

COVID-19 PANDEMIC
CAPABILITIES



COVID-19 Response Capabilities Statement

Array Architects, Array Advisors and Array Analytics assist healthcare clients and health departments along the eastern corridor from Florida up to New England with their emergency preparedness activities.

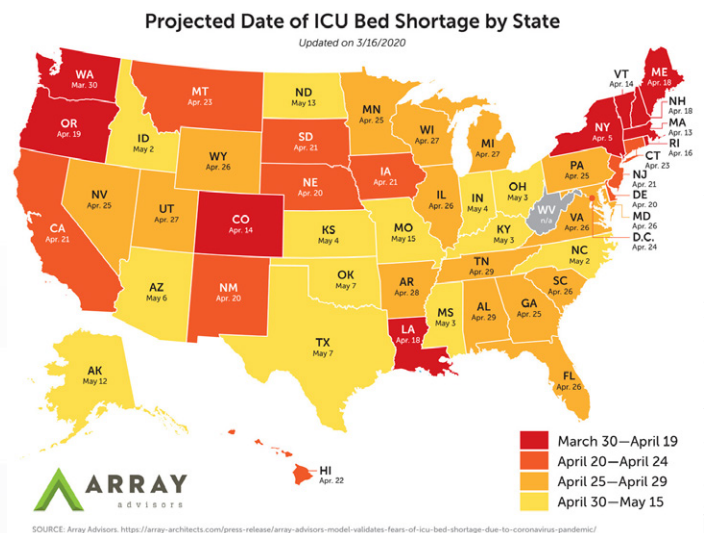
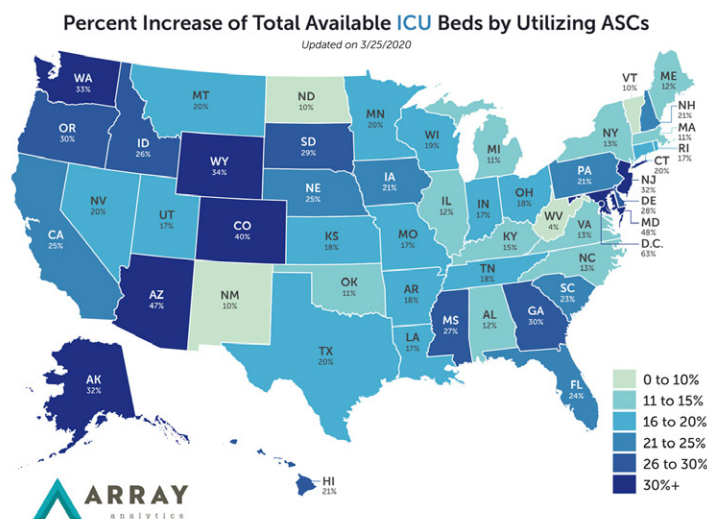
Since the team's first [predictive modeling map](#), published Monday, March 16, 2020, Array's healthcare strategic and master planners, architects and designers, interior and graphic designers as well as ancillary and support staff have focused attention on assisting the country's health systems and state health departments with overall bed and staff availability assessment tools; on-site flow; equipment and staffing planning and layout assistance; and, remote surge planning options.

The sites Array's team have overseen preparations of include tent structures, shelled hospital floors, conference rooms and convention centers. The acuity levels differ by location, and the teams coordinated with health system leadership and partner engineering firms to evaluate disease spread mitigation best practices by way of negative pressure spaces; cold and hot zones; and, patient, staff and supply flows.



Fully-equipped Seasonal Air Supported Structure at NYP Columbia University's Baker Field, New York

Three predictive maps are available for public use, and our experts have been contacted by many media outlets for their opinions related to best options and practices around COVID-19 preparedness. We are confident that our clients are ready for any surges their areas of the country may experience and that future pandemic instances will be more readily addressed.



Our Firm in Brief



After 35 years serving healthcare clients, we've learned that it's never just about the building. Every problem and challenge our clients face are unique opportunities to adapt, improve or transform—and they all require something different.

That's why we are *so much more than just healthcare architects*. Our integrated services align analysts, advisors, and architects to provide a complete continuum of project exploration and execution.

Guided by **process**, powered by **collaboration** and built around an **innovative culture**.

100%

DEDICATED TO HEALTHCARE

SIX LOCATIONS NATIONWIDE

We're strategically located throughout the country to engage with clients on site, to optimize results.

- Boca Raton, FL
- Boston, MA
- Columbus, OH
- New York, NY
- Philadelphia, PA
- Washington, DC

A N A L Y T I C S | W E A R E T E C H N O L O G Y

Array Analytics is an innovative think tank of analysts and product developers dedicated to helping healthcare systems identify and contextualize business drivers.

These days, big data is critical to making informed decisions, but information must be distilled and interpreted to truly be valuable. We developed the platform you need to dynamically draw upon real-time industry data, combine it with your own, and leverage it so you can visualize relevant business drivers and opportunities. Array Analytics is the foundation upon which targeted solutions drive transformation in healthcare business.

- Data Integration
- Market Analysis
- Predictive Analytics
- Real Estate Strategy
- Strategic Capital Allocation

A D V I S O R S | W E A R E S T R A T E G Y

Array Advisors is a multi-disciplinary team providing custom solutions to optimize healthcare operations and solve business challenges.

When addressing the distinct needs of any healthcare business, there is no solution without informed preparation and consideration. It requires a nuanced approach of dedicated professionals with a variety of viewpoints. We uncover the opportunities buried within your challenges by untangling the complexities of those problems, and then engineering a solution using industry-leading tools and techniques.

- Capacity Analysis
- Strategic Planning
- Change Management
- Lab & Pharmacy Optimization
- Lean Operational Improvement
- Transformation

A R C H I T E C T S | W E A R E D E S I G N

Array Architects is committed to improving healthcare outcomes by providing design solutions informed by integrated insights from perspectives across the organization.

No brick is placed without considering its placement. No wall is raised without determining its integrity. No systems are installed, no colors are applied, no impact is made without a careful reasoning for doing so. We don't address needs—we address your needs—taking into account the context of a project and assembling a roster of experts whose combined strengths align to give your project life, value and spirit beyond its basic function.

- Healthcare Thought Leaders
- Cross-Disciplinary Teams
- Process-Led Lean Design
- Data-Driven Decision-Making
- Customer-Focused Design

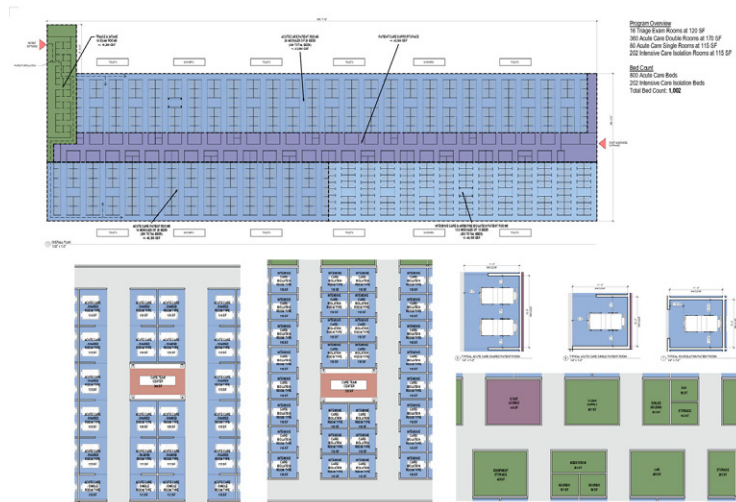


Representative Project Work

ICROWD TENTS IN NYC & BOROUGHS

To combat the dwindling hospital bed capacity in NYC, iCrowd Inc. reached out to Array to help realize their vision of installing 5,000 beds in five tent structures across the City within three weeks. As providers of medical services for large events such as the New York City Marathon, iCrowd has expertise around best practices for crowd access in public places.

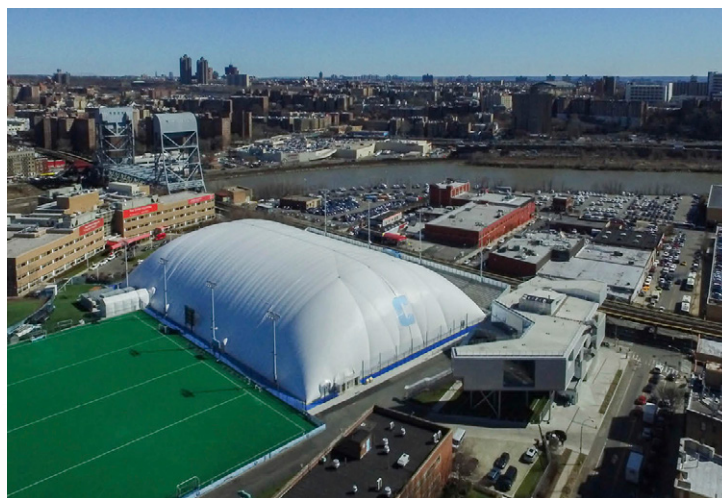
iCrowd worked with the New York State Department of Health and the US Army Corp of Engineers to identify ideal sites in New York City's five boroughs for tent locations. Each tent complex's design is comprised of multiple smaller rigid structures, semi-permanent tents typically used for large outdoor functions. Each structure can house 1,000 beds and necessary medical support space. The plan is designed to limit cross contamination of patients, staff and supplies. Patients enter into one side of the tent while supplies and staff enter in the opposite. As patients arrive via ambulance from a hospital, they are immediately transported into the main entrance to a triage room. The triage rooms are designed with a one-way flow model in mind to keep the patients moving through the space. Once triaged, a patient is moved to either a double bed bay or an isolation room determined by their acuity.



TEMPORARY TRANSFORMATIONS AT 3 NEW YORK-PRESBYTERIAN LOCATIONS

Array worked with NewYork-Presbyterian to build field hospitals at and around their Columbia, Weill Cornell and The Allen Hospital campuses to create additional patient capacity for the COVID-19 pandemic. Temporary beds and partitions were constructed for COVID-19 positive patients who are low acuity. Columbia University Medical Center and Weill Cornell has set up 44 and 38 temporary beds respectively in existing buildings and The Allen Hospital has set up 288 beds in an existing seasonal air supported structure (SASS) at Baker Field.

The [SASS field hospital](#) serving The Allen Hospital catchment area's COVID-19 patients with mild symptoms will be staffed largely by former military personnel, including physicians, nurses and medics, and others who will provide transport and other needed services, in conjunction with NYP leadership and front-line staff and will be named in honor of a decorated US Navy Seal. "Creating a medical treatment facility inside a dome normally used by our varsity athletes is a first for Columbia," said Peter Pilling, Campbell Family Director of Intercollegiate Athletics. "Everyone has a part to play in this crisis, and we are proud to do what we can to support the health care workers and volunteers who are on the front lines, treating COVID-19 patients."



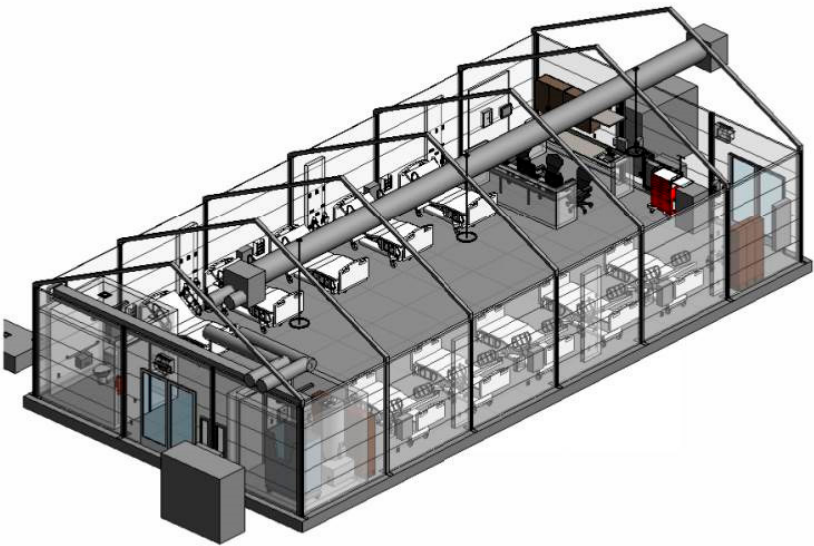
MIDATLANTIC HOSPITAL-BASED TENT CO-OP INITIATIVE

Array explored and tested various prototypes that included the conversion of mobile structures into 10-bed treatment pods for deployment to various hospital sites across the state. The exploration included the analysis of four structure types for rapid deployment.

- Conversion of Existing Mobile Office Units
- Creation of new Mobile Medical Unit with Custom Trailer Builders
- Prefabricated Hybrid Structure. (Hard Shell Tent Structures)
- Medical Tents

The Prefabricated Hybrid Structures proved to be the quickest to mobilize and customize to meet program goals. The program goals were the following:

- These Modular Patient Care Units are designed to provide safe, appropriate space and resources for the care of acute patients. Designed for use by Med/Surg-level patients, additional medical air has been included to permit flexibility in caring for increased acuity. Patients requiring ventilation could be accommodated in this configuration if necessary.
- They are intended to be placed on the campus of acute care facilities that can provide supply, nutrition, medication, and diagnostic support.
- Each Modular Patient Care Unit can accommodate up to 10 patients in hospital beds with adequate space for IV pumps and other equipment.
- Medications would be stored in locked cabinets at the team work station in bins labeled with patient names.
- A Soiled Utility room is provided for the safe disposal of bed pan waste and bio-hazardous materials.
- A single toilet room is provided.
- Documentation space for up to three caregivers is provided.
- Water and ice for patient use would be provided using bottled water and a portable cooler for ice.
- Air flow designed to move from the front staff entry to the rear soiled area to limit exposure when opening the staff access door.
- There is no isolation for the individual patients within the Modular Patient Care Unit.



MIDATLANTIC HEALTH SYSTEM & STATE HEALTH DEPARTMENT CONVENTION CENTER CO-OP INITIATIVE

To alleviate intensive care bed surge, Array designed a 250-bed COVID-19 recovery medical field hospital for positive, but convalescing patients. Those patients who are not yet strong enough to be discharged, can be assigned a bed in this negatively-pressured convention center space designed to mimic, to the extent possible, a med/surg unit.

- Emergency Code Blue Light on 14’ Poles
- Handwashing Stations
- Pharmacy (located in the food concession area)
- Clean Storage and Soiled Utility Rooms (conversion of stand-alone toilet rooms)
- Privacy Partitions between each ‘room’
- Two Shower Trailers provide 32 shower stalls for patients and staff
- Respite spaces with TVs for ambulatory patients

Staff and vendor safety was a priority in the layout and accommodations provided within this temporary space.

- Hot and cold zones with isolated mechanical systems to control air flow
- Clean and Dirty pathways with staff and patient signage
- Donning & Doffing areas, procedures
- Staff Lockers

This convention center site began admitting patients Tuesday, April 21, 2020. By week’s end, the plan was to ramp up to 90 patients.



SOUTH FLORIDA COVID-19 RESPONSE

CASE STUDY: USING SHELLLED SPACE TO INCREASE BED CAPACITY FOR COVID-19 PATIENTS

When a pandemic like COVID-19 strikes, health facilities must be prepared to act swiftly to increase bed capacity and maintain safety to patients. A healthcare client in our Southeast Florida market engaged Array to help them prepare a plan to do just that. Array had recently completed a new bed tower with two shelled floors for future growth on one of the client’s campuses, and our team identified this a prime opportunity for temporary COVID-19 bed space. With that in mind, we conducted a study of three options for increasing the amount of beds they could make available and presented the pros and cons of each scenario.

Existing Conditions

Each floor is separated into two areas with existing fire walls allowing the hospital to create two units of temporary beds. With minimal construction on the floors currently, they could be easily and quickly built out to bring them available beds in a timely manner. The Array team proposed using existing plumbing stub ups for sinks and toilets and keeping all existing walls in place to help accelerate the schedule.

Weighing Capacity Expansion Options

Health systems need fast, intuitive and flexible options for increasing capacity in place or by leveraging other facilities within their system. By defining the benefits of their options exactly, including the number of beds each one provides, the level of infection control enabled, and how much construction each one requires, health leaders are better equipped to make the best decisions for their patients. If our client proceeds with the options outlined below, they will increase their flexibility to respond as their needs evolve during the COVID-19 pandemic.

Donning & Doffing

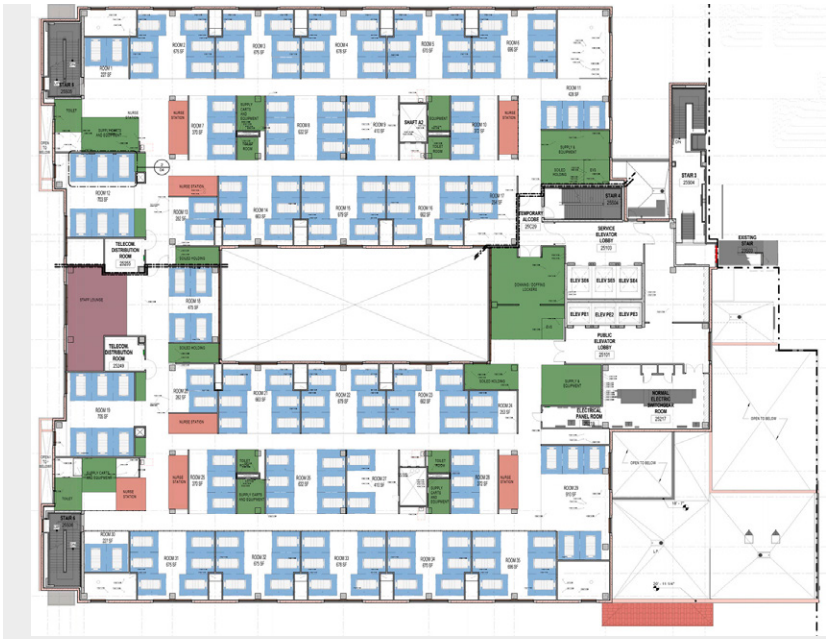
In all options, a donning and doffing area with lockers is provided adjacent to the elevators.

OPTION 1: 159 BEDS IN OPEN PLAN



The first option uses a ward-type layout with potential for up to 159 beds. The open floor concept provides the quickest construction schedule due to the small number of walls, and it limits ceilings to only enclosed rooms. Nurse stations located along the center of the corridors allow for direct observation and easy access to all patients.

OPTION 2: 160 BEDS IN SHARED ROOMS



The second option provides semi-private shared rooms, creating 160 beds. Each room is enclosed on three sides by walls, leaving the option to keep the corridor open or enclosed with plastic sheathing. While the construction time is longer due to the increased number of walls, this option provides a more intimate caring environment and the opportunity to limit exposure of infected patients.

OPTION 3: 77 BEDS IN PRIVATE ROOMS



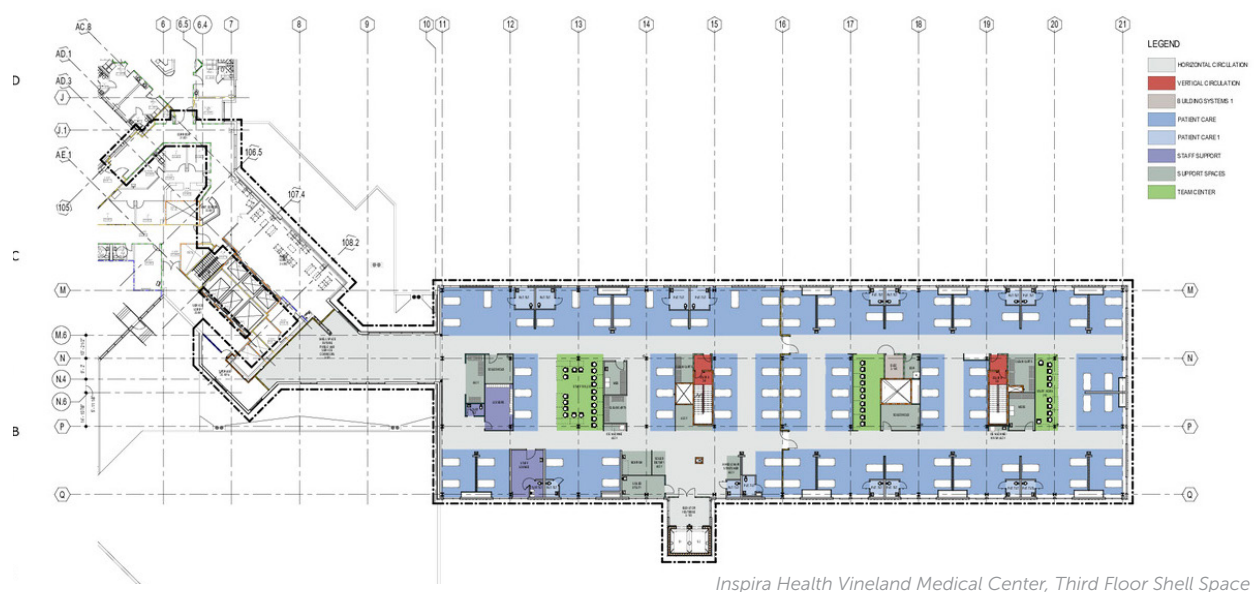
The final option provides 77 fully enclosed isolation rooms. This plan layout contains the most construction, but it also provides the highest level of care for patients who are very sick.

Representative Project Work

INSPIRA HEALTH COVID-19 COORDINATED RESPONSE

Array has partnered with Inspira Health since 2015, and recently celebrated the completing of their Mullica Hill, NJ replacement hospital. In preparing their COVID-19 Network Strategy in support of the State of New Jersey's COVID-19 response, Inspira requested Array's assistance across four hospitals in the development of their multi-phased strategy which involved various levels of response to facilitate additional bed capacity due to COVID-19 related surge in hospitalizations.

In addition to supporting Inspira Health through the development of their COVID-19 Network Strategy, Array also provided critical design and coordination services in expanding bed capacity within existing shelled space at Inspira Health's Vineland Medical Center. Working with furniture and equipment vendors as well as contractors, Array facilitated the preparation of the temporary unit. Within the existing shelled space, temporary beds and partitions were constructed to serve COVID-19 patients considered mild to moderate acuity. Since completion, the temporary COVID-19 unit delivered an additional 85 beds to the Vineland Medical Center and the State of New Jersey.





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architects

Boca Raton / Boston / Columbus / New York City / Philadelphia / Washington