

# Healthcare Hits the Reset Button

Planning, Real Estate, Design, Construction, and Operation of  
Hospitals | Clinics | ASCs | MOBs | Retail | Telehealth  
Hospital @ Home | Mobile Care  
Non-Clinical | Research Facilities

Fordham University Lincoln Center Campus, Lowenstein Building, 113 W 60th Street, 12th Floor, New York, NY 10023



8th New York City Hospital, Outpatient Facilities & Medical Office Buildings Summit

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7:45 am to 8:45 am Registration & Networking | 8:45 am to 3:30 pm Program - Lunch Included

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## Mount Sinai Tisch Cancer Study — A Repositioning Story

Douglas E. Carney, AIA, MBA, System SVP - Real Estate & Facilities, Chief Facilities Office, Mount Sinai Health System  
Michael Delaney, EVP, LF Driscoll Healthcare  
Jill Lerner, Principal, KPF  
David L. Reich, MD, President, the Mount Sinai Hospital and Mount Sinai Queens  
Leanna Sullivan, Vice President, HKS

**MODERATOR:** Marisa Kelly, Project Executive, LF Driscoll Healthcare

*“Being able to take the first 5 floors of a 1950s building into a start-of-the-art cancer facility has been extraordinary. Having additional ICU beds will be a game changer for us.” — David L. Reich*

### OVERVIEW

The panel presented the transformation of an existing Tisch building, designed in the late '50's and completed in the late 60's, and located in a long line of buildings along Madison Ave, to make it more a part — and expand the notion of— Mount Sinai as a campus. In changing and then continuing the architectural language and color along Madison Ave, and adding a state-of-the-art facade from a performance standpoint, the team has reinvented the building as a unique urban place.

The team prioritized creating a clear main entry to the hospital to distinguish it from the confusing array of entrances on Madison Ave, as well as a “box” on the corner of the building that provides a unique amenities space, with views down Madison, for cancer patients and their guests.

The team presented a before and after images of the project as well as a visualization video.

- The planned duration of the project is 40+ months.
- Will be intrusive to the hospital (i.e., noise, utilities interruption, new air handlers, install roof screen, etc.).
- Some floors of the hospital (i.e., firs. 6-9) remain fully operational during construction, with others partially occupied.
- So, the work must be done in “pieces” or components and phases.
- Project began with the north side of the building.



Before



After

## PROJECT CHALLENGES

*“This goes beyond the construction, what we have to do here — it’s about failures and communication, and things that don’t always come up in construction...the challenge of building a building that’s so connected to the campus and making the process not only less intrusive, but invisible at the same time.” — Michael Delaney*

*“Challenges? It’s like changing the engine in your car as you’re going down the Jersey Turnpike — it’s some of the most complicated logistics I’ve ever worked on.” — David L. Reich*

The team called the project “a great NYC challenge and a great healthcare challenge” that they needed to break into components and create a concerted logistical and phase strategy. Other overarching challenges include:

- Maximizing patient beds by creating places of flexibility and acuity adaptable spaces.
- Incorporating urgent care dedicated to cancer patients on the first floor so they don’t have to go to the Emergency Room.
- Maximizing daylight into the rooms.
- Being sensitive to the impact of construction on staff in particular—not just patients.
- Keeping a dedicated amenities space on each floor for family’s respite outside the patient room.
- How to improve on operational issues, circulation, and flows.
- Create some momentum by creating the entrance first.

### Infrastructure Challenges

*“The structural design gymnastics were extremely difficult to create the entrance — and extremely sophisticated.” — Doug Carney*

The panel members explained that repurposing the building is very complex because it involves integrating infrastructure throughout the existing building — which in turn is connected to so many other campus buildings on a pedestrian level, bridges, below level.

Specific challenges include:

- ▶ A significant structural impact to integrate the new entrance with the lobby.
- ▶ The bones of the building have fundamental compromises.
- ▶ Having to use the existing floor plate, which is *not* the size designed for a hospital today.
- ▶ Finding rooftop space for mechanical and emergency systems repository.

## LOGISTICAL CONSIDERATIONS

*“We have to be nimble...with how we build this.” — Michael Delaney*

- Logistics don't work if you can't communicate with your design team and they don't produce a design that is buildable.
- It's about behaviors as much as construction, how you get along and come up with solutions that work for the client.
- How to go from the outside in?
- What happens in what order, how to reduce impact inside the hospital.
- How to improve operational issues, circulation and flows without building a new building.

## UNFORESEEN LESSONS LEARNED

- It's better to have a meaningful master plan in place that serves as a roadmap that's integrated and aligned with the budgets, strategy and marketplace.
- Labor management landscape has changed. Staff has higher expectations; we need to work with them and expect the unexpected — 20,000 people enter and leave that campus every day.
- Create a roadshow for the community to communicate and set expectations properly beforehand.
- Make proactive outreach to internal staff to let them know clearly what is going to happen.
- Don't lose sight of the design in solving the technical challenges.

# HOW THE FUTURE OF HEALTHCARE DELIVERY IS REWRITING TODAY'S CAPITAL SPENDING PLANS

Michelle Mader, Managing Director, Ankura

Jonathan Cogswell, VP, Manhattan Development, Northwell Health

*“Operation margins are razor thin. There are no margins right now in healthcare—or they are few and few between.” — Michelle Mader*

## OVERVIEW

The panels pointed out that approximately half of US hospitals ended 2022 in the negative— and the pandemic taught us that healthcare is not recession-proof, as had been the conventional wisdom.

They explored where healthcare gets their funding for big capital facilities projects in a hard market, when access to capital is difficult, the key economic realities putting pressure on healthcare systems ability to profit and raise revenue, structural trends in healthcare delivery, and how the industry can move forward in funding capital projects.

The environment for healthcare systems and most anyone in the healthcare market is tough at present to get capital projects approved, etc., because of **pressure on all the usual sources of capital funding**, including:

### Private Equity:

- Stepped a few years ago, particularly in 2022, when things were going great in the market.
- Completed a bunch of buyouts with the strategy of infusing capital into capital projects — but 84% more of those went bankrupt this year.
- Healthcare startups are laying off in masses and going bankrupt because they got into an industry they didn't understand and thought operated like retail and commercial markets.

### Bonds:

- Community bonds are often a source of financing, but in this context of inflation and escalation, that is not an available option.

### Philanthropy:

- Tends to follow the markets generally—currently thin, even though here is some good philanthropic work going on.

### Investment Portfolios:

- It's been a hard 12 months for investments — the worst since 2008.

### **Banks:**

- Banks are just not giving out loans right now.

### **Insurance Companies:**

- The only ones giving loans right now because they are not all tied up in credit.

### **“FORCES COLLIDING”**

- **Rising Acuity:** The single most contributing factor right now, outside of labor and supply cost increases — is an industry-wide increase in length of stay. Every extra day a patient is in your hospital, margin is lost.
  - Also puts more pressure on facilities because of an analogous need for more beds, dialysis, ICUs, Telemetry, etc.
- **Slow Reform:** CMS vs. Actual Cost — Congress is tired, and proposed increases are not keeping up with inflation for things like Medicare advantage program.

*“So, we’re becoming accountants...we’re looking at projects in very different ways than we used to. We’re looking at every single penny.” — Jonathan Cogswell*

## **HOW DO WE REACT? WHAT CAN WE DO TO IMPROVE THE VALUE OF CAPITAL PROJECTS AND DRIVE COSTS DOWN?**

### **CAPITAL PLANNING IS FOCUSED ON NEAR-TERM CHALLENGES:**

#### **Structural changes to healthcare’s delivery model**

The profession has shifted rapidly over the past year or two:

- There’s been a shift from inpatient to outpatient of about 1% a year at Northwell, moving patients out of hospitals and into the ambulatory network — *some 55,000 encounters a year.*
  - ▶ This shift will continue to increase and increase over the coming years.
- How do we prepare our Ambulatory network for this influx of patients?
- Looking to bring in the middle ground, the smaller office practices - a new step in the continuum of care.
  - ▶ How do we bring in the specialty practices into the mix?
- Telehealth and home healthcare has increased dramatically.
- Master planning is happening in a different way, looking at continuity of care.

## WHAT DOES THIS MEAN FOR FUTURE CAPITAL PLANS?

*“Fill it or kill it — it’s all about utilization: If you can’t fill the beds or have 90-95% utilization, we don’t open it. If you can’t staff it, you can’t generate revenue and you can’t bill it.” — Michelle Mader*

*“‘If you build it, they will come,’ is a thing of the past.” — Jonathan Cogswell*

## CAPITAL PLANS THAT DEFINE WHAT WE NEED BASED ON WHAT WE CAN AFFORD

The panelists described the healthcare industry as playing *whack a mole* today, with systems triaging and looking for short term returns on a monthly basis, not 3-5 years forwards as was the norm. If you can afford to build it, you have to be able to create revenue and profit *as soon as a capital project is done*.

Another trend discussed is that that healthcare entities are now not being called health *systems* anymore, but health *platforms* — and that impacts capital planning.

### Key Takeaways for Capital Planning Strategies and ROI Recovery

- Pause or abandon projects.
- Need to build flexible facilities for use by different users, not lock into specialized facilities.
- Consolidation and right sizing—there’s way too many beds and empty assets around the country. Can’t have inventory sitting around.
- Margin vs. Revenue: It’s not about growth anymore, it’s about revenue and ROI.
- It’s no longer cost/SF, it’s *revenue/SF*.
- Staffing Centric: Labor has stabilized, but still seeing escalation and inflation.
- Technology: Looking to leverage AI for cost savings— AI never takes a break, it pulls in revenue, and never asks for benefits.
- Partnership versus M&A: Can’t afford to do Mergers and Acquisitions these days.
- Niche: Fewer projects, more linear, less dispersed.

### Impacts to PDC COMMUNITY: Maximization of Flexibility

- We don’t ask what can this building be used for, now we decide what it’s for.
- Partnering with groups and working as a team.
- Repurposing vs. New.
- Standardization: Functional programming, smaller designs, pre-fab/modular.
- Construction-led projects based on budgeting and cost control.



## How to help clients plan their Capital Well

- In master planning, start with liquidity and cash flow.
- Reduce Costs and leverage economies of scale.
- Manage liquidity on projects as much as possible.
- Right now, it's all about data.
- Execute operationally is expensive, labor and supplies are expensive.
- Optimize cost savings through consolidation and fill it or kill it approach.
- New construction outside of NYC, \$700-1000SF— you have to fill a LOT of beds.
- Either mission-driven or consolidate to grow.

## MODULARITY

*"I can repurpose spaces more quickly with modularity." — Jonathan Cogswell*

The trend is toward standardization rather than specialization, and flexibility in spaces ("plug and play") take a cardiology space during the day and turn it into Urgent Care facility at night, and modularity lends itself to this approach, which also presents budget advantages in terms of cost savings.

## HOME CARE SERVICES: HOW WILL HOSPITALS BE INVOLVED?

Home Care is "young" in Northwell Health system, for example, and institutions are still trying to figure it out. At present, Northwell doesn't help people set up care in their homes, that's done by social services. However, involvement with providing services will continue to evolve and morph for health care systems as they merge telehealth, hospital, and home health in what will be much more a platform and partnership.

# STRATEGIC PLANNING FOR SUSTAINABILITY: TRANSITION FROM PR OPPORTUNITY TO STAKEHOLDER EXPECTATION.

Myrrh Caplan, LEED Fellow, National VP, Sustainability, Skanska USA Building  
Brian Kirk, Director, Facilities Operations and Engineering, Infrastructure, New York Presbyterian  
Dan Scher, VP Strategic Planning and Sustainability, Medxcel

*“Part of the work we’re doing is to help clients understand that, at the end of the day, you need to have a clear picture of where your energy is being expended, and where it’s inefficient.” — Myrrh Caplan*

## OVERVIEW

This sustainability panel focused on what the priorities should be for healthcare Institutions, with the top priority being the need to focus on carbon reduction and running hospitals and facilities in a way that reduces the carbon impact. They also reviewed why Life Science renovations are so expensive.

Because a significant number of hospitals and healthcare systems are very energy intensive, and there’s much concern about how they will be able to meet deadlines for reduction by 2024 and 2030. They will be subject to fines if they are not in compliance.

There are a lot of mid-century buildings in health systems, and it’s going to take a lot of work to get them to where they need to go.

- According to the Urban Green Council: 25% of health care buildings won’t qualify in 2030, and 70% will not meet the standard for the next deadline after and will have to pay fines.
- NY SERDA programs are helping with financial incentives, but it will take significant capital investment to meet the 2024 and 2030 goals.
- The energy-efficiency model is transitioning to a carbon model where energy efficiency factors into the carbon level.
- New, higher level of Financial Disclosure of carbon is a real game changer, but the content has not yet been finalized.
- Healthcare is lagging behind many other industries — it’s difficult to make significant changes in the patient environment.
- Non-profit health care — bond ratings are being influenced.

## Key Considerations and Opportunities

- Healthcare providers have direct control over energy.
- It’s an advocacy opportunity for owners, but will figure into their accounting.
- Prioritize what can be done in order to reach established carbon footprint goals.
- Use tools like EC3 which was developed to look at construction materials to help choose lower carbon options.

- When you have an organization that has a carbon timeline, as you bring energy use down, that level of data has to be captured so that you can know the full carbon footprint.
- It's a data collection process.
- With Telehealth you need to figure in transportation of equipment to the home in your sustainability strategy.

### SCOPE Considerations

- SCOPE 3 is generally estimate-driven, and it remains to be seen if incremental changes will be able to be accounted for.
- Focus on the really big chunks of your SCOPE 3.
- DATA: Every organization, every month or quarter, will be finding new sources of data, but then you get into SCOPE 3 things, like travel. It's a lot of work if you don't have a system where you can just access that data.
- CAPACITY: How much capacity do you have to collect data, especially for SCOPE 3.
- To do SCOPE 3 better, look at economies of scale. So, you have to agree on what's important and where you can move the needle, and make those more easily attainable in the future.
- SCOPE 1 and 2 (fuel and energy): how are they being managed today?

### Sustainability Challenges

- There's not yet a storage solution for wind and solar (intermittency).
- Many technologies have to happen before a significant bump in sustainability can become a reality.
- Electrification: NYC grid is still 90% fossil fuel, so coming off gas in the short term would actually raise carbon emissions.
- Still not clear how to replace natural gas.
- Inspiring and motivating people to focus on this: Access to capital is a big deal, and the bond entities have taken a big interest and that's significant.
- Geothermal pumps: There are limited opportunities for scale in the city, but it's a big effort can potentially contribute to heat recovery and the next generation of HVAC. But drilling into rock is very expensive when putting piles into the ground.
- Wind Farms: It's going to take time to full electrification, and not enough land mass for solar and wind at their current conversion rates.

# ADAPTIVE REUSE FOR HEALTHCARE & LIFE SCIENCE FACILITIES: WHY ARE THEY SO EXPENSIVE AND WHAT CAN BE DONE?

Mitch Green, Senior VP, Preconstruction, AECOM Tishman

Chris Korsh, AIA, Senior Principal; Regional Leader, Healthcare, HOK

Kate Abudarham, Specialist, STO Corp

Jenn Ryden, Senior Project Manager, Healthcare, Stantec

Michael Lorimer, Associate Principal, Americas East Healthcare Business Leader, ARUP

Max Driscoll, Head of Sustainability, AECOM Tishman

*“It’s amazing how many blue cables there are in buildings these days...on an average healthcare fit-out on one floor, say 25,000-30,000 SF, there are more blue cables that homer to the IT than Babe Ruth hit in his career.” — Mitch Green*

## OVERVIEW

Mitch Green kicked off the presentation by emphasizing that the cost of renovating for Life Science and Healthcare has become distressingly high. Green and the panel of professionals covered the conventional promise of— and incentives for— adaptive reuse, followed by the realities of renovating and adaptive reuse, what these entail, and what impacts cost. Finally, they presented reasons why adaptive reuse is still viable and even beneficial option and which approaches can mitigate the costs of adaptive reuse for healthcare.

### ADAPTIVE REUSE: THE PROMISE

- Decide on a new use that can fit into an old building without major work — and voila!
- Give new life to “old bones”, tax breaks, save history!
- Examples of Adaptive Reuse: a Midwest silo that’s now a hotel, and the Boston Charles Street Jail is a luxury hotel, Chicago Cook County Hospital is now a hotel.

### ADAPTIVE REUSE: THE HEALTH CARE REALITY - CAN IT BE? MAYBE NOT:

- Adaptive reuse really becomes UPCYCLING
- People, processes & machines demand:
  - Occupancy Class, Population load (permits?)
  - Exit paths, Doors, Stairs & Fire Suppression requirements
  - A/C Capacity, Air Changes & Exhaust separations
  - Electrical Capacity, Emergency Power



- Plumbing density, Hot Water & Drainage
- IT

### **KNOCK-ON IMPACTS:**

- “Adaptive Reuse” really becomes “UPCYCLING
- New infrastructure often drives the need for: Structural Alchemy
- People, processes & machines demand:
  - Reduced on-site productivity due to ICRA & ILSM (at home: efficiency goes down, disruption goes up)
  - Reduced straight time hours for “noisy” work
  - Increased OT & weekend work
  - AND for the Owner...disruption & revenue loss

### **WE ACTUALLY GO BACKWARD TO GO FORWARD:**

Putting a new use into an existing building cost about the same as putting it in a new building, so that’s fine...but is it *really*?

- First you need demolition
- Structural alchemy
- Abatement
- The mysteries of Local Law 11 (older building looks great on the outside, but there’s a lot of problem in an older buildings and time on things like spent tracing, relocation and reorganizing conduits).

### **HOT TOPICS IMPACTING COSTS**

- HIPAA/Speech Privacy (walls, ceilings, A/C & lighting)
- 23-1/2 Hour Healthcare & Life Safety
- HC Equity, Healthcare Standards & CMMS Funding
- Building Flexibility for...the next Pandemic
- BIM, VR & Augmented Reality: VR can be challenging and time consuming but it enables clients to tell designers, engineers, etc. that there isn’t enough space on the ceilings and something different must be done
- Skilled labor shortage
- Onsite labor productivity driving the need for more modular and prefab

- De-Carbonization: Is the FDNY at work with LL97?
- SCOPE 3 Supply chain emissions make up the lion's share of carbon emissions
  - There's a need for national directory that shows the carbon level for construction materials

## REASONS WHY TO KEEP DOING HEALTH & LIFE SCIENCE RENOVATIONS

- Renovation can still be faster
- Renovation Real Estate deals can be more flexible and creative
- The lure of the 100% corner

## WHAT CAN WE DO ABOUT THE COST OF HEALTHCARE RENOVATIONS?

**Maximize ROI:** from closet movers to value creation. **Find value for the client:** Top line revenue, net operating profit, expanded services, new customers

**Minimize "Drag":** Revenue Loss, disruption, phasing

**Consider Alternatives:** Resize spaces, telemedicine, remote work

### Additional options:

- ▶ More Prefab (i.e., exam rooms), utilize Modular — except fire-rated walls
- ▶ Distributed Generation...baseline or peak-shaving
- ▶ Fewer sound traps
- ▶ Eliminate perimeter heat
- ▶ Distributed generation (baseline or peak shaving)
- ▶ Geothermal walls add value for energy savings
- ▶ Think horizontally via floors, *not vertically* through multiple floors of occupied space
- ▶ Day 1, Day 2: Affordable functional flexibility
  - **Ex: Day 2 room reconfigurations:** move doors, change sinks, 93% -96% materials re-use
  - ▶ Maximize materials reuse
  - ▶ Rethink plumbing (pneumatic, vacuum) and eliminate disruption to operations
  - ▶ "Meetingless" Fridays!

## HOW TO GET STARTED:

- Designers: Be kind and respect the MEP team more — they deserve it.
- Owners: Be generous. If you give up a little available space on a floor, you might get a better functioning system out of it.
- CMs: Speak up more, ask more questions, don't let it be "business as usual."

## POCKETS OF OPPORTUNITY & THE 100% CORNER: IDENTIFYING THE RIGHT ADAPTIVE REUSE PROJECT

James Colgate, AIA, Partner, Bryan Cave Leighton Paisner LLC - Mayor's Adaptive Reuse Task Force, former NYC Planning  
Elliot Dennis, Broker, Wexler Healthcare Properties  
Guy Leibler, President, HBC Development

**MODERATOR:** Alan Whitson, President, Corporate Realty, Design and Management Institute

*“Owners are more willing than ever to come into the healthcare space, and think about can they do this in my building.” — Elliot Dennis*

*“If you look at the building code or zoning solution, if you want to go from office building to an healthcare outpatient facility, the codes are not normally the problem...But there are real regulatory hurdles for residential conversions. One of the big recommendations over the next couple of years will make it really easy to convert office buildings to residences for buildings that were built 1977 to 1990, which makes it more likely candidates for conversion to residential, if the numbers work, rather than medical.” — James Colgate*

### What are people looking for in the Manhattan Real Estate Market?

**ED:** With regard to adaptive reuse and things of that nature post-covid, I've never seen so many ownership groups approach us and say, “We've got 50,000 SF of office space, can you take a look at it for potential healthcare space?”

Pre-Covid, we wouldn't have gotten a lot of such calls.

We go in and evaluate: In this good for healthcare? Why is it going to work, why is it NOT going to work?

### Looking at the market place from your standpoint, what are the opportunities healthcare organizations should look at for adaptive reuse?

**GL:** As many have noted today, everything is data-driven, and it's too expensive to run a healthcare platform system without it being able to generate a revenue.

Hospitals that have been community pillars for generations are too old and expensive to run. They use too many BTUs and too many FTEs, and are damn expensive to operate. Which is why many hospitals are going to use their capital over the next decade to fix and invest in upgrading facilities.

Healthcare systems are no longer looking for small spaces (5 and 20k SF) for their ambulatory care facilities, they need 50k+ SF at least. Where do you find these spaces? **Big box retail stores**, for example in Manhasset. They are well-located, and typically have big floor plates between 50-60k SF, for a two-story store. They have great column spacing, high ceilings /good headroom — though a little limited on floor load, which can be accommodated—as well as parking, and good demographics.

Over the past few years, we've seen tremendous interest in these spaces, for example, NYU Presbyterian and White Plains Hospital.



## In Manhattan, what happens if people start occupying what used to be manufacturing or office space, which didn't have a lot of healthcare in close proximity? Does it make sense from a planning standpoint to put healthcare nearby? How do the city, architects, and contractors deal with that?

**JC:** My expertise is the five boroughs of NYC. The contraction in the office space world is palpable, I hear from clients and developers that they don't know what to do with the space in those buildings.

The Mayor's task force came up with recommendations for what we do with office buildings generally in the post-Covid environment. We got together with architects, planners, agencies and governments officials and to try to figure out what the issues were in order to facilitate the reuse of these buildings for other purposes. The regulations that got in the way most were impeding the conversion of offices into residences, and inherent issues with office buildings and reusing them that are architectural and how they are constructed and what you need to do to them.

To facilitate the conversion from office to residences the task force made recommendations addressing where the conflicts were — the codes are not normally the problem. If you look at the building code or zoning solution, if you want to go from office building to an healthcare outpatient facility, the codes are not normally the problem. You may have practical MEP or structural issues, but not problems with the regulatory mechanisms that govern their conversion.

But there are real regulatory hurdles for residential conversions. One of the big recommendations over the next couple of years will make it really easy to convert office buildings to residences for buildings that were built 1977 to 1990, which makes it more likely candidates for conversion to residential if the numbers work, rather than medical.

## If Manhattan opens up more housing, do we need to start thinking in our strategic planning what medical needs to be close to the new housing?

**GL:** As an example, a project we've been working on in Westfield, NJ, which we receive all entitlements for, it's very nice community, very well-established, and has a train line.

We're doing an adaptive reuse for the former Lord & Taylor store on the train line and it will probably be healthcare and office, but we also on either side of the building we are going to build 232 residential apartments — some 55 and older, some unrestricted.

We also have designation to build two, 100k SF office buildings. We've seen flight out of NYC with a big banks and others, so we are looking at a lot of projects on a mixed-use basis, and converting parking lots to housing, and taking down the stores and looking at residential—and essentially at every use possible, but each store site has different demographics and DNA and calls for unique analysis for whether retail, residential, or healthcare would be suited to that site.

## We're looking at increased demand for medical use across the US. Do we have to look further afield and have a more strategic outlook for potential opportunities?

**ED:** What we're seeing is that care is coming to the patients, and our perspective is that we go where the tenants go. So,

But some of these buildings **don't** have the massive floor plates that healthcare systems would like for a multi-specialty facility—which every landlord would like in their portfolio—and that's the goal for maybe converting their building to healthcare.

We represent the Woolworth building with a former NYU Continuing Ed space there, and we're marketing it for healthcare. And it's funny when you get into the bones of some of these old buildings that you think maybe is not

great infrastructurally for healthcare, it turns out that they have a direct line of 4000 amps we can tap into for an imaging center and the floor loads are incredible.

It's about investigating thoroughly on the front end to see if it's going to work, and you can bring healthcare to some creative places.

### So, the opportunity is out there?

**GL:** The opportunity is out there for the right asset. Do your homework in advance, don't show up without knowing exactly what you have, and try to understand what the potential client needs.

The needle is getting thinner and thinner, and you need to be much more selective. It's not the wild west that it was 10 years ago.

### From a planning standpoint — is it doable?

**JC:** The regulatory and planning environment in the five boroughs of NYC is not hindering, it's just going to be market forces.

Yes, some buildings will be converted to residences, and those people will need doctors for medical issues that need tending to, but there's going to be a population increase in NYC regardless of whether or not we're converting some buildings or building new buildings. Everyone is gearing up for more population in our area. Office conversion to residential is a small part of a larger plan that will end up with the ability to offer much more housing in the metropolitan area.

## HOW TO CREATE VALUE, SAVE TIME AND CONTROL IN ADAPTIVE REUSE PROJECTS

Emil Martone, AIA, Director of Design & Construction, Weill Cornell Medicine, Capital Planning

Laura Morris, CHID, IIDA. LEED AP BD+C, Lean Green Belt, Associate Principal / Health, Perkins & Will

Rahul Tikekar, PE, MS, MBA, Principal / Senior Vice President, Loring Consulting Engineers

**MODERATOR:** Alan Whitson, President, Corporate Realty, Design and Management Institute

*“With the concept of adaptive reuse, we’ve gone from building to building to building until we find the one that fits the program and project goal.” — Emil Martone*

*We have to think about designs differently, as each building and constraints are opportunities to find creative solutions, for example, wayfinding in buildings with big floor plates. — Laura Morris*

### How important is it to know the objective of a reuse project?

**Emil Martone:** Well, obviously I think everything starts with what your purpose is, and what your programmatic goal is. Certain buildings lend themselves to conversions and some don't.

It's really about infrastructure.

- LL97 is becoming front and center and starting to drive a lot of the decision making both on the up-front capital and ongoing energy costs and trying to avoid fines in subsequent years.
- Spend considerable amount of effort, time and money up front on projects.
- Concur that the smaller 5-10k SF sites not economically viable going forward.
- Trying to co-locate sub-specialties together and create multiple clinical practice areas to get economies of scale on the front-end capital as well as from an operational standpoint.
- These leases can get incredibly complex.
- Might spend 6 months with MEP engineers to understand the landlord's mechanical systems.
- On larger sites, building a building within a building allows you to be as independent of the landlord's MEP system as possible so you can control your own destiny.
- In the TI allowance or the landlord's work letter, there's going to be a lot of work there making sure that what you're asking for makes sense, because these are multi-million-dollar decisions all around.
- Taking the architects' test fit to the engineers is an incredibly important piece of the equation.

### As architects, how do you figure out what the objective is?

**Laura Morris:**

- Best when clients do their due diligence.

- Architects need to ask the right questions when getting an RFP with a generic program and some test fits, to fully understand:
  - ✓ Has the due diligence been actually been done?
  - ✓ What is the capacity of the building is mechanically and structurally?
  - ✓ Ceiling heights and floor-to-floor heights
- Once you have a full understanding with an open mind, you can be real partners with clients and work to find the right solutions.
- Be realistic and honest with clients about what the building can and cannot support for healthcare.

## From an MEP standpoint, how do you extract the short- and long-term goals?

### Rahul Tikekar:

From the MEP standpoint, it's important to understand three objectives and approaching them in a proactive manner is really important to making a project successful:

- 1) SCOPE:** Where the outpatient center going to be located is important, but also what is the infrastructure in that building that can support it, i.e.:
  - ▶ HVAC proper filtration systems for health care facilities depending on the kind of facility, i.e., emergency power, proper voltage, appropriate incoming water service.
- 2) SCHEDULE:** Important to clarify the schedule based on what you can actually achieve.
  - ▶ Post-pandemic, significant supply delays exist that need to be accounted for and equipment can be a year or 18 months out.
- 3) BUDGET:** Infrastructure is often not included in the cost/SF estimate, which can give clients sticker shock when the infrastructure cost is reflected down the line.

## How do you do your due diligence, including knowing the unknown and discovering opportunities?

### Emil Martone:

- A key piece is having a landlord who either is educated and sophisticated— or helping you to educate them—the process is intense and the landlord has to understand what they are signing up for.
- More landlords today understand compared to even a few years ago.
- While you want a landlord who communicates and understands, it's important that your lawyers are document things really well, and put whatever protections you may need in place today and build in as much flexibility as possible.

### Laura Morris:

- It's about understanding what's in the lease and what the owner is responsible for, what the architect is responsible for, what the owner's paying for, and that line is blurry.
- Understanding the tolerance level for who is paying for what and being very clear about that.



- Be clear about what is going above and beyond what the landlord is paying for.
- We have to think about our designs differently: There are opportunities in each building for unique solutions, we need to look at the constraints as opportunities to find creative solutions, i.e., intuitive wayfinding and graphic design in buildings with big floor plates.

**Rahul Tikekar:**

- For a small money, the owner can get the big picture and whether a building is even a good candidate — could look great but the facade could be leaky or the MEP infrastructure might not be suitable or economically feasible to upgrade.
- Do total due diligence with architect and engineers before starting or even signing the lease preparing a Basis for Design is very important to make sure the building is suitable.
- There's opportunity in putting on different thinking caps: Say you are designing an exam room or a doctor's office; you have to think from that standpoint.
  - ▶ Take advantage of FGI outpatient guidelines.
  - ▶ Think away from how you would design a surgical suite or procedure room.

**Have you ever worked on a Project A that morphed into a Project B that morphed into a Project C—and Project C is better or worse than Project A?**

**Emil Martone:**

- With the concept of reuse, we've gone from building to building to building until we find the one that fits the program and project goal.
- Be consistent and objective lenses you're looking through — be careful not to fall in love with something before making sure that it's really going to work.

**Laura Morris:**

- Been pretty successful at getting to the end goal of the project and making sure it happens.
- We may ebb and flow through that and determine that a different floor is better for a certain program, or lose some program to get to the right side of a facade, access points might.
- Sometimes programs change, for example, become more staff-oriented, so rethinking and moving staff spaces towards the perimeter.
- It's key to be continually in dialogue with MEP partners and to understand that some things will change— look at those changes as opportunities.

**Rahul Tikekar:**

- If you have very low floor-to-slab heights and you are putting operating room equipment there, do you have clearance and structure and space to accommodate both the program and equipment?
- Work with architecture team, MEP, and owners to develop a suitable program for the space.

## Tips and insights: What to do and what to avoid?

### Emil Martone:

**DO** start design as early as possible, by the time you sign your lease you want to be as deep into your design as you can.

**DO** make sure you have the MEP engineer review the lease to drill down on the technical points to make sure the landlord can provide the required level of systems that you need.

### Laura Morris:

**DO** If you don't have a savvy landlord used to doing healthcare, have partners review the lease early on so client doesn't have to pay for changes later on.

**DON'T** assume going into the design that you have an open plate that all ideas can happen ( i.e., consider ceiling heights and equipment issues) and definitely:

- ▶ Do your due diligence
- ▶ Do as much existing conditions as possible, as-built drawings are not enough
- ▶ Do more 3D scanning, it's not optional
- ▶ Do the clash detection thoroughly from the beginning

### Rahul Tikekar:

**DO** get the team together and ask all possible questions you can ask in the beginning, i.e.:

- ▶ Is your building in a flood zone?
- ▶ Do you have groundwater?

**DON'T** wait until construction phase if you are doing anything prefab, for example, to get the team on board as early as possible.

**DON'T** rush into a lease without asking all the right questions.

# SECRETS OF MINING BIG DATA — PREDICT THE FUTURE WITH THE CONFIDENCE OF THE PAST

GRACE LIN, AIA, CSI-CDT, DBIA, SENIOR Project MANAGER, CBRE HEALTHCARE  
ZIG RUBEL, FAIA, CO-FOUNDER / CEO / foresight digital

*“Foresight can generate a business model so that user can see if they are going to make money or not, looking at several different scenarios and details... then they can be pointed to another tool that can auto place different blocks (stacking), quickly iterating design what a design solution might be based on operational parameters.” — Zig Rubel*

*“Chat GPT can’t yet do a registered architect’s job.” — Grace Lin*

*I think our clients and our customers want more speed and more options and a quantitative way of what is assessing what is better or not. — Zig Rubel*

## OVERVIEW

The panelists introduced conference attendees to AI tools and methodologies for how these new tools can draw upon data to optimize what’s needed and how to plan for a range of healthcare facilities.

They reviewed the strengths and capabilities of these AI tools, as well as what they don’t do as well as this point in time.

They presented two different dialogues around different ways to use **Chat GPT**, a natural language model that can conduct human-like conversations, and is accessible and easy to use.

While many companies want to implement ChatGPT, there is still **a lot of apprehension around the possibility of inaccuracies or plagiarism** (i.e., NYC Dept. of Ed banned it because of these concerns).

The presenters note that Chat GPT is not always accurate, but will improve over time. The platform requires supervision, but does facilitate implementation of mundane, time-consuming tasks.

They also introduced **Foresight Digital**, a medical planning software, and how it can be used to support the planning process. They called Foresight a modern way of planning for healthcare facilities, with big data that is now even bigger, and which can speedily configure complex healthcare projects.

## CHAT GPT - DIALOGUE 1

### WHAT DOES CHAT GPT THINK A CONVERSATION SHOULD BE?

- ✓ Mining big data can provide valuable insights into **predicting the future of healthcare** and optimizing the planning and design of cardiology centers.
- ✓ By analyzing past patient data, treatment outcomes, and trends in healthcare technology, **project teams can make informed decisions** on how to optimize the center for cost, patient and staff experience.

## CHAT GPT - DIALOGUE 2

### WHAT DOES CHAT GPT THINK A CONVERSATION SHOULD BE?

- ✓ Project teams can also leverage **what-if scenarios** to identify potential experience plans and key spaces for a cardiology center.
- ✓ By using **publicly accessible data** on patient volumes, treatment outcomes, and staff efficiency, teams **can identify areas for improvement and optimize the center** for cost and patient and staff experience.

## THE OPPORTUNITY

- We're still in a world of data silos, and manual operation is time-consuming.
- The siloed world does not offer many choices.
- Continuing to project the past is quite *expensive*.

## THE FUTURE - FORESIGHT DIGITAL

### A DATA-DRIVEN MEDICAL PLANNING SOFTWARE: GENERATE, ITERATE, CHOOSE

- Helped reach consensus during early development planning phases and saved time and money.
- Integrated, automated, fast, flexible, virtualizing operations helps improve and inexpensive.

## INTRODUCTION TO USING FORESIGHT

### CASE STUDY: HELPING A HEALTHCARE ORGANIZATION WITH AN INSPIRING VISION FOR A NEW AMBULATORY CARE CENTER.

CEO had selected a location, funding, architecture, and schedule, etc., but some had concerns about this aggressive approach. They went to CBRE for help to evaluate this plan, who then turned to Foresight. They sought a data-informed decision and asked:

**What is important to their organization?**

**What are the KPIs and metrics we want to measure for success?**

- What is the impact?
- What is the standard of quality?
- How flexible is the building?
- What is the cost?
- What is the time to market

## PRESENTING A DATA GENERATED PROGRAMMING OPERATIONAL SOLUTION

### Location and Catchment Area:

- ▶ Gave a start location in midtown (zip code).
- ▶ Looked at location of other healthcare facilities.
- ▶ Looked at how far patients would have drive to identify the **catchment area**.

- Turns out to be a 1-mile radius, midtown Manhattan, with a larger catchment area that includes in Brooklyn and Queens with parts of NJ.

### Population Demographics:

- ▶ Can see how the population is stratified by men and women, age cohort, etc.
- ▶ How they will change over time, which is where the growth comes in.
- ▶ You can have a data-driven conversation about how the growth will impact your facilities when you design and build it out.

### Socio-Economic Indicators:

- ▶ Able to look by zip code at income, race, etc.
- ▶ Helps to understand what the needs are for a building before you design.

### Using Foresight to develop a data-driven plan for healthcare with speed and increasingly greater accuracy and effectiveness

- ▶ Pick out your service lines for everyone who needs health care.
- ▶ Create **Experience Plans by patient type**, i.e., unique patient travel pathways dependent on diagnosis or care type starting with lift-off points off a journey.
- ▶ Each Experience Plan is the functional choreography of a patient journey a **with a key room or key driver** (where patient gets care or interacts with doctor, i.e., x-ray, surgery, EKG).
- ▶ Look at capacities (i.e., room utilization) and build a space program based on who's coming to the facility and shows the spatial relationships and departmental adjacencies.
- ▶ Generate a Rooms List with number of rooms based on standard type or size (i.e., 120 SF) — or modular rooms for flexible space.
- ▶ Determine what you really need so you don't build what you don't need.

### SUMMARY OF BENEFITS OF THE FORESIGHT PROCESS

- ✓ **Data tells you how many** doctors and diagnostic and treatment centers you need
- ✓ **Can see early on in the analysis** where the money is coming from, why patients are coming to a facility
- ▶ Can **generate a business model** so that user can see if they are going to make money or not, looking at several different scenarios and details and them can be pointed to another tool
- ▶ Then the **data can auto place different blocks** (stacking) to begin design and configure complex healthcare project solutions.

## COPING WITH THE GRAY AREAS OF TECHNOLOGY, EQUIPMENT, AND DESIGN

John Rodenbek, AIA LEED AP, NCARB, EDAC, Partner, E4H Environments for Health Architecture  
James Ticer, Senior Principal, Healthcare Practice Area Leader, Discipline Head, MEQ Planning, SM&W

*“A “gray area” is any element of a project where multiple parties are involved but no one group has overall responsibility...you get into the project, and there are areas that no one wants to touch.” — John Rodenbek, AIA*

*Make flexibility an explicit design goal — who coordinates and gathers info across the institution for technology. — James Ticer*

*“Provide additional access points for data and electrical service — not just for patients and visitors, but because you don’t know what technology could be coming in down the road.” — John Rodenbeck, AIA*

### TECHNOLOGY IN HEALTHCARE

- High acuity or critical patient service areas are becoming more connected to technology.
- Expectations from healthcare organization are the design and technology elements — a big investment.
- Traditional consultancy solicitations don’t often address the gray areas effectively.
- There is no single right answer to solve some of the questions, but there is a right one for the client.

### GREY AREA PROJECTS

- Any element of a project where multiple parties are involved but no one group has overall responsibility:
  - ▶ Hybrid operating rooms
  - ▶ Electronic patient charting requirements
  - ▶ Physiologic monitoring
  - ▶ IT connectivity requirements for medical equipment and systems.
- Engineering team needs to find air handling, for example, but they can’t give the whole answer.

### PRACTICAL ISSUES: MEDICATION MANAGEMENT

Ex: Nursing waiting to fill Rx due to change in medication —

- ▶ Medication room: Nice size, medical dispensing units on one side, work counter on the other side, hand washing station, documentation station, centrally located on the unit — a great design solutions.

- ▶ But then, someone changes the model of medication distribution to med carts — charge in an equipment room charging overnight, and nurses the next morning lined up waiting to get in to fill patient medications.
- ▶ Result is delayed medication distribution, which delays morning meals and has a domino disruptive effect on protocols.

## INTEGRATED CLINICAL ENVIRONMENT (ICE)

### How Smart is Smart?

- Planner can know what connectivity is needed for smart tech, but not how they need to talk —which effects work flow in the space.
- As design team works through the room, who stands in the middle of that?
- Who asks the questions? Everyone should be asking questions in schematic design.
- What to do about building that infrastructure?

## FUTURE PROOFING / MAKE FUTURE READY: HOW FAR TO GO?

- FGI Minimums Requirements vs. Flexibility
- FGI was created to set safety standards, not to model spaces based on operational needs.
- But equipment is not always specified until later in the process — so pick your equipment early, otherwise you are designing to the worst-case scenario to make sure you can accommodate it.
- Provide excess capacity in the electrical and IT closets — they are almost always inadequate.
- Depress slabs in areas with excessive floor raceway requirements.
- Provide universal structural ceiling grids.
- Segregate structural bays with capacity to accommodate excessive weight and vibration stability.
- Provide additional access points for data and electrical service — not just for patients and visitors, but because you don't know what technology could be coming in down the road.

## AMBULATORY CARE

### Exam Rooms

#### Patient Populations vs. Space

- ▶ Increasing shifts to outpatient care and a need to make better use of available space.
- ▶ How do you organize the exam room to suit flexibility specialty care and technology goals — different specialties can have very different work flows.
- ▶ Teleconsulting and Telehealth allow for greater expertise at the exam table but have their own requirements — what does it do to the rooms?

#### Typical 120 SF Exam Room — Adapt to Different Specialties and Technologies

- ✓ Involves zoning of space to accommodate technology — both equipment and data ports.
- ✓ How multipurpose can it be?



- ✓ Understanding who uses the exam room based on volume?

### Specialty Exam Rooms

- ▶ Reduces flexibility options.
- ▶ Volume data for day one and future become critical.
- ▶ Cohosting specialty exam rooms may not work.
- ▶ Often you have to retrofit technology into a space, so the vision for technology needs to be discussed as early as possible.
- ▶ Over time we are finding how we can morph a consult room into an exam room (see recording), how do you share this space with another specialists.

#### **Conflicts between design, technology and equipment can be managed:**

- ✓ Get everyone at the table early on: client design, tech, equipment, clinicians, and stakeholders to discuss tradeoffs between design, tech and equipment based on facility goals.
- ✓ Collaborate and communicate with various stakeholders about the challenges and differences in clinical requirements to avoid operational setbacks.
- ✓ Get Clear direction from the healthcare organization on patient types, specialties and physicians, day one and future.

### INPATIENT UNITS

- There aren't classes to teach, say, charting in a specific environment
- Changing patient care is informing design and technology
- Flexible spaces need to be adaptive in nature
- Clinician requirements for access to more data for decision-making
- Greater patient and family engagement in the care process
- Emphasis on giving patients more control

### IPTV

- ▶ Move info to the bedside
- ▶ More control over your space — window shades, order lunch, but tech has to be easy to operate or it's a waste

### RTLs

- ▶ Smart bedrooms — what does that mean? See slide.
- ▶ Consider HIPPA when integrating technology into smart rooms
- ▶ Establishing ground rules

## PROJECT-WIDE REQUIREMENTS

- Basis of design and standardized spaces and tech versus project-specific approval process for Budget / Selections / Changes.
- Establish a Basis of Design.
- Utilize Best Practices and planning standards, i.e., FGI, Hybrid?
- Make flexibility an explicit design goal — who coordinates and gathers info across institution for technology.
- Do your own research — peer-to-peer institutional discussions on what works and what doesn't.

## PLANNING FOR CHANGE AND FLEXIBILITY

- Review new development and trends against goals.
- Address the possibilities of Future Functional Change.
- Clearly identify the responsible parties on both the design and client teams.
- Document working assumptions, goals, and milestone decisions.

## ROBOTS IN CONSTRUCTION TODAY & TOMORROW

Donald Ferrell, Regional Facilities Vice President, Northern Region - Hackensack Meridian Health  
Michael Kampin, Principal, Tri-State Regional Director, US Buildings Program Management, Stantec  
Mike Rivells, Digital Construction Manager, Hilti  
Jorge Tubella, Construction Technology Specialist – Haskell (pre-recorded)

### OVERVIEW

The panel introduced a number of new robots—either built or in development—capable of impacting construction projects for greater efficiency and that are capable of mitigating human error and various physical risks or negative effects of some construction processes on workers.

#### FEATURED ROBOTS:

##### HILTI-JAIBOT

The attendees were shown a video of the Hilti-Jaibot in action.

This semi-autonomous drone robot for ceiling installations — helps to eliminate human error and deliver MEP projects on time.

##### HILTI-EXOSKELETON

Assisted technology that helps reduce stress, makes repetitive tasks easier. Is lightweight, like an adjustable backpack. Can be pre-fitted for height, etc. use for HVAC, drywall, sanding, goes up and down and saves time over the long run.

##### BOLT HASKELL (Boston Dynamics)

A robot dog that measures conditions, ties into BIM model.

#### OTHER TECHNOLOGIES:

**Tybot** - A rebar-laying— ties off rebar in place robot (*Advanced Construction Robotics*)

**Dusty** - Prints layouts on construction surfaces, also ties into BIM, don't have to chalk things down (*Dusty Robotics*)

**Canvas** - Automates drywall finishing (*Canvas*)

**Hadrian X** - Concrete brick-laying (*FBR*)

**3D Printed Houses** (*SQ4D*)

#### KEY TAKEAWAYS

##### What's currently in use?

- 30,000 SF house in Hackensack — used drones to fly through building, otherwise no robotics.

- As owners asking: “How do we get the project to the market faster for less money?” Looking to robotics companies for the best method to use on projects to speed things.
- “Where do we think this is going in the industry?”
- A platform can have multiple uses, adoption of these technologies is slow.
- Not going to see a futuristic scenario where things are being built by themselves.
- What you will see is technology in construction taking arduous, strenuous, repetitive tasks and having a person with a robot perform that task, rather than timeless bots everywhere doing their own thing.
- Designed to take the BIM model to the field without human error or worry and the amount of skilled labor you can get on the job, and makes the process quicker and smoother.

## Opportunities

- As far as safety is concerned, the technology is huge.
- Seeing great adoption of assistive devices in technology in construction from a health and safety aspect, mitigating injuries (and associated costs, and impacts quality of life), alleviating fatigue, supporting health and safety of the worker.
- Allow more time and less cost for design, optimizes speed to market, can facilitate changes and increase flexibility.
- Any 3D software will work as inputs into the robots.

## Impediments

- Everyone is worried about their job, so we get pushback with new technologies that do the work themselves— until there’s a skilled labor shortage.
- Use the tech for the repetitive process allows for optimization of the skilled labor you do have.
- There are different stages of overall acceptance on construction teams.

## How can we become adopters?

- Really has to come from the owner driving it down to the design team and contractors and pushing the technology—the key partner in all this.
- Success of the team drives the success of the project, so it’s up to the owner to ask what’s the best thing for the project, and, say, get patient facilities on line faster.
- European markets seem to have more adoption, and in the US, from the west first moving across to the east.
- Get out of the status quo.

## BUILDING AND SUPPORTING THE AGILE DESIGN & CONSTRUCTION TEAM

Stephen Friedman, PE, CHFM, HFDP, LEED AP, Director, Facilities Engineering + Infrastructure + Construction, Memorial Sloan Kettering Cancer Center

Sara Kendall, VP and General Manager, Turner Construction

Melissa Kiefer, Vice President, Project Development, Planning, Design and Construction, Hospital For Special Surgery

Elizabeth Sullivan, Assoc. AIA, LEED GA, EDAC, AVP, Architecture, Facilities Services, Northwell Health

**MODERATOR:** Mike Hoak, AIA, EDAC, LEED AP BD+C, Principal, Ewing Cole

*“Perception used to be that pre-fab is more expensive, but it’s not. So why are we reinventing the bathrooms when we can draft the components and plug and play with such spaces.” — Melissa Kiefer*

*“The exploding cost of health care construction is 50% nationally, so clients are bringing expertise / construction very early on to provide cost data to understand what the project cost will really be.” — Sara Kendall*

*“Sharing the cost model is how you are going to get a really good project because you’ve gotten buy in.” — Melissa Kiefer*

*“It’s important when looking at modular construction it needs to be very well thought-out, it can’t just be about cost, it also has to be about what the patient is going to see.” — Steven Friedman*

### OVERVIEW

Healthcare clients want their projects built faster, the programs are always changing, and the scope creeps. As a result, teams that are agile can yield benefits to schedule, quality, and cost. The panelists discussed how their teams have become more agile, what the models for agility is, how collaboration has changed, and even how prefab impacts the nimbleness of a team.

#### Is AEC Industry taking a page out of the software industry in terms of agile design?

- ▶ The heart of what agility is: Responding to change over following a plan — and responding to change and the limitations that might crop up over the life of a project.
- ▶ Customer collaboration over contract negotiation.

#### Advantages of These Models?

##### Current Renaissance in Healthcare:

- ▶ Traditional approach of design-bid-build going by the wayside, and even design build is being turned upside down— but not so much in NYC, but around the world.

- ▶ Building teams earlier and bringing in contractor expertise early, meet goals in a different way from the design-bid-build process, which results in a significant schedule advantage.
- ▶ Includes contractors doing value place work in the field to provide expertise in constructability, how to detail things, to provide efficiencies in design.
- ▶ The main advantage is schedule. Not necessarily lower cost, though.
- ▶ At a current 900,000 SF project inpatient tower on York Ave. — challenges: controversial and push back on a community level, material shortages, high construction costs, labor shortages. Has a tremendous impact on schedule.
- ▶ So, embracing the IPD process (Innovative Project Delivery). Bringing in CM and major trade partners early.
- ▶ Costs for MEP portion of the project for hospitals has increased from 35-40% to 45-45% because of:
  - Materials and equipment — currently sometimes waiting over a year, so instead of having architects and engineers design something that involves difficult to get materials or equipment, instead going out and selecting equipment with trade partners at the table to find out what that is available.
  - Results in better speed to market, so a definite advantage.
- ▶ Not entirely convinced that Design-Build being the most efficient way to complete healthcare projects — but the projects all benefit from early collaboration, which allows the team to be nimble from the beginning throughout the process.
- ▶ Have end users engaged, having different types of meetings, utilizing different technologies, for example, to help people understand what they are looking at (i.e., a 3D walk-through).
- ▶ “Itch” to see things in person after everything went virtual during Covid.
- ▶ Trying to get users to understand the 2D drawings is challenging, so using a variety of tools from BIM, 3D axons, creating a virtual walk-through, and ultimately building a mockup, to create a visual sense of the space and how things are connected.
- ▶ Building a number new buildings at HSS, including a tower and a new ambulatory care pavilion in or Der empty out the main hospital building to go in think about how to use their facilities to their highest and best use.
- ▶ Setting expectations with the project team up front, the use of 2D and 3D translation tools, are common themes among the panelists about how to be an agile team.
- ▶ For a small but vitally important project to be completed on time for HSS, the hospital (client) team:
  - Improved nimbleness by defining a full schedule with key partners, thinking about all the things that need to happen and making that a checklist from that for the team.
  - Considering what could or will force the team’s hand.

## How Has Design Collaboration Changed of Late? What is the Physical Change?

- ▶ Definitely a lot more “early collaboration” with team.
- ▶ Emphasis on pre-construction in the healthcare sector. No longer need to sell the advantages of pre-construction to the team in the healthcare space.
- ▶ Not necessarily seen this across other spaces in NY.
- ▶ The biggest recent challenge is the exploding cost of health care construction of 50% nationally, so clients are bringing expertise / construction very early on to provide cost data to understand what the project cost will really be.
- ▶ Huge sustainability and resiliency components that are driving up cost.
- ▶ Clients engaging the team to understand the cost implications
- ▶ Seeing in healthcare that the construction team is being asked provide data — critical cost data, more than any other industry from the people building every day in the marketplace, dissecting by program.
- ▶ Contractors helping to make decisions early in the process rather than being excluded until later. After designers and facilities make decision and then bring in contractors for value engineering further on in the process.

## How Are Health Systems Prioritizing?

- ▶ As CMs are brought in earlier and earlier, the shift is that they’re asking key questions and seeing and aligning key priorities for the project.
- ▶ Now CMS are asking more questions like “Wha’s in the slab,” etc.
- ▶ Trying to be more transparent with the design team on cost so they can help with identifying and fully understanding the challenging issues and goals of the client.

## What are the Benefits of Prefab?

- ▶ Definitely seeing the advantages of Prefab, not just on the energy plans but in the builds
- ▶ Looking at modular, pre-fab construction for anything that’s common, i.e., exam rooms, toilet rooms, less specialized spaces, but it
- ▶ Prefab gives you quality control— built in parallel or upfront with design.
- ▶ In typical healthcare construction, the systems are either in the basement or top of house (i.e., boiler plans— if it’s built offsite, you can bring it in and connect with power and piping and you’re all set.
- ▶ Quality control is huge with prefab — tested ahead of time, no mistakes, no unknowns everything is correct when it arrives on site.



- ▶ Exam rooms challenging for the healthcare space —every user and doctor is different, so frequent reinvention of the exam room.
- ▶ There was a perception notion that modular and pre-fab is more expensive, but it's not.
- ▶ There are a lot of benefits from the quality, the install, the constructions, reduces the timeline.
- ▶ Why reinvent the bathrooms when we can draft the components and plug and play with such spaces? The technology has advanced over the past five years.

### Do you see Modular as Expediting Future Changes in Planning?

- ▶ Expediting future changes in planning — say in converting an exam room, when you only have to shut down a unit for a weekend or week?
- ▶ How to design for the agility of future unknowns — the ability to flex?
- ▶ The more modular anything is, the easier it is to replace them because you have the catalog, you know the exact dimensions of the part, what the power needs or medical gas, etc. — even during punchiest phase.
- ▶ The less individualistic elements in a room, the easier it will be.
- ▶ Big benefit is that five years down the line and there are different, new challenges then you can make changes and be more agile in operating the facility.
- ▶ Definitely part of what the discussion they move toward new/more outpatient ambulatory care facilities.
- ▶ “The key for us as owners is that we’re going to stakeholders and leadership and building consensus on what the key elements going forward we need to be flexible in order to flip A to B or B to C.
- ▶ From a planning perspective, having a basic module that can be adapted and flex, especially for new construction is key.
- ▶ Make groupings of rooms and things as flexible as possible—most of the time the change is going to be equipment.
- ▶ It’s okay to push back on end-users and doctors, it’s okay to challenge them.

### Impact on Operations and Equipment Selection

- ▶ Campus engineers have to learn new systems to run a piece of equipment that’s different from what the majority of what they use includes in the building or campus— *because of what the contractor chose.*
- ▶ To be agile, consider the technical expertise needs that have to be met and managed — how many things can people learn how to operate and fix? How many different panels and breakers do you want to stock?
- ▶ Have intentionality about equipment selection while still managing cost.

- ▶ With modular, when something breaks you can quickly fix it because you have components in stock in your facility and you can turn it around — when program spaces are down that's a lost patient care and revenue, and patient satisfaction goes down.
- ▶ It's important when looking at modular construction it needs to be very well thought-out, it can't just be about cost, but also the patient is going to see—look more like a hotel lobby than a hospital.
- ▶ In suggesting equipment, make sure there's local representation in the area, because we can't service physical equipment or engineering that's out of state.”
- ▶ Bring on consultants who build a digital “twin” to get the info and specs they need to service or replace equipment or parts.

## **FINAL TAKEAWAYS: BUILDING AGILITY IN DESIGNING AND BUILDING TODAY**

- ▶ Agile teams are really built around *trust*, early engagement of team members and alignment of goals.
- ▶ Don't be afraid to make changes in the team so that the hard problems can be solved— you want people who are going to be supportive.
- ▶ Be able to pivot and work together collaboratively.
- ▶ Think about the process and how to get there and be comfortable enough to stop to resolve issues more quickly by talking openly about issues
- ▶ It's no longer owner on one side of the fence and contractor on the other — Covid created a new way of thinking.
- ▶ Sharing the cost model with everyone on the team brings the team together is how to get a really good project, because you have buy in.