

An architectural rendering of a hospital courtyard. A large white pergola structure with a grid of beams spans the top of the scene. Numerous vertical light fixtures, some yellow and some orange, hang from the pergola. In the background, there are modern buildings, trees, and a glass-walled structure. In the foreground, there are white tents and people walking. The overall atmosphere is bright and open.

Creating Hospitals *without Walls*: *Addressing Health at the Level of Individuals, Communities and Globally*

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Clemson University

European Healthcare Design | London 2018

Creating Hospitals *without Walls*: *Addressing Health at the Level of Individuals, Communities and Globally*

Why and What +
Design Criteria and Strategies +
A Tale of Two Projects +





Houston, TX

**Central Business
District**
40.8 million SF
1178 acres

Texas Medical Center

27 million SF
1000 acres

5 Miles

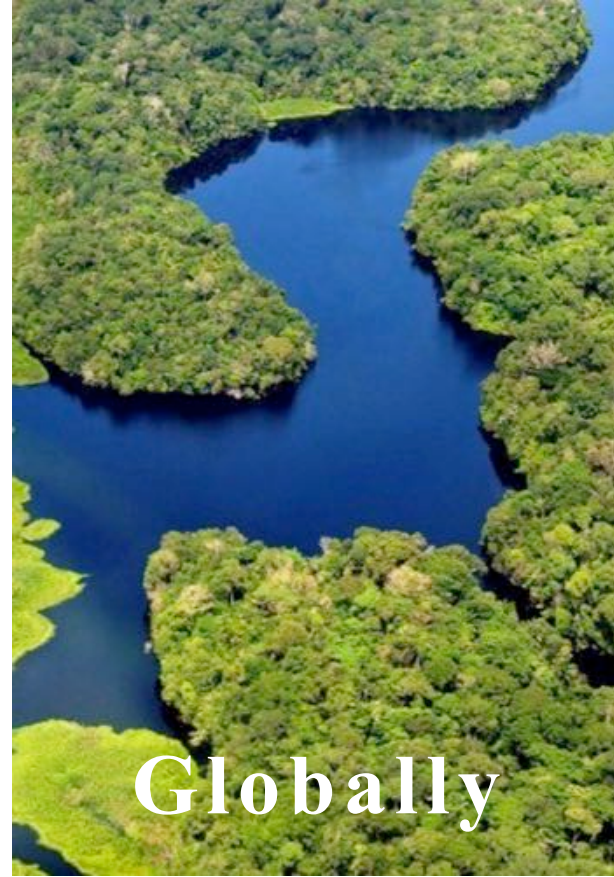
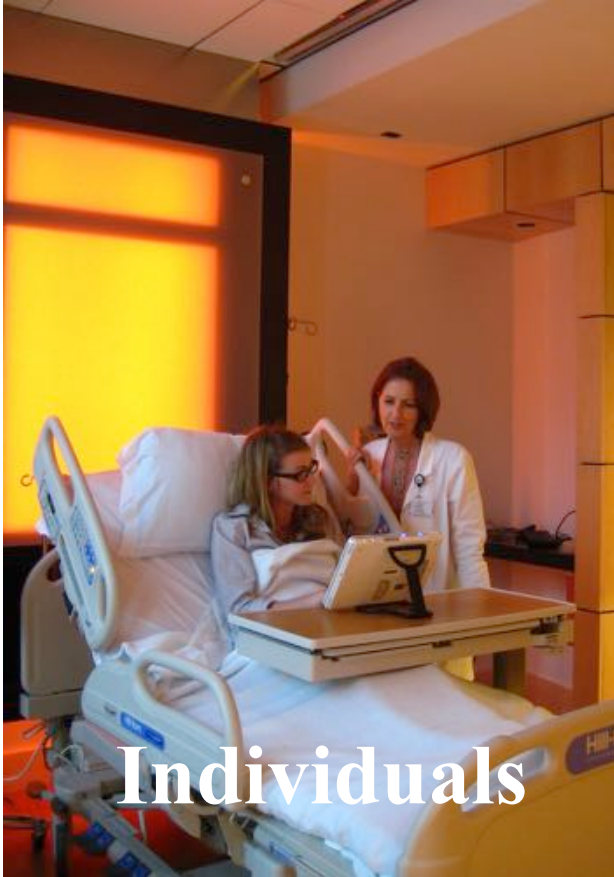
*Hospitals and large
medical centers are
inherently like towns and
cities*

- 24/7/365
- All activities and events of life
- Constantly changing, evolving and growing
- Complex social, political, regulatory and economic forces
- Major employer and economic engines in their communities
- Significant impact on public infrastructure and the local environment

Given hospitals and medical centers have an implied if not explicit mission to protect and restore health [do no harm], they should represent best practices for creating healthy places



Healthcare organizations and environments should be designed to both promote and restore health at three scales:



Health Campus Without Walls

How will the design blur the boundary between the campus and its surroundings?

When we talk about designing for the health of the campus and the surrounding community, we must keep in mind that there is more than one type of health.

We can think of health as falling into 5 major categories:

1. Mental
2. Social
3. Physical
4. Economic
5. Environmental

Only by creating designs that keep all of these in mind can we create a campus that is truly a healthy urban design.



BEYOND HEALING

*How do we **better integrate** a medical campus with the public community?*



LIVE



WORK



PLAY



MEET



DISCOVER



STAY

Health Campus Without Walls

How will the design blur the boundary between the campus and its surroundings?

Walls can be created around our campuses in many ways. They do not need to be physical walls but rather are a result of how our campuses meet their urban context. When studying these transitions, we find that there are many different types of edges between spaces. These edges can manifest as hard edges that prevent movement through space, as soft edges that promote interaction between spaces or as something between the two.



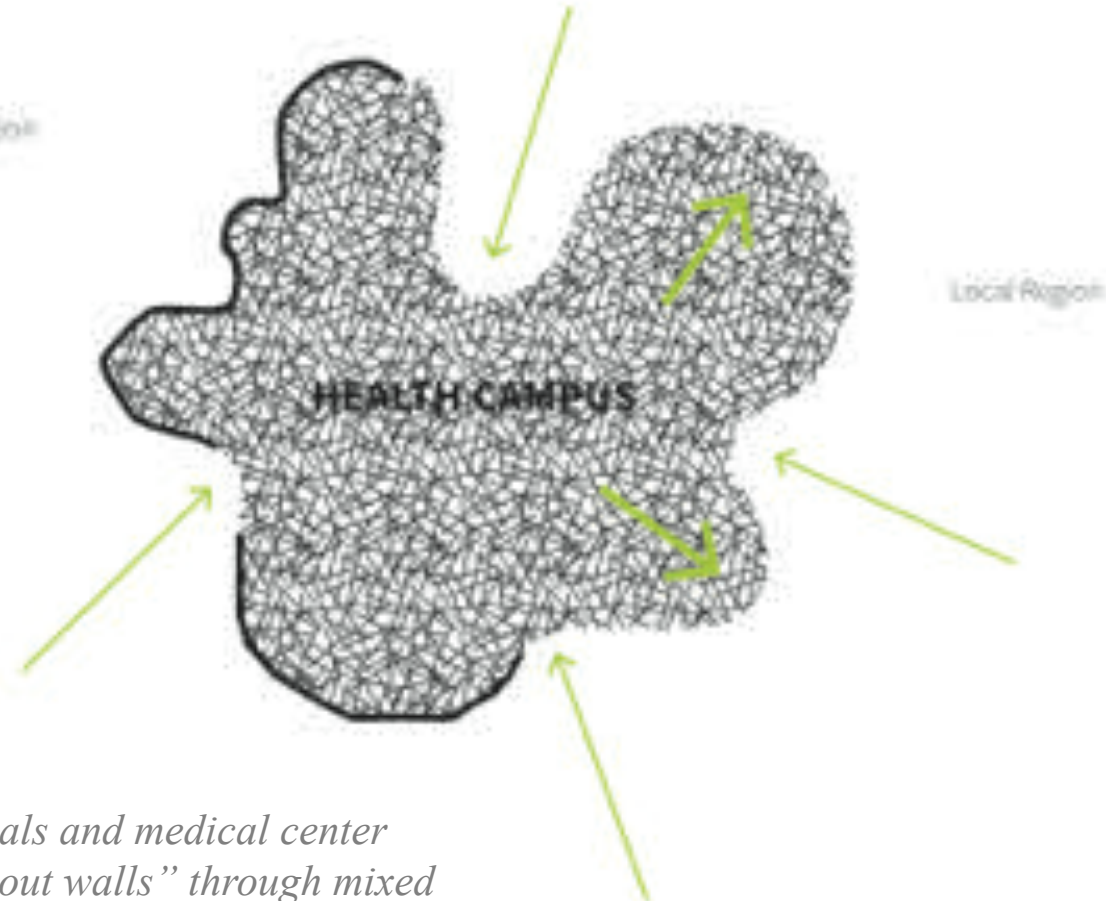
Health Campus Without Walls

How will the design blur the boundary between the campus and its surroundings?

In a well defined urban campus, most of the boundaries between the campus and its context should be fluid, rather than rigid "walls" we should seek to design spaces that can be subject to a push and pull between the region and the campus itself. This fluidity allows for a blurring of the boundaries between what is campus and what is city. This blurring ensures that both entities react and enrich each other rather than remaining walled-off neighbors.

- Intersperse clinical, research, academic, retail, residential and civic
- Blurred boundaries and transparent edges
- Indoor/outdoor public spaces
- Retail at street level
- Extension of the existing street grid and surrounding urban fabric

Local Region



Local Region

Create hospitals and medical center district "without walls" through mixed uses and blurred boundaries

DESIGN CRITERIA/ CONCEPT

ABILITY TO ACCOMMODATE GROWTH



DIVERSITY OF MIXED USES



PUBLIC SPACES & ACTIVITIES



SUSTAINABLE PARKING



WALKABILITY & ALTERNATIVE TRANSPORTATION



EASY ACCESS & LEGIBLE WAYFINDING



GREEN SPACES, ROOFS & WALLS



DAYLIGHT & CONNECTIONS TO NATURE



0.2-0.4%



10-15%



PROVIDE AT LEAST ONE



10-15%



10-15%



10-15%



10-15%



10-15%



10-15%



10-15%



10-15%



10-15%



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10-15%



10-15%



10-15%

DESIGN STRATEGIES

Ability to Accommodate Growth and Change

The ability to accommodate growth and change includes four aspects: Adaptability, Convertibility, Transformability and Expandability.

Adaptability: the ability of the built environment to support a number of functions and physical reconfigurations without altering the architecture or structure of the facility.

Convertibility: the ability to accommodate varying functions through a certain amount of pre-determined construction. Assists in reducing construction duration and considering future relocations and expansions.

Transformability: the ability to alter the interior or exterior components of a space in response to user requirements without the need for new construction.

Expandability: the replication and/or expansion of existing facilities that can be created at multiple locations and scales.

Why?

The future demands for healthcare facilities can be unpredictable and challenging. These facilities are pressed with meeting countless needs over the course of their lifetime and adapting to ever-changing modern technological advancements, social constructs, business practices, healthcare delivery methods, population growth and numerous other factors. Due to these unforeseen and unforeseen factors, hospital facilities must be highly adaptable to maintain their value over decades of ever-changing demands. Success on a long-term scale for these facilities is dependent upon dramatically reducing their lifecycle costs and maintaining a high-level of performance.

Banner Estrella Medical Center
NGBJ



How to Implement

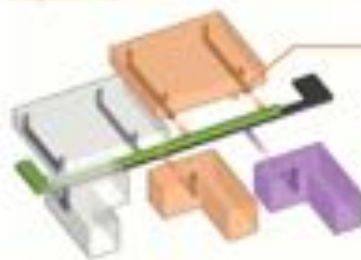
- Site Placement:** By assessing a certain amount of obsolescence, demolition and new construction can be made less destructive to the site and existing facilities.
- Infrastructure Standardization:** Structural uniformity allows for increased flexibility in later years. Common types of standardization include modularization and grid-based systems.
- Plug and Play:** Creating permanent, circulatory paths and infrastructure with the ability to connect new modularized facilities into the main structure.
- Determinative Zones:** Clearly defining different "hard" and "soft" zoning regions, allowing for expansion and demolition without disrupting critical connections.
- Open-Ended Circulation:** Open-ended hallways which reach to buildings' facades, enabling future connections with minimal disruption to established corridors.
- Flexible Boundaries:** Creating clusters with similar functions and eliminating hard boundaries between them, allowing for integration and flexible use.
- Shell Spaces:** Creating spaces that can support a diversity of functions while maintaining proximal relationships, until finer programmatic determinations are made.
- Multi-Use Spaces:** Creating spaces that can be utilized for universal and other high-volatility functions.
- Interstitial Floors:** Giving mechanical systems their own independent levels to enable ease of access and more easily facilitate reconfiguration, maintenance and replacement with minimal disruption to daily activities.

Images

Image Source: www.1010magazine.com. The Plug and Play Strategy: A Case Study at Banner Estrella Medical Center, Phoenix, AZ. Image Source: www.1010magazine.com. The Interstitial Floor Strategy: A Case Study at Kaleidoscope Health Center, Raleigh, NC. Image Source: www.1010magazine.com. The Shell Space Strategy: A Case Study at Banner Estrella Medical Center, Phoenix, AZ. Image Source: www.1010magazine.com. The Multi-Use Space Strategy: A Case Study at Banner Estrella Medical Center, Phoenix, AZ. Image Source: www.1010magazine.com. The Interstitial Floor Strategy: A Case Study at Kaleidoscope Health Center, Raleigh, NC.

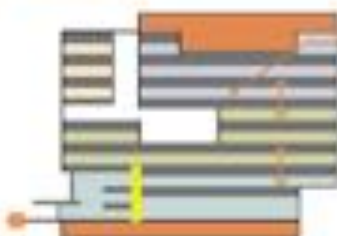
Strategies

Plug and Play



- Circulation Spine
- Infrastructure
- Phase Two
- Phase Three

Interstitial Floors



- HVAC
- Universal Mechanical Layer Public Elevator

Case Studies

Banner Estrella Medical Center Phoenix, AZ, USA NBBJ

Through the integration of temporary zones connected through a permanent circulation core, Banner Estrella Hospital, by NBBJ, is designed to flexibly adapt to changes in business, the market, and technology. This revolutionary design was devised by planning backwards: first understanding where expansions would be placed and then constructing the current existing core and facilities. This approach ensures that there will be adequate rooms and support for expansion.

Image Source: www.1010magazine.com. The Plug and Play Strategy: A Case Study at Banner Estrella Medical Center, Phoenix, AZ.

Kaleidoscope Health Center Vascular Institute Raleigh, NC, USA Yazdani Studio of CannonDesign

This facility supports maximum flexibility through its universal structural grid system and shell-like interior spaces, which can be easily retrofitted. Ceilings are kept at 10M height and services such as stair and elevator cores are pushed to one side in order to allow for maximum flexibility within the floors. Along with horizontal flexibility, equipment and services are located in the "penthouse" and basement to allow for maximum vertical flexibility.

Image Source: www.1010magazine.com. The Interstitial Floor Strategy: A Case Study at Kaleidoscope Health Center, Raleigh, NC.



Diversity of Mixed Uses

The prevailing conception of health is evolving from a **pathogenic model** (focused on the treatment of illness), towards a **sabotogenic model** (focused on supporting health and wellness initiatives). This shift involves a **wider programmatic diversity** than what has historically been incorporated into healthcare settings. Through **mixing commercial, residential, educational, and public activities within wider medical settings**, we begin the necessary work of **transforming hospitals from simply places for the sick, to centers for public and community life**.

Why?

Healthcare architecture addresses the needs of the infirm, and has thus **developed a negative reputation** as a place for the sick or dying. Though hospitals are frequently the **busiest business** in their respective neighborhoods, and may be the **most significant drivers** of local civic, professional, educational, and economic life, they rarely enjoy positive associations. Nonetheless, they remain **important civic institutions**. We are born in them, experience our **most difficult times** in them, heal in them, give birth in them, and ultimately, we die in them. They are therefore **worthy of reputations befitting their significance**. **By incorporating diverse functions into hospitals, we redefine our relationships to them.**

As healthcare trends towards a population health model, **healthcare design must engage with the community**. To get people interested in health and wellness, healthcare facilities must become **more intuitively integrated** into community life. Rather than visiting hospitals only during instances of illness, people must be **actively encouraged to visit and participate in public health initiatives and preventative care**. The incorporation of mixed uses may be one significant way to **reconnect this**. **By colocating healthcare with other uses** (including, but not limited to, retail, restaurants, housing, etc.), **communities begin to instinctively engage in wellness initiatives.**

Baton Rouge Health District
Perkins + Will



How to Implement

- Use the ground plane to **engage pedestrians through storefront access**
- Incorporate **public spaces and gardens** into the hospital grounds and landscaping
- **Enable care partners to engage in public life** while on the hospital campus through the use of restaurants and retail space
- **Repurpose meeting spaces for after-hour public recreational use** (i.e. an auditorium could be converted into a movie theater or public event space)
- Include **libraries** so patients, family members, and the community at large have a **space where they can learn and engage with their health**.
- Provide spaces for **out-of-school learning** for inpatient children
- Add **in-house childcare facilities** for hospital workers
- Design **spaces for informal gathering** to foster relationships between patients and care givers (i.e. coffee shops or gardens)
- Provide **temporary housing** for patients and families who would otherwise have difficulty commuting
- Create areas where patients can **interact with service animals** as a means of alleviating stress
- **Add gyms** which offer memberships to the public and provide space for patient rehabilitation

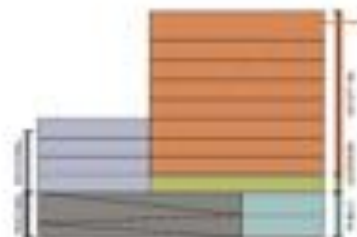
Strategies

Strategic Community Planning and Zoning



[Baton Rouge Health District](#)

Programmatic "Stacking"



[Baton Rouge Health District](#)

Case Studies

Baton Rouge Health District

Baton Rouge, Louisiana
Perkins + Will

The Baton Rouge Health District focuses on the growth between two regional medical centers. The district supports population health to prepare for the future of healthcare. Street improvements will create healthy transportation opportunities for the community and better efficiency for emergency services. Mixed use functions will improve the economy of the area ("eyes-on-the-street") (Jane Jacobs), and will allow the medical centers to compete with others on the national stage. Wellness centers, farmers markets, and parks will all be featured in the district.



National Cancer Center

Rio de Janeiro, Brazil
Cannon Design

The hospital involves a partnership between private investors and the city government, which enabled its mixed use design. Included in the facility are shops, gardens, recreation spaces, an adult education center, public parking, and low-income housing. The public spaces and residential areas don't interfere with the medical spaces, but are woven in so they still interact.

[Image Source: <http://www.cannondesign.com/press-gallery/national-cancer-center-rio-de-janeiro/>](#)



Active Public Corridor

How will the design activate the public space?

Importance:

Welcoming public space promotes **mental and physical health** among communities. The well-defined and accessible networks of public space create **social interaction** among local environment and communities.



Active Public Corridor

How will the design activate the public space?

Mixed-Use spaces

Mixed use spaces engage community and hospital in various levels. Retail, restaurant, and arts not only have positive influence on patients, but also draw residents from neighborhood to this Active Public Corridor. The vibrant public spaces encourage communities to gather for public events, stimulate face to face interaction, and promote public health.



University of Groningen, Netherlands

BEYOND HEALING

How do we better integrate a medical campus with the public community?



Site plan diagram of the British medical center (robotics, intensive care)

BEYOND HEALING

How do we better integrate a medical campus with the public community?



MEET



Los Angeles Landscape at UCLA

Public Spaces & Activities

"A public space is defined as one that provides access to all. It's a place where people can congregate and engage in multiple activities, a place of movement and flow, and a place of cultural inclusiveness. The more public spaces there are, the better. Integrate, quieten, flow, public or private, but in all cases they are inseparable and enhance the human experience."

- JOHN K. PANGRATZ, FAIA, FACHA

Public space is more than just a front lobby & has the ability to shape the user experience and to influence the public health of the larger community. Public spaces and activities should provide access to all in order to engage the local community and create a gathering spot for social interaction & civic connection. Public spaces that reflect the local culture indicate a sense of identity for the surrounding community.

Why?

"Well-designed and maintained public space is critical to the health of any city. Such gathering spaces allow for social mixing, civic participation, recreation, and a sense of belonging. Public space can also be used for daily events or seasonal or annual fairs that bring together diverse populations of the city."

- UNESCO

Integrating public spaces and activities into the hospital campus supports the mission of healthcare systems to improve the health of the population. Public spaces and activities can also significantly impact the user experience. As healthcare becomes a consumer-based market, the patient experience will significantly impact hospital reimbursement. Hospitals should evaluate the design of public spaces to create an inviting atmosphere that connects to the existing context and brings the community together, regardless of a user's health condition.

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Focal Point Community Campus
HDR



How to Implement

Programmatic Design Strategies:

- Program unique public services and activities into the hospital campus such as community gardens, teaching kitchens, and/or recreational facilities
- Create an interface between healthcare and community by providing public services on or near the ground level

Spatial Design Strategies:

Healthcare public space can create a memorable and positive experience that helps the healing process. The unique functions of healthcare public spaces should be broken down into 4 typologies:

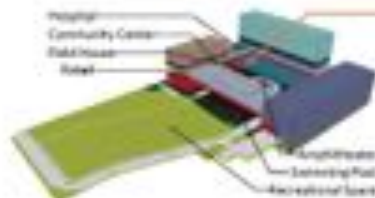
- **Collector Spaces** that are active and orienting, with high population and noise levels.
Example: entrance lobby
- **Introspective Spaces** that accommodate high volumes but are personal, quieter and calming spaces.
Example: chapel
- **Purpose Spaces** that are dynamic and service-based for specific functions and varying volumes.
Example: dining hall
- **Mover Spaces** that feature constant movement and ebb and flow of user volumes.
Example: public corridor

Sources

APA, Characteristics & Guidelines of Green Public Spaces
WHO, The Role of Public Spaces in Healing
UNESCO, Access through Green to Public Space
of Urban Planning Public Spaces for Healthcare Facilities

Strategies

Programmatic Design



Spatial Design



Case Studies

Focal Point Community Campus Chicago, Illinois HDR

Located in one of the most vibrant yet blighted neighborhoods in Southwest Chicago, the Focal Point Community Campus **embraces a public healthcare setting that embraces its local community.** Fitness centers and community services run along the 2nd floor, while the ground floor is wrapped in glass and provides wellness gardens and recreation areas for public use.

Image Source: <http://www.hdr.com> and <http://www.focalpointchicago.com>



Cherokee Indian Hospital Cherokee, North Carolina Design Strategies

Cherokee Indian Hospital said, "We don't just want you to build us a building; **we want you to build us a beautiful building that the community absolutely loves, and that they claim as their own, and that helps promote greater engagement from them.**" The design team brought the local culture into the public spaces, especially the main concourse where a "river" runs throughout beneath the "trees" created by the structure.

Image Source: <http://www.cherokeehospital.com>



Health Campus Without Walls

How will the design blur the boundary between the campus and its surroundings?

PROVIDE AMENITIES

When campuses use some of their land to provide amenities to the community, they pull residents onto the campus and bring life to the campus. Amenities are places which exist solely for the enjoyment of the users, to enrich the quality of their lives. They can include public art, theatres, parks and seating areas.



Copenhagen School of Business

Sustainable Parking

Sustainable parking can be defined, according to landscape architect Bruce Abbey, as parking areas that encourage the conservation of resources, incorporate stormwater management, promote energy efficiency, minimize waste, and improve outdoor environmental quality with respect to air, water, soil, plants and visual qualities.

Why?

For healthcare facilities, sustainable parking strategies can create a more positive experience for all building users. Additionally, utilizing an integrated approach that looks beyond designing for a single function can allow parking lots to become **productive "landscapes"** with **ecological, social, cultural and economic benefits**. Considering the expense of traditional parking structures, **sustainable strategies may reduce future construction demands and building footprints** if flexibly planned for repurposing. Integrating sustainable and therapeutic parking areas can improve the environmental quality, functionality and efficiency of a site, and improves the experience of patients, families and staff by creating a more calming atmosphere upon entry to the healthcare facility. Creating parking areas designed with **natural features** such as native plants and shade trees can decrease stress. As the temperature of artificial surfaces such as asphalt and concrete can be 40 to 104 degrees higher than vegetated surfaces, utilizing tree canopies to increase shade may **increase the comfort level of users, decrease air temperatures, and counteract the "heat island" effect, improving air quality and reducing airborne pollutants**. Additionally, low-impact parking lot design reduces stormwater runoff and pollutant loads.

Technical University of Denmark
Lyngby, Denmark



How to Implement

- Incorporate **stormwater management systems** by designing parking lots with vegetated swales, infiltration trenches, rain gardens, and bio-retention areas.
- Plant **tree canopies** over ground lots to counteract the "heat island" effect.
- Design to **recycle rainwater runoff** for gray water usage.
- Utilize **permeable paving materials** to aid in stormwater management.
- Design **back-under parking** areas to park underneath raised buildings, conserving land area.
- If structured parking is necessary, incorporate **plants/bollards** within the structure to be used as a **natural rainwater filters** before the water is absorbed into ground.
- Design for **multi-use programs**, such as play/exercise areas, cultural purposes and retail, including events such as farmer's markets, which can ultimately reduce land use.
- Divide lots into **smaller sections** to minimize the overall parking lot scale and decrease travel distances.
- Use **roof-top reflect fabrics** over the top level of parking garages to reflect sunlight and reduce heat island effects.
- Use **internal light wells** to efficiently utilize daylight.

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Strategies

Sustainable Surface Lot



- Bio-retention stormwater filter
- Permeable paving materials
- Infiltration trenches and bio-retention

Mixed-Use Parking Structure



- Reflective fabrics
- Green roof used for plants
- Back-under parking area with green roof

Case Studies

Edwards Gardens Sustainable Lots

Toronto, Ontario, Canada
Scholten & Company

The design of the Edwards Gardens sustainable parking lot utilizes a system of **permeable paving materials, bio-swales with abundant native and adaptive trees and plants**, as well as **integrated solar panels**. The design for the sustainable parking lot incorporates measures that are aimed at **encouraging filtration of pollutants and reducing runoff rates**. Additionally, the parking lot integrates **public art** throughout to create an **active experience**.

<http://www.scholten.com>



SALT Parkade

Calgary, Alberta
Bing Thom Architects

Underneath a **green roof soccer field** is a three-story parking garage located on the Southern Alberta Institute of Technology campus. Designed by Bing Thom Architects, the garage maximizes parking usage by being **underground** and also utilizes a **green roof** to aid in the **filtration of rain water run off**. Through the use of a **ventilated mesh facade** energy use from mechanical systems is reduced due to **passive ventilation and sun shading**.

<http://www.bingthom.com>

INTEGRATED TRANSPORTATION NETWORK

How will the design influence user movement through the site?

Integrated Parking Options



Separated Parking Structure | LAPD Headquarters



Parking Combined Inside the Building | Mosses (Dwelling) Copenhagen



Underground Parking | Rijswijk, Den Haag, Netherlands



Ground Parking, Under Tree Canopy | Kimmel and Eastwick, Lexington, Kentucky

Walkability & Alternative Transportation

Walkability and alternative modes of transportation have a vital role in allowing community access to all members of a community. **Walkability** of a site can be achieved by providing buffering from traffic, continuous sidewalks, identifiable and accessible crosswalks, rest areas, shelters, and visual interest.

Alternative transportation can be categorized in various ways: it can be **communal** and **public** (i.e. buses, subways, and trains) or **individual** (i.e. bikes or taxis). **Communal transportation** offers the possibility of interaction with others, protection from the weather, and public travel for those unable to drive or wait for extended periods. One key drawback to communal transportation is a dependence on fixed schedules. **Bike-sharing** programs are a great opportunity for communities to encourage physical activity.

Walkability and alternative transportation not only help with sustainability by **decreasing CO2 emissions**, but also have an impact on **general public health and wellness** by leaving people more active. Walking can be the gateway to promoting a healthy lifestyle for patients, visitors, and staff. Though it is important to provide enough efficient parking for patients and staff, **alternative transportation and walkability can help reduce the need for parking spots**. Walkability promotes healthy lifestyles and allows people to **engage with nature and its therapeutic effects**. Furthermore, easy access can help reduce stress and allow for a more pleasant visit.

Indianapolis Culture Trail
R.W. Armstrong & Randell Ernstberger Assoc.

How to Implement

- **Bike racks** and **bike-sharing** opportunities for patients, staff, family members and the community
- Clear, safe, and accessible **crosswalks** and **signage** for pedestrians to be safe and have a clear walking path
- **Traffic calming solutions** for pedestrian safety
- **Sheltered bus and taxi pickup/dropoff** areas for patients, family, and staff
- **Safe barriers** between pedestrians and vehicular traffic to ensure safety and a enjoyable experience
- **Separation of traffic** of cars, buses, bicycles and pedestrians to ensure safety and a steady flow of traffic
- Provide **outdoor community space** such as gardens, outdoor eating spaces, and protected outdoor waiting areas to **engage people**

Literature

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Strategies

Bike Sharing Program



Distinct Separation of Traffic



Case Studies

Castle Rock Adventist Hospital Castle Rock, CO Blue Navigator Marketing Group

The Castle Rock Adventist Hospital has a free **bike share program** that allows the community to use 25 bikes made available on the hospital's campus. The bikes are located at four different locations in town, allowing people to travel from one place to another while promoting health and wellness for the community.

<http://www.castlerockadventisthospital.com/our-community>

Oregon Health and Science University Portland, OR City of Portland

Portland has an award-winning public transportation system that has bus, tram, and bike routes running by its hospitals. The public transportation routes run throughout the entire city to help ensure easy access for patients, visitors, and staff. As the bus stops there are **sheltered areas** protecting pedestrians from the elements while they wait.

<http://www.ohsu.edu/portal/transportation>



INTEGRATED TRANSPORTATION NETWORK

How will the design influence user movement through the site?

TRANSPORTATION NODES

Transport Nodes help simplify travel through the city and offer a multitude of solutions.

Most cities have several large stations that serve as major hubs for buses and trains, but simple bike parking or storage at a mass transit stop provides a convenience.



Photo: iStock



Photo: iStock

Health Campus Without Walls

How will the design blur the boundary between the campus and its surroundings?

PEDESTRIAN FRIENDLY STREETS



University of Chicago



Northwestern Memorial Hospital

Active Public Corridor

How will the design activate the public space?

Tempered green spaces

The green spaces with water features mitigate the environment temperature, filtering the air and create pleasure environment for users. Also, the pleasure green spaces has the therapeutic impacts on patients in medical campus.



Campus for Research, Education and Technological Enterprise, Singapore

Easy Access and Legible Wayfinding

Easy access and legible wayfinding have as core elements the ability of an individual to...

- 1) know where he or she is,
- 2) know his or her destination,
- 3) know which route gets him or her to the destination,
- 4) know when he or she has reached the destination, and
- 5) know how to return.

From the moment someone arrives on a hospital's property, the paths, visual cues, configuration of spaces, landmarks, and structural differences, symmetry of layout and signage work together to guide people and ease their movement throughout the healthcare facility.

Incorporating easy access and legible wayfinding into a healthcare facility is important for the seamless navigation of patients, care providers, visitors and staff to their appropriate location. At a time when people are often at their most vulnerable, or are concerned for the health of a loved one, the designers of a healthcare facility should seek to mitigate stress. The decisions architects and planners make, from building massing to colors to finished interiors, influence the experience of navigating the space.

Additionally, elderly visitors experience difficulty in wayfinding due to various sensory and motor impairments. Hospitals should seek to simplify wayfinding for this population, with signage that includes large, frequent pictures.

UCLA Outpatient Surgery and Oncology Center
Michael W. Felton Architects

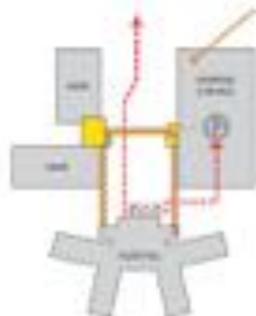


How to Implement

- **Clear entry sequence** for arrival, drop off, parking, and return to main entry
- **Clear site lines** from entrance to the street
- **Views to the outside** for campus orientation
- **Simple organization along a central spine**
- **Inclusion of identifiable landmarks**
- **Reducing the complexity of routes** in the facility
(i.e., multiple floors and moving between buildings)
- **Reducing barriers** from the general travel routes
- **Consistent signage** differentiating services

Strategies

Organization of clear, definable circulation systems from site entry



Orientation within atriums and courtyards using landmarks



Case Studies

Legacy Silver Creek Hospital
Silverdale, Washington, USA
ZGF Architects

The design intent was to create **clear, definable circulation systems** to orient patients, staff and visitors beginning at the first entry to the site. The hospital, medical office building and parking structure are linked by an enclosed pedestrian bridge system. The entry lobbies for each component are expressed as glass lanterns that provide welcoming and easily identifiable circulation paths.

<http://www.zgf.com/projects/legacy-hospital-main-entrance>

Orbis Medical Center
Sittard-Geleen, Netherlands
Holland Hospital Architects

Atriums act as a reference from multiple vantage points throughout the facility. Visitors are positively impacted with a **clear visual understanding of their orientation** to aide wayfinding, provide a connection to nature and a sense of retreat inside the building. Placing sculptures, fountains, plants and monumental stairs in the atrium act as identifying landmarks to guide individuals and foster social connections.

<http://www.hollandhospital.com/orbis>



Stratton

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The Image of the City | The Image of the Hospital and Hospital Campus
Kevin Lynch



DISTRICTS



EDGES



NODES



LANDMARKS



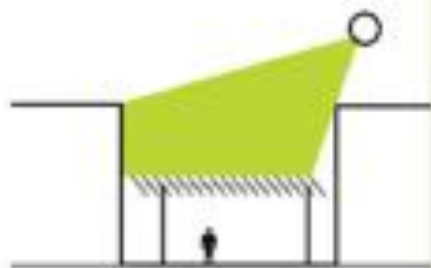
PATHS

Active Public Corridor

How will the design activate the public space?

Shaded paths

Inviting walkways are created through the combination of proper pathways, materiality, width, shading, and lighting. These shaded paths create a pleasant environment for pedestrians to feel comfortable and safe as their journey to their destinations.



Compass for Research Excellence and Technological Enterprise, Singapore

Active Public Corridor

How will the design activate the public space?

Iconic landmark

Landmarks are the physical objects such as building, art monuments, and fountains which help people to navigate along the corridor to their destination. The significant physical characteristic of landmark is singularity, unique, and memorable in local context, making the landmark a key element in allowing a user to identify where they are.



University Medical Center Groningen, Netherlands

Green Spaces, Roofs & Walls

Green spaces are defined as **landscape that are partially or completely covered with vegetation** such as trees, shrubs or water features. These pieces of land are set aside for **aesthetic and functional purposes in the built environment**. In healthcare, green spaces help enhance the beauty and quality of open areas on both the exterior and the interior of the facility and positively impact the building's habitat. Green space includes parks and community gardens and can be used for recreational purposes. The word "green" has also become synonymous with the notion of sustainability in the building industry.

Green spaces engender connections to both nature and other living organisms. By immersing ourselves in natural surroundings, we stimulate the healing process.

Views to nature are **therapeutic and foster a sense of place**. Creating spaces that provide patients, staff and visitors relief from the daily stresses of their circumstances and work. Views for greater success in treatment plans and work efficiency. The presence of serene vistas may also promote low blood mobility and metrics.

Additionally, green spaces can **reduce energy use and the carbon footprint of the building**, which in turn will reduce its lifecycle costs. The potential economic savings these spaces did provide are making points for clients. Green spaces and environmental systems can also reduce heat island effects on roofs and assist with stormwater runoff and filtration.

Swiss Re Office Building
Hadi Tebrani

How to Implement

- Design **internal courtyards** to bring greenery into the public spaces and campus.
- Locate hospitals near existing parks and gardens and provide walkways to connect the facility to these areas.
- Provide **attractive and vegetated public spaces on rooftops** with seating that are accessible to patients, family and staff.
- Incorporate **water features**.
- Enhance the indoor walking experience by **designing meandering pathways and green corridors** that provide views to nature.
- Bring **greenery into the main public spaces** (i.e. lobbies and waiting areas) as well as into staff lounge/break spaces.
- Incorporate **stormwater runoff management systems** into green spaces.

Literature

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Strategies

Green Roof Strategy



Internal Courtyard



Case Studies

Palomar Medical Center Escondido, CA COA Architects

Palomar Medical Center is a sustainable and high-performance healthcare facility that **utilizes a green roof as one of their innovative design strategies**. The technology extends to the landscape on the ground level as well as onto the roof. On the roof, **accessibility is differentiated into distinct places, separated by level**. Paved pathways also give users an opportunity to experience views from different vantage points and **provide patients the positive distraction of green spaces outside their windows**.

<http://www.coaarchitects.com/projects/palomar-medical-center/>

Basel Rehab Basel, Switzerland Herzog & de Meuron

Basel Rehab uses **roofs, terraces, gardens and internal courtyards to attract and aid in the rehabilitation of patients**. The internal courtyards are **accessible garden spaces on the ground level** and provide views from the circulation corridors above.

<http://www.herzoganddeameuron.com/projects/basel-rehabilitation-center.html>



Daylight & Connections to Nature

Daylight and connections to nature are two strategies aimed at improving patient and staff experience and outcomes. Daylighting is the practice of placing windows or other openings and reflective surfaces so that during the day natural light provides effective internal lighting. This can maximize visual comfort and reduce energy usage. Connection to nature involves feeling the presence of the living world around us, which elevates the spirit. Connections may be visual (i.e. looking at greenery through a window), or physical (i.e. being able to walk through a garden).

Improved Experience

Patients' reported experience and perception of care, which are tied to funding, relate to the built environment. Various daylighting techniques can be used to create shadow or diffuse lighting depending on the intended experience.

Improved Health

Daylighting and access to nature can positively impact all building occupants, as they are connected to reduce hospital stays and improved mood. Daylight also regulates circadian rhythms (Bendall 2001). Access to nature provides attention restoration (Kellert 2012), and reduces staff stress and fatigue.

Sustainability

Daylighting strategies can reduce artificial lighting needs. Greenery on site can reduce heat island effects caused by impervious surfaces, as well as filter and reduce runoff.

Rush University Medical Center
Perkins + Will



How to Implement

- Provide courtyards or accessible gardens, using articulated or perforated plans
- Use floor-to-ceiling windows where possible, with dynamic shading systems for greater control of lighting
- Interior rooms may still receive borrowed light from adjacent daylight spaces by using glass partitions
- Exterior spaces can be programmed to encourage use
- Provide skylights in patient rooms
- Bring nature into the building by using plants, water features and natural materials such as wood and stone

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Strategies

Articulated Plan



Perforated Plan



Case Studies

Community Hospital of Brandenburg Brandenburg-Gemeinschaft Heine, Wischer und Partner

Brandenburg uses the articulated plan to maximize the ratio of exterior walls to building area. Ribbons of windows along all of the facades allow for easy access to daylight and views to nature.

Image Source: <http://www.architecturaldigest.com/story/2014/04/16/brandenburg-hospital-123456789>

St. Annas Krankenhaus Ulm Ulmer, The Netherlands De Jong-Corvermaker Alpa

Inside the patient towers and an articulated form, the base of this project uses a central, daylight, multi-story atrium to bring borrowed light into various lower departments.

Image Source: <http://www.architecturaldigest.com/story/2014/04/16/st-annas-hospital-123456789>

Basel Rehab Basel, Switzerland ZDF, Hering & de Maessene

Basel Rehab as a healing environment is characterized by its use of programmed courtyards in a perforated plan. Upon entering the facility there is an immediate view to one of the outdoor spaces. Another daylighting strategy visible is skylighting, included in all patient rooms.

Image Source: <http://www.architecturaldigest.com/story/2014/04/16/basel-rehab-123456789>



Articulated and Perforated Building Forms

How to bring natural elements and urban functionality to architecture

POCKET PARK

A pocket park is defined by the large buildings and context surrounding it. It can be useful as an extension of the building's usage.

- Historic Marker
- Art Gallery



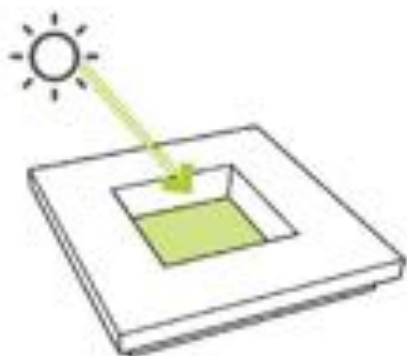
Articulated and Perforated Building Forms

How to bring natural elements and urban functionality to architecture

COURTYARDS

Daylight Intervention:

Daylight intervention in the courtyard can improve the quality of the interior lobby space, which attracts more people to stay in the courtyard and feel comfortable.

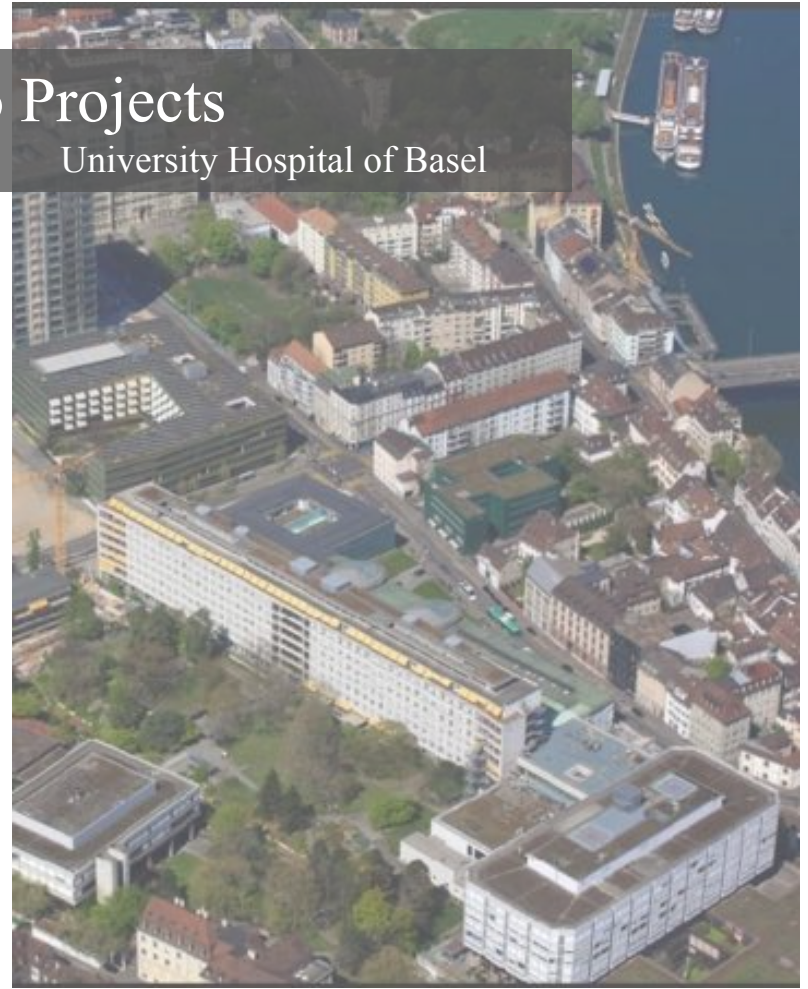


American Council on Architecture

A Tale of Two Projects

Northwestern Memorial Hospital

University Hospital of Basel





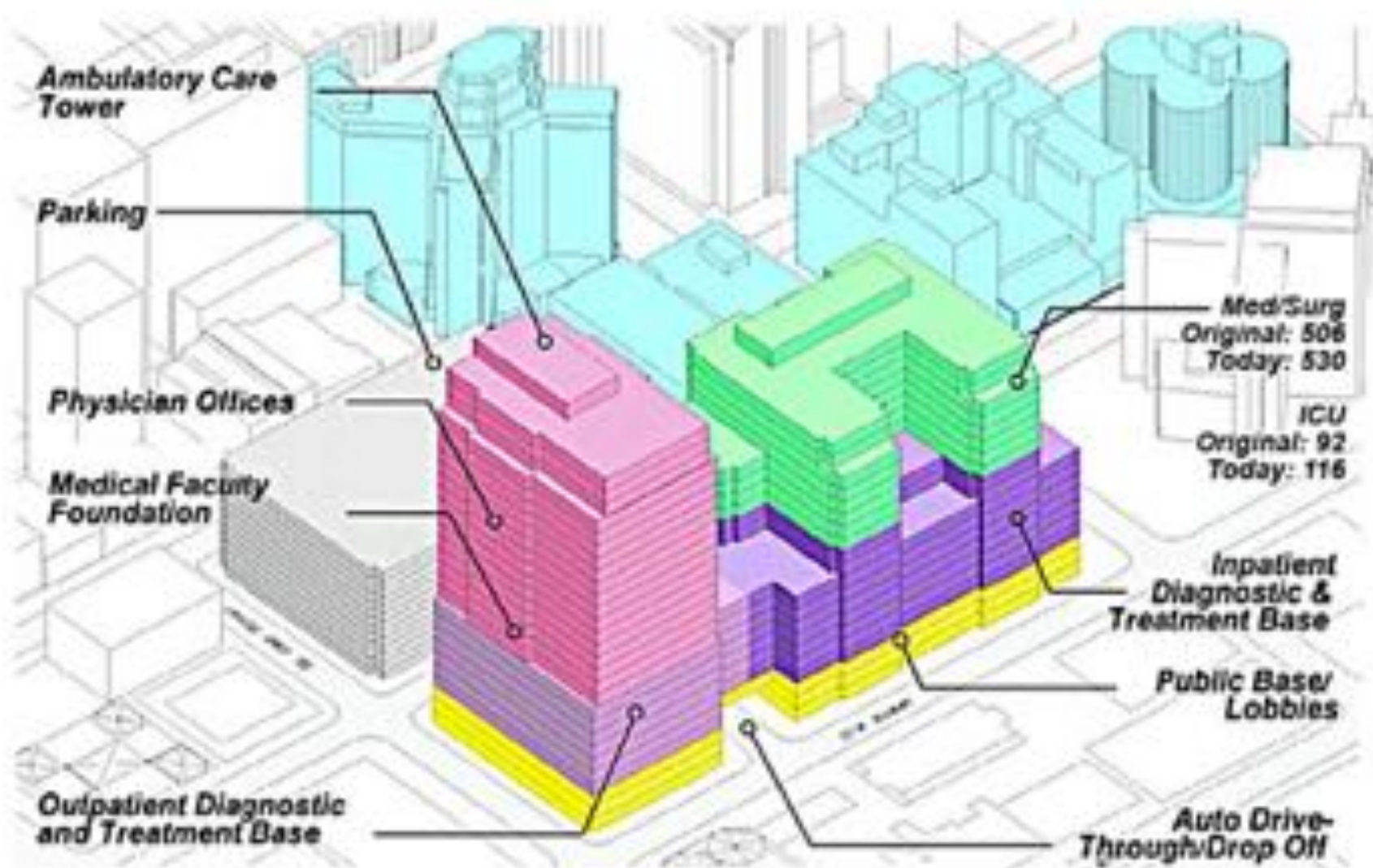
Hospital as Neighborhood Center

Northwestern Memorial Hospital | Chicago, USA

Northwestern Memorial Campus:
Streeterville Neighborhood Chicago

Michigan Ave | "Magnificent Mile"





Ambulatory Care Tower

Parking

Physician Offices

Medical Faculty Foundation

Outpatient Diagnostic and Treatment Base

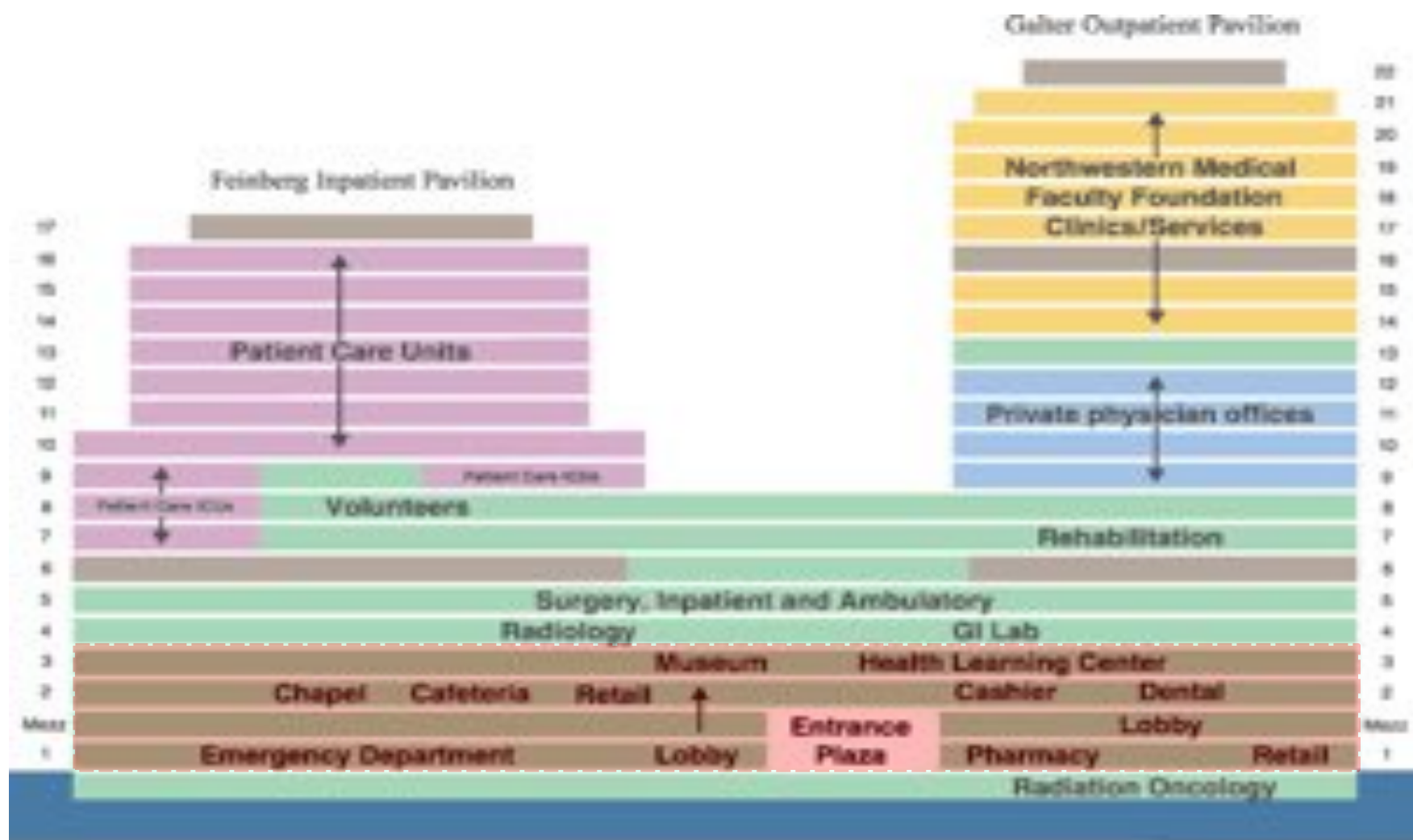
Med/Surg
Original: 506
Today: 530

ICU
Original: 92
Today: 116

Inpatient Diagnostic & Treatment Base

Public Base/Lobbies

Auto Drive-Through/Drop Off



Huron Street

Places & Pathways for All

Northwestern Memorial Hospital | Chicago



Commercial at Street Level

Northwestern Memorial Hospital | Chicago



Green Streets as Buffers

Northwestern Memorial Hospital | Chicago



Places for Movement and Pause

Northwestern Memorial Hospital | Chicago



Hospital Campus as Urban Park

University Hospital of Basel | Switzerland



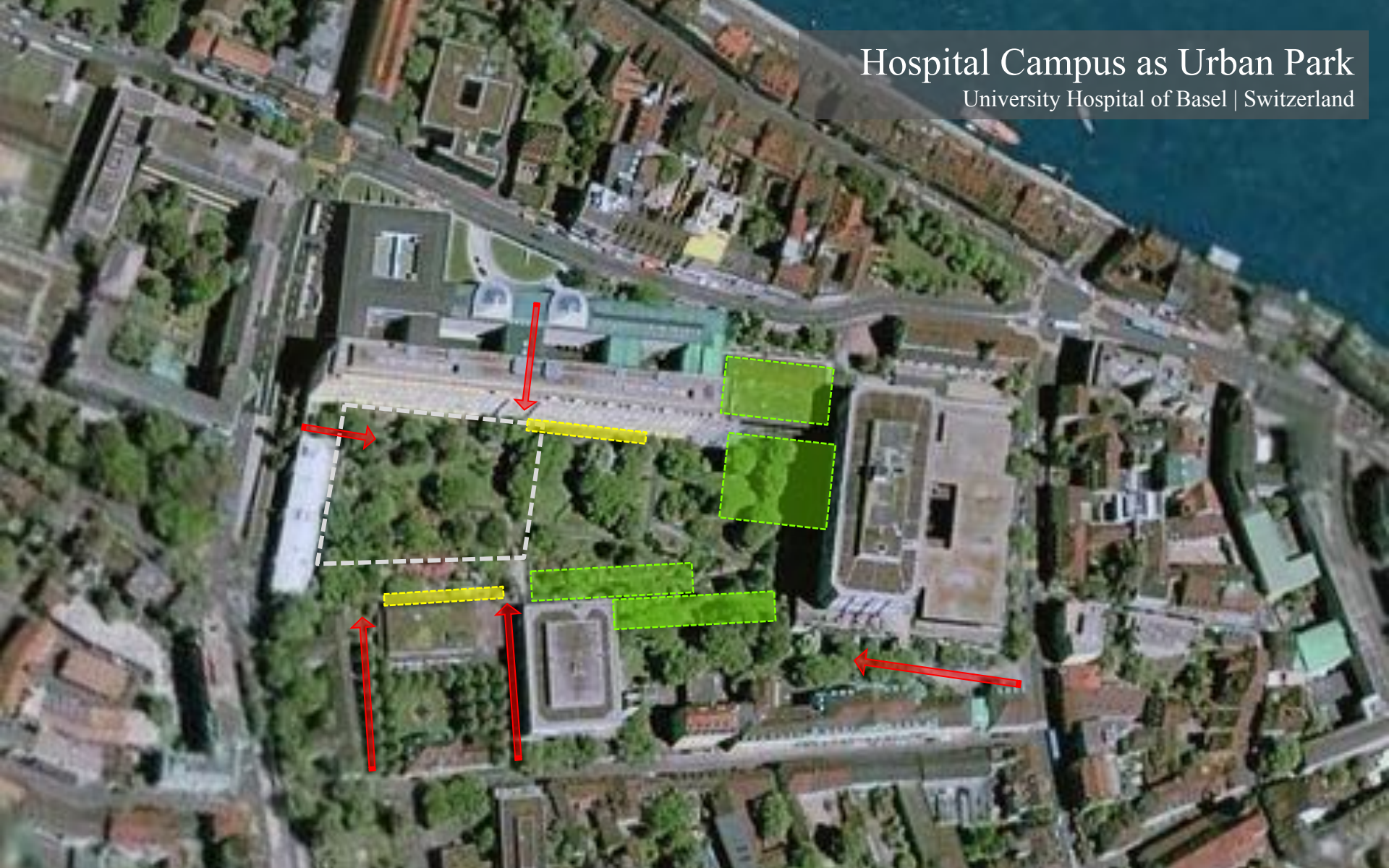
Hospital Campus as Urban Park

University Hospital of Basel | Switzerland



Hospital Campus as Urban Park

University Hospital of Basel | Switzerland





A place to meet and commune

University Hospital of Basel | Switzerland



A place of respite for staff

University Hospital of Basel | Switzerland



A therapeutic place for patients

University Hospital of Basel | Switzerland



A place to relax for all
University Hospital of Basel | Switzerland



Proposed Focal Point Community Medical Center: Chicago | HDR

An architectural rendering of a hospital courtyard. A large, white, grid-patterned canopy covers the area. Numerous vertical light fixtures in yellow, orange, and red hang from the canopy. In the background, there are modern buildings, trees, and a glass-walled structure. A sign in the foreground reads "Kaiser Permanente Heart Health".

Creating Hospitals *without Walls*:
Addressing Health at the Level of Individuals, Communities and Globally

Questions and Discussion
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