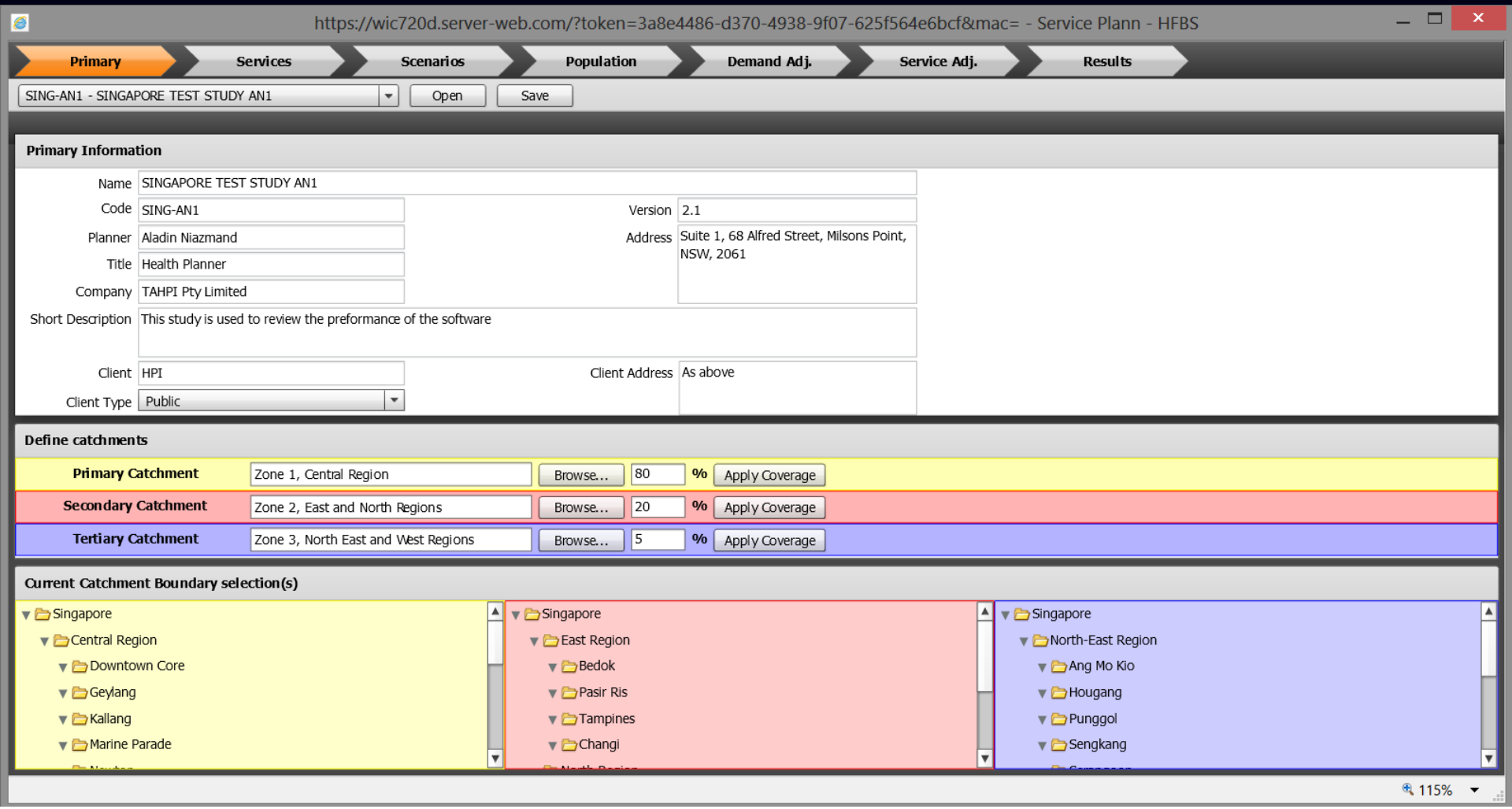


Select Wider Catchment(s)

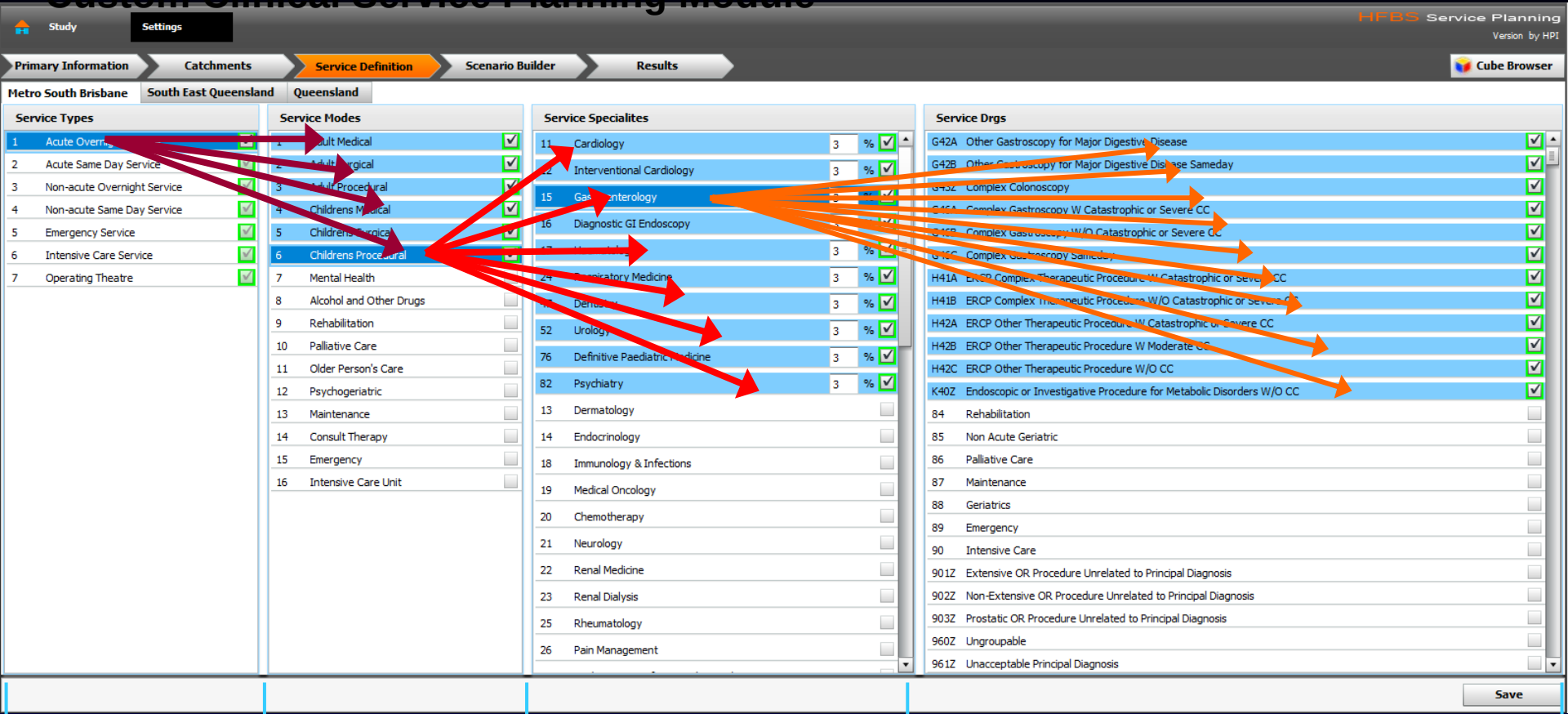


Service Planning | Guidelines | Briefing | Budgeting | FF&E | Design | Construction | HR and Recurrent | Maintenance

..or select from list of localities



Custom Clinical Service Planning Module



Service Types

Service Modes

Service Specialities

Service Diagnosis Related Groups (DRG's)

Select Services to study- HFBS covers all services

Service Types

- Adult Overnight
- Adult Same day
- Non-acute Overnight
- Non-acute Same Day
- Emergency
- Intensive Care
- Operating Theatre

Service Modes

- Adult Medical
- Adult Surgical
- Adult Procedural
- Childrens Medical
- Childrens Surgical
- Childrens Procedural
- Mental Health
- Rehabilitation
- Paliative Care
- Older Persons Care
- Phychogeriatric
- Maintenance
- Consult Therapy
- Emergency
- Intensive Care Unit
- ….

Service Specialities

- Cardiology
- Interventional Cardiology
- Gastroenterology
- Diagnostic GI Endoscopy
- Haematology
- Respiratory Medicine
- Dentistry
- Urology
- Definitive Paed. Medicine
- Psychiatry
- Dermatology
- Endocrinology
- Immunology
- Medical Ongology
- ….

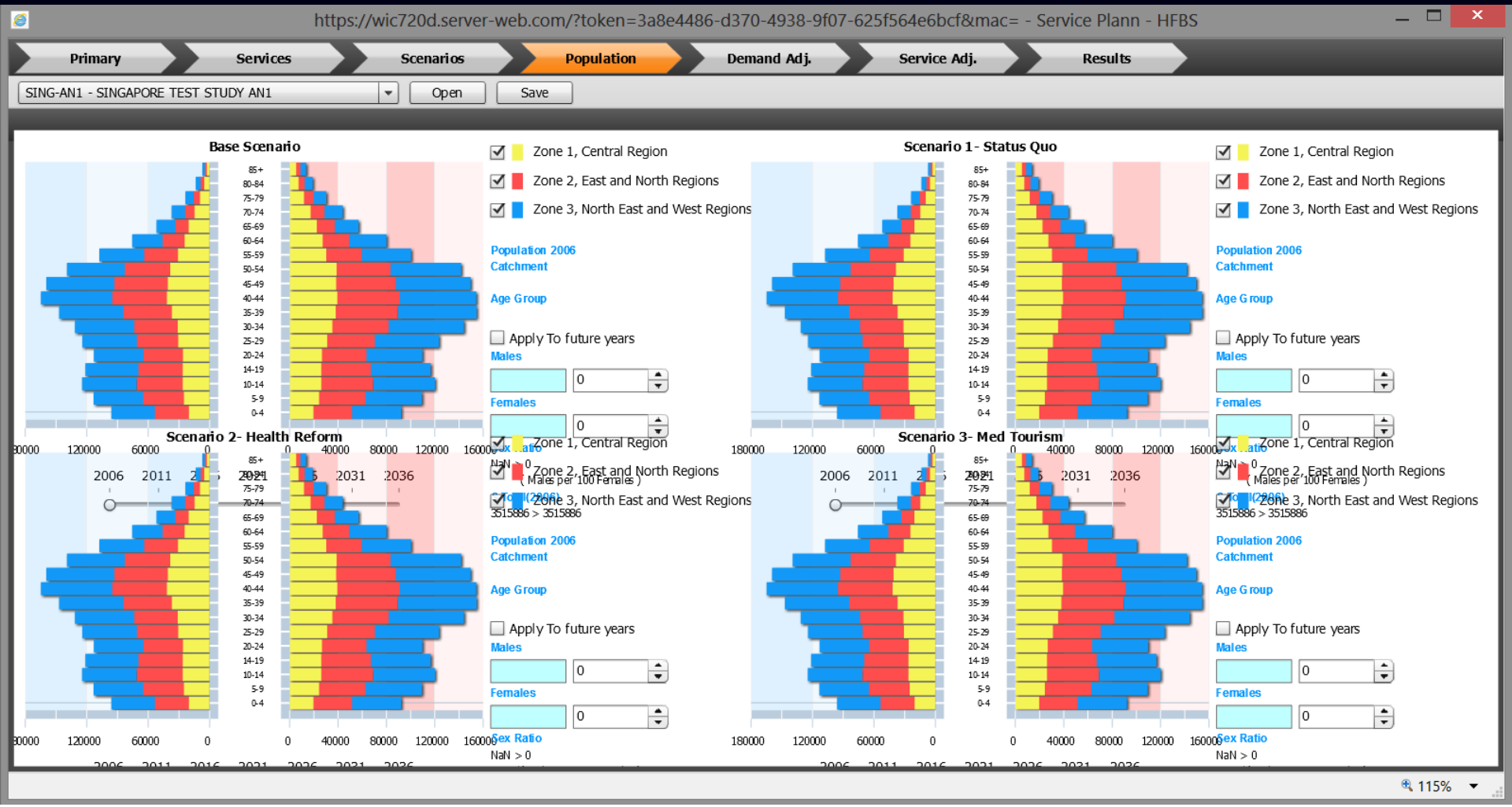
Service Diagnosis Related Groups (DRG's)

- G42A Other Gastroscopy
- G42B Other Gastroscopy for Major Digestive…..
- G43Z Complex Colonoscopy
- G46A Complex Colonoscopy Q Catastrophic or ….
- G46B Complex Gastroscopy W/O Catastrophic or ….
- G46C Complex Gastroscopy Sameday
- IH41A ERCP Complex Therapeutic Procedure W ….
- H41B ERCP Complex Therapeutic Procedure A/O…
- ….
- ….

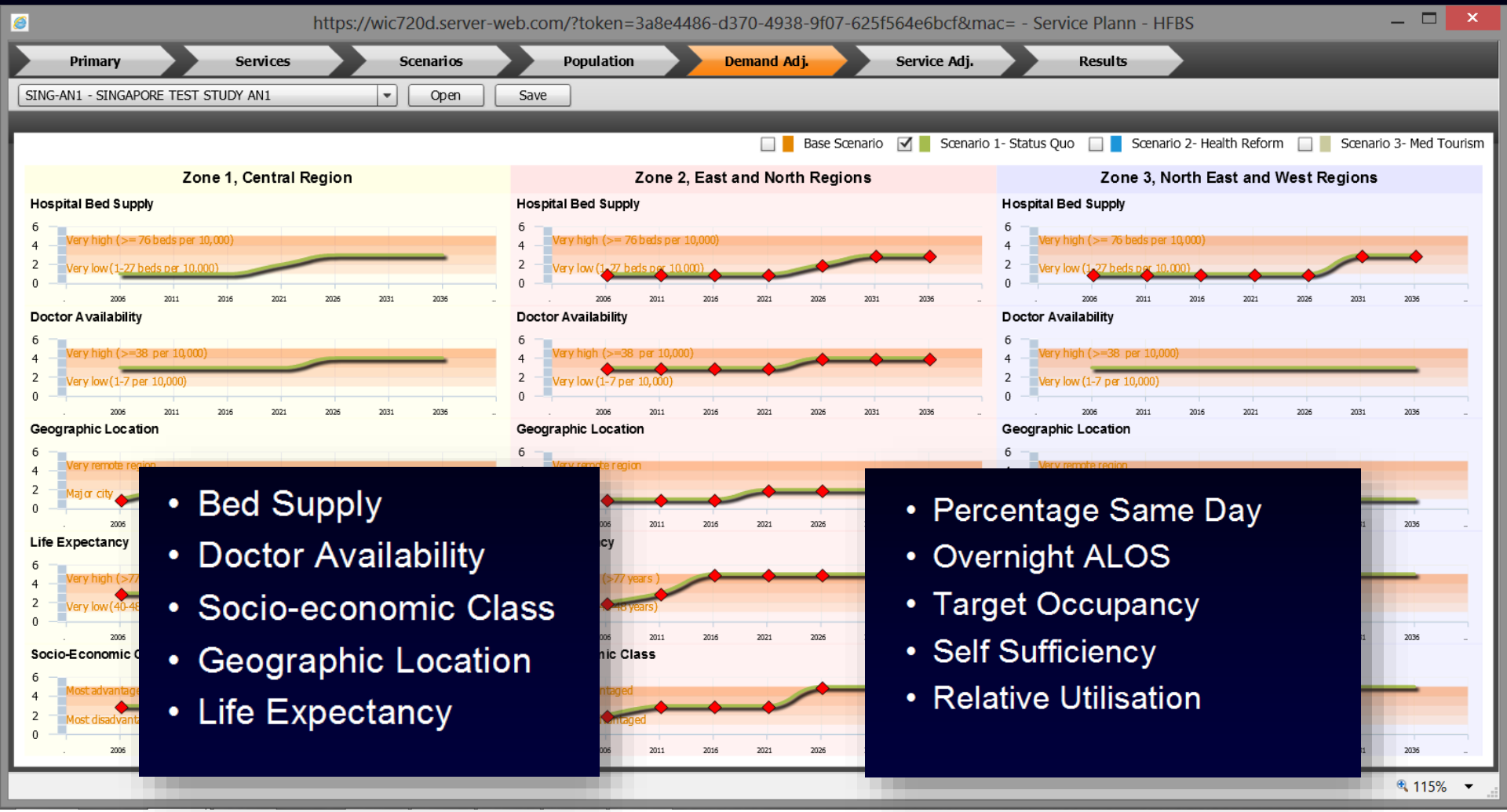
Select Services to study- HFBS covers all services

Service Planning | Guidelines | Briefing | Budgeting | FF&E | Design | Construction | HR and Recurrent | Maintenance

Create unlimited scenarios, adjust population profiles



Accept or modify Demand Adjustment Factors



- Bed Supply
- Doctor Availability
- Socio-economic Class
- Geographic Location
- Life Expectancy

- Percentage Same Day
- Overnight ALOS
- Target Occupancy
- Self Sufficiency
- Relative Utilisation

Adjustable System Settings at the Domain Level …

Study Settings

English (U.S.)

HFBS Service Planning
Version by HPI

Service Definitions | Adjustment Factors | Provision Factors

Demand Adjustment Factors

Name	Default Scale	Very Low	Low	Moderate	High	Very High
2006						
BedSupply	Very low (1-27 beds per 10,000)	0.33	0.79	1.07	1.5	2.21
DoctorAvailability	High (30 - 38 per 10,000)	4.02	1.6	1.23	0.99	0.77
GeographicLocation	Major city	1	0.98	1.02	1.08	1.41
LifeExpectency	High (71-77 years)	1.458	1.321	1.187	1.109	1.025
SocioEconomicClass	Advantaged	1.08	1	0.98	0.97	0.97
2011						
BedSupply	Very low (1-27 beds per 10,000)	0.33	0.79	1.07	1.5	2.21
DoctorAvailability	High (30 - 38 per 10,000)	4.02	1.6	1.23	0.99	0.77
GeographicLocation	Major city	1	0.98	1.02	1.08	1.41
LifeExpectency	High (71-77 years)	1.458	1.321	1.187	1.109	1.025
SocioEconomicClass	Advantaged	1.08	1	0.98	0.97	0.97
2016						
BedSupply	Very low (1-27 beds per 10,000)	0.33	0.79	1.07	1.5	2.21
DoctorAvailability	High (30 - 38 per 10,000)	4.02	1.6	1.23	0.99	0.77
GeographicLocation	Major city	1	0.98	1.02	1.08	1.41
LifeExpectency	High (71-77 years)	1.458	1.321	1.187	1.109	1.025
SocioEconomicClass	Advantaged	1.08	1	0.98	0.97	0.97
2021						
BedSupply	Very low (1-27 beds per 10,000)	0.33	0.79	1.07	1.5	2.21
DoctorAvailability	High (30 - 38 per 10,000)	4.02	1.6	1.23	0.99	0.77
GeographicLocation	Major city	1	0.98	1.02	1.08	1.41
LifeExpectency	High (71-77 years)	1.458	1.321	1.187	1.109	1.025

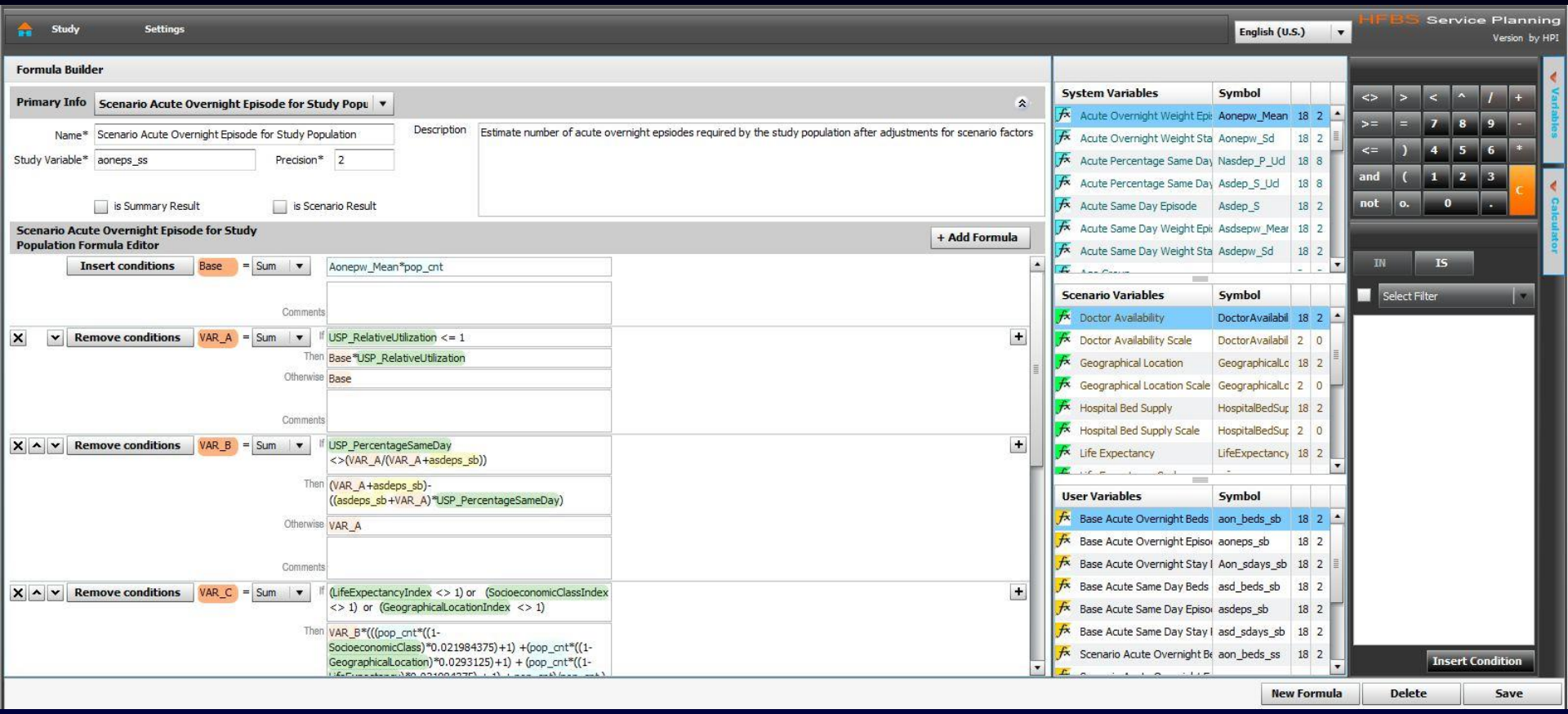
Select Adjuster Type | Select Scale Index

Apply to All | Save

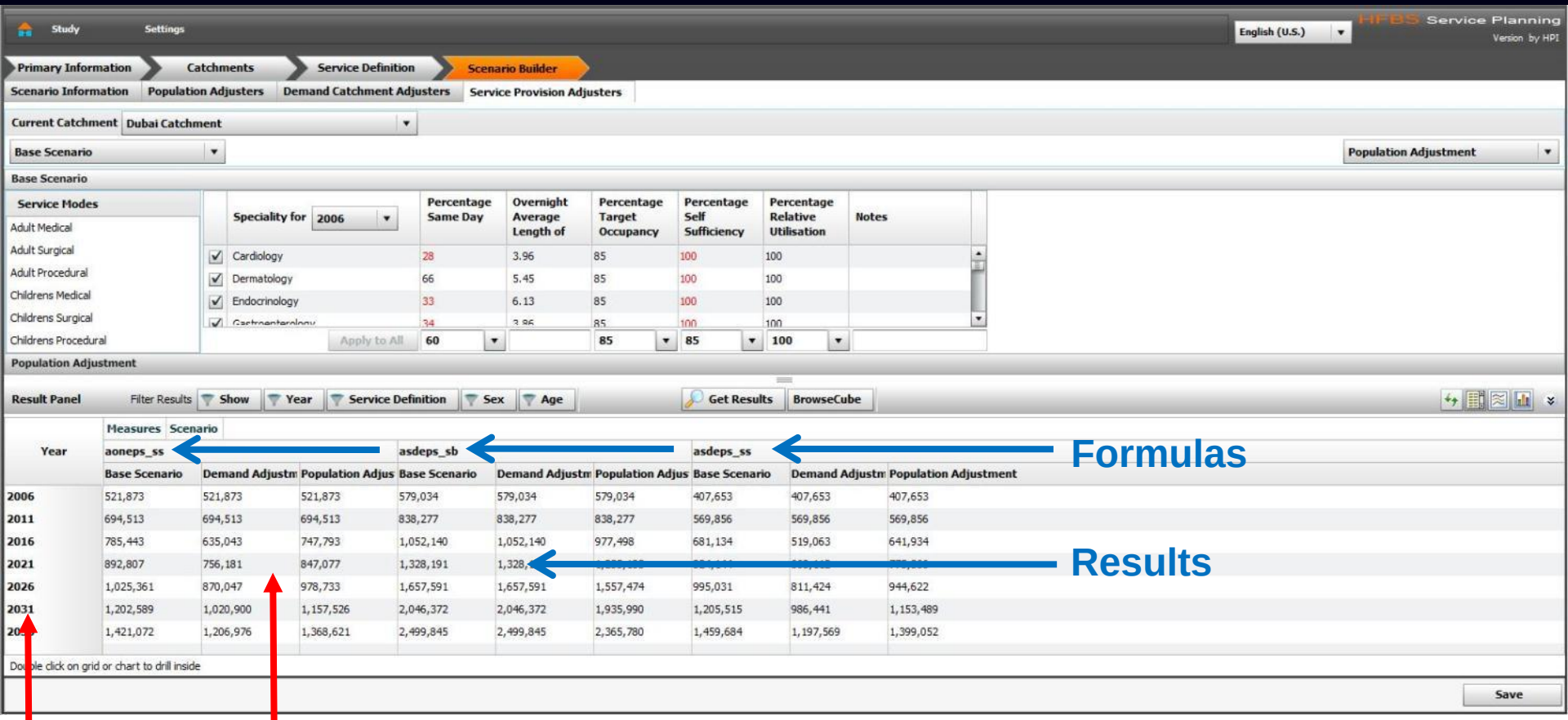
Demand Adjustment Factors

Formula Builder , based on all variables and data

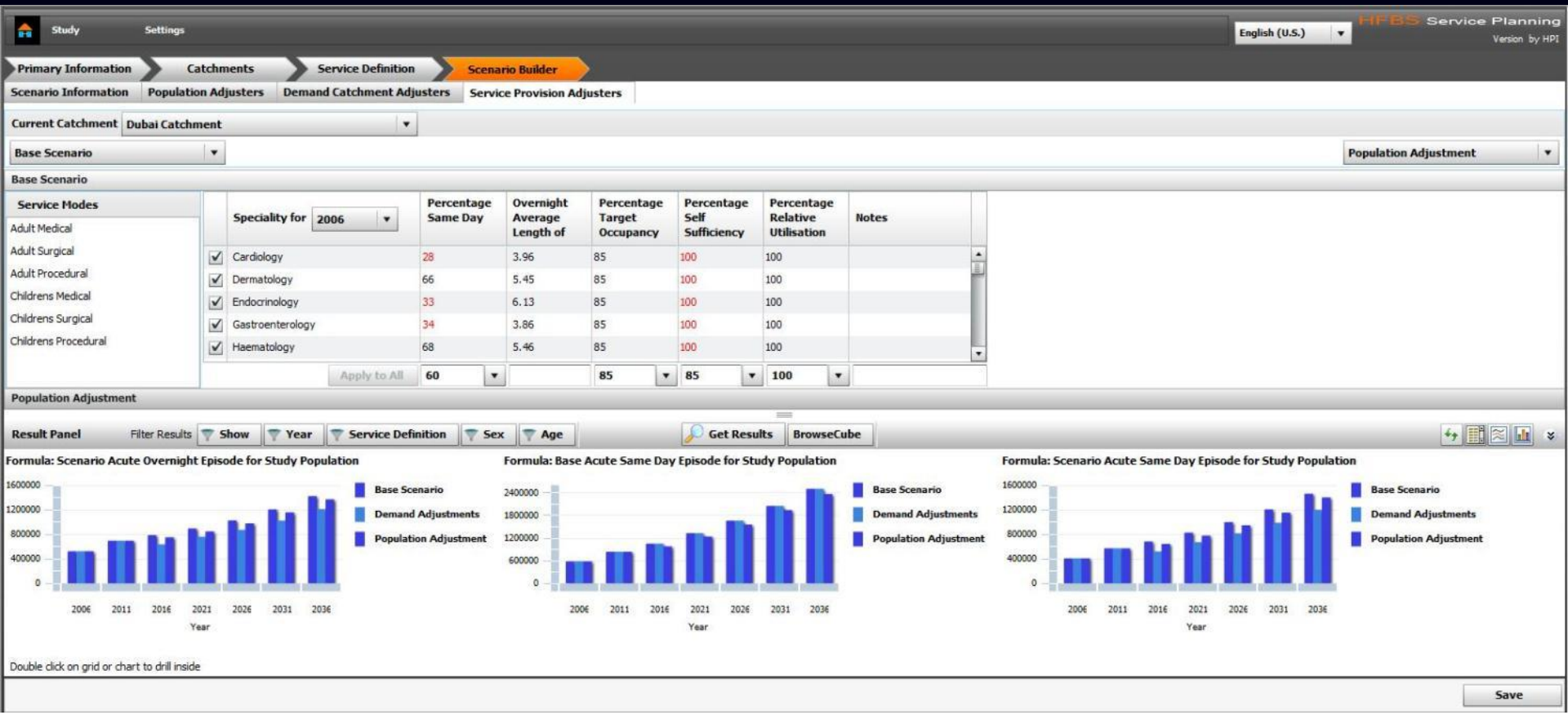
- Built-in formulas
- User Generated formulas
- Conditional output



Select Demand formulas and get instant results

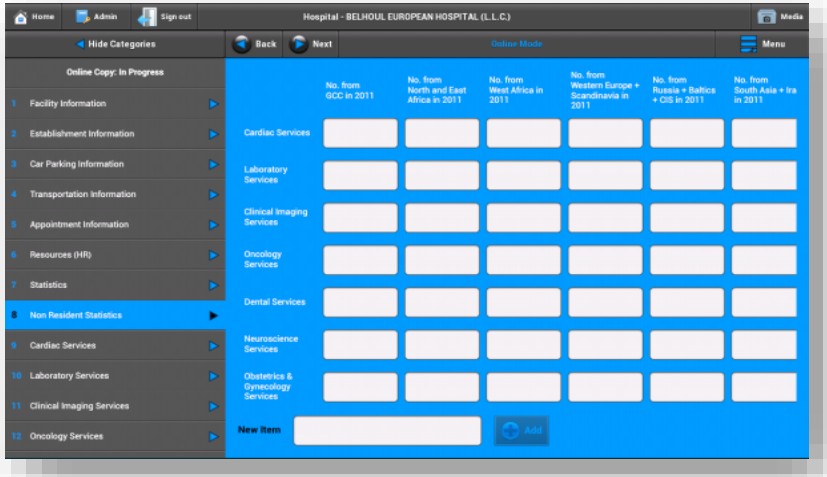


See the demand scenario results as graphs

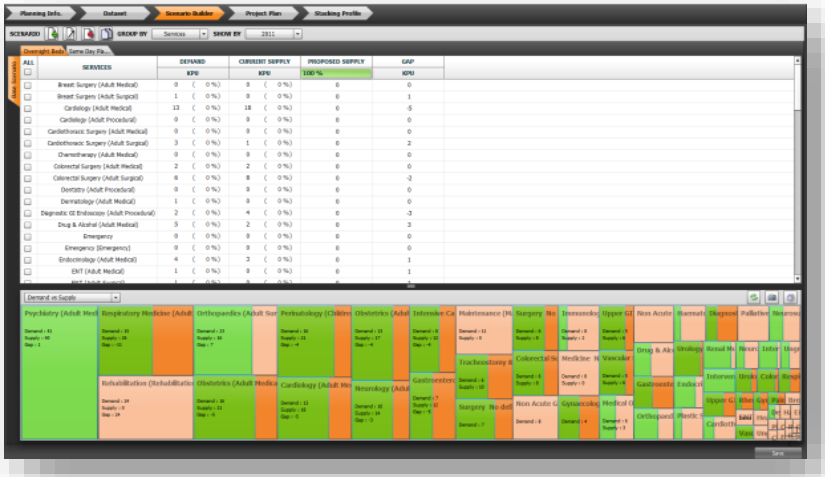


Analysis of Supply and Demand leading to "Capacity Planning"

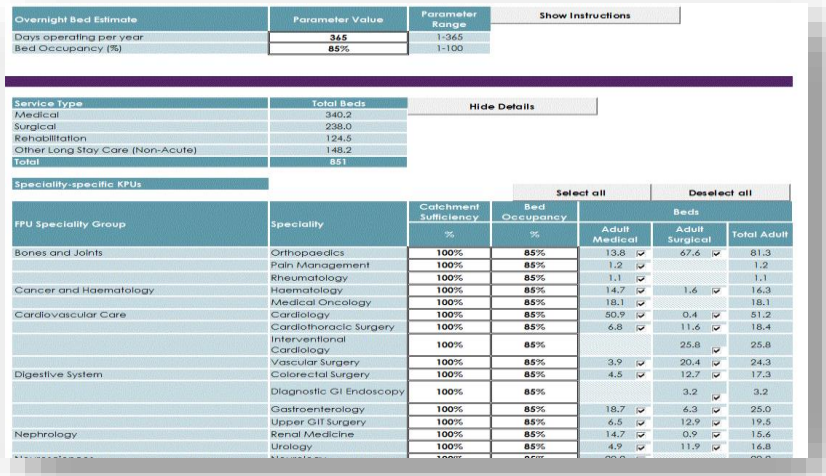
Supply Capture Module



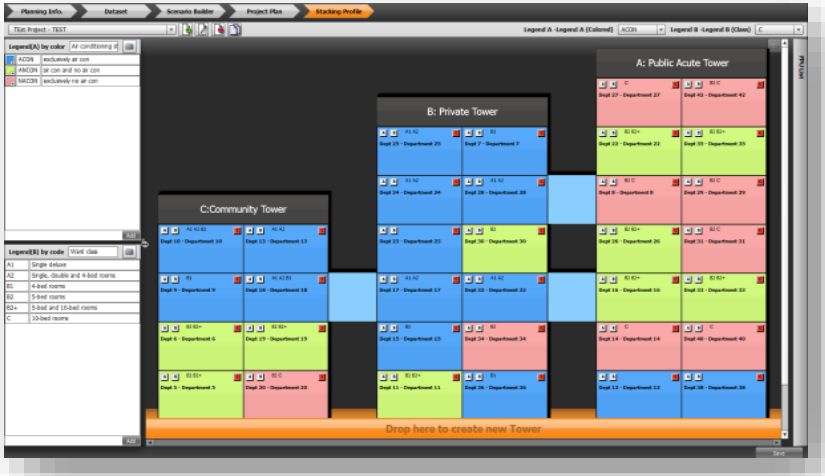
Capacity Analysis



Automated Asset Sizing



Functional Profiling



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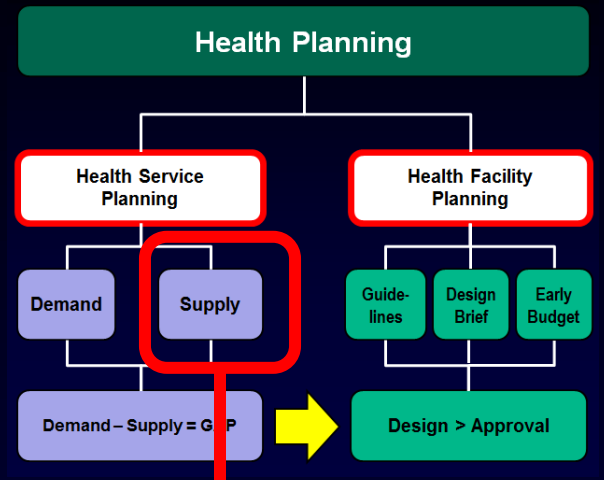


Health Service Supply

Define Supply Catchment

Obtain Raw Supply Activity; and / or

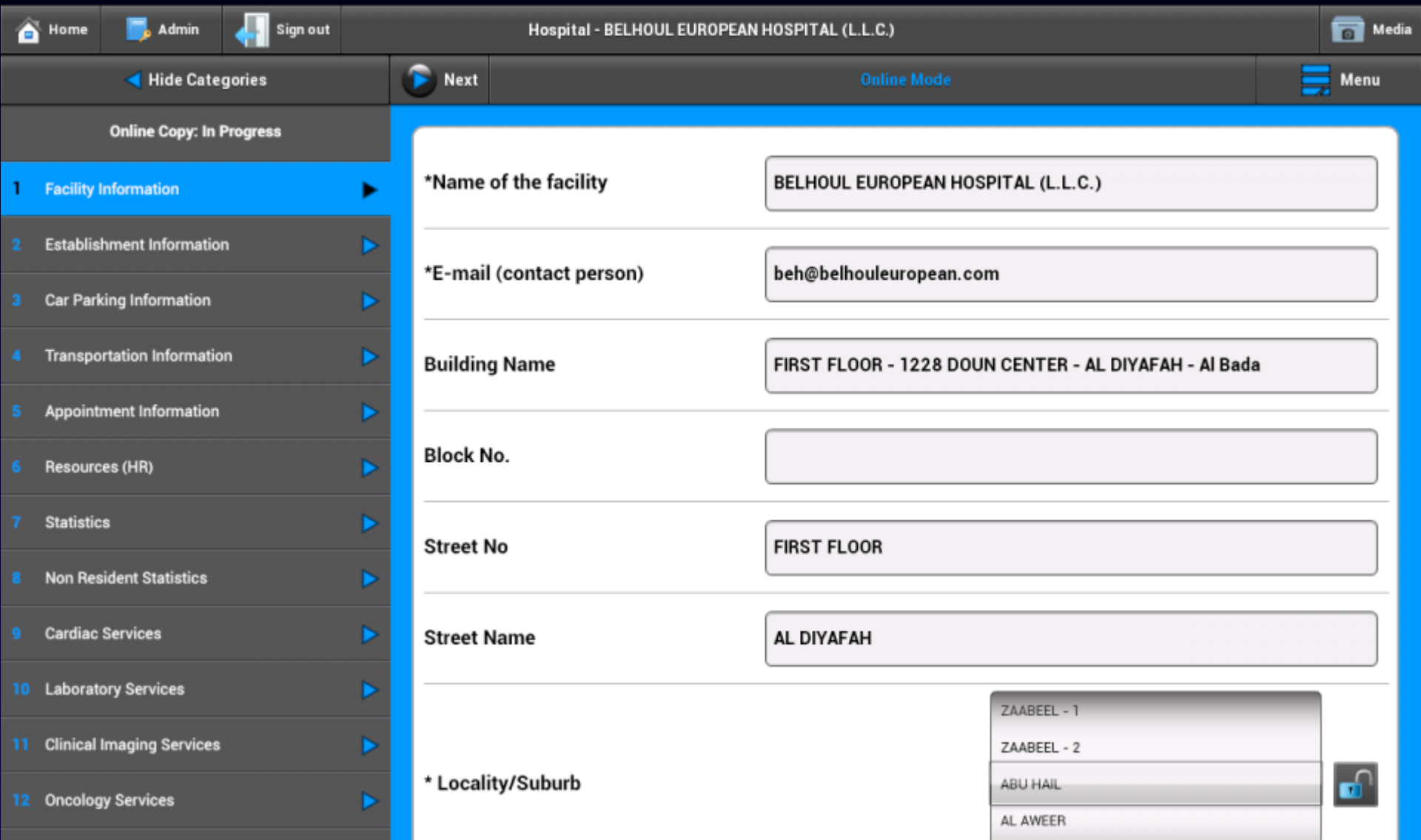
Obtain Supply data by KPU's

Project through future years

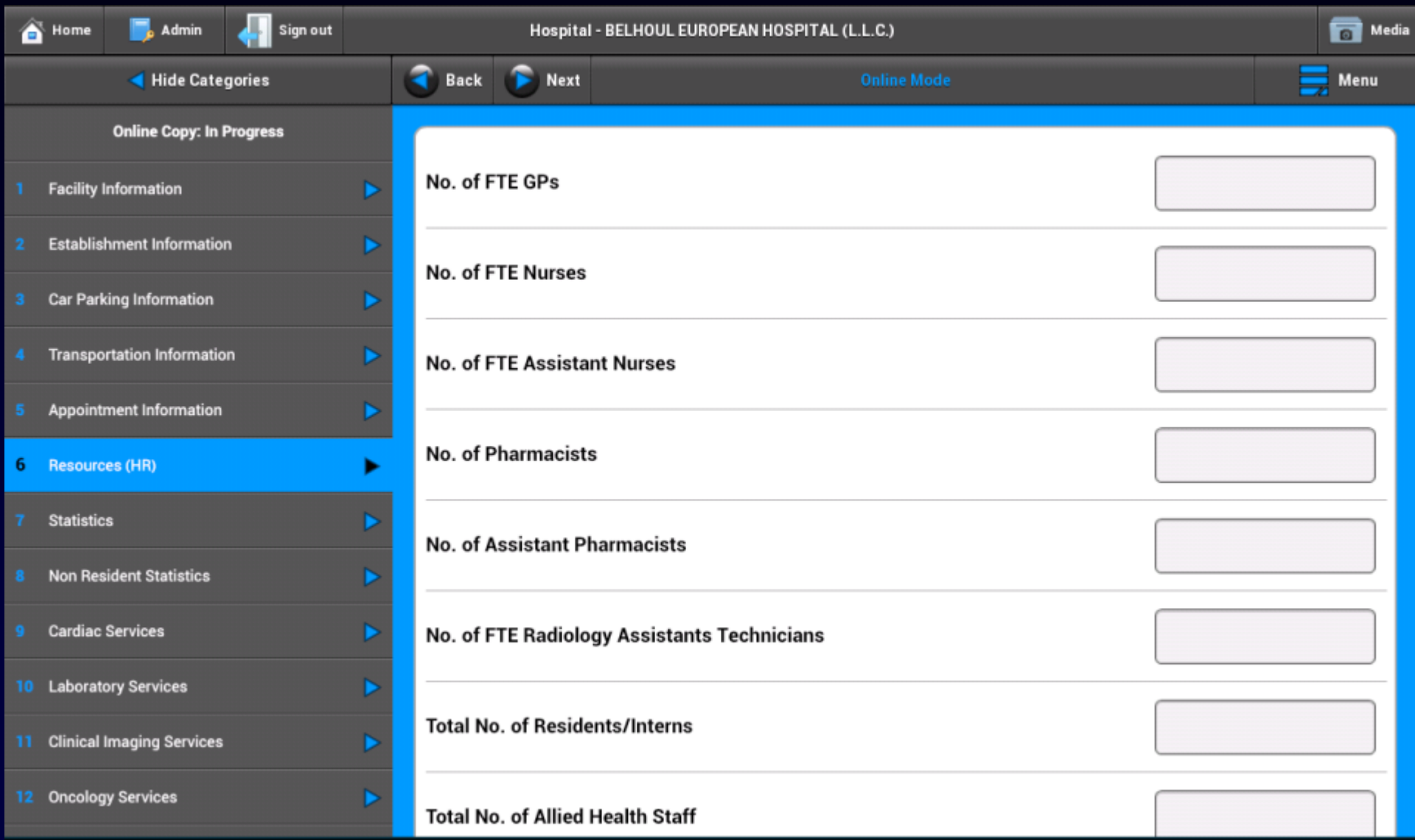
Service Planning Supply Capture

Available for PC or Android Tablets

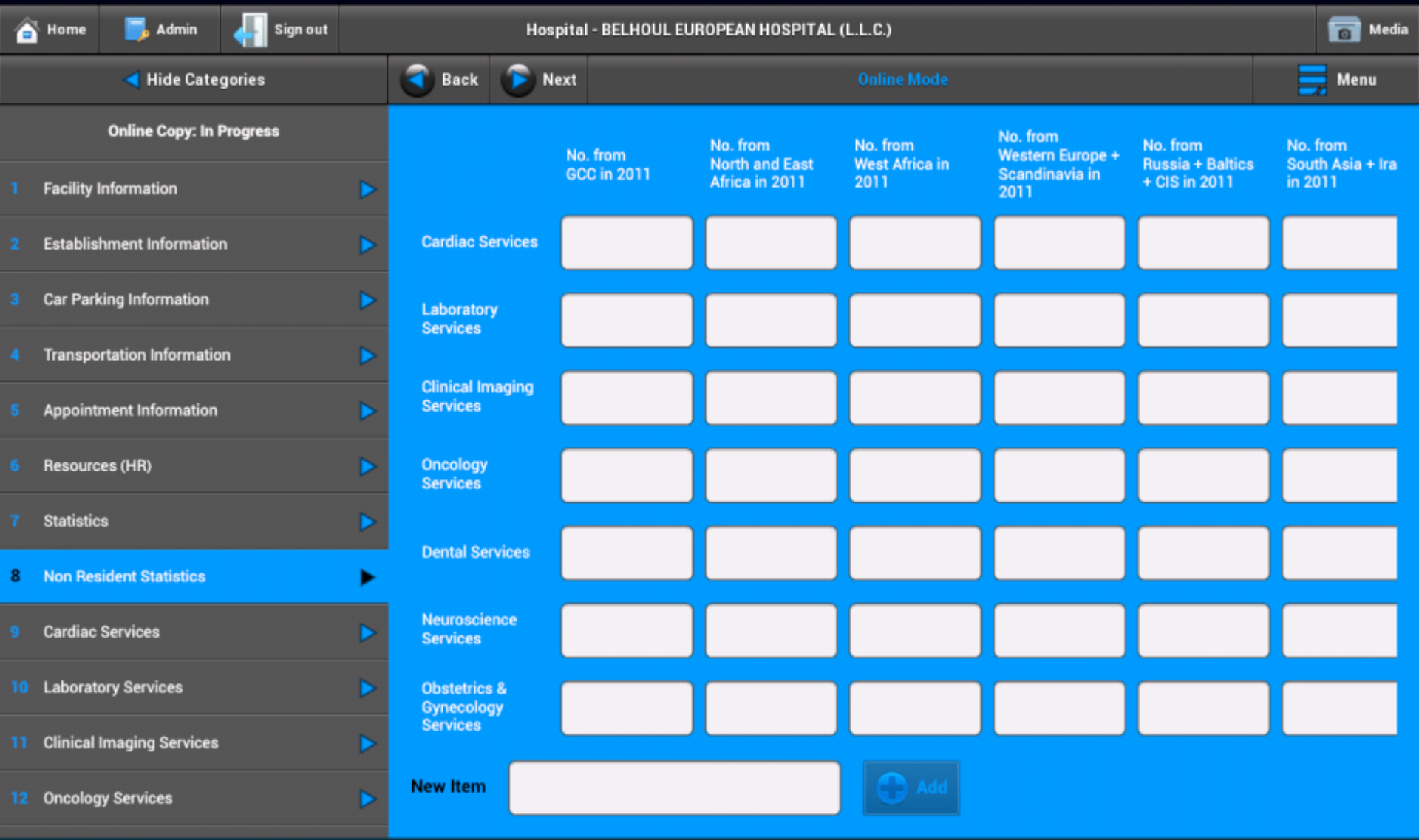
Capture primary property information



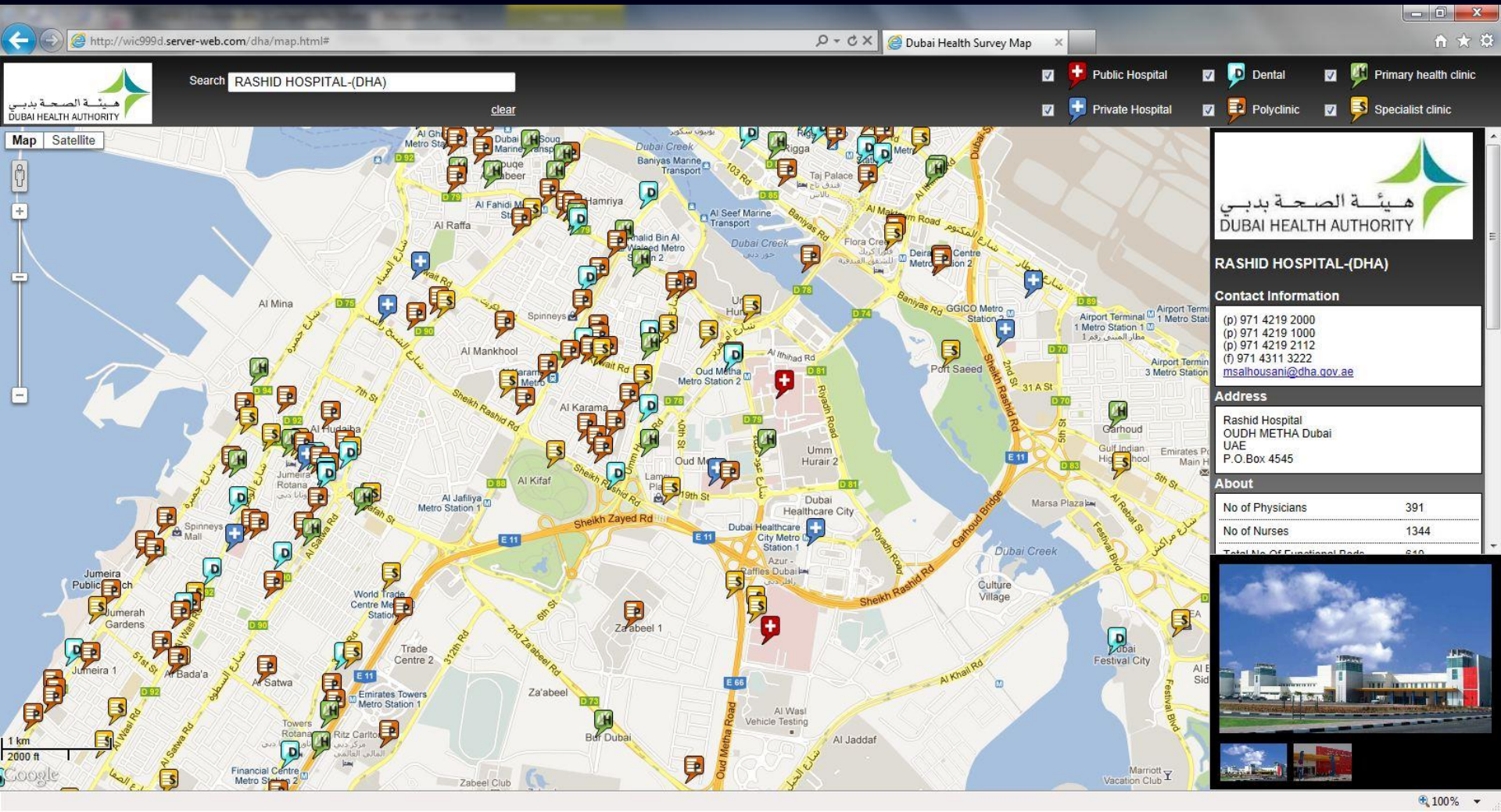
Capture staff FTE information



Capture service information



Automatically create map with links to data



Demand – Supply = Service GAP

Service Gap KPU's:

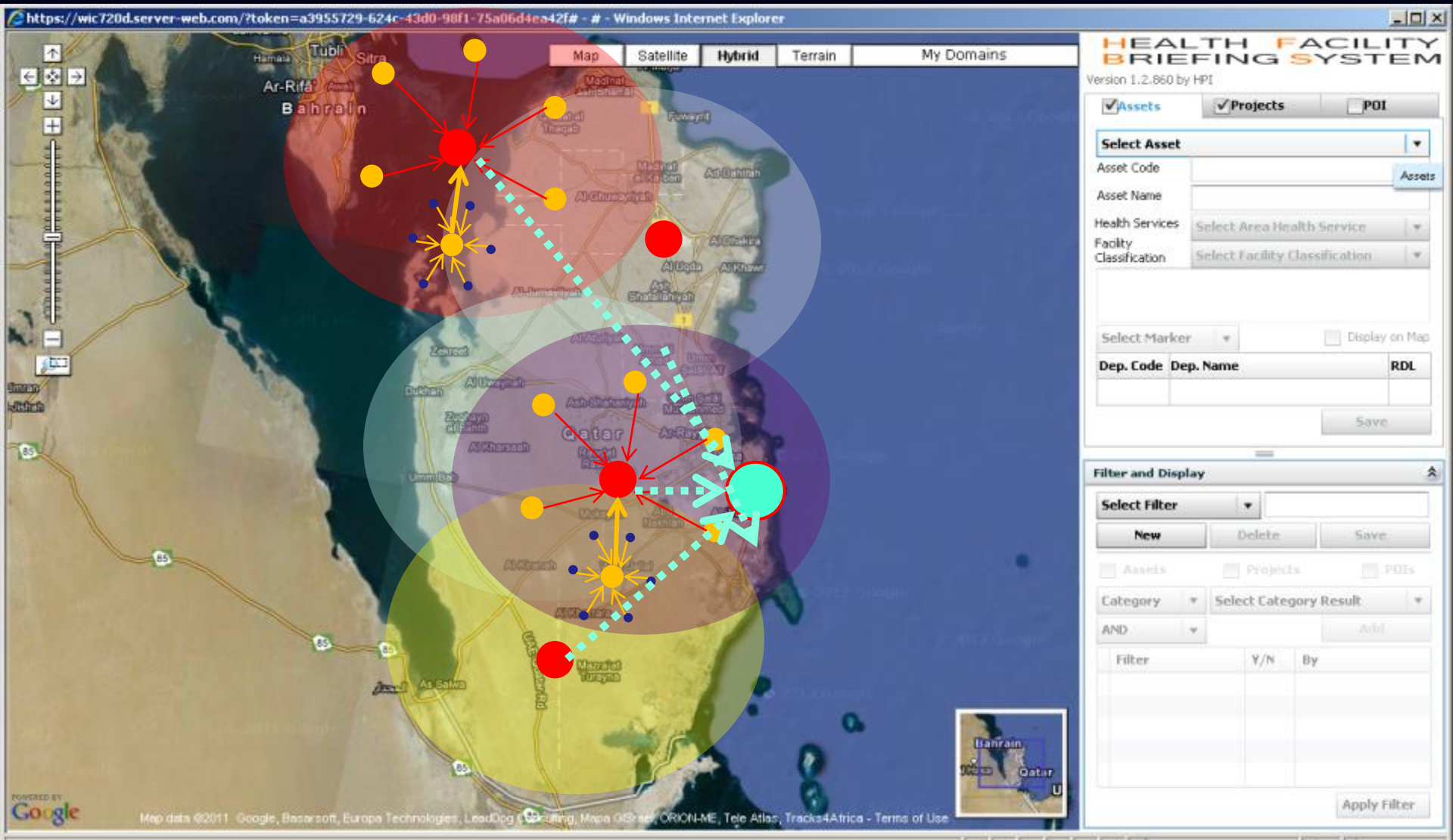
- Acute Overnight Beds
- ICU Cubicles
- Emergency Cubicles
- Elective Operating Rooms
- Emergency Operating Rooms

By Service Mode, Speciality, DRG, Age, Gender,

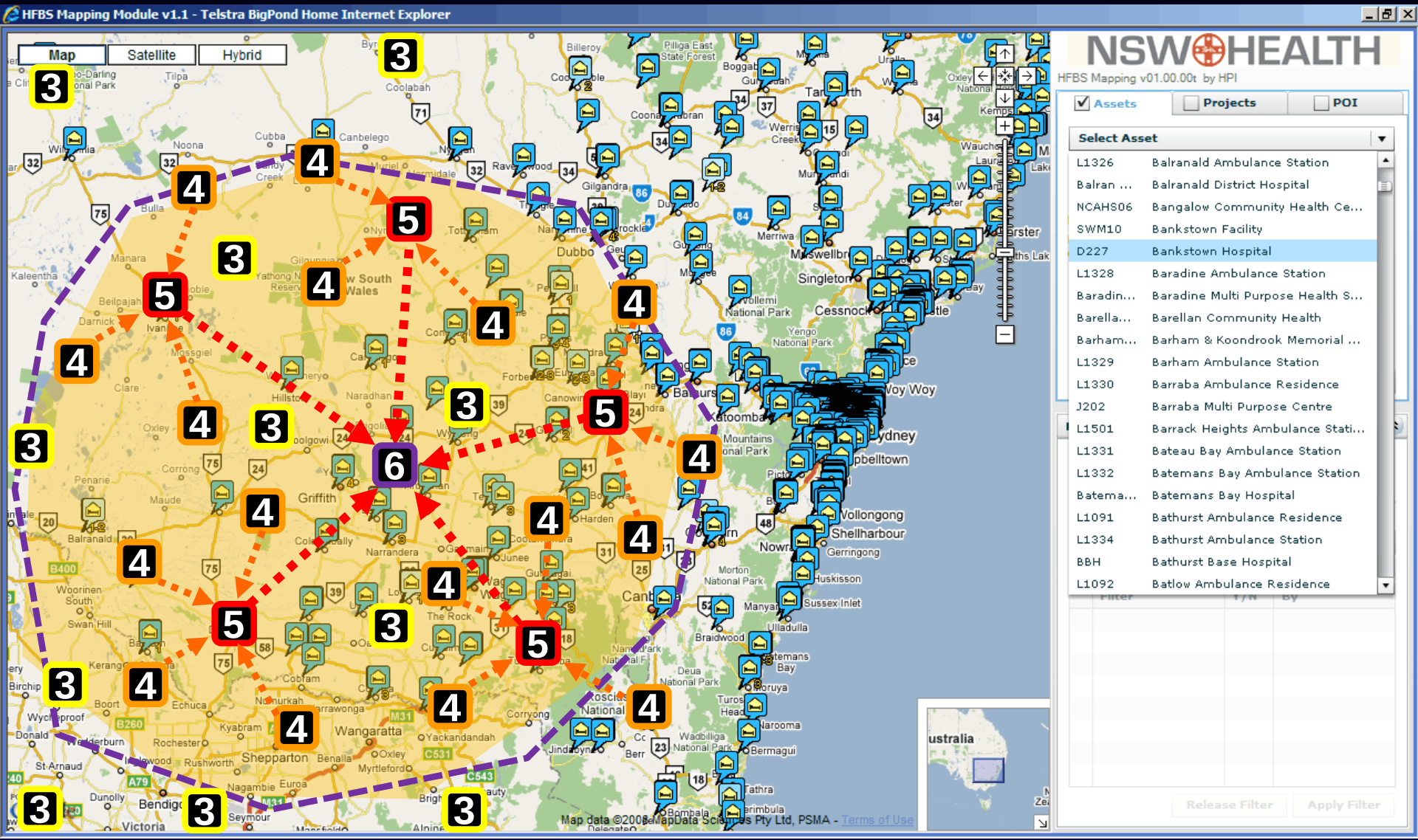
Determine Role Delineation and Distribution

Role Delineation Level (RDL)	General Description
RDL 6	Statewide Services Hospital with Research, Education & Training
RDL 5	Tertiary Hospital with Education and Traiining
RDL 4	General Hospital (most typical Private Hospitals)
RDL 3	Small Regional Hospital + visiting specialists, low risk elective surgery
RDL 2	Remote and Rural Hospitals and Clinics
RDL 1	Outpatient only by Registered Nurse and GP, possible phone support

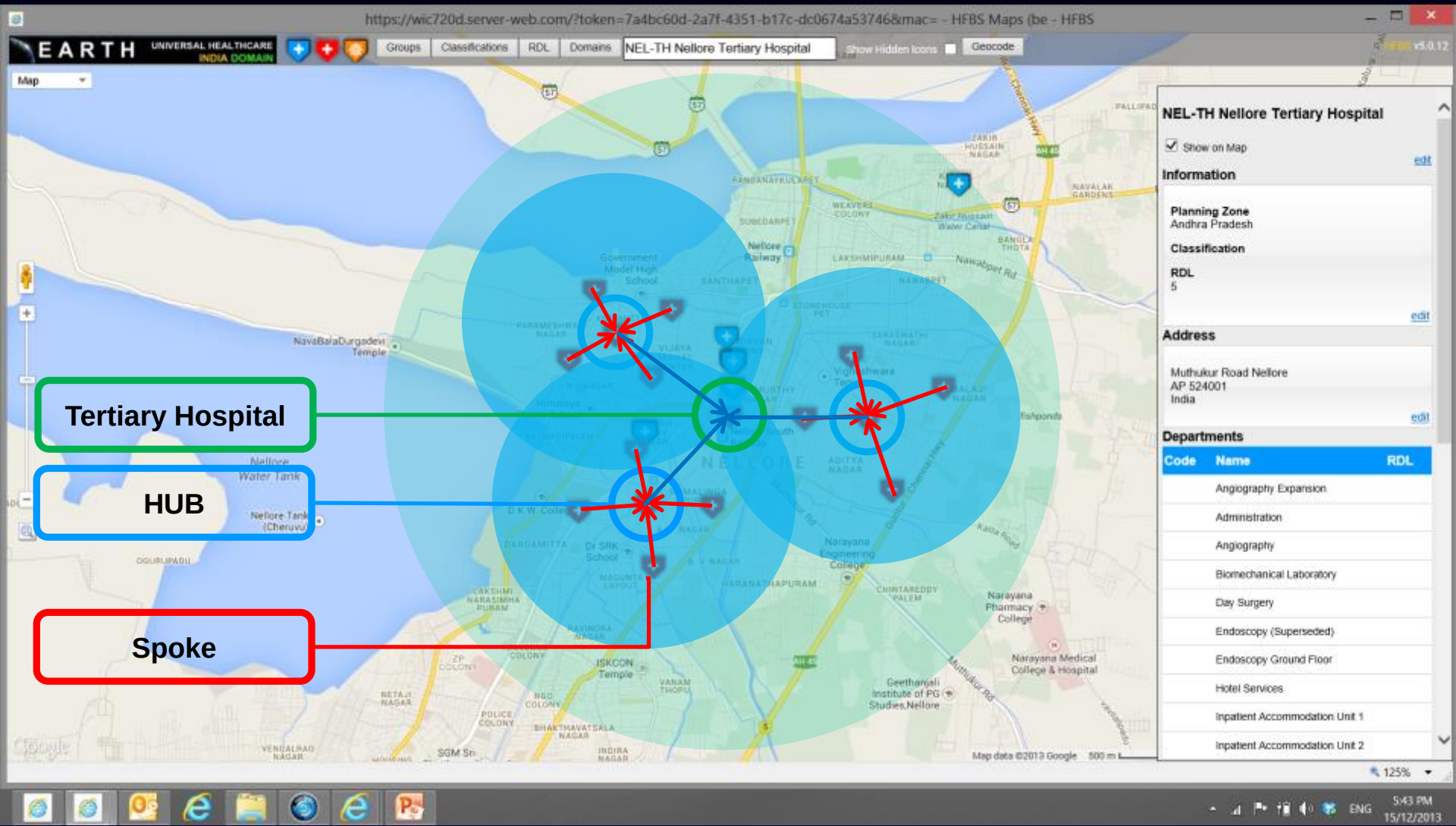
Role Delineation Levels & Referral Pattern



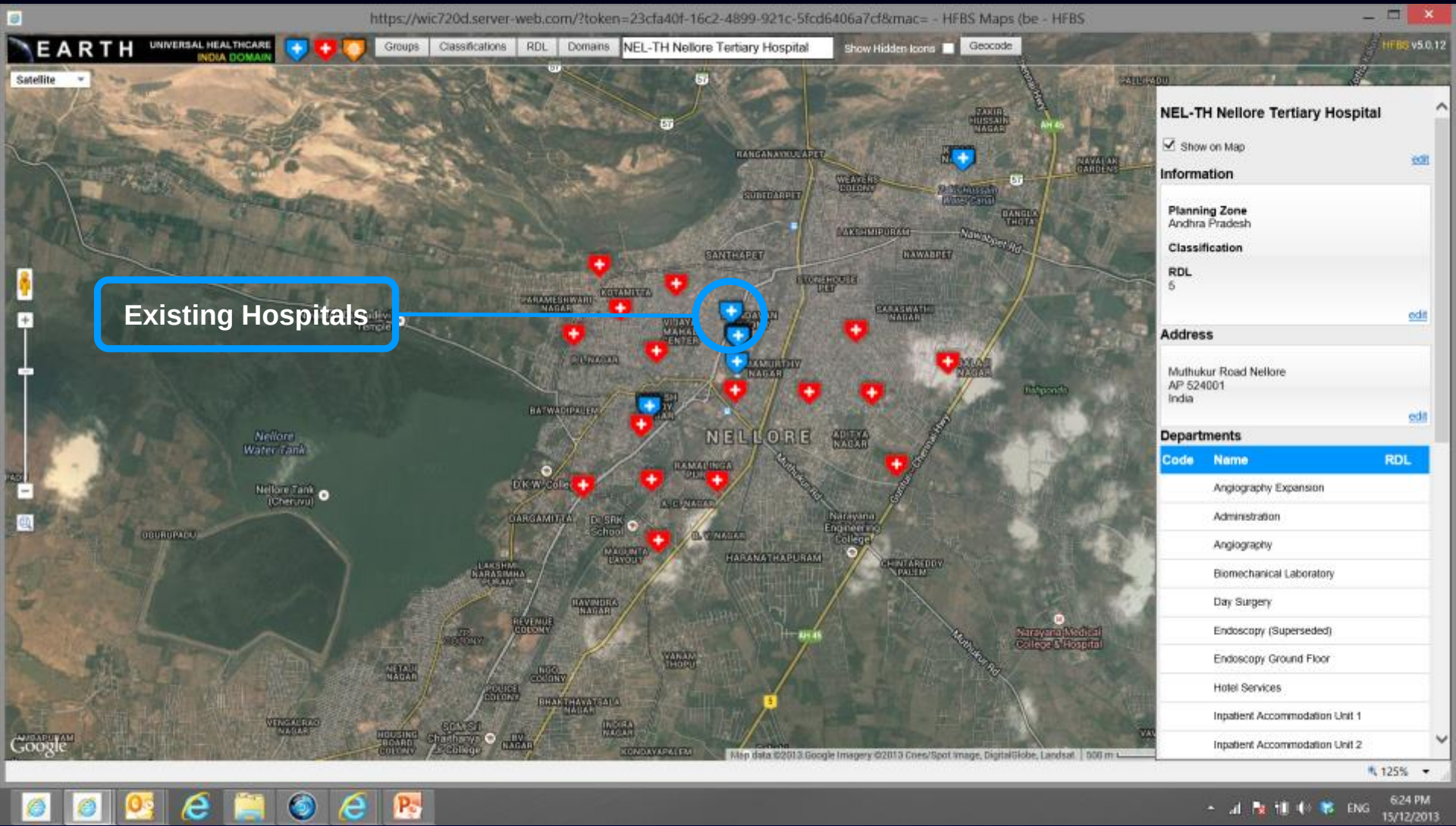
Distribute projected services by RDL for equitable access



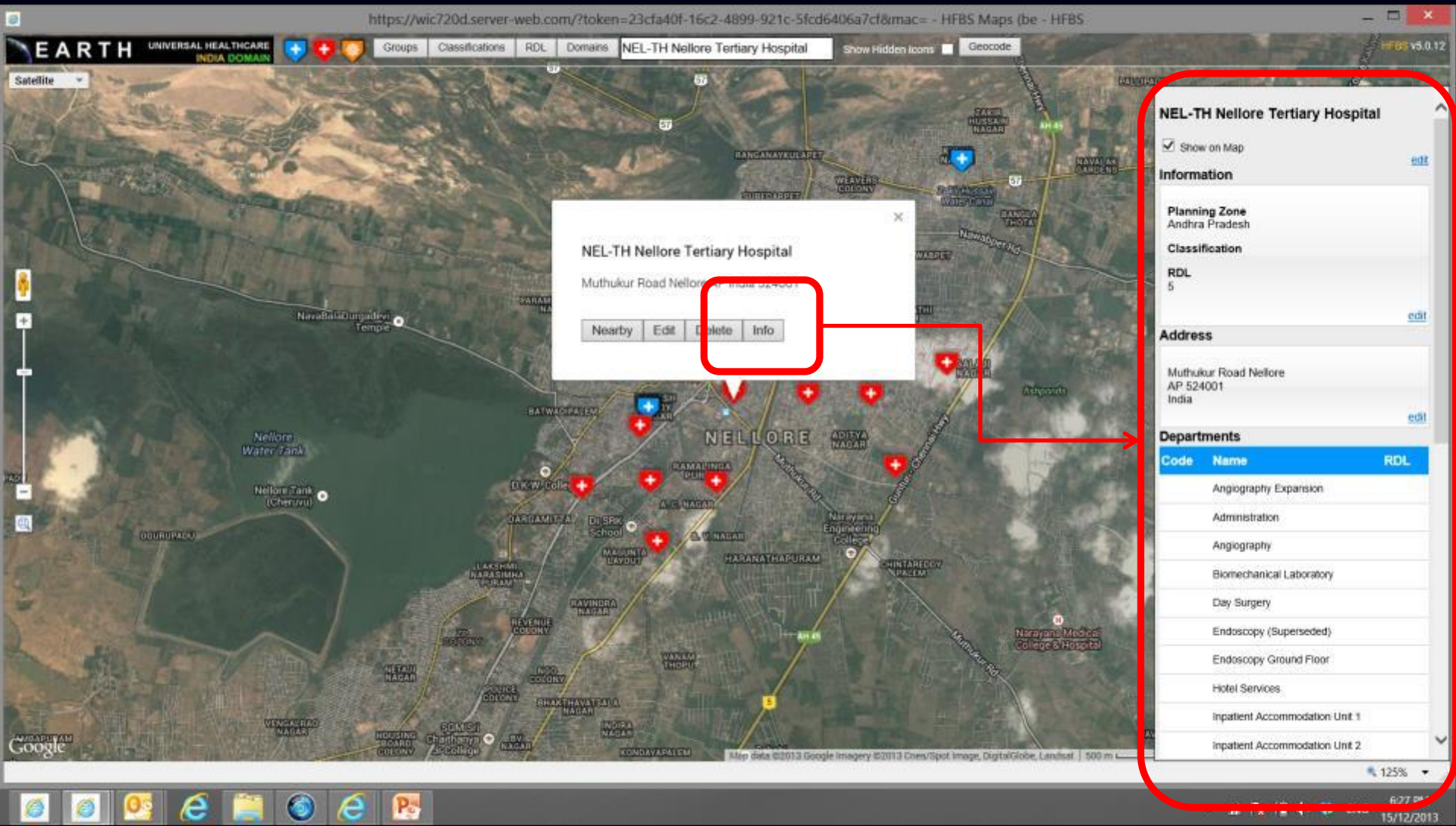
Distribute projected services by Hub & Spoke network model



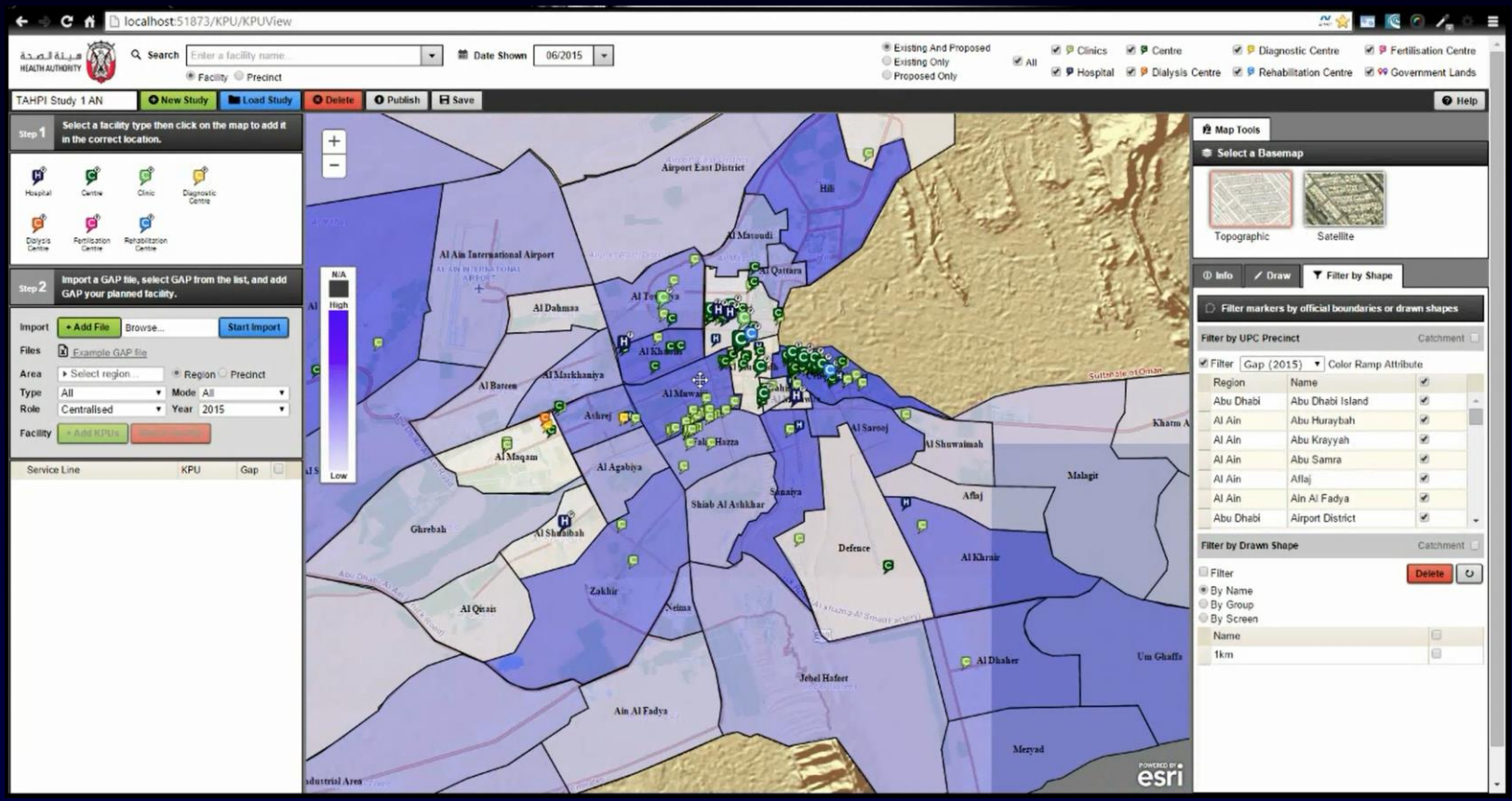
Capture current supply side of healthcare (existing facilities)



Map icons linked to the facility primary information

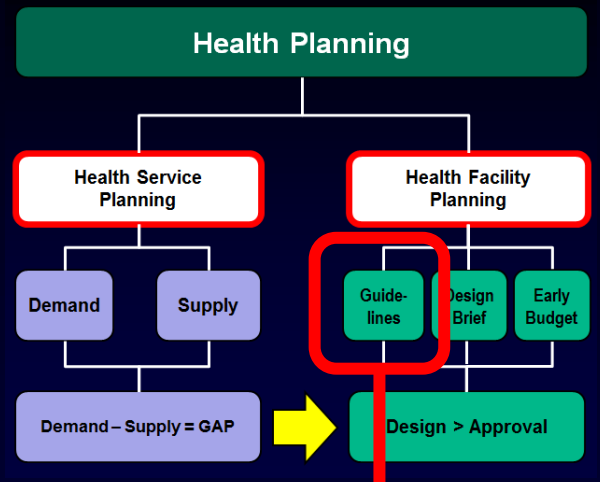


Generate 'Heat Maps' to study area deficiencies



HFBS 5 hosting Health Facility Guidelines

Soft Modular



Health Facility Guidelines

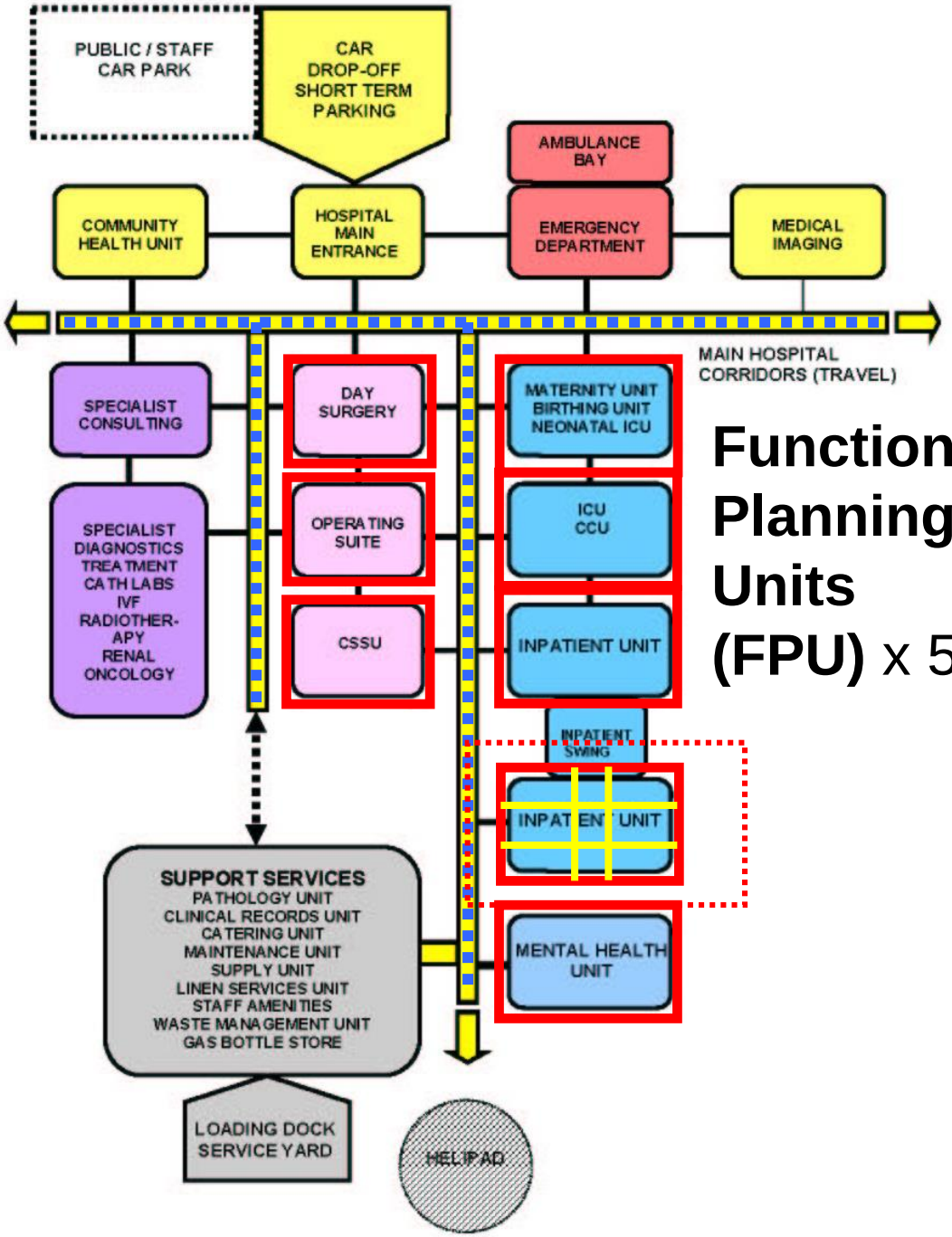
- Role Delineation Level Guide (RDL)
- Functional Planning Units (FPU)
- Standard Components (SC)
- Schedule of SCs for FPUs by RDL
- Operational Policies (OP)

New types of Guidelines

- **Ready-to-use Health Facility Design Guidelines**
  - International (IHFG)
  - HAAD (HAAD HFG)
  - Australia (AHFG) Standard Components
  - New Zealand (AHFG)
  - Singapore (MOHH)
  - India (Indian HFG)
  - SHCC (SHCC HFG)
  - PNG (PNG HFG)

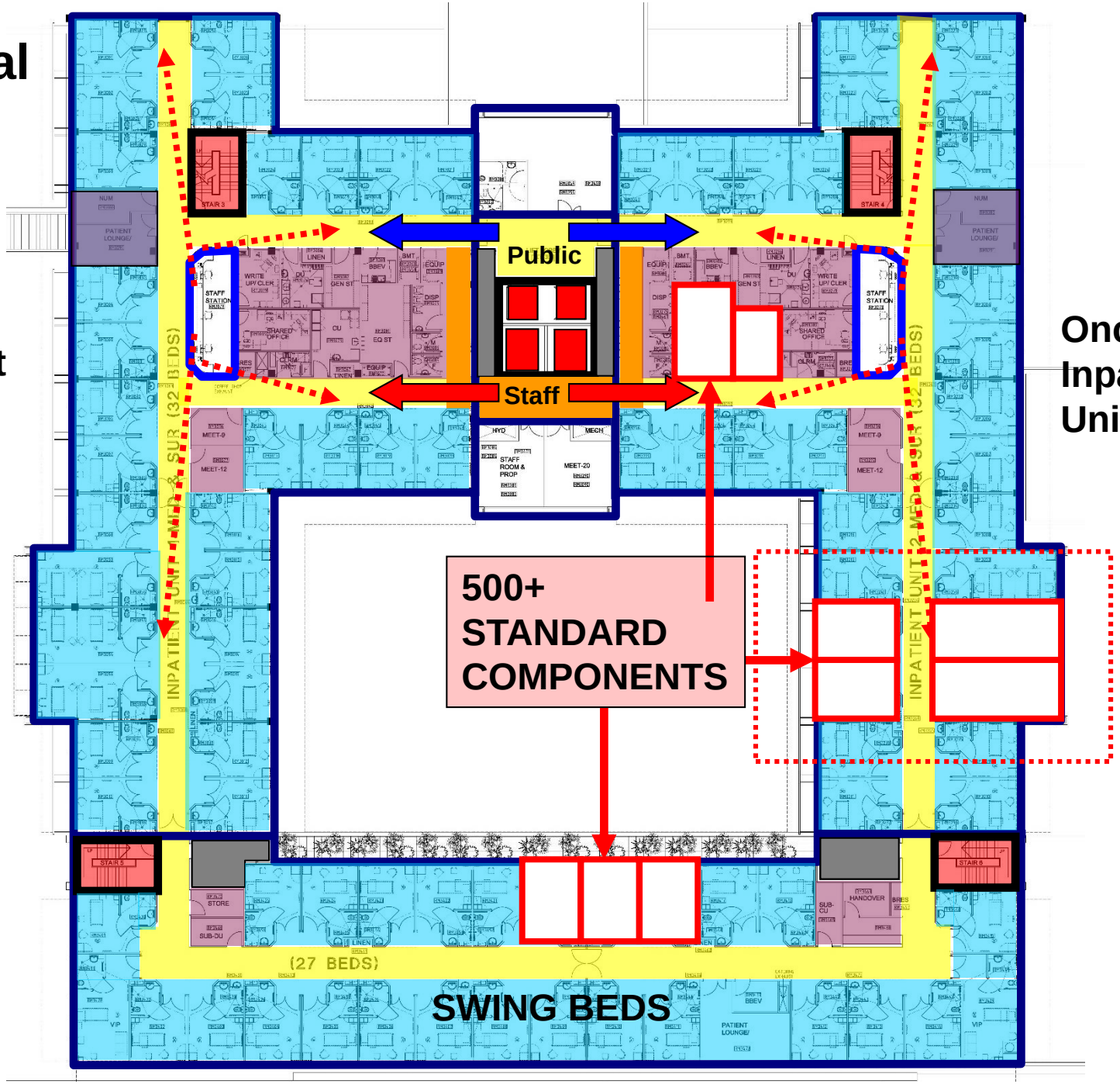
- **Other types of Guidelines**
  - FGI 2014
  - HTM
  - HBN
  - NFPA
  - ADA

Typical Hospital Diagram

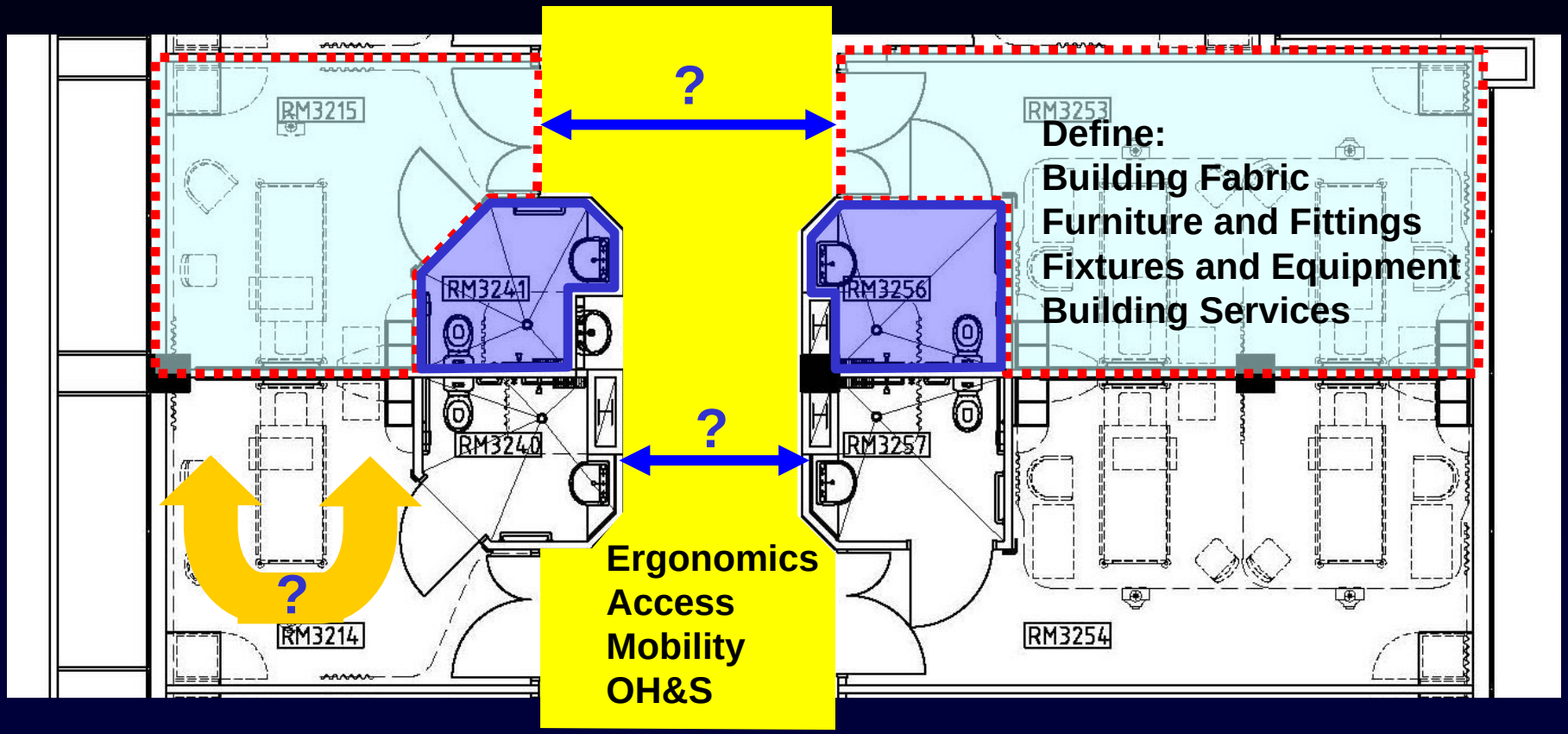


Functional Planning Units (FPU) x 50 Max

Typical FPU


Medical Inpatient Unit
Oncology Inpatient Unit
Public
Staff
500+ STANDARD COMPONENTS
SWING BEDS
(27 BEDS)
INPATIENT UNIT 1 MED & SUR (32 BEDS)
INPATIENT UNIT 2 MED & SUR (32 BEDS)
STAIR 3
STAIR 4
STAIR 5
STAIR 6
STAFF STATION
STAFF ROOM & PROP
MEET-9
MEET-12
MEET-20
HYD
MECH
LINEN
STORE
SUB-DU
SUB-CU
HANDOVER
PATIENT LOUNGE
VIP

Standard Components x 500



Typical Bedrooms

Approximately 500 Standard Components can define any hospital

need to be sustainable in every respect as an essential public service. Therefore they need to carefully balance the required features and standards against capital and operational costs without compromising the quality of care. Sustainability demands that the precious knowledge of healthcare design be shared rather than wasted after every successful project. These guidelines bring that shared knowledge to the world to achieve these key objectives:

- Establish the minimum acceptable standards
- Maintain public confidence in the facilities which comply with these guidelines
- Provide a basis for the approval and licensing of healthcare facilities
- Provide guidance to designers on the special needs of healthcare facilities
- Consider the wellbeing, safety, privacy and dignity of patients, staff and visitors
- Eliminate design features that result in unacceptable practices
- Allow Health Authorities to require compliance with these guidelines
- Provide a knowledge base to inform future healthcare design consultants

These Guidelines will be continually reviewed, updated and expanded. Readers are encouraged to provide feedback and to contribute material for future updates.

and Security.

Part D – Infection Control This part details the Infection Control requirements of healthcare facilities.

Part E – Engineering This part focuses on the acceptable International engineering guidelines and standards for Mechanical, Electrical, Plumbing, Fire and other building services.

Part F – Feasibility Planning & Costing Guidelines This part includes feasibility planning, capital costing, financial appraisal and procurement strategy.

Part Q – Equipment Planning Guidelines This part covers the methodology for the planning, procurement & placement the Furniture Fittings, Fixtures & Equipment (FF&FE) both Medical and Non-medical.

Part S – Health Service Planning Guidelines This part includes catchment identification, service definition, needs assessment, demand projections, gap analysis and service profiling.

Guideline Sections	Size	Price			
Part A - Administrative Provisions	1.5mb	Free	View Index	Preview	Download
Part B - Health Facility Briefing and Design	9.3mb	Free	View Index	Preview	Download
Part C - Access, Mobility, OH&S Revised	1.5mb	Free	View Index	Preview	Download
Part D - Infection Control Revised	1.1mb	Free	View Index	Preview	Download
Part E - Engineering Services and Environmental Design	67.3kb	Free	View Index	Preview	Download
Part F - Feasibility Planning & Costing Guidelines New	175.0kb	Free	View Index	Preview	Download
Part Q - Equipment Planning Guidelines New	449.4kb	Free	View Index	Preview	Download
Part S - Health Service Planning	866.6kb	Free	View Index	Preview	Download

Back

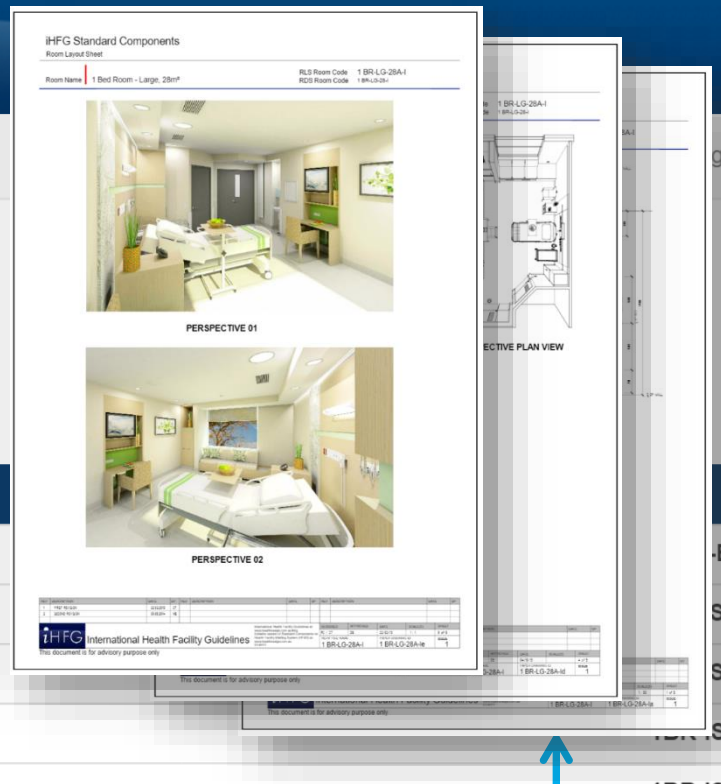
Part B - Health Facility Briefing and Design	9.3mb	Free	Preview	Download
Planning Preliminary Information	1.1mb	Free	Preview	Download
Planning Preliminaries	34.8kb	Free	Preview	Download
Role Delineation Guide	26.0kb	Free	Preview	Download
Standard Components	30.3kb	Free	Preview	Download
Planning	1.0mb	Free	Preview	Download
Acceptable Standard and Guidelines	26.8kb	Free	Preview	Download
Functional Planning Units (FPU)				
Administration Unit	632.5kb	Free	Preview	Download
Admissions Unit & Discharge	742.0kb	Free	Preview	Download
Birthing Unit	365.2kb	Free	Preview	Download
Cardiac Investigation Unit	778.8kb	Free	Preview	Download
Catering Unit	582.0kb	Free	Preview	Download
Clinical Information Unit	565.2kb	Free	Preview	Download
Community Health Unit	843.6kb	Free	Preview	Download

iHFG

Guidelines | Standard Components | HFBS | Schedules | Contacts | Cart 0

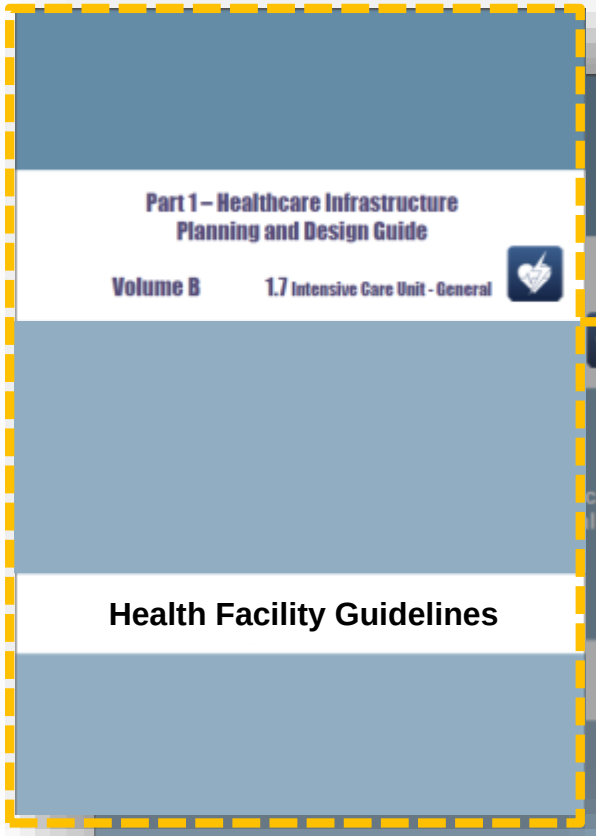
2. Call points, Power, Light Switch, Data and Gas outlets
3. Bed Screens
4. Sanitary Fixtures

1 2 4 6 A B C D E F ↔ P Q ↔ Z

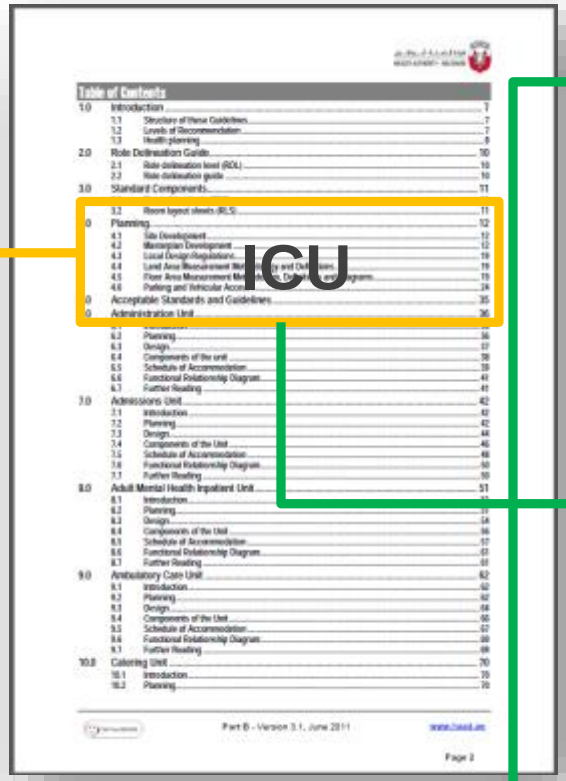


Standard Components					Code
1 Bed Room - Bariatric, 20m2 3D					-BA-20-I
1 Bed Room - Isolation, 18m2, Neg Pressure					S-N-18-I
1 Bed Room - Isolation, 28m2, Neg Pressure					S-N-28-I
1 Bed Room - Isolation, 18m2, Pos Pressure					S-P-18-I
1 Bed Room - Isolation, 28m2, Pos Pressure					1BR-IS-P-28-I
1 Bed Room - Large, 28m2, Inboard Ensuite 3D					1BR-LG-I-A
Room Data Sheet *1_bed_room_large_28m2_rds.pdf*		63.3kb	Free	Preview	Download
Room Layout Sheet *1 br-lg-28a-i.pdf*		1.3mb	Free	Preview	Download
AutoCAD Drawing *1br-lg-28-i-a1.dwg*		285.6kb	$2.99		Add to Cart
Autodesk Revit *1 br-lg-28a-i.rvt*		36.1mb	$64.99		Add to Cart
1 Bed Room - Large, 28m2, Outboard Ensuite 3D					1BR-LG-I-B
1 Bed Room - Mental Health, 18m2, Inboard Ens 3D					1BR-MH-18-I-A
1 Bed Room - Mental Health, 18m2, Corridor Ens 3D					1BR-MH-18-I-B

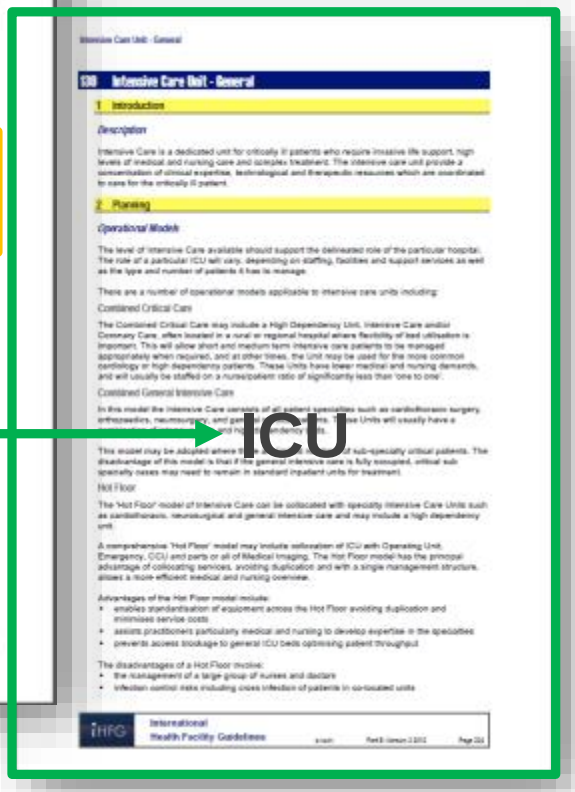
Look up the 50 relevant FPU guidelines



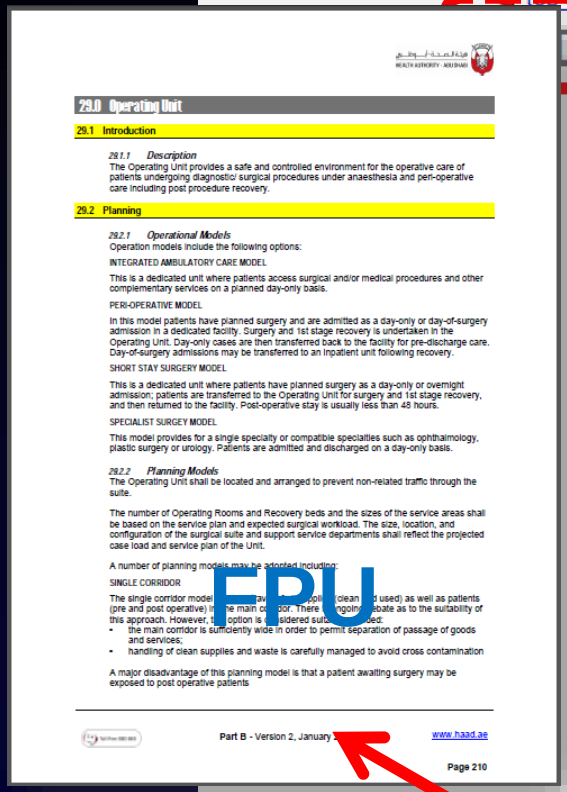
Volumes



Index of 50 FPU's



FPU Guidelines



29.0 Operating Unit

29.1 Introduction

29.1.1 Description

The Operating Unit provides a safe and controlled environment for the operative care of patients undergoing diagnostic/ surgical procedures under anaesthesia and peri-operative care including post procedure recovery.

29.2 Planning

29.2.1 Operational Models

Operation models include the following options:

INTEGRATED AMBULATORY CARE MODEL

This is a dedicated unit where patients access surgical and/or medical procedures and other complementary services on a planned day-only basis.

PERI-OPERATIVE MODEL

In this model patients have planned surgery and are admitted as a day-only or day-of-surgery admission in a dedicated facility. Surgery and 1st stage recovery is undertaken in the Operating Unit. Day-only cases are then transferred back to the facility for pre-discharge care. Day-of-surgery admissions may be transferred to an inpatient unit following recovery.

SHORT STAY SURGERY MODEL

This is a dedicated unit where patients have planned surgery as a day-only or overnight admission; patients are transferred to the Operating Unit for surgery and 1st stage recovery, and then returned to the facility. Post-operative stay is usually less than 48 hours.

SPECIALIST SURGEY MODEL

This model provides for a single specialty or compatible specialties such as ophthalmology, plastic surgery or urology. Patients are admitted and discharged on a day-only basis.

29.2.2 Planning Models

The Operating Unit shall be located and arranged to prevent non-related traffic through the suite.

The number of Operating Rooms and Recovery beds and the sizes of the service areas shall be based on the service plan and expected surgical workload. The size, location, and configuration of the surgical suite and support service departments shall reflect the projected case load and service plan of the Unit.

A number of planning models may be adopted including:

SINGLE CORRIDOR

The single corridor model [illegible] (clean and used) as well as patients (pre and post operative) in the main corridor. There [illegible] debate as to the suitability of this approach. However, [illegible] option is considered suitable if:

- the main corridor is sufficiently wide in order to permit separation of passage of goods and services;
- handling of clean supplies and waste is carefully managed to avoid cross contamination

A major disadvantage of this planning model is that a patient awaiting surgery may be exposed to post operative patients

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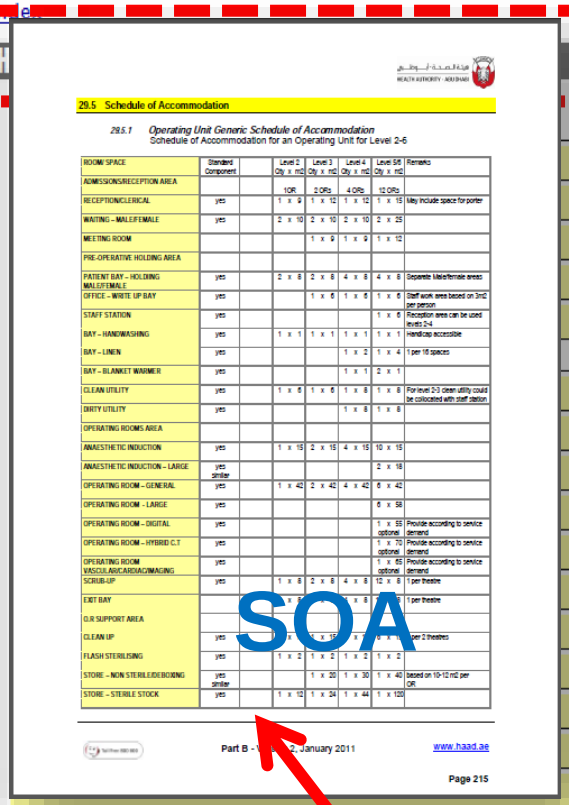
EPU



29.5 Schedule of Accommodation

29.5.1 Operating Unit Generic Schedule of Accommodation

Schedule of Accommodation for an Operating Unit for Level 2-6

ROOM/ SPACE	Standard Component		Level 2 Qty x m2	Level 3 Qty x m2	Level 4 Qty x m2	Level 5/6 Qty x m2	Remarks
ADMISSION/RECEPTION AREA			10R	2 ORs	4 ORs	12 ORs	
RECEPTION/CLERICAL	yes		1 x 9	1 x 12	1 x 12	1 x 15	May include space for porter
WAITING – MALE/FEMALE	yes		2 x 10	2 x 10	2 x 10	2 x 25	
MEETING ROOM				1 x 9	1 x 9	1 x 12	
PRE-OPERATIVE HOLDING AREA							
PATIENT BAY – HOLDING MALE/FEMALE	yes		2 x 8	2 x 8	4 x 8	4 x 8	Separate Male/female areas
OFFICE – WRITE UP BAY	yes			1 x 6	1 x 6	1 x 6	Staff work area based on 3m2 per person
STAFF STATION	yes					1 x 6	Reception area can be used by(s) 2-4
BAY – HANDWASHING	yes		1 x 1	1 x 1	1 x 1	1 x 1	Handicap accessible
BAY – LINEN	yes				1 x 2	1 x 4	1 per 16 spaces
BAY – BLANKET WARMER	yes				1 x 1	2 x 1	
CLEAN UTILITY	yes		1 x 6	1 x 6	1 x 8	1 x 8	For level 2-3 clean utility could be colocated with staff station
DIRTY UTILITY	yes				1 x 8	1 x 8	
OPERATING ROOMS AREA							
ANAESTHETIC INDUCTION	yes		1 x 15	2 x 15	4 x 15	10 x 15	
ANAESTHETIC INDUCTION – LARGE	yes similar					2 x 18	
OPERATING ROOM – GENERAL	yes		1 x 42	2 x 42	4 x 42	6 x 42	
OPERATING ROOM – LARGE	yes					6 x 58	
OPERATING ROOM – DIGITAL	yes					1 x 55 optional	Provide according to service demand
OPERATING ROOM – HYBRID C.T	yes					1 x 70 optional	Provide according to service demand
OPERATING ROOM VASCULAR/CARDIAC/IMAGING	yes					1 x 65 optional	Provide according to service demand
SCRUB-UP	yes		1 x 8	2 x 8	4 x 8	12 x 8	1 per theatre
EXIT BAY			1 x 8			1 x 8	1 per theatre
O.R SUPPORT AREA							
CLEAN UP	yes		1 x 6	1 x 6	1 x 6	1 x 6	per 2 theatres
FLASH STERILISING	yes		1 x 2	1 x 2	1 x 2	1 x 2	
STORE – NON STERILE/DEBOXING	yes similar			1 x 20	1 x 30	1 x 40	based on 10-12 m2 per OR
STORE – STERILE STOCK	yes		1 x 12	1 x 24	1 x 44	1 x 120	

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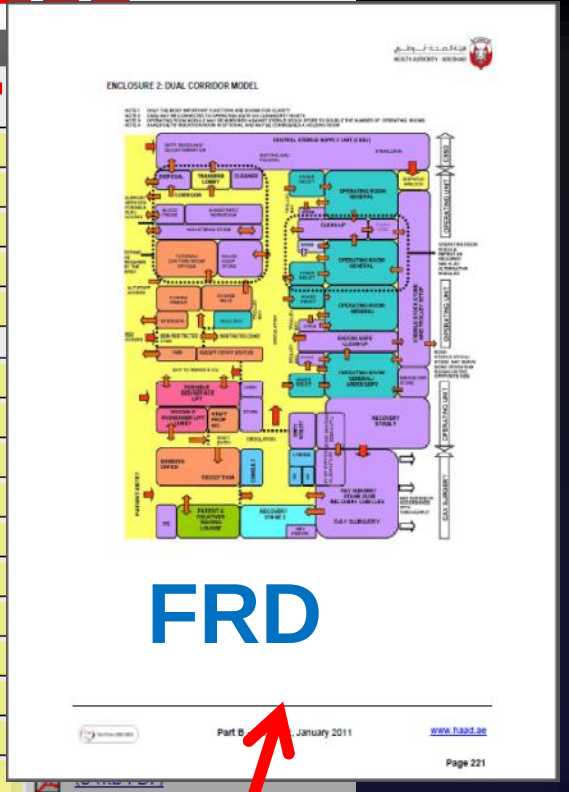
SOA



ENCLOSURE 2: DUAL CORRIDOR MODEL

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FRD

Emergency Unit (183kb PDF)

Engineering & Maintenance Unit (59kb PDF)

Hospital Morgue (205kb PDF)

Inpatient Accommodation Unit (380kb PDF)

Intensive Care Unit (1617kb PDF)

IVF Unit (Fertilisation Centres) (197kb PDF)

Linen Handling Unit (59kb PDF)

Main Entrance Unit (252kb PDF)

Medical Imaging Unit (152kb PDF)

Mobile Unit (40kb PDF)

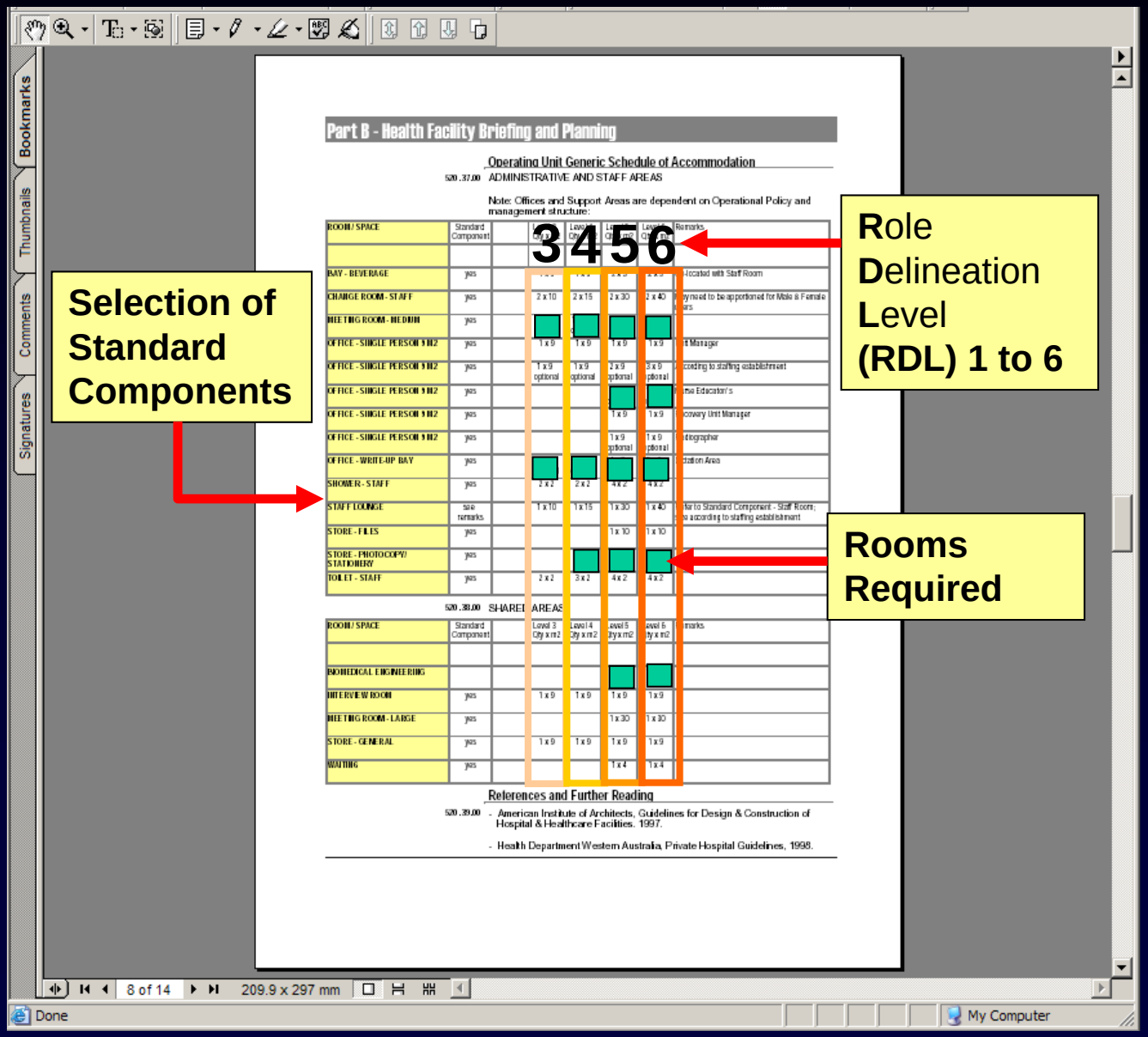
Nuclear Medicine Unit (182kb PDF)

Obstetrics Unit (12[illegible]kb PDF)

Operating Unit (982kb PDF)

Pathology Unit (81kb PDF)

Look up Room Schedules under RDL columns



FPU= 50
RDS= 500
RLS= 500

RDS

RLS

iHFG

Guidelines | Standard Components | HFBS | Schedules | Contacts | Shopping Cart 0

1 Bed Room - Mental Health, 18m2, Bk-to-bk Ens 3D 1BR-MH-18-I-C

1 Bed Room - Mental Health, 28m2, Inboard Ens 3D 1BR-MH-28-I-A

Room Data Sheet	1_bed_room_mental_health_28m2_rds.pdf	62.3kb	Free	Preview	Download
AutoCAD Drawing	1br-mh-28-i-a.dwg	208.1kb	$2.99		Add to Cart
Room Layout Sheet	1br-mh-28-a-i.pdf	567.2kb	Free	Preview	Download
Autodesk Revit	1.br-mh-28-a-i .rvt	55.5mb	$64.99		Add to Cart

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4 Bed Room - Standard, 42m2, Inboard Ensuite 4BR-ST-42-I-A

HAAD Guidelines Milestone: Version 1

Room Data Sheets

Department	Standard Components	Room Tag: 3276	
Room Name	Operating Room - Digital	Room Code: OR-DIG-U	
Net Room Area Briefed	55.0 M2	Room No:	
No of Rooms	1		
Subtotal of Briefed Area	55.00 M2		
Hours of Operation	24 Hours		
Occupancy	1 patient; 5 - 12 staff		
Also covers these Rooms			
Description/ Special Requirements	The Operating Room - Digital provides a fully digital integrated aseptic environment in which to carry out surgical procedures under local, regional or general anaesthetic.The digital operating room will include ceiling pendant systems, operating theatre imaging equipment and video monitoring equipment. The Operating Room - Digital may be used for surgical procedures that require large and bulky equipment, including Neurosurgery, Orthopaedics and Cardiac Surgery or may also be used for general surgery and specialties including ENT, Urology, Gynaecology, Ophthalmology, Plastic Surgery and any other procedures that do not require bulky equipment. The Operating Room will have direct access to a Scrub-up Room, exit bay and sterile stock/set-up area. Cardiac Protected electrical area Special Air Conditioning - HEPA filtration Additional Design Considerations: - Minimum critical dimension 6000mm. - 'Laser In Use' warning lights may be required outside all exit doors to room if laser equipment is to be used - Lead shielding may be required depending on use of X-ray equipment; to be assessed by Radiation Consultant - External windows are desirable - double glazed with integral Venetian blinds - Provide isolated power supply individually to each large Operating Room, together with its associated line isolation and overload monitors		
Amendment	24.10.10, - First Draft		

Room Fabric and outline specifications

ID	Fabric	Material	Finish	Specification	Selection	Remarks
5010	Ceiling	Plasterboard	Paint, washable	Flush set, suspended		
6015	Cornice	Plasterboard	Paint	Flush coved between wall & ceiling		
8010	Door protection	Composite	Prefinished PVC	Protection plate to 900 AFFL		
8040	Door protection	Composite	Prefinished PVC	To door frame		

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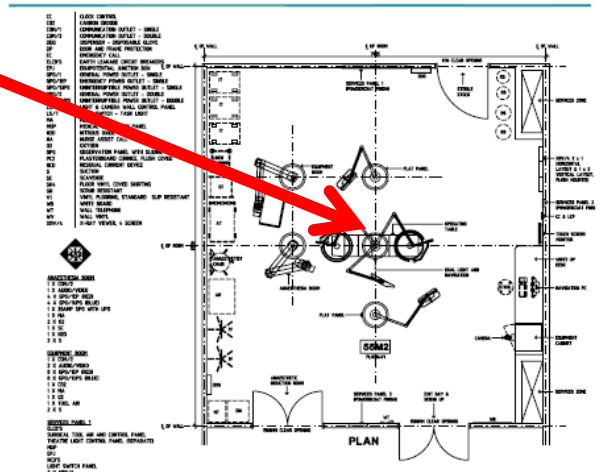
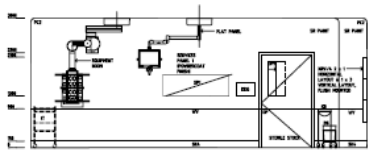
UAE STANDARD COMPONENTS

Room Layout Sheet

Room Name: Operating Room - Digital

RLS Room Code: OR-DIG-U
RDS Room Code: OPADIGU





ELEVATION 1

HAAD Guidelines by TAHRI

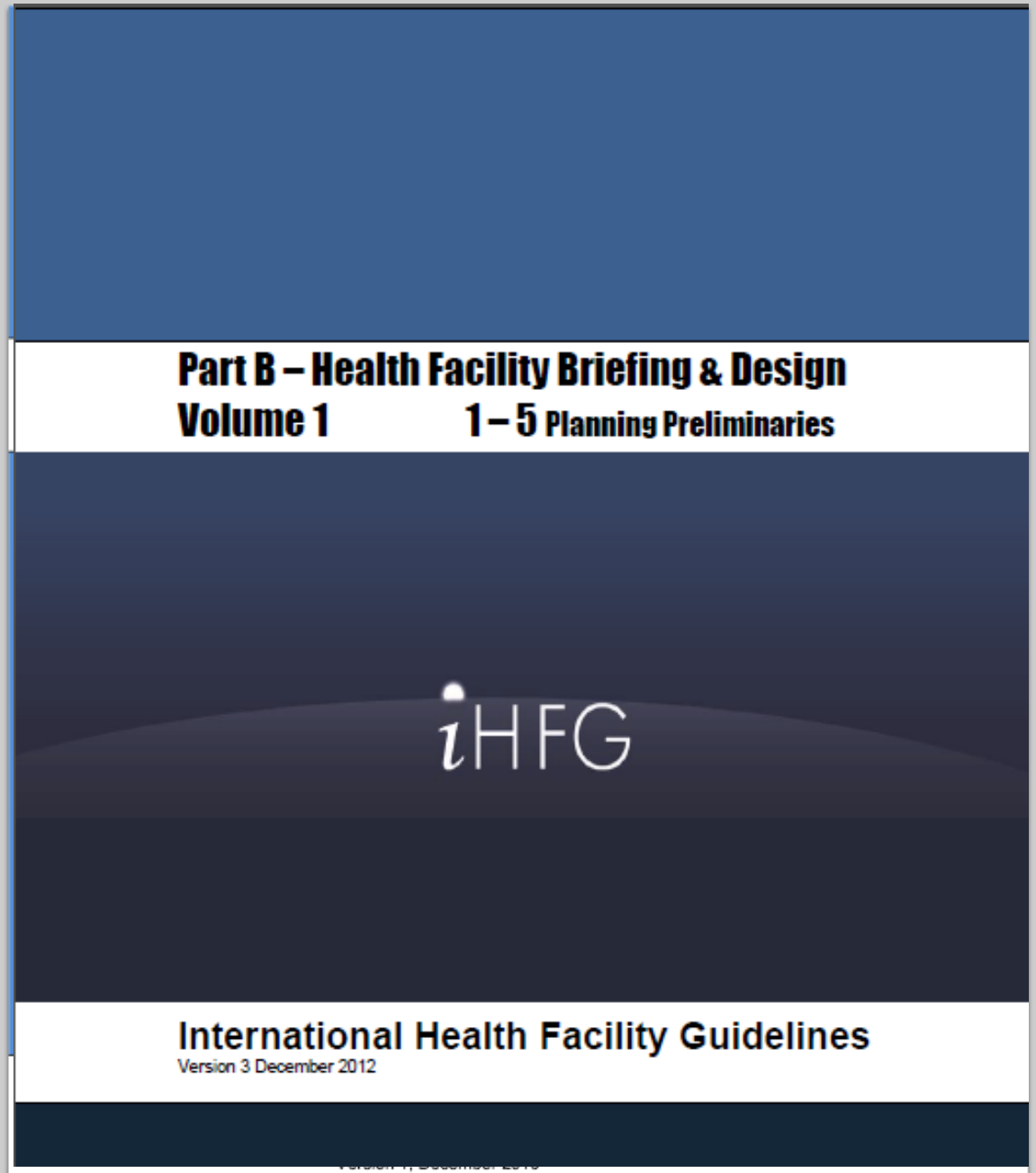
OR-DIG-U

The International Health Facility Guidelines (iHFG) by Health Projects International (HPI) and its network (TAHPI) is available from the panel below. Click on "Guidelines" to navigate to the indiviudla chapters. Click on the "Standard Components to see indiviudal Room Data Sheets and matching Room Layout Sheets (Medical Templates). Any item selected will be downloaded to the iPAD from the web. The content is updated automatically if a newer version becomes available. "Guidelines" on the navigation bar to the left or the symbol below.

Guidelines | Standard Components

< Back | Part B - Health Facility Briefing and Design >

Introduction >
Role Delineation Guide >
Standard Components >
Planning >
Acceptable Standard and Guidelines >
Administration Unit >
Admissions Unit >
Adult Mental Health Inpatient Unit >
Ambulatory Care Unit >
Catering Unit >
Child & Adolescent Mental Health Unit >



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Guidelines | Standard Components

M N O P R S T

- Office - Workstation OFF-WS-U
- Office - Write-up Bay, 1m2 OFF-WI-1-U
- Office - Write-up Bay, 6m2 OFF-WI-6-U
- Office - Write-up, 3m2 OFF-WI-3-U
- Office - Write-Up (Shared), 12m2 OFF-WIS-U
- Operating Room - CT Control OR-CTCR-U
- Operating Room - CT Procedure OR-CT-U
- Operating Room - Digital OR-DIG-U
  - Room Layout Sheet
  - Room Data Sheet
- Operating Room - General ORGN-U
- Operating Room - Hybrid - CT Scanning Room OR-HY-CT-U
- Operating Room - Large ORLA-U

IHFG Standard Project Milestone: **Current**

Room Data Sheets

Department	HFBS Standard Components	Room Tag: 3276
Room Name	Operating Room - Digital	Room Code: OR-DIG-U

Net Room Area Briefed	55.0 M2
No of Rooms	1
Subtotal of Briefed Area	55.00 M2
Hours of Operation	24 Hours
Occupancy	1 patient; 5 - 12 staff
Also covers these Rooms	
Description/ Special Requirements	The Operating Room - Digital provides a fully digital integrated aseptic environment in which to carry out surgical procedures under local, regional or general anaesthetic.The digital operating room will include ceiling pendant systems, operating theatre imaging equipment and video monitoring equipment. The Operating Room - Digital may be used for surgical procedures that require large and bulky equipment, including Neurosurgery, Orthopaedics and Cardiac Surgery or may also be used for general surgery and specialties including ENT, Urology, Gynaecology, Ophthalmology, Plastic Surgery and any other procedures that do not require bulky equipment. The Operating Room will have direct access to a Scrub-up Room, exit bay and sterile stock/set-up area. Cardiac Protected electrical area Special Air Conditioning - HEPA filtration Additional Design Considerations: - Minimum critical dimension 6000mm. - 'Laser In Use' warning lights may be required outside all exit doors to room if laser equipment is to be used - Lead shielding may be required depending on use of X-ray equipment; to be assessed by Radiation Consultant - External windows are desirable - double glazed with integral Venetian blinds - Provide isolated power supply individually to each large Operating Room, together with its associated line isolation and overload monitors
Amendment	24.10.10, - First Draft

Room Fabric and outline specifications

ID	Fabric	Material	Finish	Specification	Selection	Remarks
5010	Ceiling	Plasterboard	Paint, washable	Flush set, suspended		
6015	Cornice	Plasterboard	Paint	Flush coved		

The International Health Facility Guidelines (iHFG) by Health Projects International (HPI) and its network (TAHPI) is available from the panel below. Click on "Guidelines" to navigate to the indiviudla chapters. Click on the "Standard Components to see indiviudal Room Data Sheets and matching Room Layout Sheets (Medical Templates). Any item selected will be downloaded to the iPAD from the web. The content is updated automatically if a newer version becomes available. "Guidelines" on the navigation bar to the left or the symbol below.

Guidelines | Standard Components

I L M N O P R

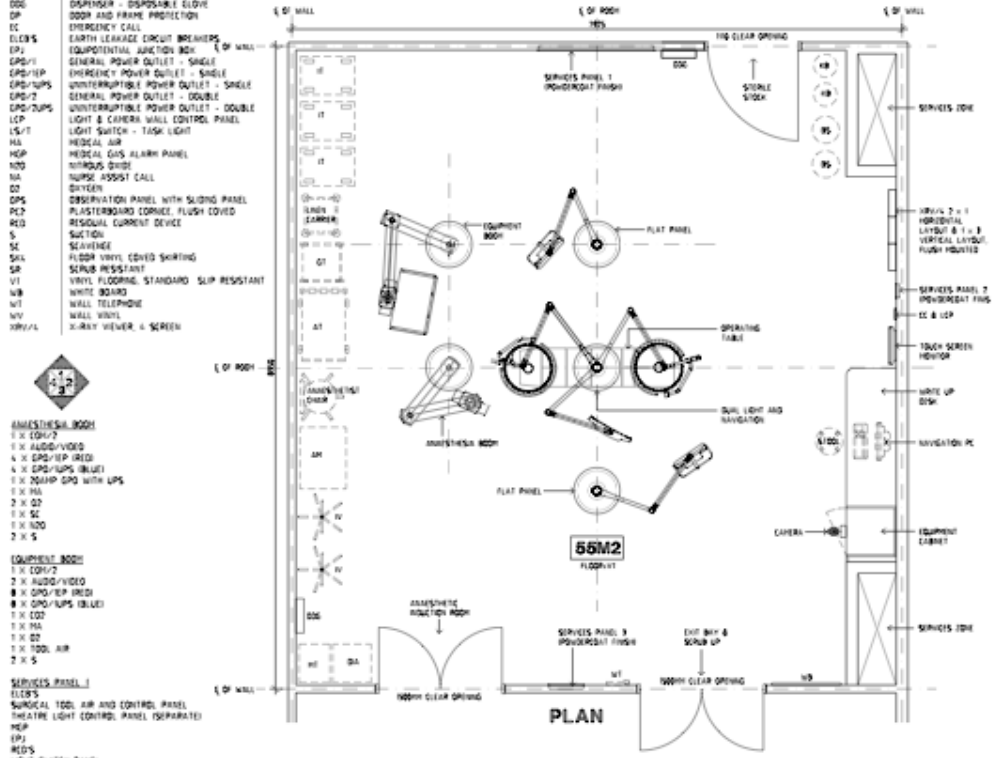
- Office - Single Person, 12m2 OFF-S12-U
- Office - Workstation OFF-WS-U
- Office - Write-up Bay, 1m2 OFF-WI-1-U
- Office - Write-up Bay, 6m2 OFF-WI-6-U
- Office - Write-up, 3m2 OFF-WI-3-U
- Office - Write-Up (Shared), 12m2 OFF-WIS-U
- Operating Room - CT Control OR-CTCR-U
- Operating Room - CT Procedure OR-CT-U
- Operating Room - Digital OR-DIG-U
  - Room Layout Sheet
  - Room Data Sheet
- Operating Room - General ORGN-U
- Operating Room - Hybrid - CT Scanning Room OR-HY-CT-U

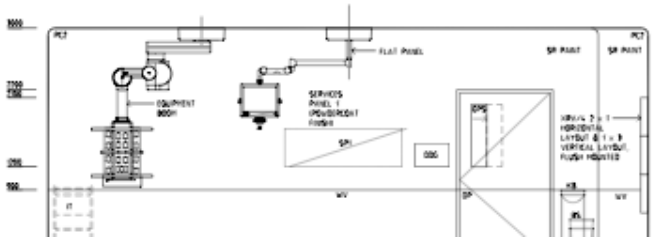
HFBS STANDARD COMPONENTS

Room Layout Sheet

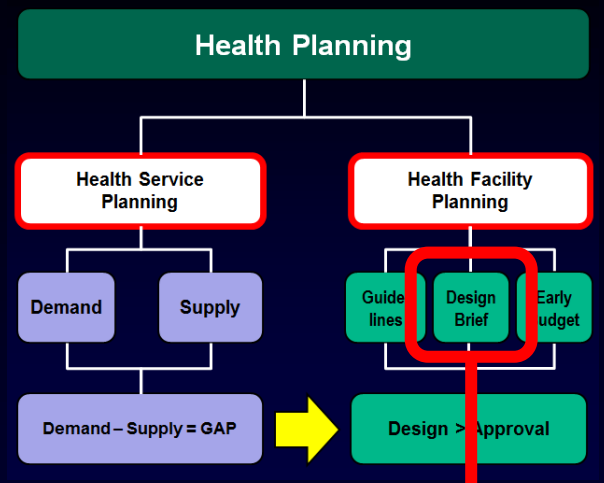
Room Name: Operating Room - Digital

RLS Room Code: OR-DIG-U
RDS Room Code: OR-DIG-U





Soft Modular



Health Facility Briefing

Obtain Service Plan or Clinical Service Plan (CSP)

Determine Models of Care

Convert KPU's to SOA

- What room types? How large? How many?

Group KPU's into manageable unit sizes

Expand SOA to full RDS

- Where? What equipment? What finishes?

Obtain all Key Planning Units (KPU's) from Service Plan

KPU=Inpatient Bed numbers

Clinical Facility Planning Unit Type	KPU
Medical	346
Surgical	
Obstetrics	
Delivery and Birthing Rooms	
Special Care Nursery	
Paediatrics	
Mental Health	
Rehabilitation	
Long Stay Care	83

KPU=ICU numbers

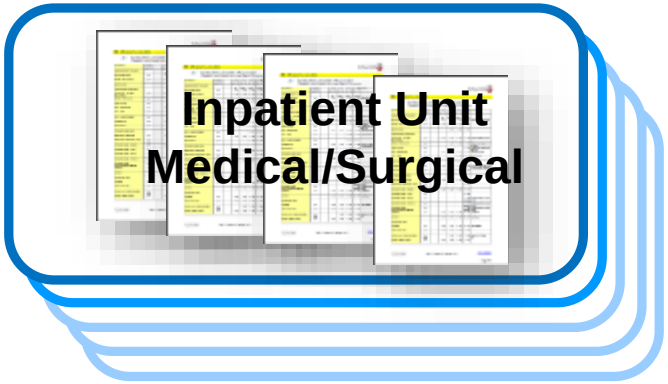
Clinical Facility Planning Unit Type	KPU
General Adult	24
Paediatrics	
Neonatal	
Cardiothoracic	
Neurosciences	
Coronary Care	
High Dependency Care	
ED Cubicles/Rooms	

KPU=OT numbers

Clinical Facility Planning Unit Type	KPU
Short stay theatres	6
General Operating Theatres	8
Specialist Theatres	4
Endoscopy	
Robotic Theatres	
Hybrid Imaging Theatres	
Presurgical Prepatation Beds	28
First Stage Recovery Beds	56
Second Stage Recovery Beds	28
Third Stage Recovery Chairs	28

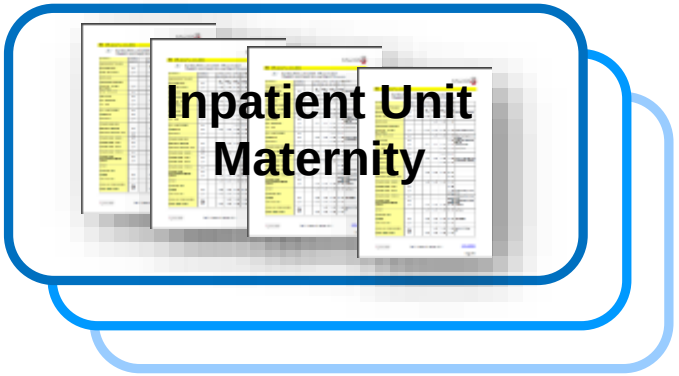
Group KPU's into Functional Planning Units (FPU's)

FPU

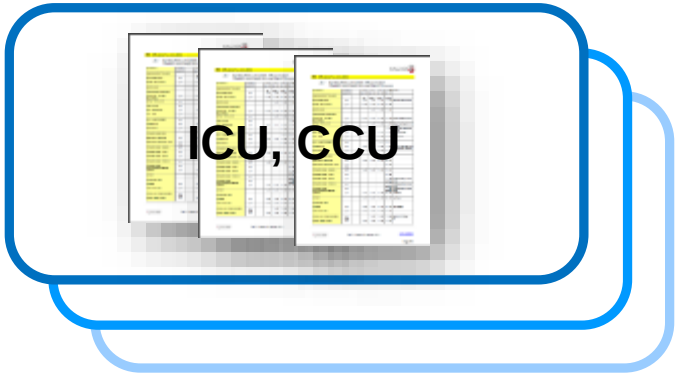


30 beds x 6

FPU

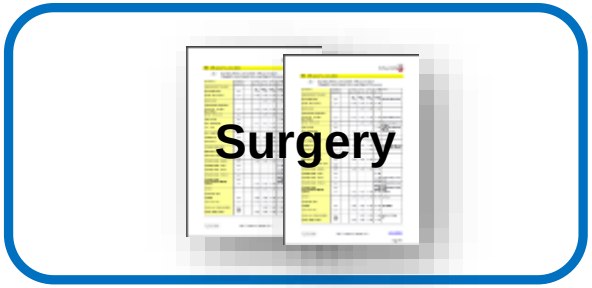


FPU



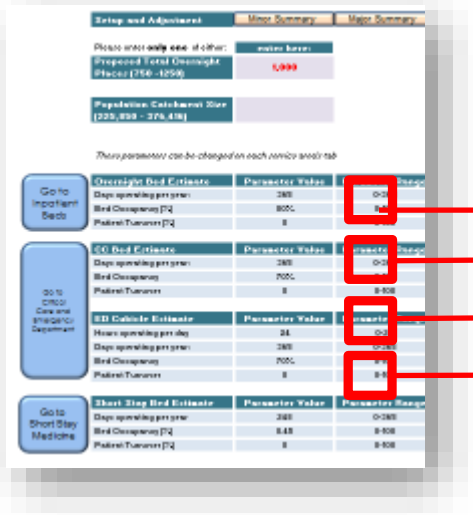
12 beds x 3

FPU



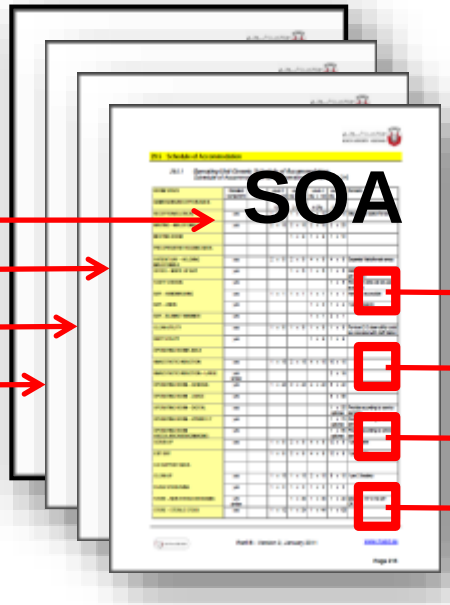
KPU is expanded into full SOA, classified by FPU
SOA adds all support rooms and m2 sizes

KPU



KPU by speciality

FPU



FPU x 50 = SOA

SOA Summary

Net Departmental Area
Add % Circulation
=Gross Departmental Area

Add % Travel
Add % Engineering
=Gross Building Area

Add Carparking etc

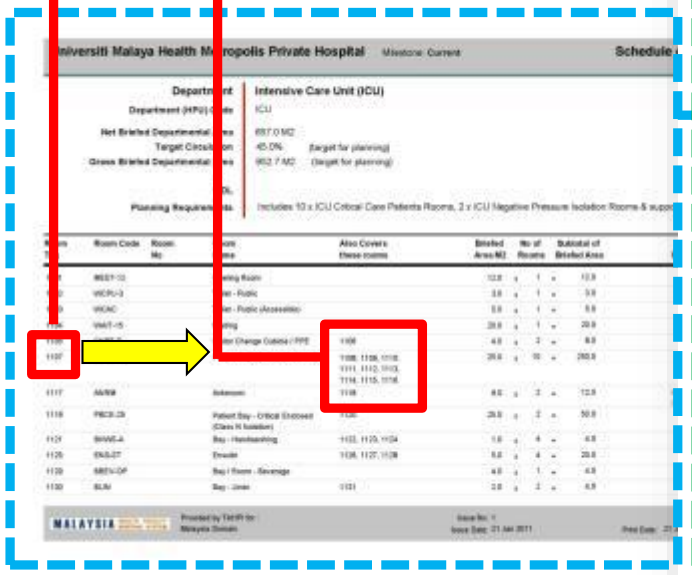
Total Project Area m2

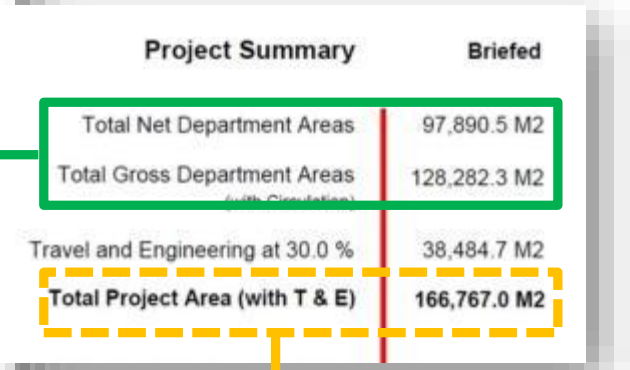
Total Area Calculations

Schedule of Accommodation (SOA) with areas

Unique Room Types
(Master Rooms)

Also Covers …
(Clone Rooms)



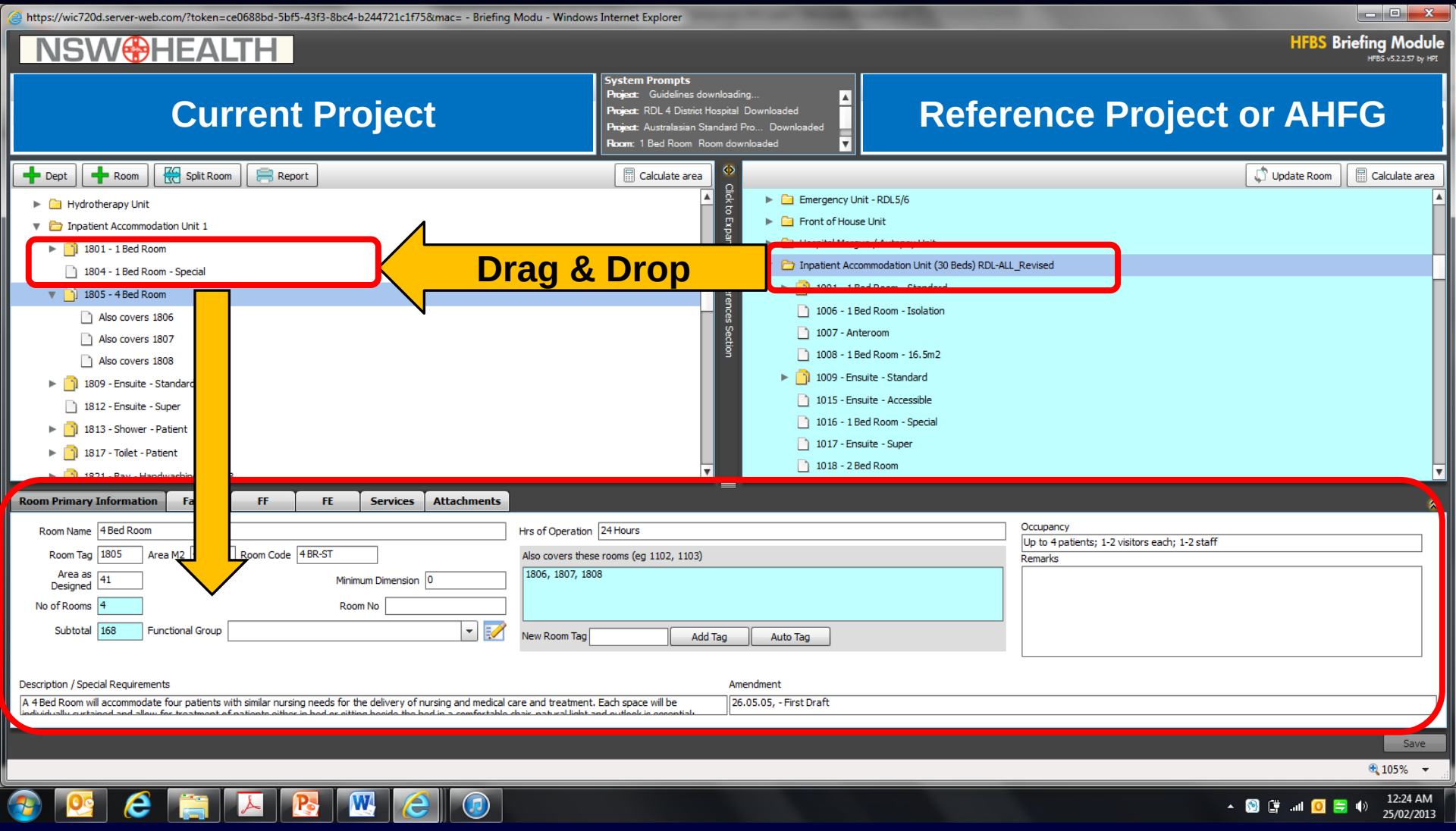


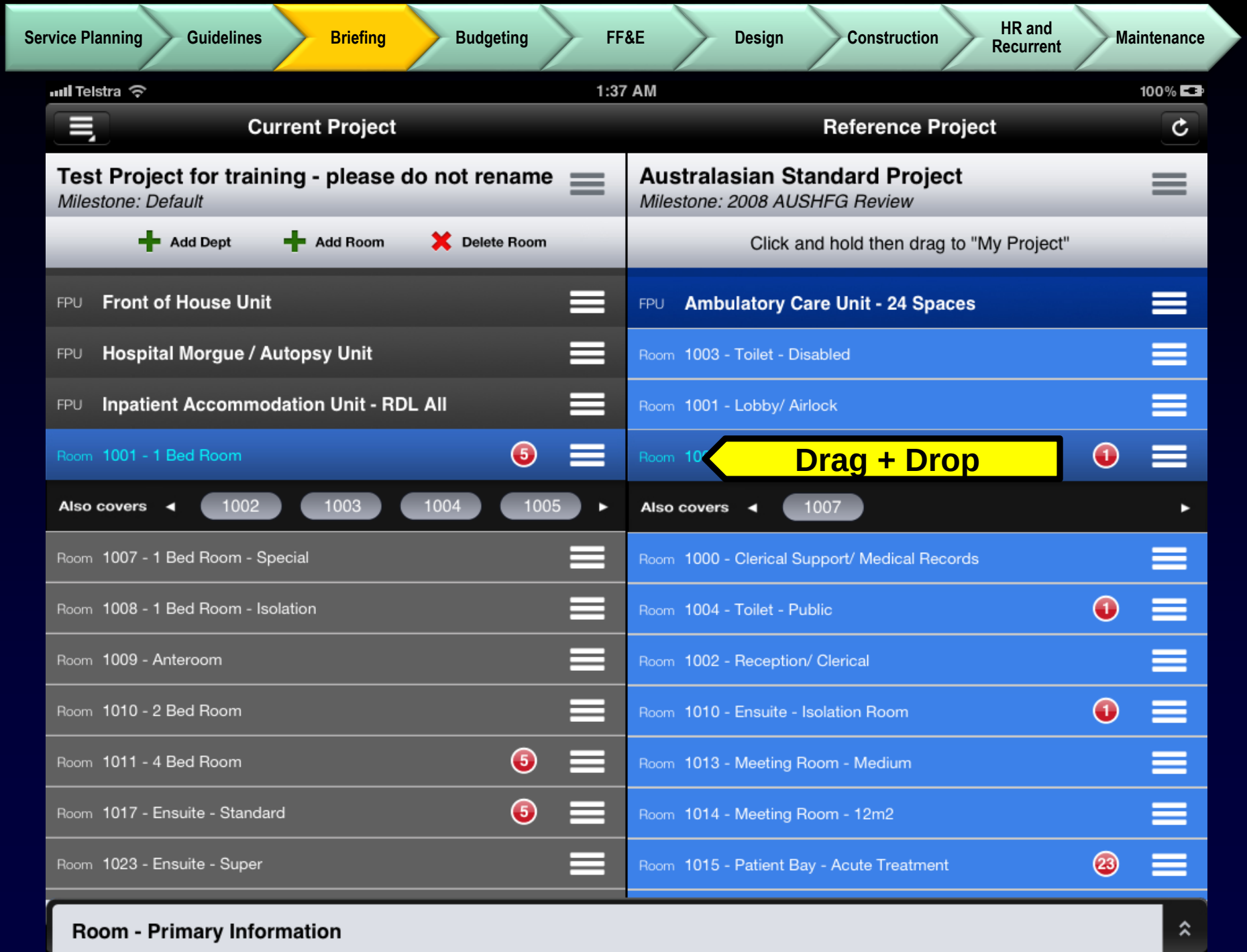
Departments (FPU's)
Room by Room

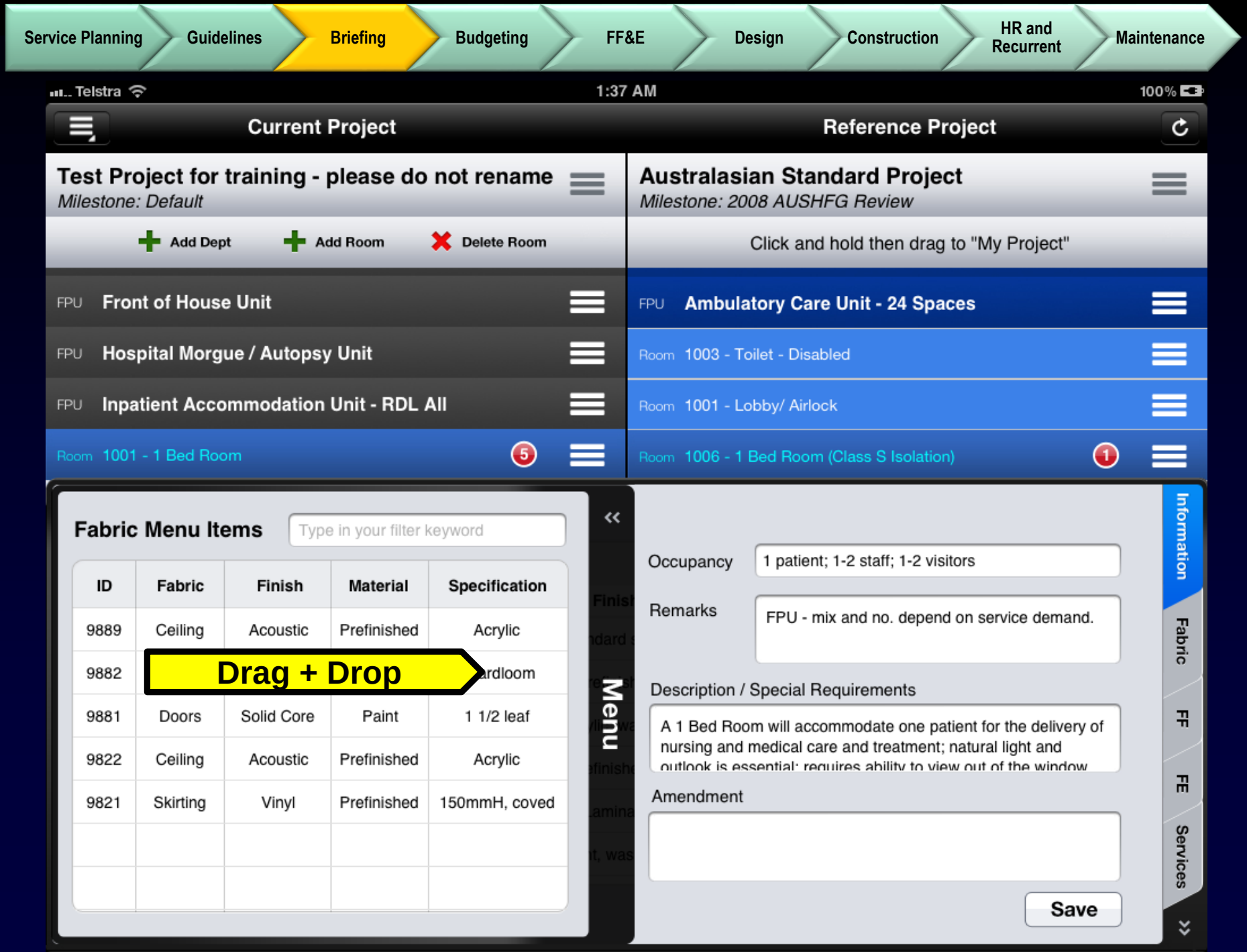
Departments (FPU's)
Summary

Project
Summary

HFBS 5 Briefing Module




Service Planning
Guidelines
Briefing
Budgeting
FF&E
Design
Construction
HR and Recurrent
Maintenance
Telstra
1:37 AM
100%
Current Project
Reference Project
Test Project for training - please do not rename
Milestone: Default
Australasian Standard Project
Milestone: 2008 AUSHFG Review
Add Dept
Add Room
Delete Room
Click and hold then drag to "My Project"
FPU Front of House Unit
FPU Hospital Morgue / Autopsy Unit
FPU Inpatient Accommodation Unit - RDL All
Room 1001 - 1 Bed Room
5
Also covers
1002
1003
1004
1005
Room 1007 - 1 Bed Room - Special
Room 1008 - 1 Bed Room - Isolation
Room 1009 - Anteroom
Room 1010 - 2 Bed Room
Room 1011 - 4 Bed Room
5
Room 1017 - Ensuite - Standard
5
Room 1023 - Ensuite - Super
FPU Ambulatory Care Unit - 24 Spaces
Room 1003 - Toilet - Disabled
Room 1001 - Lobby/ Airlock
Room 10
Drag + Drop
1
Also covers
1007
Room 1000 - Clerical Support/ Medical Records
Room 1004 - Toilet - Public
1
Room 1002 - Reception/ Clerical
Room 1010 - Ensuite - Isolation Room
1
Room 1013 - Meeting Room - Medium
Room 1014 - Meeting Room - 12m2
Room 1015 - Patient Bay - Acute Treatment
23
Room - Primary Information


Service Planning
Guidelines
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Design
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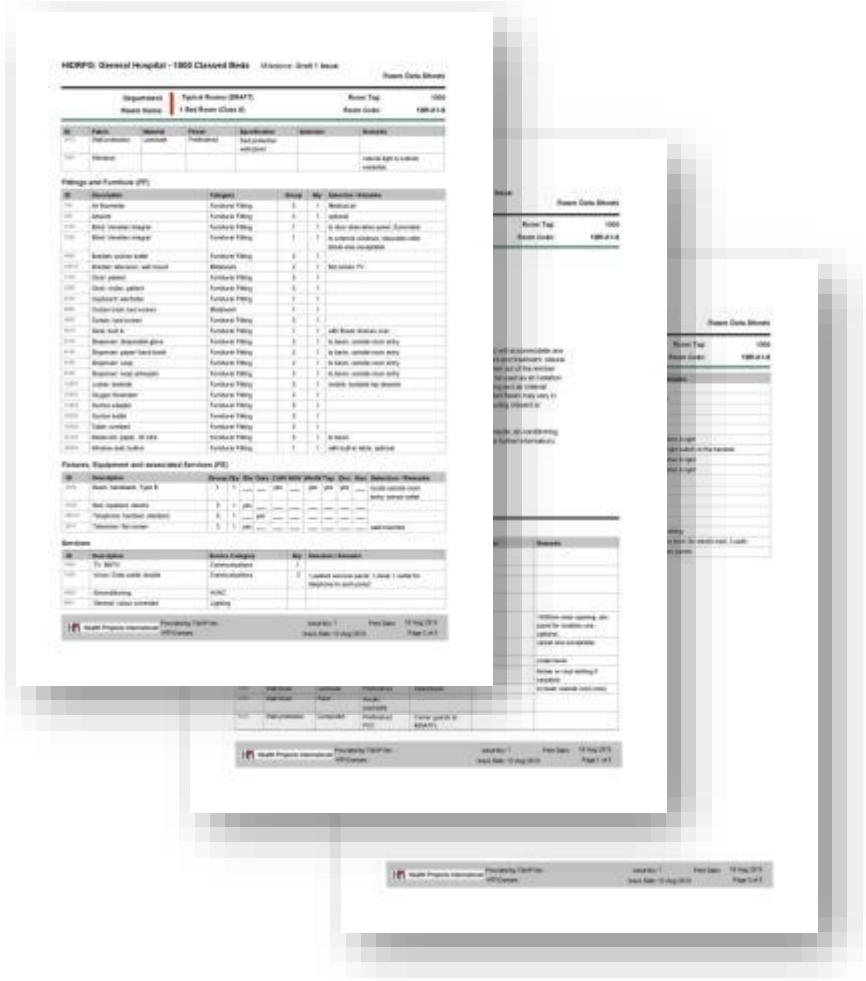
1:37 AM
100%
Current Project
Reference Project
Test Project for training - please do not rename
Milestone: Default
Australasian Standard Project
Milestone: 2008 AUSHFG Review
Add Dept
Add Room
Delete Room
Click and hold then drag to "My Project"
FPU Front of House Unit
FPU Hospital Morgue / Autopsy Unit
FPU Inpatient Accommodation Unit - RDL All
Room 1001 - 1 Bed Room
5
FPU Ambulatory Care Unit - 24 Spaces
Room 1003 - Toilet - Disabled
Room 1001 - Lobby/ Airlock
Room 1006 - 1 Bed Room (Class S Isolation)
1
Fabric Menu Items
Type in your filter keyword
ID
Fabric
Finish
Material
Specification
9889
Ceiling
Acoustic
Prefinished
Acrylic
9882
Drag + Drop
9881
Doors
Solid Core
Paint
1 1/2 leaf
9822
Ceiling
Acoustic
Prefinished
Acrylic
9821
Skirting
Vinyl
Prefinished
150mmH, coved
Menu
Occupancy
1 patient; 1-2 staff; 1-2 visitors
Remarks
FPU - mix and no. depend on service demand.
Description / Special Requirements
A 1 Bed Room will accommodate one patient for the delivery of nursing and medical care and treatment; natural light and
Amendment
Save
Information
Fabric
FF
FE
Services

Room Data Sheets (RDS)

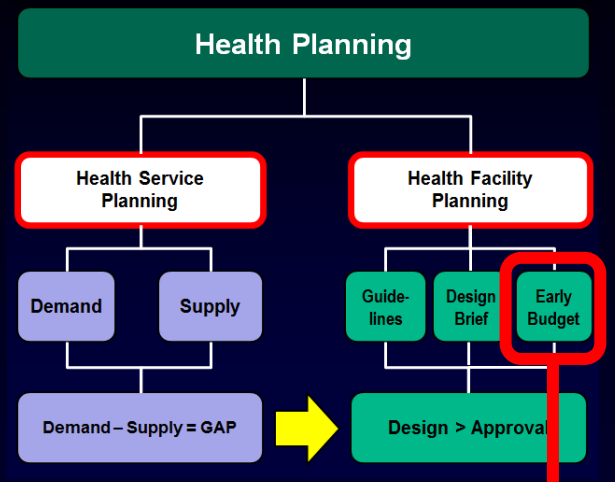


Key Information Captured

Primary Information:
Room Type Code
Room Name
Room Area
Special Requirements

Outline Specs:
Building Fabric and Finishes
Furniture and Fittings
Fixtures and Equipment
Building Services and Outlets

Soft Modular



Early Budgeting

Use the Briefing Information with or without design:

- FPU's and SOA
- Adjust for RDL
- Adjust for Level of Refurbishment
- Adjust for Locality Factor
- Apply unit rates and calculate cost

HFBS 5 Project Budget Module

[Project] RDL 4 District Hospital [Project] > PDP

Proj. Info | Contract Info | Proj. Program | Dept. Cost Rates | Costing Templates | Proj. Specific Cost | Proj. Summary

Departments (HPU's) & Cost Rates

Calculated Cost Rates as % of Domain or Project Cost Rate $ [Set to Default]

Cost Category	Category Description	% of Domain or Project Cost Rate
NEW	New Work	100
MAJR	Major Refurbishment	75
MEDR	Medium Refurbishment	50
MINR	Minor Refurbishment	20
NONE	No Work	

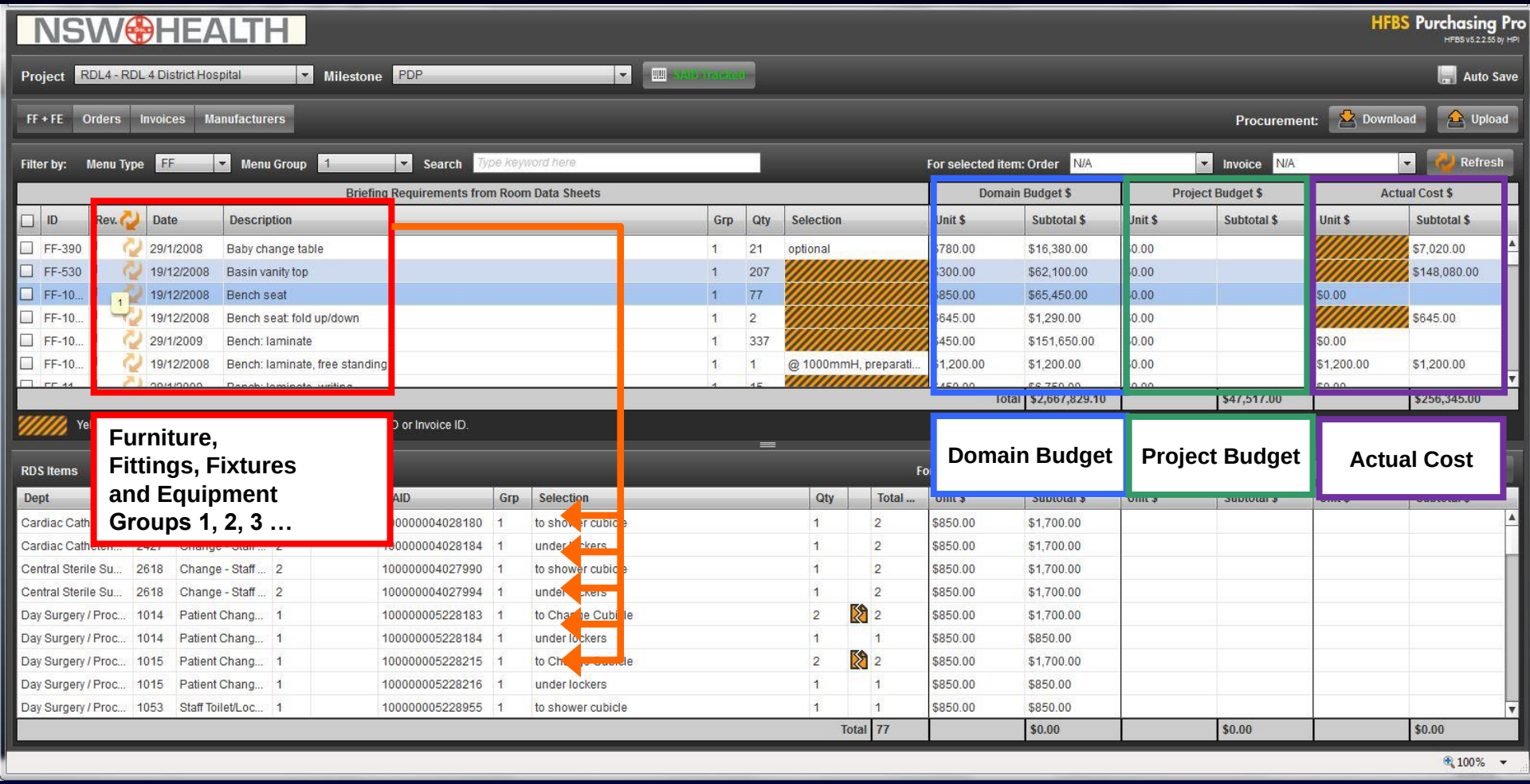
Automated calculation of building budget based on HFBS briefing data and FPU cost rates

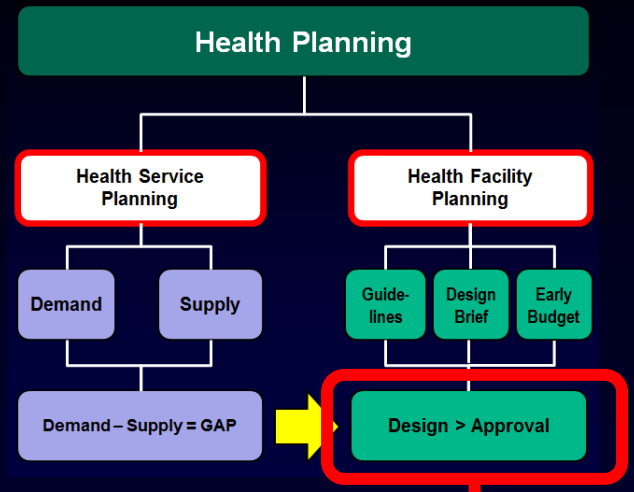
Departmental Cost Rates + New / Refurbishment Area %

Name	Code	Domain Cost Rate $	RDL	Project Cost Rate $	Gross Area	NEW %	MAJR %	MEDR %	MINR %	NONE %	Dept. Cost $
_Test Department for demonstration			N/A		337	100					0
Administration	EU	1,675	3-4	1,175	287	25	50	15	5	5	239,430
Adult Acute Mental Health Inpatient Unit	IAU	1,600	4	1,600	468	100					748,800
Ambulatory Care Unit	ACU	1,125	4	1,125	1,495	100					1,681,875
Cardiac Catheterisation Unit - L5			5		802	100					0
Catering Unit	CATERU	1,725	4	1,725	464	100					800,400
Central Sterile Supply Unit - L5			5		615	100					0
Child Care Unit	CCCU	1,125	N/A	1,125	4	100					4,500
Cleaning/ Housekeeping Unit	CLEANU	875	4	875	132	100					115,500
Coffee Shop	MEU	1,025	N/A	1,368	42	100					57,456
Community Health	CHU	1,125	4	1,125	831	100					934,875
Community Mental Health	CHU	1,125	4	1,125	345	100					388,125
Dental Unit	ACU	1,125	4	1,125	274	100					308,250
Education & Training Unit	EDU	1,100	4	1,100	337	100					370,700
Emergency Unit	EU	1,750	5	1,750	774	100					1,354,500
Engineering & Maintenance Unit	MAINTU	900	4	900	139	100					125,100

NCC Net Construction Cost	GCC Gross Construction Cost	TPC Total Project Cost	TEC Total End Cost
350,382,000 AED	350,382,000 AED	350,822,001 AED	350,822,001 AED

HFBS 5 Purchasing Module; get budget, determine FF&E cost





Planning and Design

What Standards ?

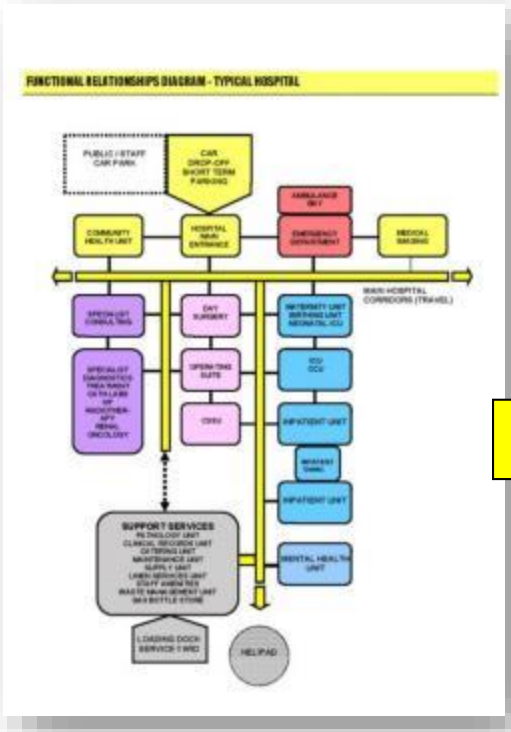
What Functional Relationships ?

What Spacial Configurations?

What finishes and materials?

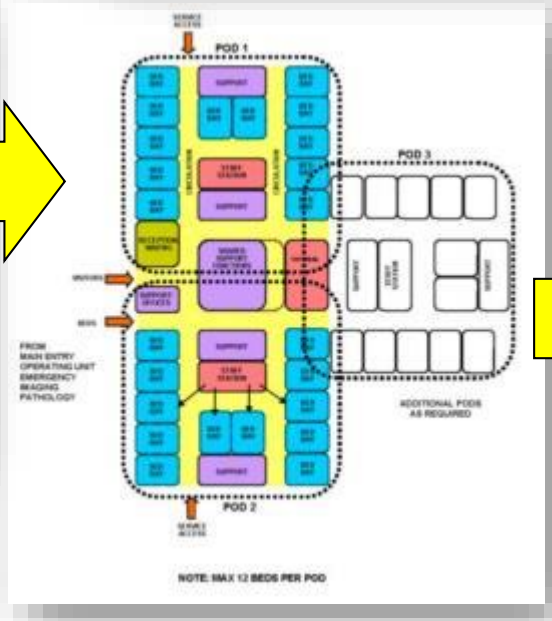
What building services?

Functional Relationship Diagrams (FRD)

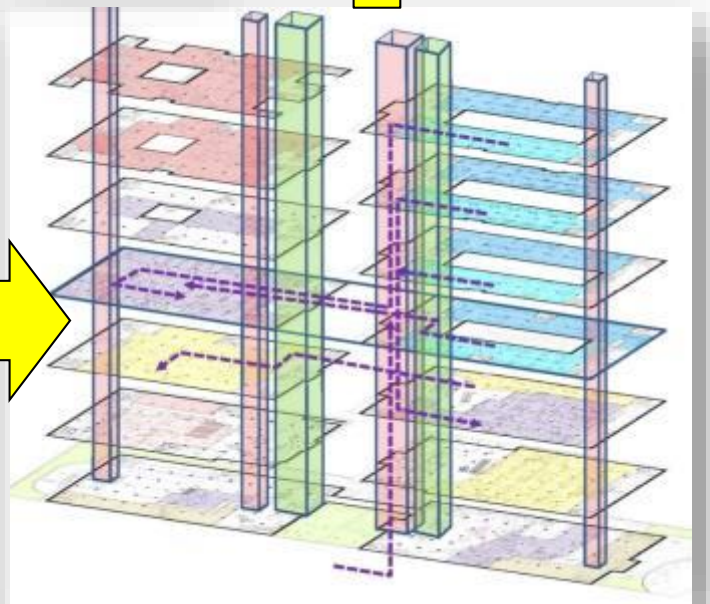


Whole Hospital
Global Relationships

Guide Architectural
Massing & Design

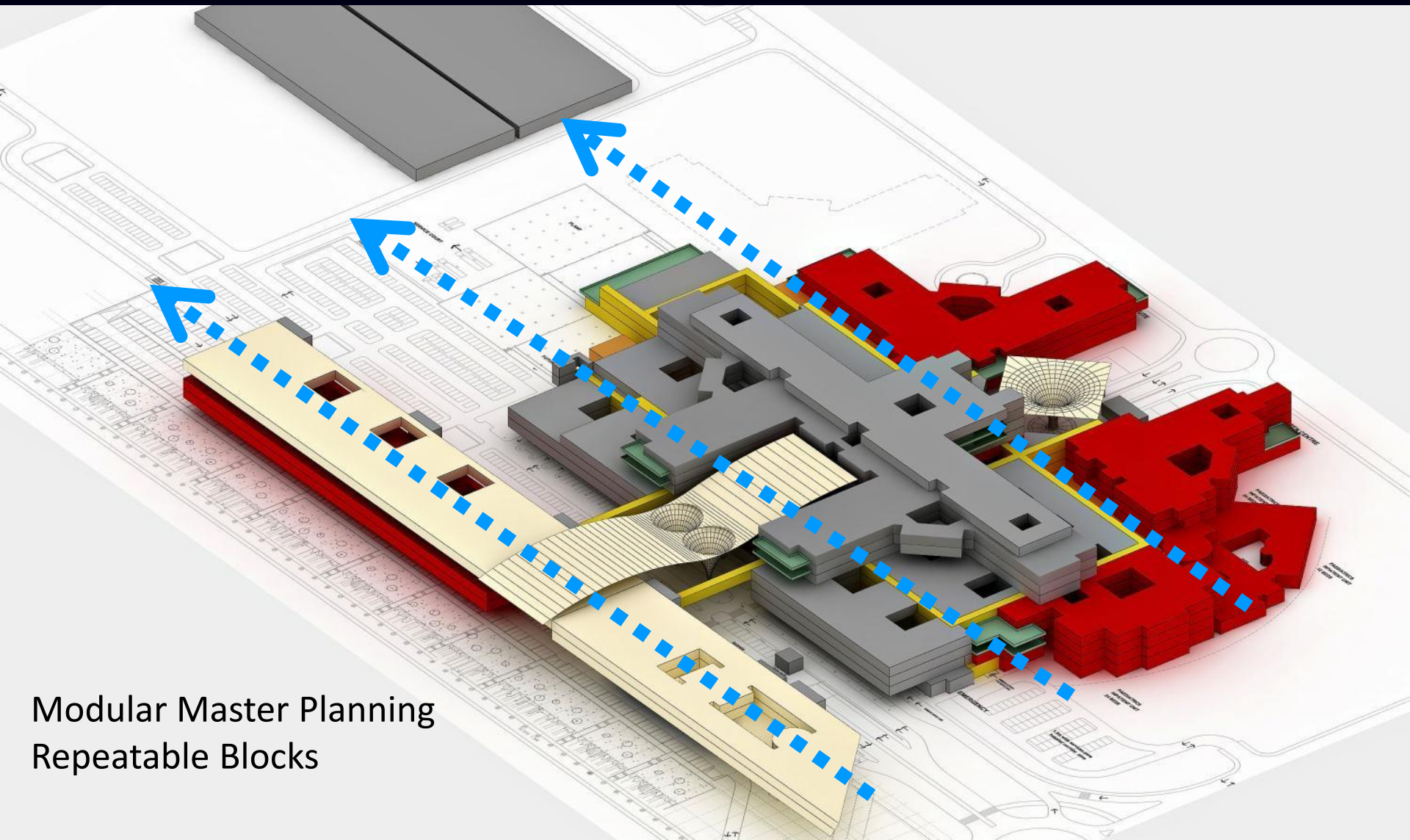


Each FPU
Functional Flows



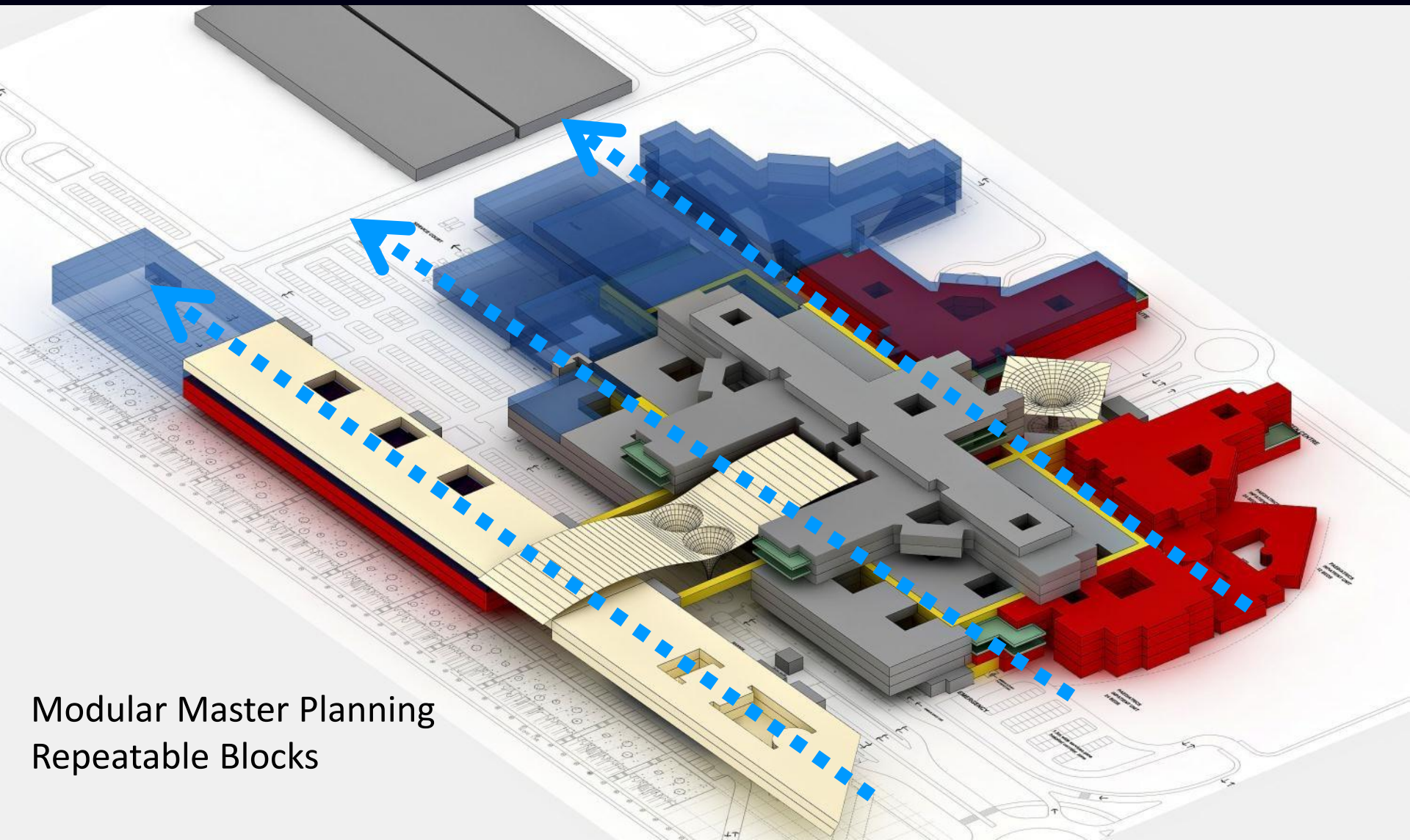
Blocking and
Stacking

Departmental Design Models



Modular Master Planning
Repeatable Blocks

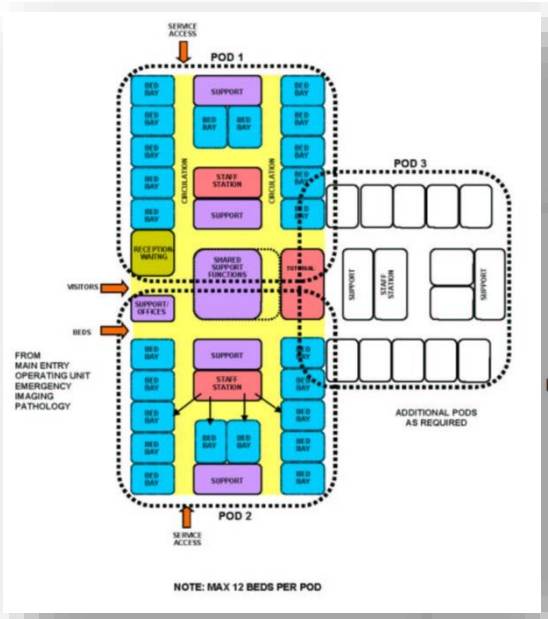
Departmental Design Models, Repeatable Blocks

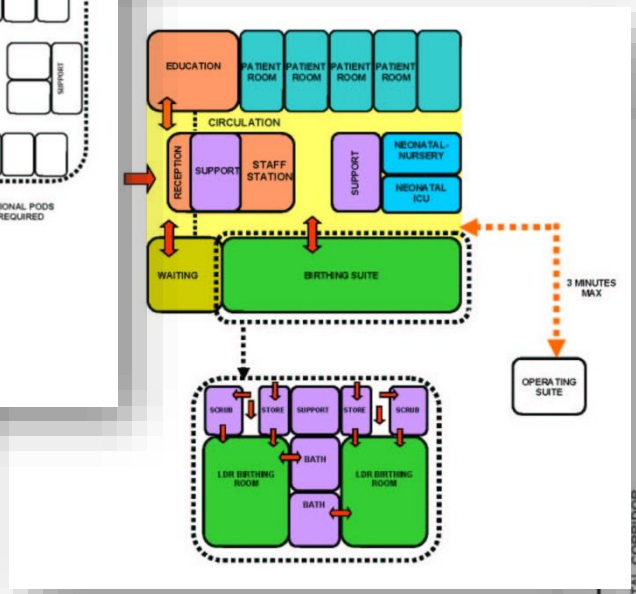


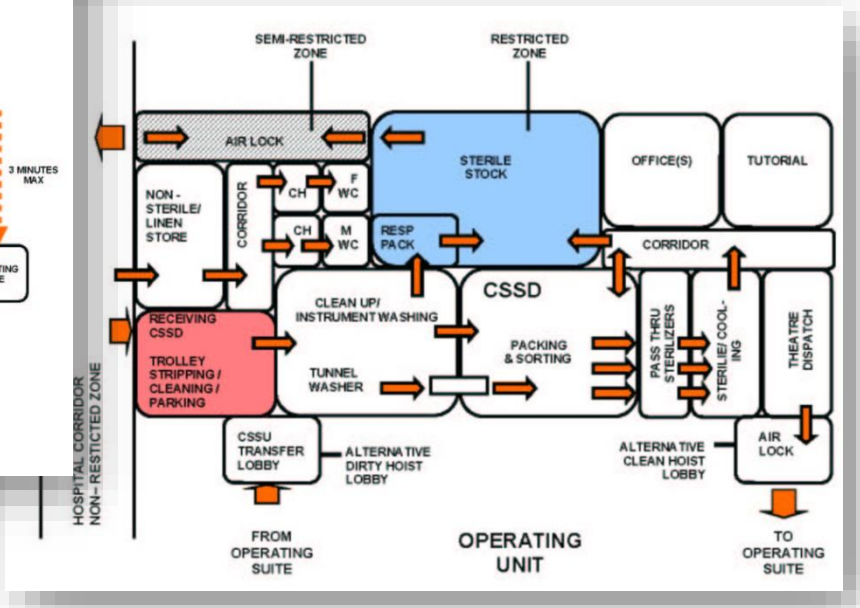
Modular Master Planning
Repeatable Blocks

Departmental Design Models

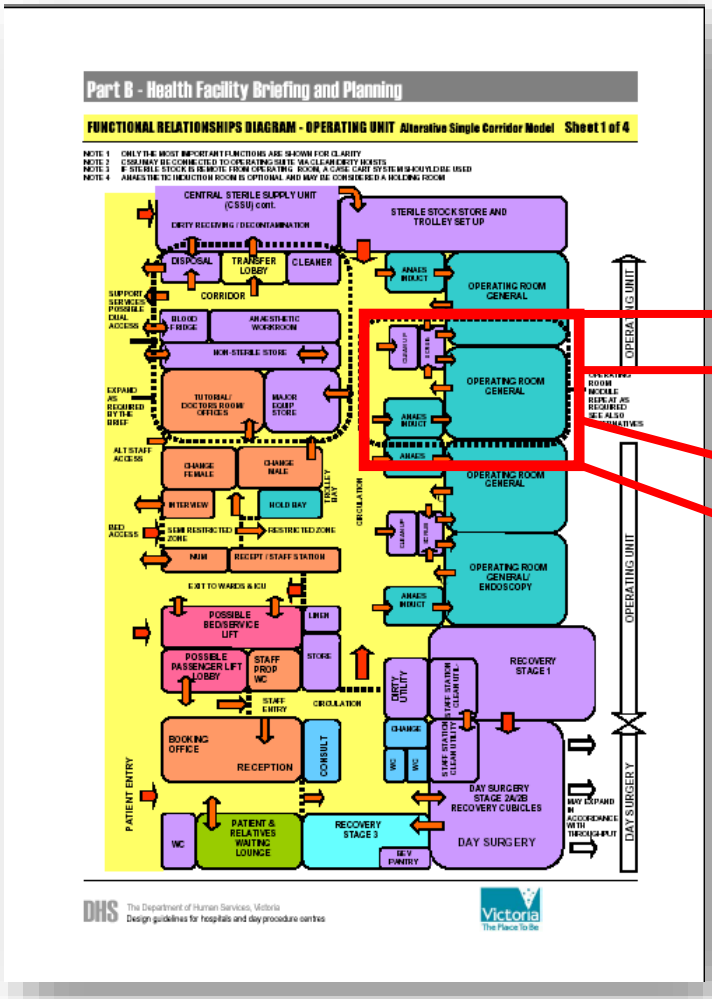
Departmental Design Models

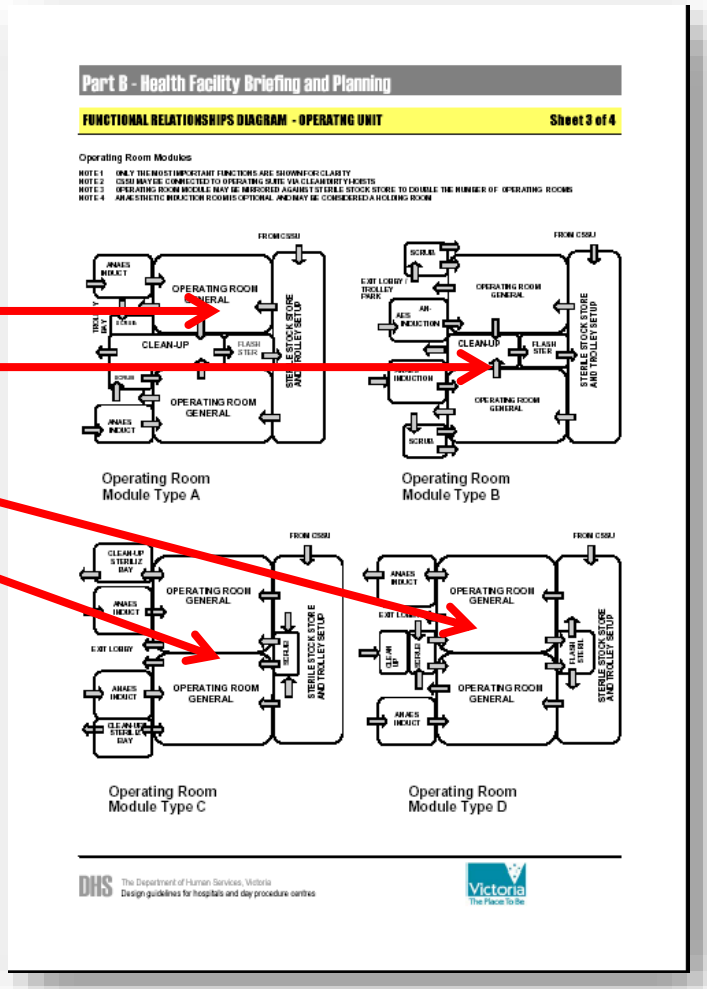






Departmental Design Models





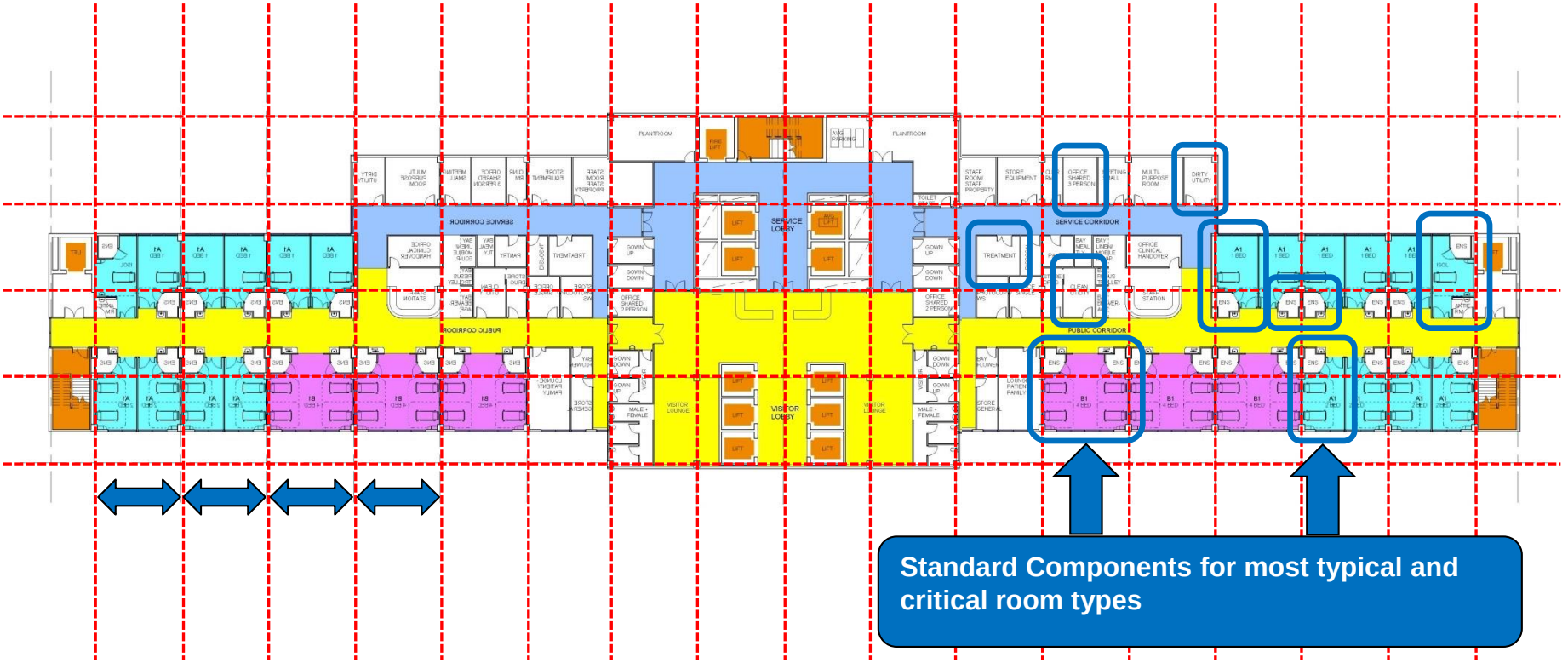
Modular Plans – **Plug and Play**

Soft Modular

Modular Plans – **Plug and Play**

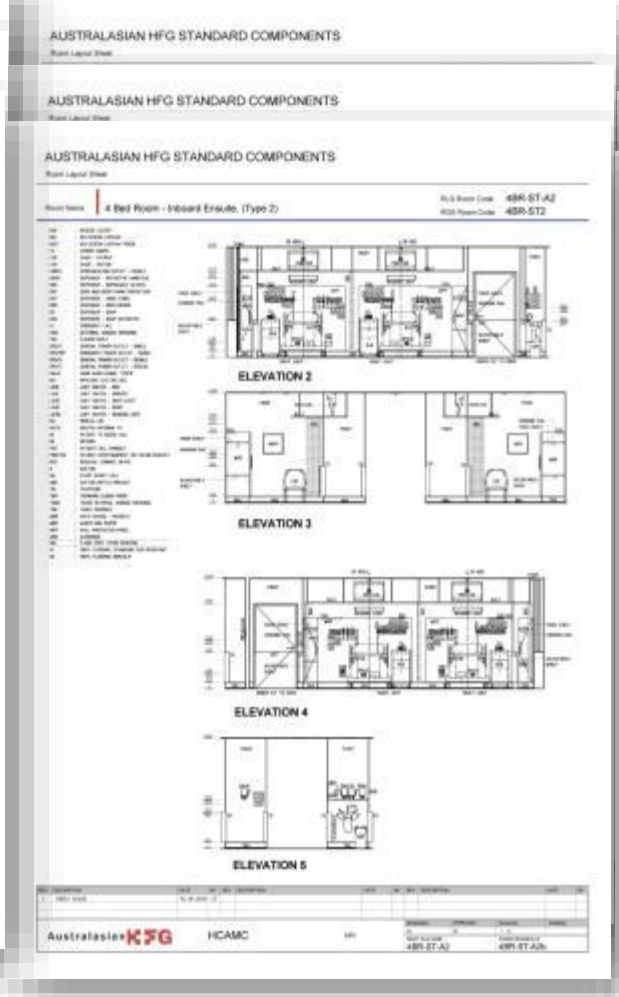
Modular Plans – **Plug and Play**

Modular Plans – **Plug and Play**

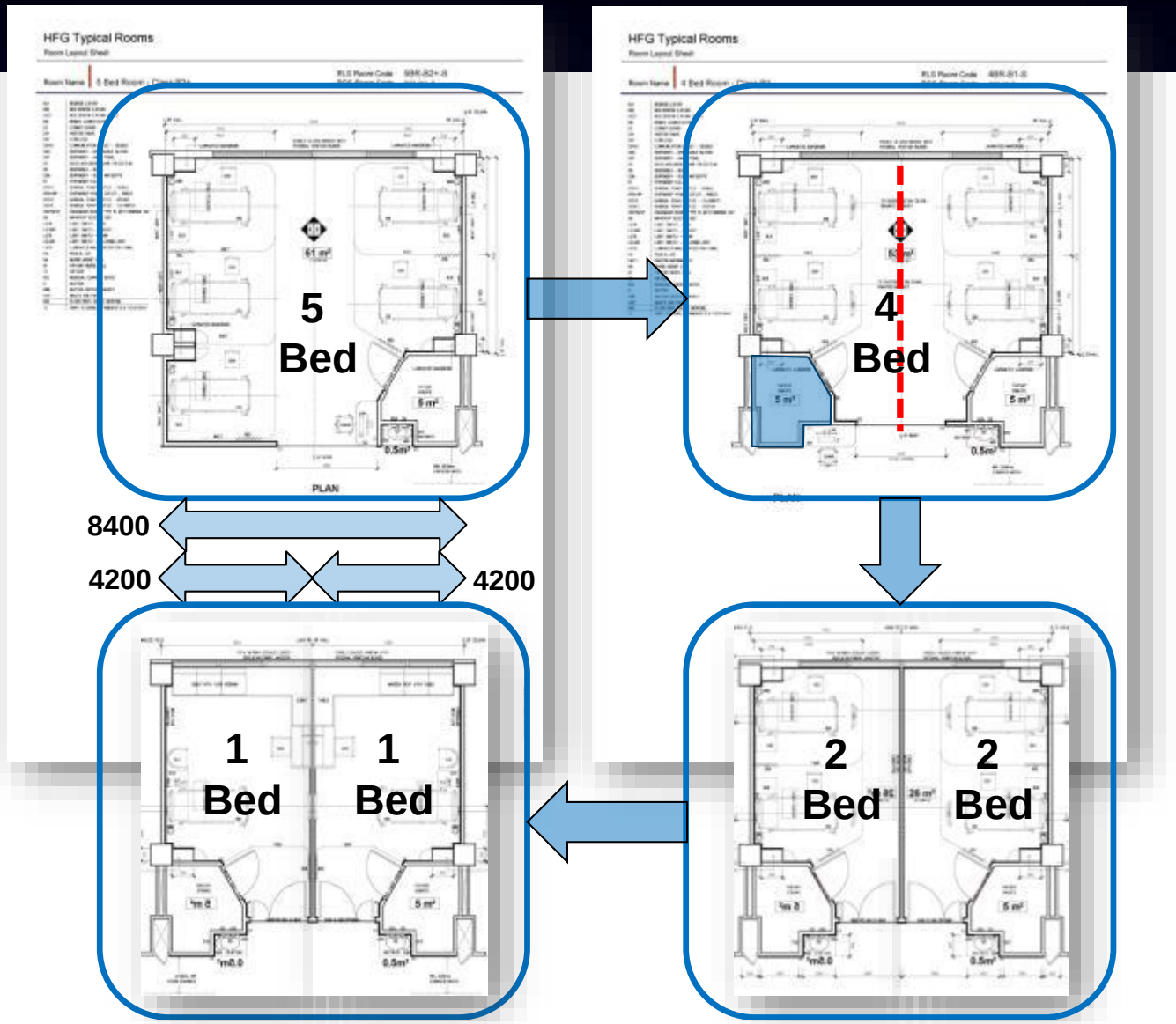


Room Layout Sheets (RLS), eg bedrooms

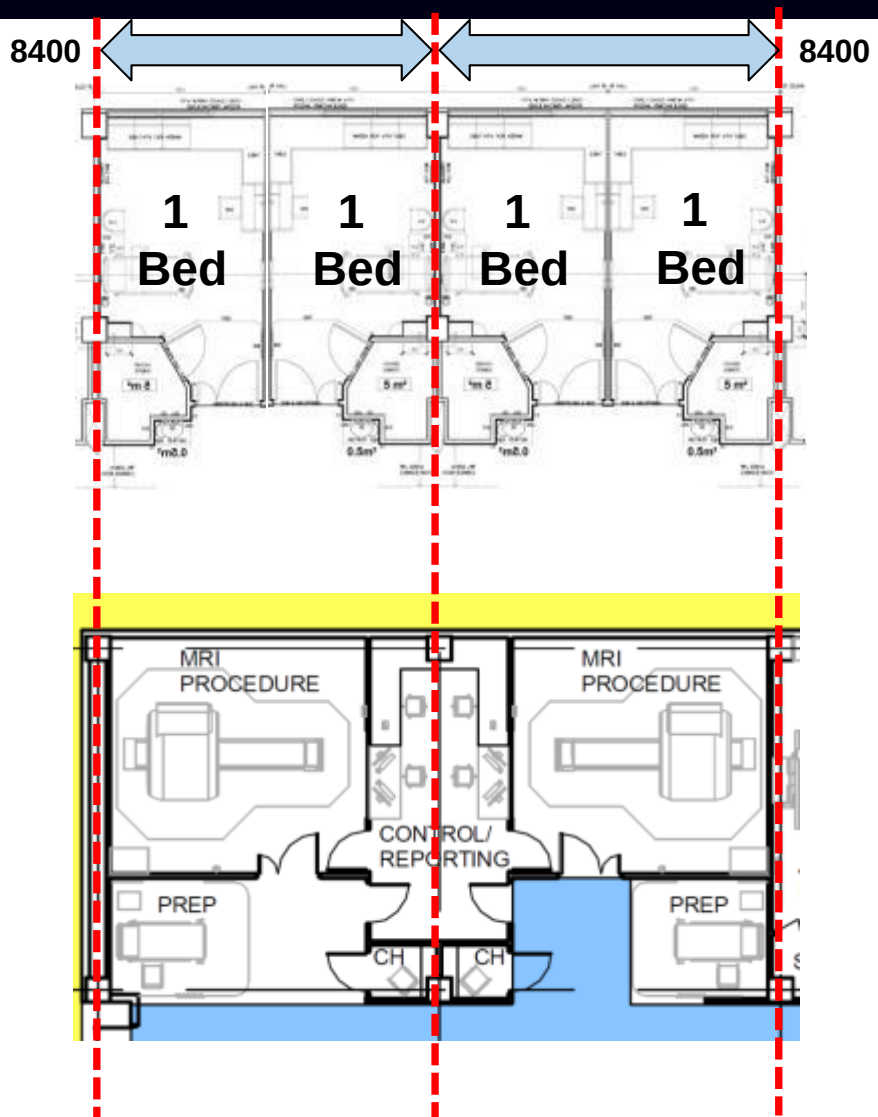
These represent “Deemed to Satisfy” or DTS



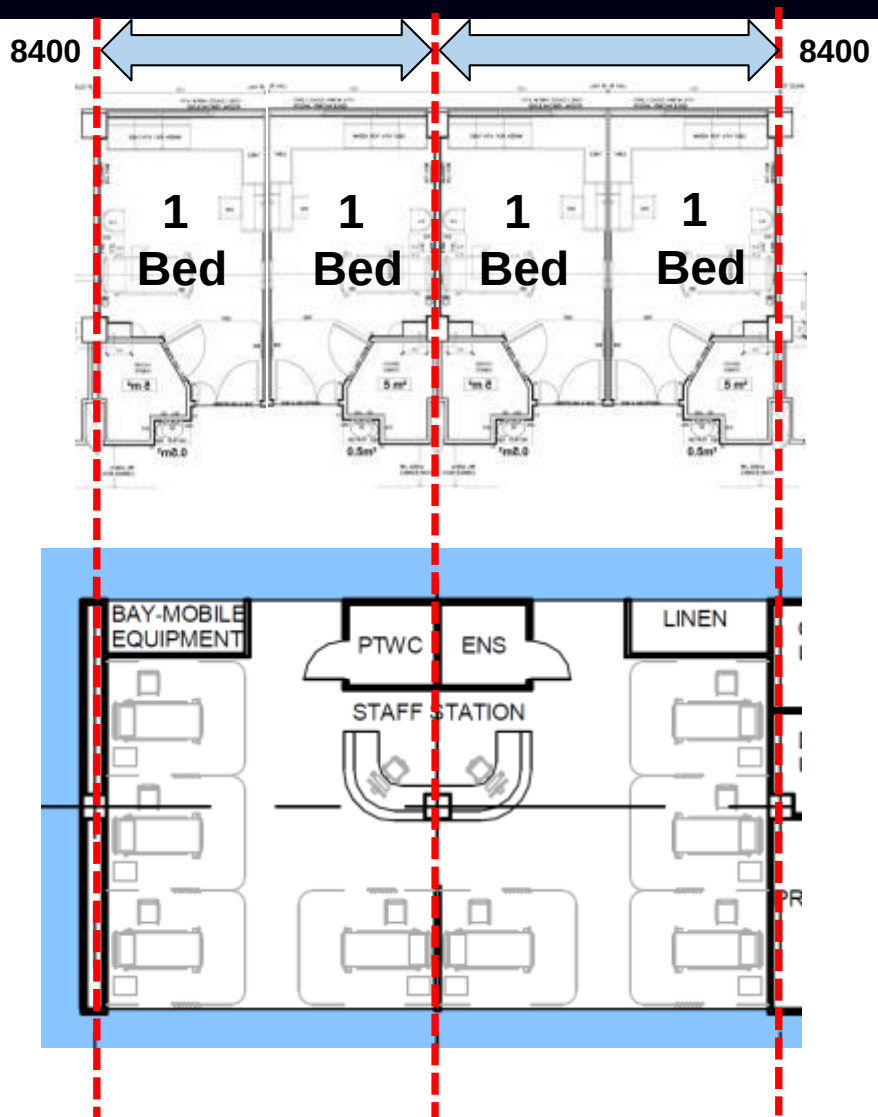
Future Proofing and Flexibility from 5/6 beds >> to 1 bed



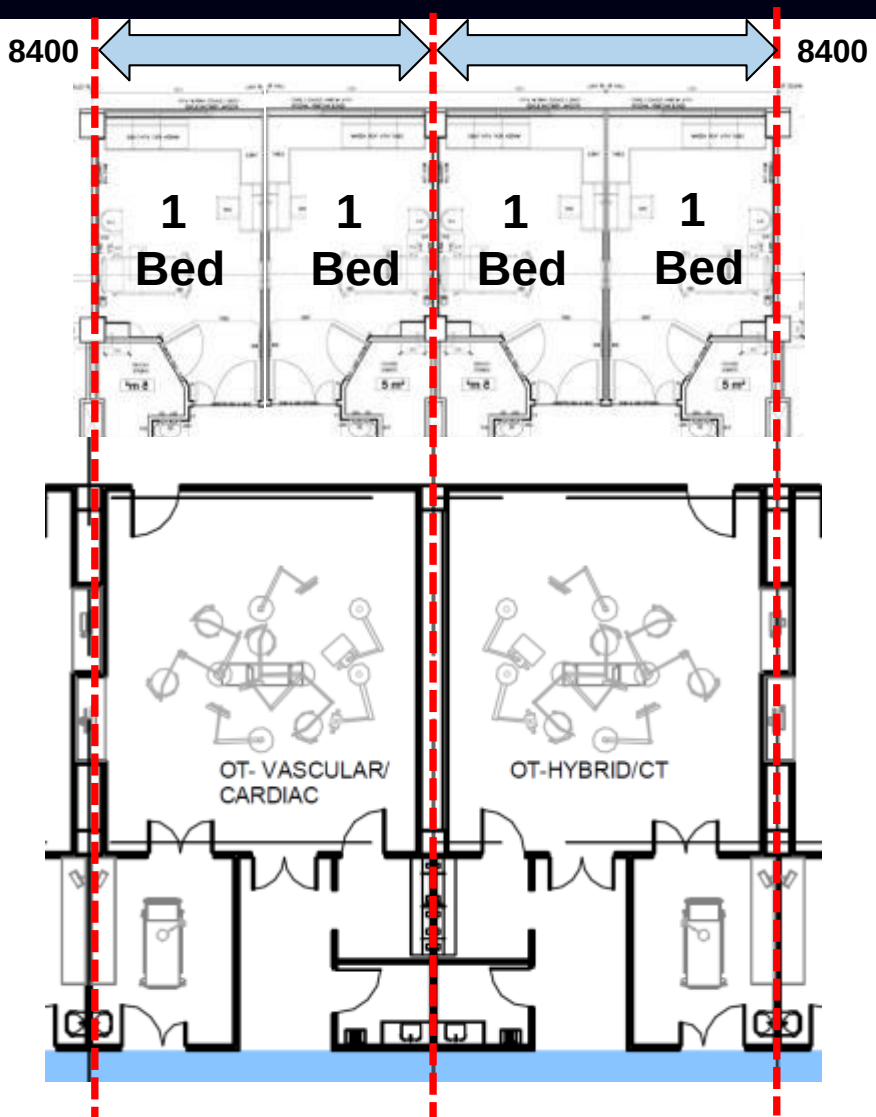
Test the grid against other Standard Components



Test the grid against other Standard Components

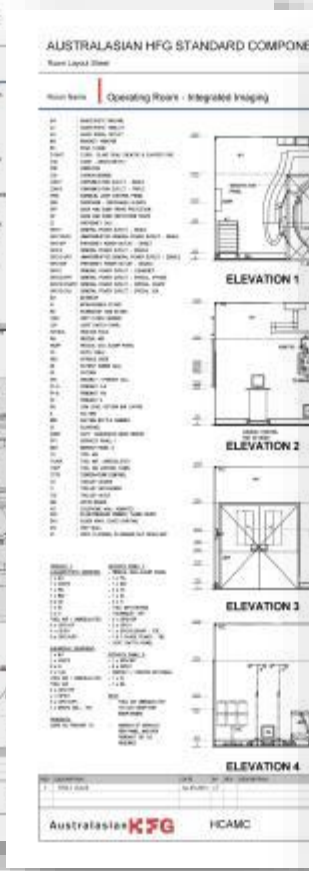


Test the grid against other Standard Components

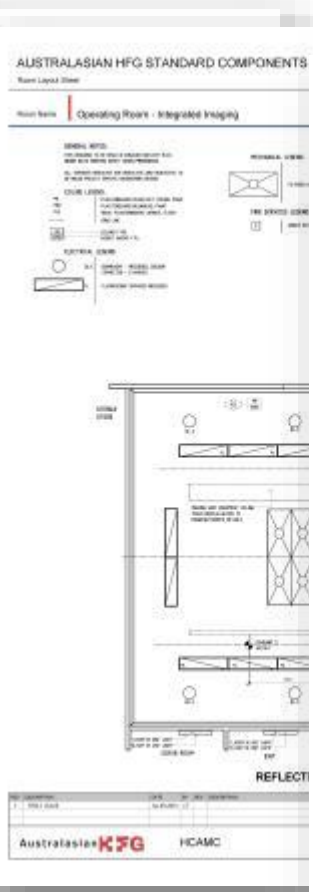


Ready to Use Modular RLS – Typical elements included

Plans



Elevations

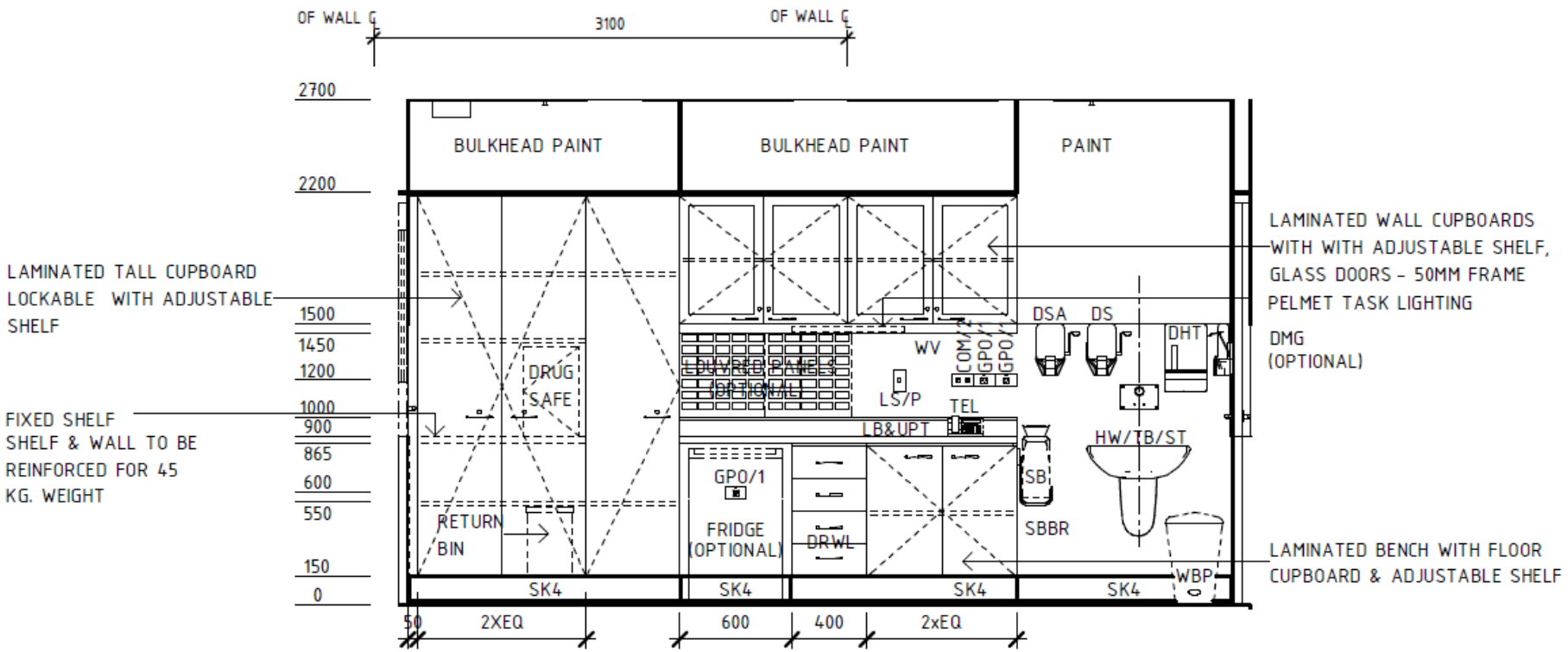


RCP

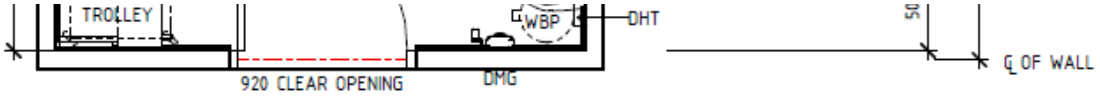
Axonometrics

Rendered 3D

Ready to Use Modular RLS – High level of resolution

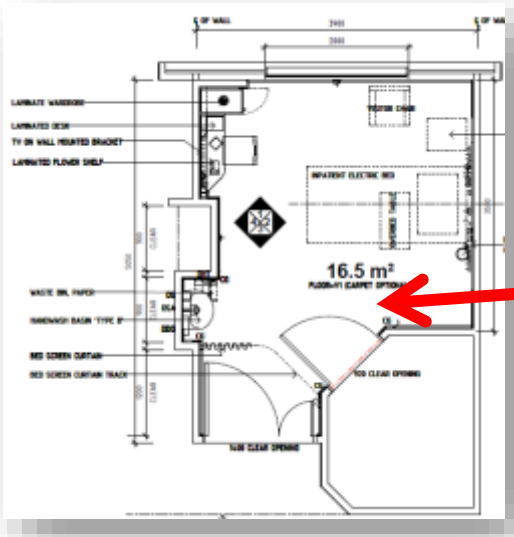


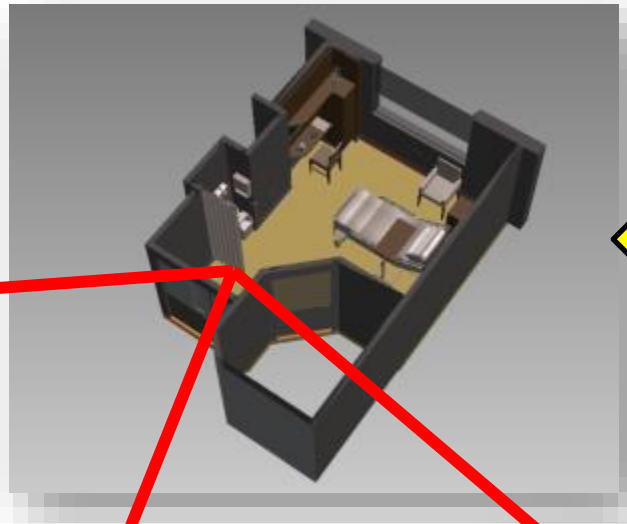
ELEVATION 2



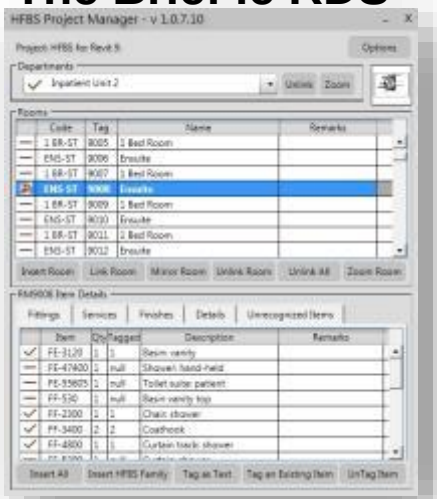
PLAN

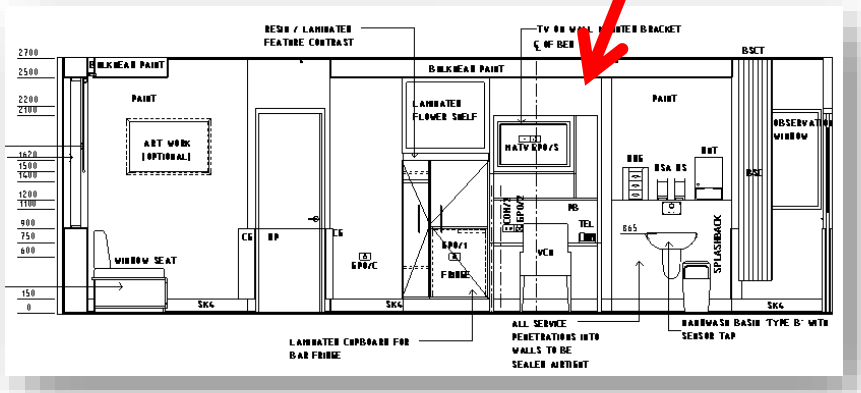
Brief > Single Model > HFBS for Revit



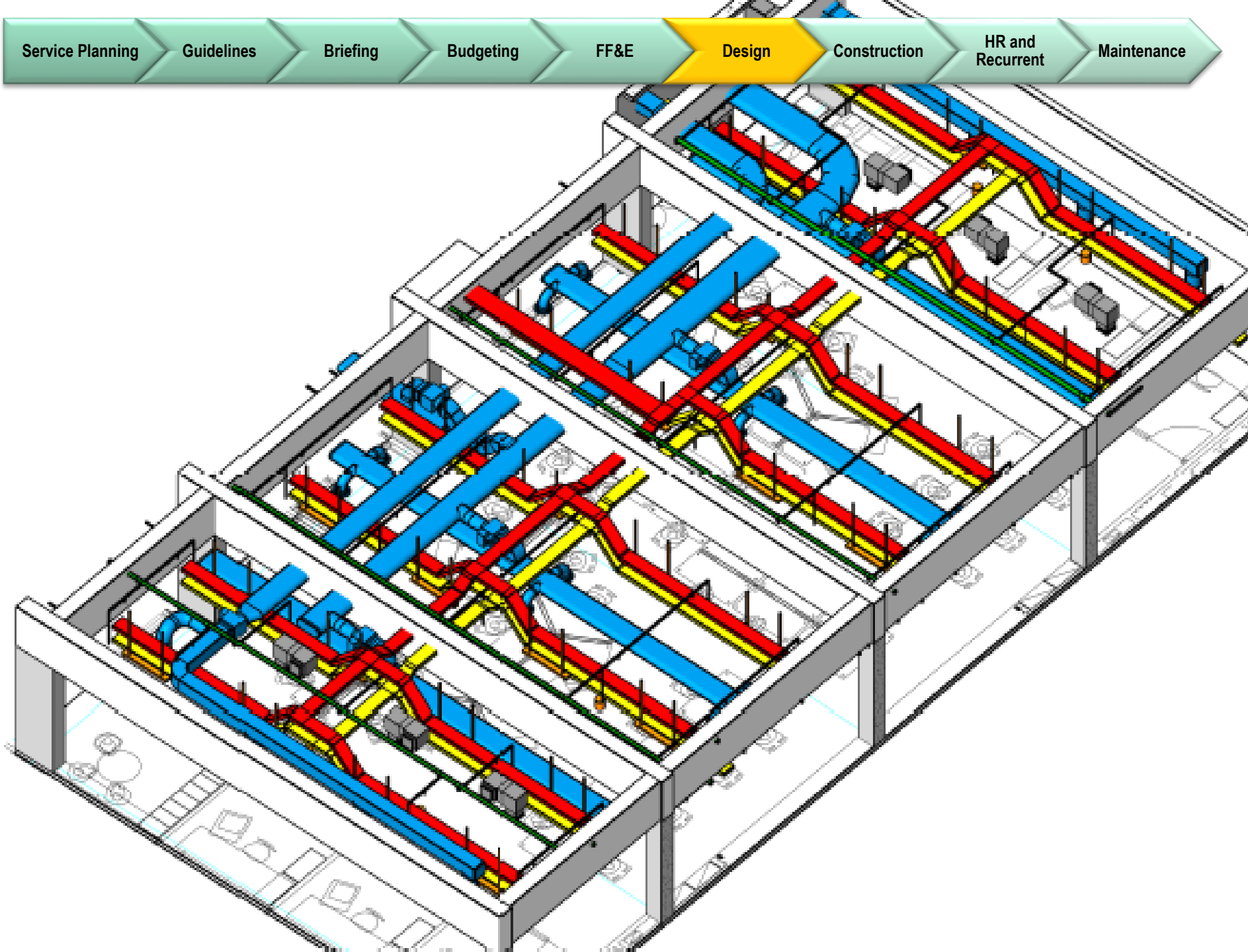


The Brief ie RDS





Service Planning | Guidelines | Briefing | Budgeting | FF&E | **Design** | Construction | HR and Recurrent | Maintenance



Design for Prefabrication

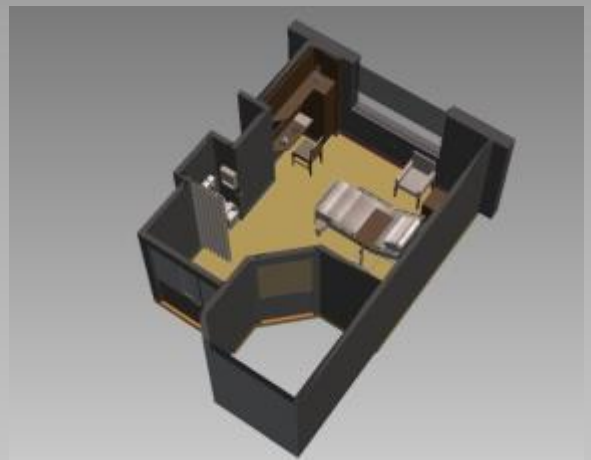
Create a catalogue of options, continually innovate + improve

1 br-is-n-18-i

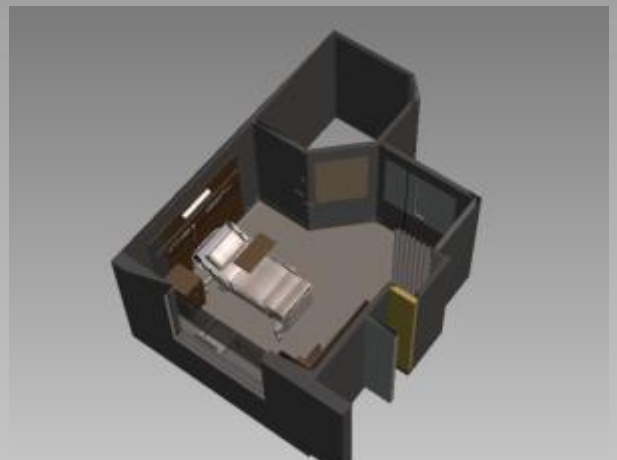
1 br-lg-28-i-a1

1 br-lg-28-i-b1

1br-st-16-i-a

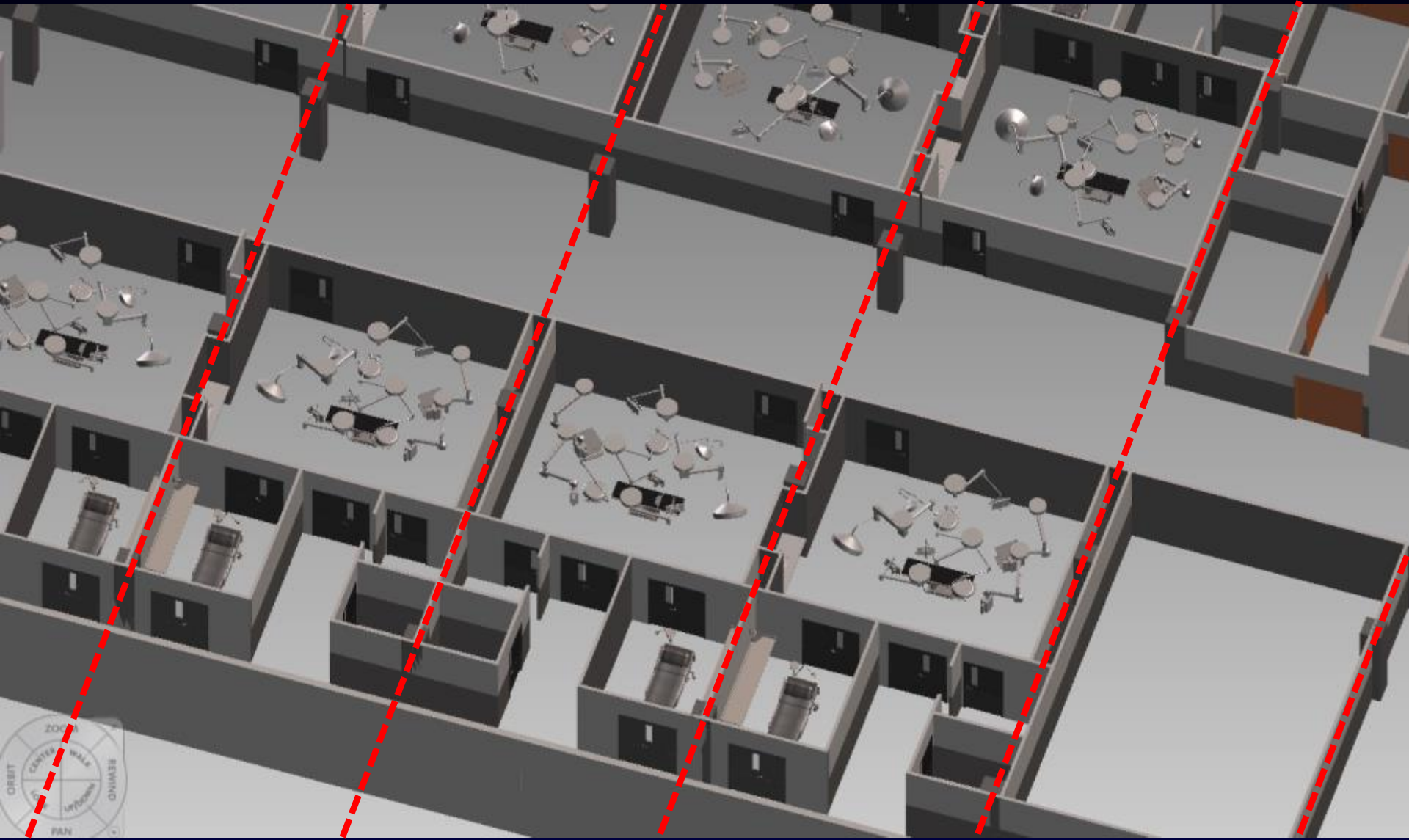


1br-st-16-i-b

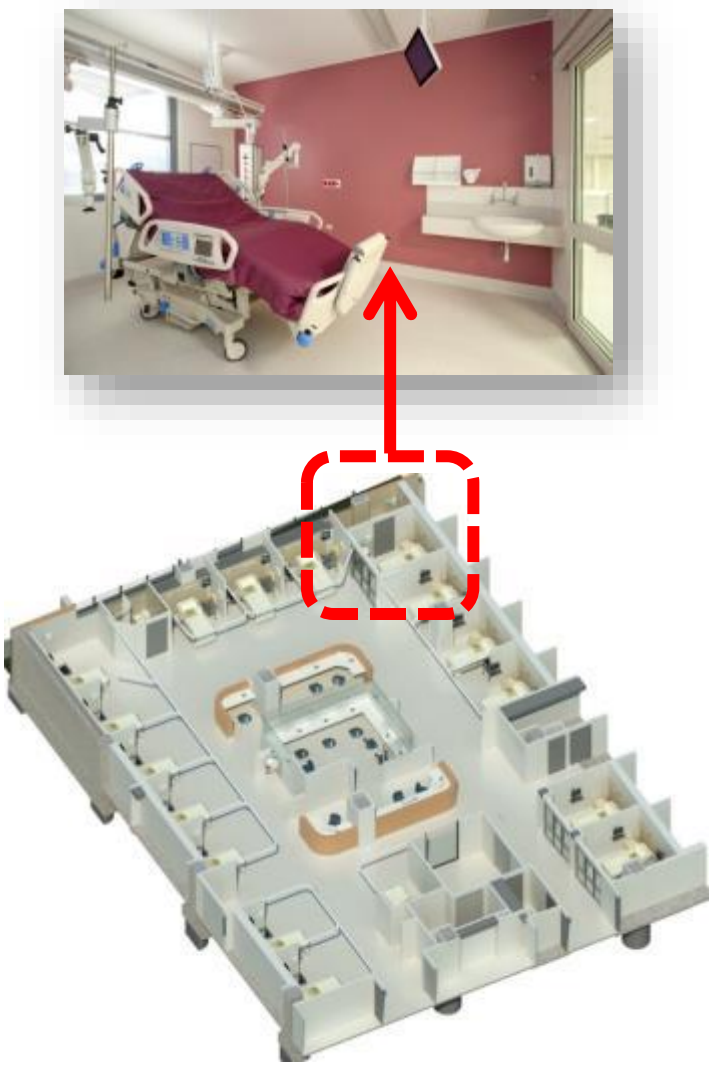


1br-st-16-i-c

Assemble the Standard Components as “Proof of Concept”



HFBS 5 Planning model based on Standard Components



Mock-ups/ Prototypes – do it, then share it

Video removed
Due to size restrictions

Mock-up in the virtual world, then share it

Video removed
Due to size restrictions

HFBS 5 + BIM generated Room Layout Sheets + 3D views

iHFG Standard Components

Room Layout Sheet

Room Name | 1 Bed Room - Standard, 16.5m2 (Inboard Ensuit)

RLS Room Code 1 BR-ST-16-I-B
RDS Room Code 1 BR-ST-16-I-B

PERSPECTIVE VIEW 01

PERSPECTIVE VIEW 02

iHFG International Health Facility Guidelines

This document is for advisory purpose only

iHFG Standard Components

Room Layout Sheet

Room Name | 1 Bed Room - Standard, 16.5m2 (Inboard Ensuit)

RLS Room Code 1 BR-ST-16-I-B
RDS Room Code 1 BR-ST-16-I-B

PERSPECTIVE VIEW 03

Full information package:

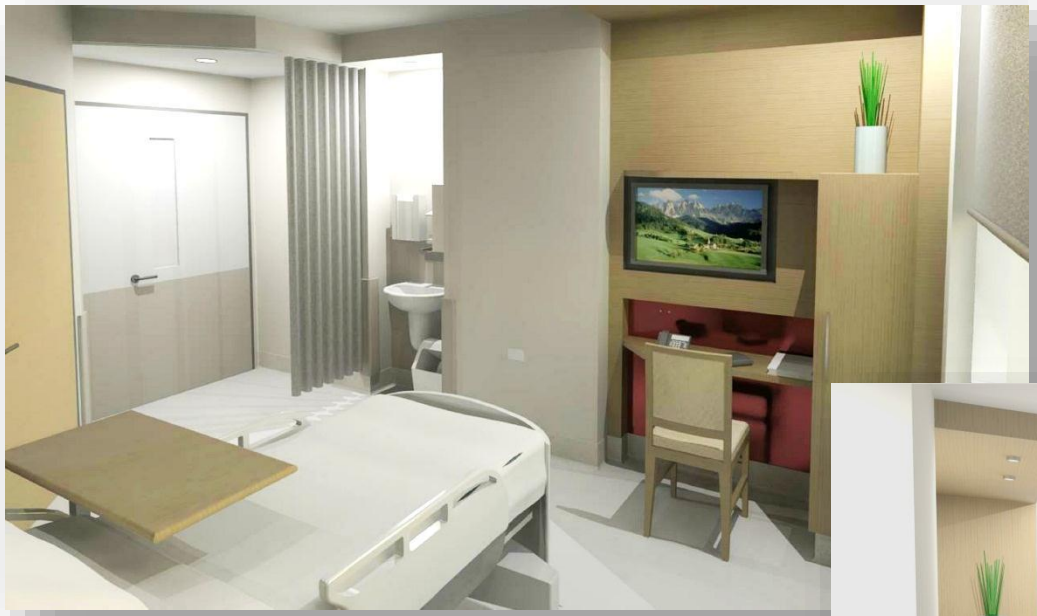
- **Easy to understand**
- **Based on 3D modelling**
- **Includes RCP**

iHFG International Health Facility Guidelines

This document is for advisory purpose only

Standards-compliant Room Modules for 8400 grid

Standards-compliant Room Modules for 7800 grid

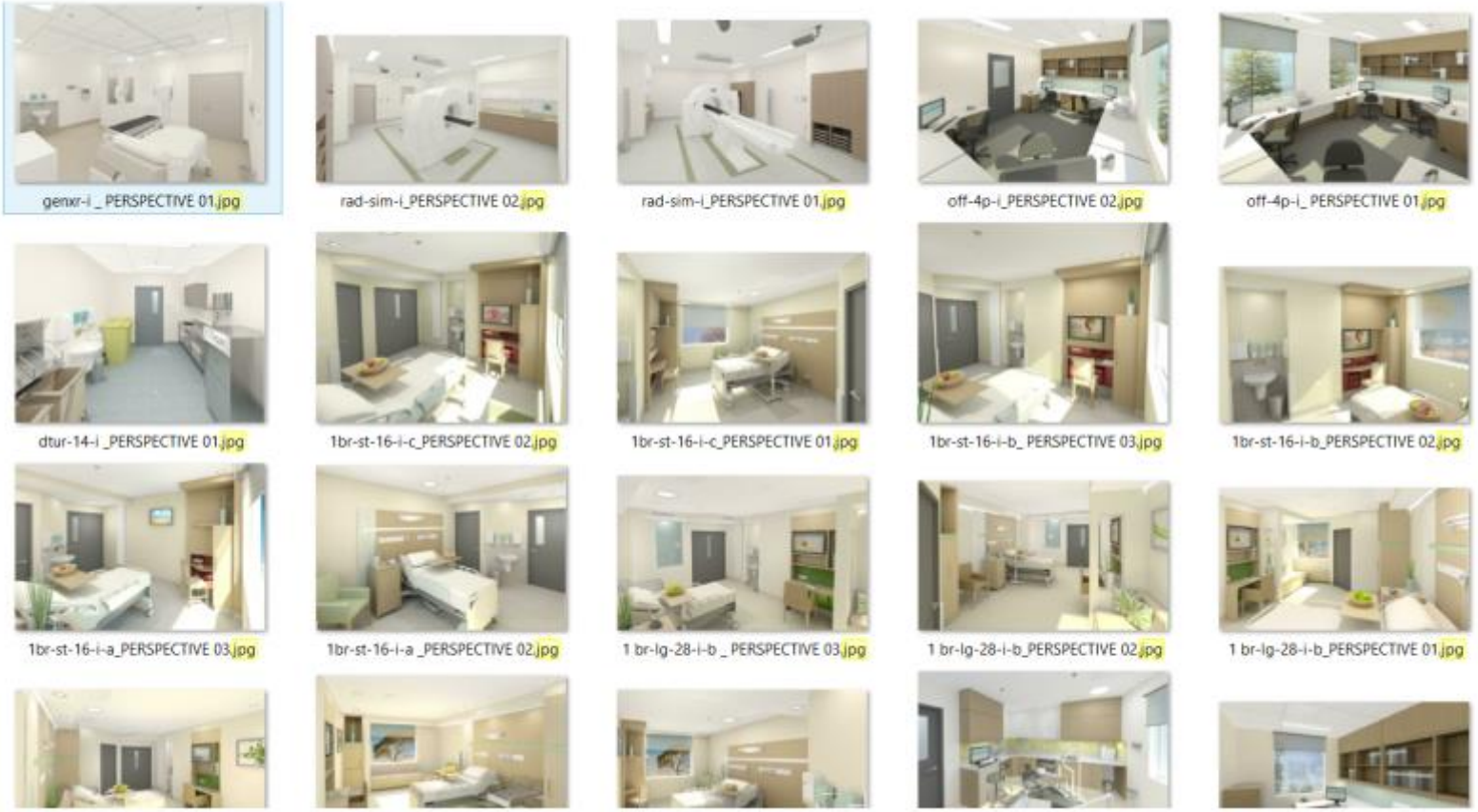


Standards-compliant Room Modules for 7200 grid

Standards-compliant Room Modules for special use

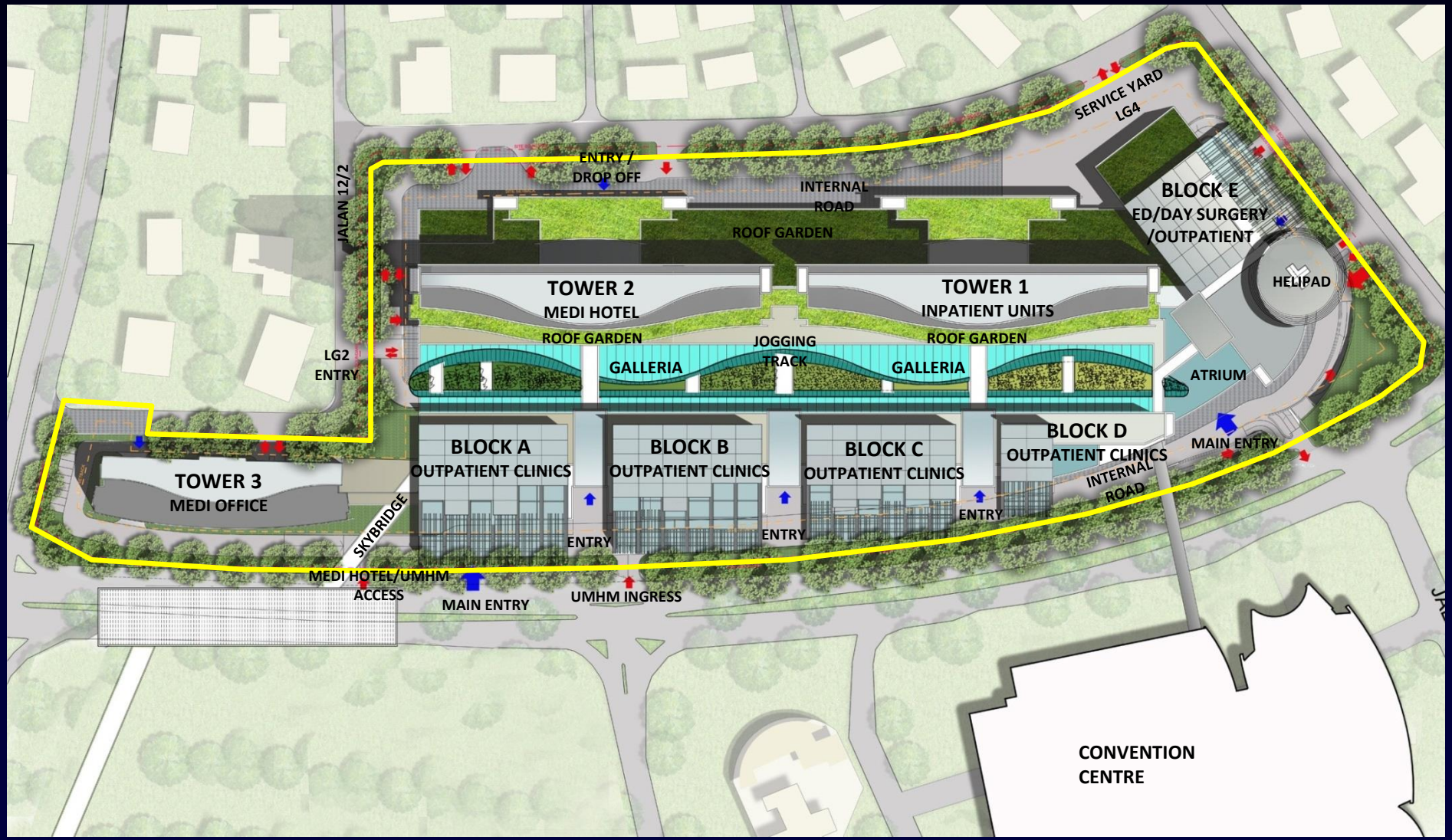
Standards-compliant Room Modules for special room types

A catalogue of virtual prototypes



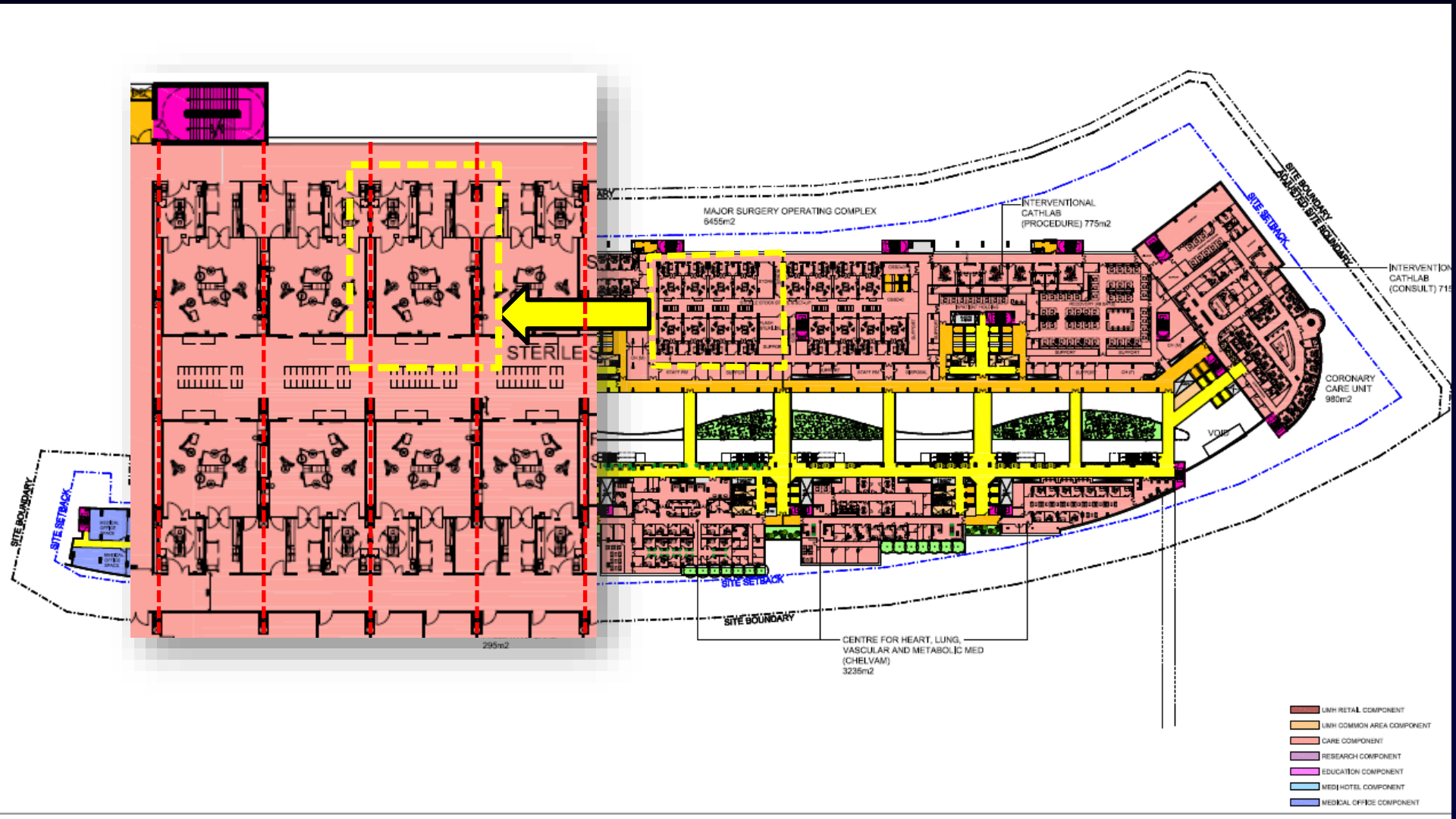
- 1 Bed Standard
- 1 Bed Mental Health
- 1 Bed VIP
- 2 Bed Standard
- Clean Utility
- Discharge Lounge
- Dirty Utility 10
- Dirty Utility 12
- Ensuite Standard
- ICU
- ICU1
- Induction Rm
- LDR Birthing Room
- Nursery
- Office Consult
- Office Standard
- Operating Rm
- Operating Rm 1
- Recovery Stage 1
- Recovery Stage 2
- Staff Station 9
- Staff Station 25
- Waiting 46

Modular Design does not mean lack of innovation or small buildings
Buildings of any complexity or variety can benefit from Modular Approach



Modular Design does not mean lack of innovation or small buildings

It means Innovation at an **Industrial Scale** for any size building



Service Planning | Guidelines | Briefing | Budgeting | FF&E | Design | **Construction** | HR and Recurrent | Maintenance

Prefab and Modular available at every level and scale ….

Custom Clinical Service Planning Module

Choose elements from a factory showroom

KEF-TAHPI Showroom in Dubai

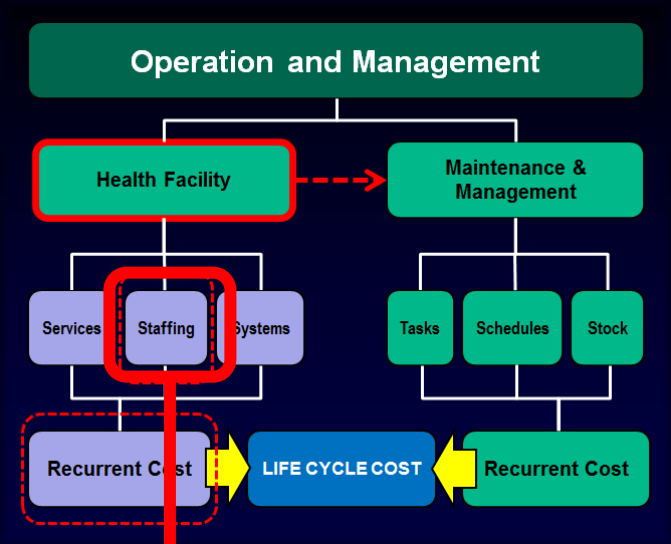
Patient bedroom build in the factory

Patient bedroom build in the factory

Patient ensuite bathroom built in the factory

Example of fully prefabricated hospital

Recurrent Cost Planning (running cost)



Recurrent Cost Planning

- Human Resources
- Goods & Services

Recurrent Cost Planning

HR (Employment) Costs

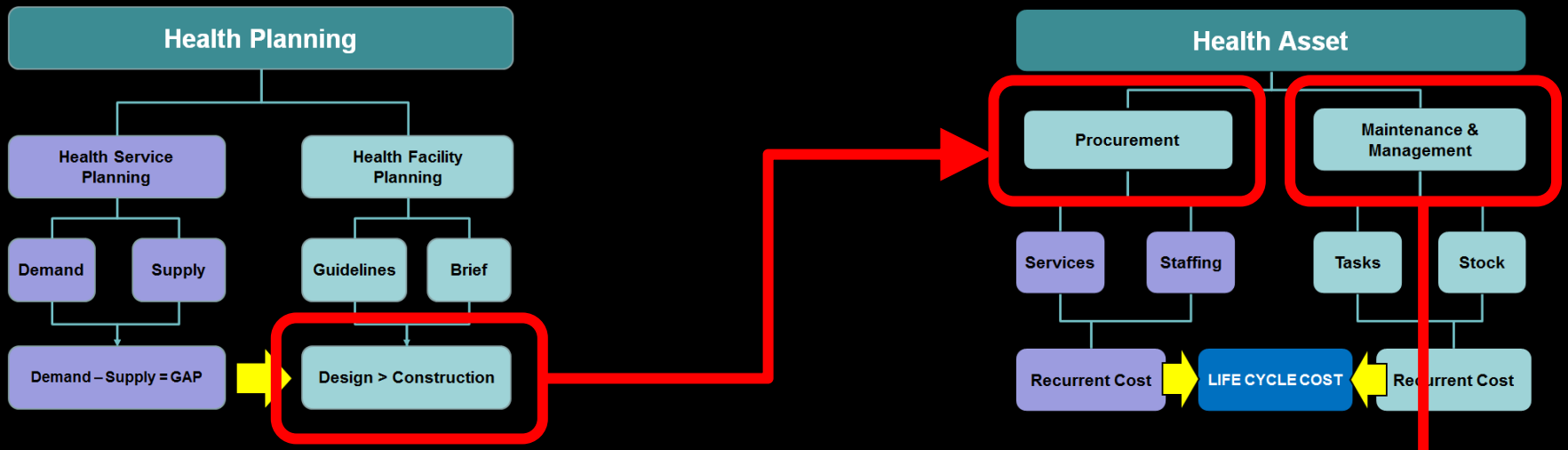
- Calculate Optimum Staff FTE's per FPU
- Apply employment cost rates per Employment Type
- Add all the on-costs and escalate
- Arrive at TOTAL EMPLOYMENT COSTS

Goods and Services Costs (G&S)

- Use HFBS benchmarks to apply G&S costs
- Apply other recurrent costs
- Apply periodical renewals

Recurrent Cost = Employment $ + G&S $

Service Planning | Guidelines | Briefing | Budgeting | FF&E | Design | Construction | HR and Recurrent | Maintenance



Maintenance + Manag't

Property Information

Asset Information

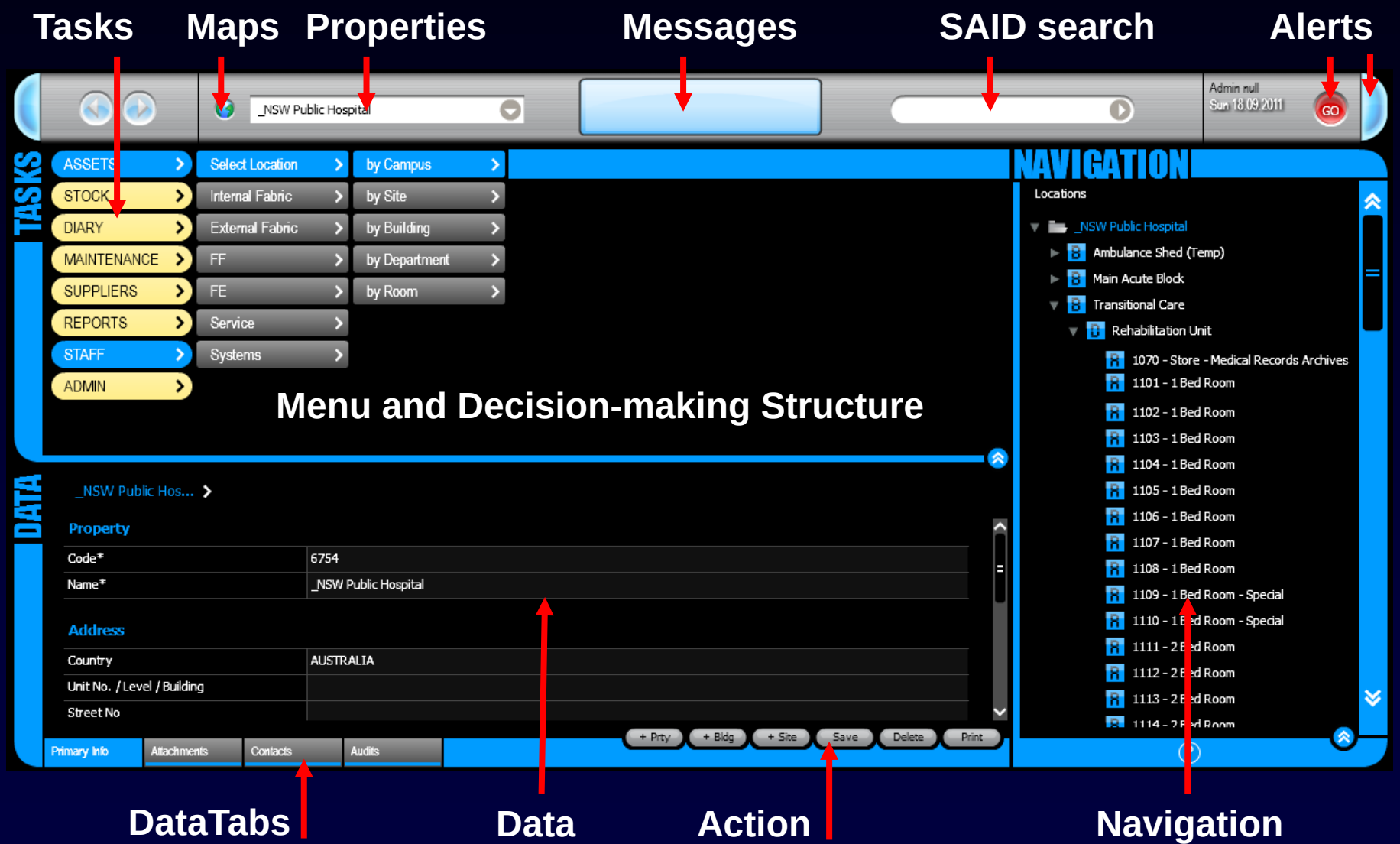
Asset Tracking

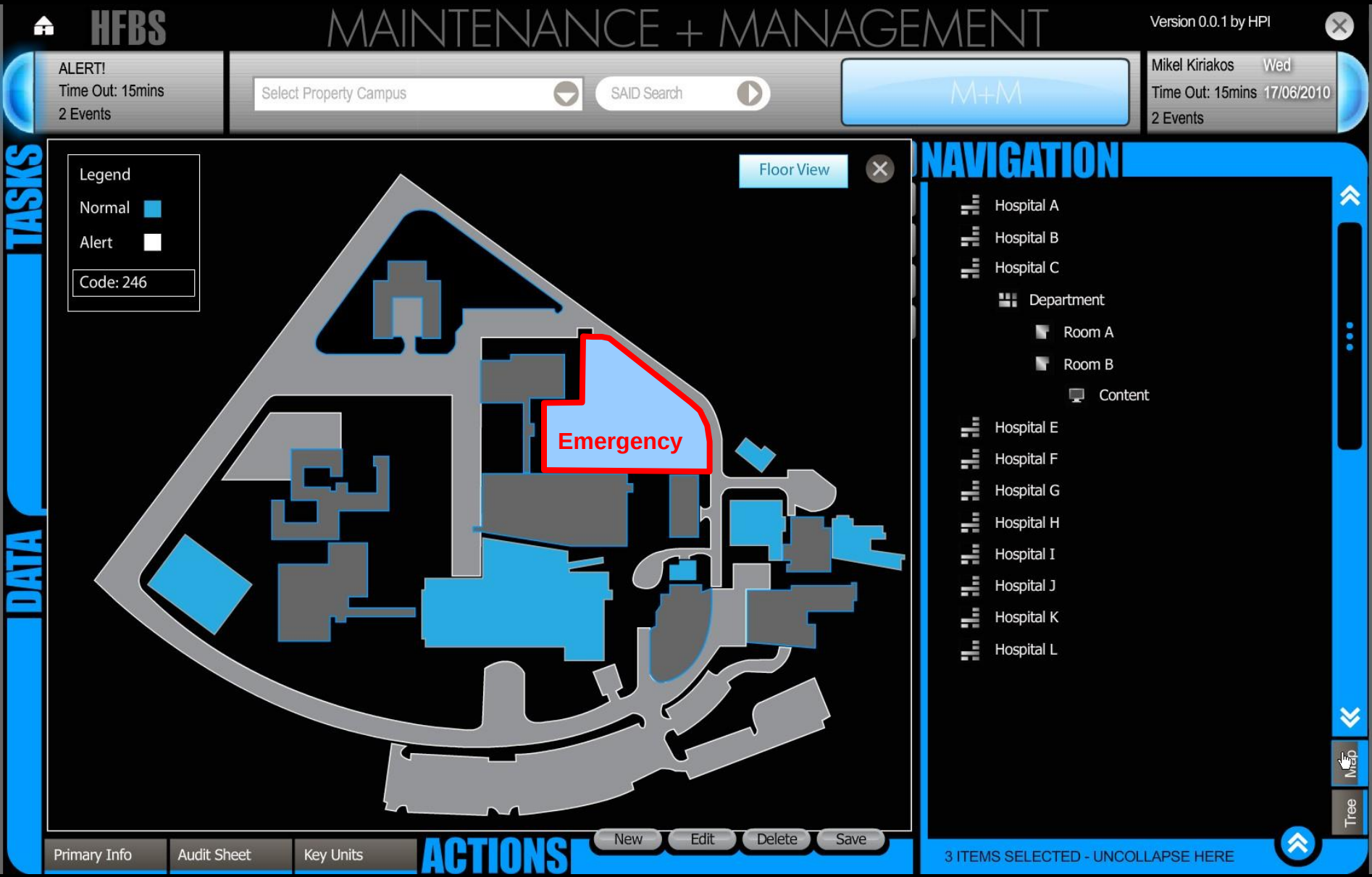
Maintenance and Alerts

Recurrent and Life Cycle costs

Maintenance Information on Tablets

Property Module to facilitate Maintenance




HFBS
MAINTENANCE + MANAGEMENT
Version 0.0.1 by HPI
ALERT!
Time Out: 15mins
2 Events
Select Property Campus
SAID Search
M+M
Mikel Kiriakos Wed
Time Out: 15mins 17/06/2010
2 Events
TASKS
DATA
Legend
Normal
Alert
Code: 246
Floor View
Emergency
NAVIGATION
Hospital A
Hospital B
Hospital C
Department
Room A
Room B
Content
Hospital E
Hospital F
Hospital G
Hospital H
Hospital I
Hospital J
Hospital K
Hospital L
Map
Tree
Primary Info
Audit Sheet
Key Units
ACTIONS
New
Edit
Delete
Save
3 ITEMS SELECTED - UNCOLLAPSE HERE

HFBS

MAINTENANCE + MANAGEMENT

Version 0.0.1 by HPI

ALERT!
Time Out: 15mins
2 Events

Select Property Campus

SAID Search

M+M

Mikel Kiriakos Wed
Time Out: 15mins 17/06/2010
2 Events

TASKS

DATA

SELECT FLOOR

Map View

4
3
2
1
G
P1
P2

NAVIGATION

- Hospital A
- Hospital B
- Hospital C
  - Department
    - Room A
    - Room B
      - Content
- Hospital E
- Hospital F
- Hospital G
- Hospital H
- Hospital I
- Hospital J
- Hospital K
- Hospital L

Map
Tree

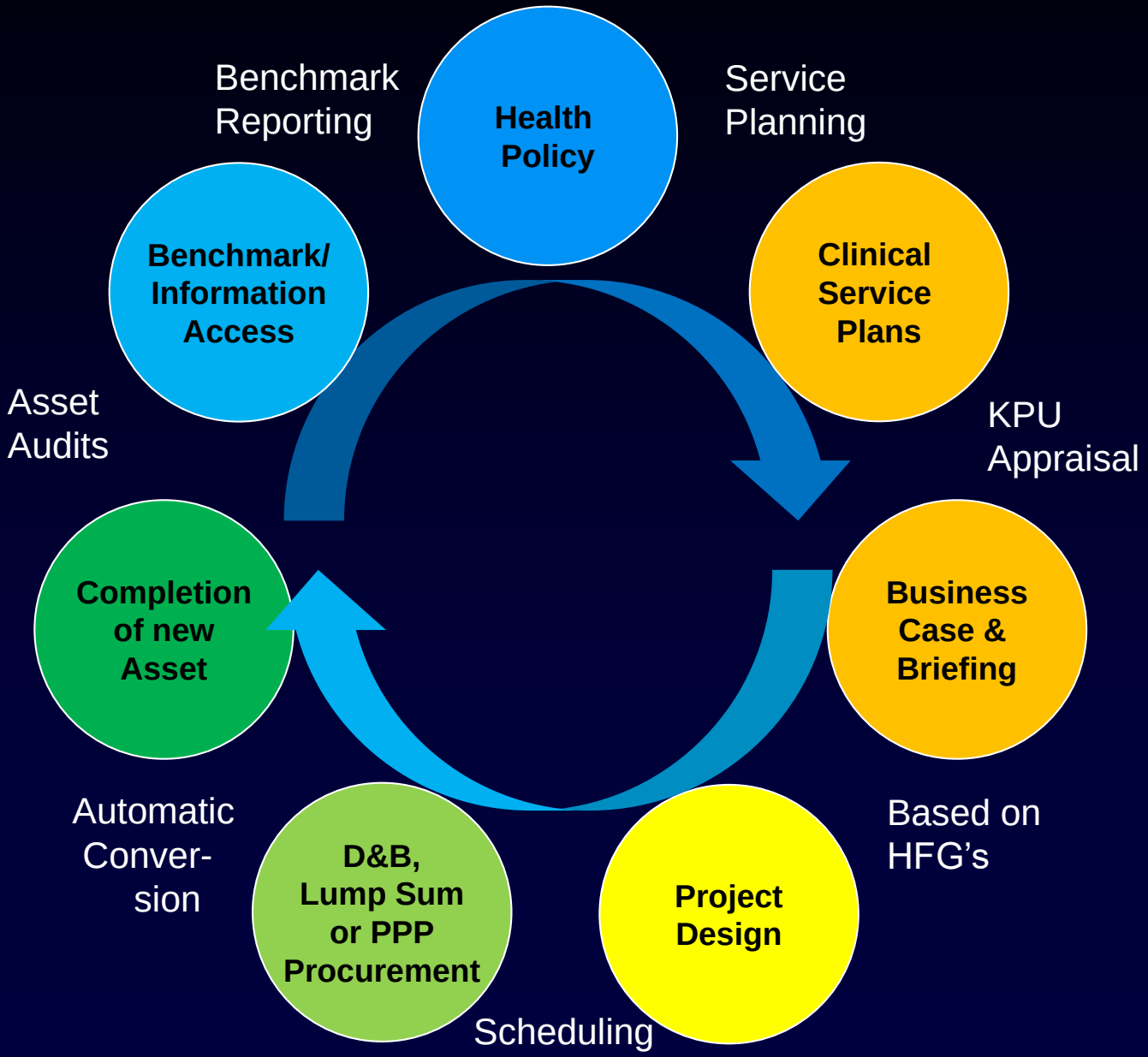
Primary Info | Audit Sheet | Key Units

ACTIONS

New | Edit | Delete | Save

3 ITEMS SELECTED - UNCOLLAPSE HERE

Maintain the full Knowledge Cycle



THANK YOU

Rick Shands, Director, TAHPI UK

rshands@tahpi.net

http://www.hfbsinfo.com/solutions/hfbsmodules/

http://www.hfbsinfo.com/solutions/healthserviceplanning/

http://tahpi.net/