



SUSTAINABILITY

# PLANNING A NEW DATA CENTER?

## Consider:

- 1- That just as Form follows Function, Sustainability follows Functionality.
- 2- Knowing how service distribution options function will reveal the sustainability of a data center.
- 3- Compared to other distribution options, Interstitial not only improves sustainability, but improves operations while reducing costs.
- 4- Challenge traditionally accepted distribution practices and compare options to know their impact to sustainability, cost and performance

## Key criteria of the impact Distribution of Service has on Functionality and Sustainability

### DATA CENTER SHELF LIFE

#### 1) Adaptability:

Does your distribution choice restrict you to one cooling method or does it adapt to any method?

Interstitial is a flexible distribution system. Whether building new or converting existing space, the dedicated layers for air and cable with the Interstitial floor system effectively distributes any combination of cooling methods - air, rear door heat exchangers, direct to chip cold plates, and immersion. As technology changes, your data center adapts ensuring return on your investment for a long time.

#### 2) Moves, Adds. Changes:

Interstitial's system isn't locked on to a ceiling or floor grid. Cabinet layout is virtually unrestricted without impacting cooling efficiency. Services are always unimpeded to the cabinet regardless of the cooling method(s) and regardless of the layout. Services distributed under the floor ensure MAC work is completed easier, safer, faster and less costly for the life of the facility compared to overhead distribution.

### REAL ESTATE AND CONSTRUCTION

#### 3) What space requirement is driven by your distribution choice?

An Interstitial choice typically reduces the overall space requirement by 30% compared to the typical on slab/ flood the room choice. A reduced building size reduces the amount of real estate to be purchased, the cost of construction, building schedule and the carbon footprint. A reduced building size can also open up more site selection options (retrofit existing space vs new build).

#### 4) What ceiling height is driven by the service distribution choice?

Services below the floor is not only easier and less costly to install initially and manage over time, but doesn't require the excessive ceiling height needed by overhead distribution. That feature can make existing space an option for site selection where it would not be otherwise. Existing space has considerably less of a cost and carbon footprint than a new site making it a more sustainable option.

## ENERGY

5) How efficiently does your distribution choice drive conditioned air to where it is needed?

Interstitial delivers air directly to the server cabinet without any extra help. A flooded room approach delivers air indiscriminately and everywhere. Additional measures are required to direct the air to where it's needed. Hot/Cold aisle containment, suspended ceilings, extra wide aisle widths, locating AC units at both ends of an aisle and limiting aisle lengths are all necessary attempting to get a flooded room distribution working. Those extra measures increase initial and ongoing costs, negatively impacts sustainability and still requires up to 34% of the server fans to work outside their specified range and draw up to 40% more energy.

6) Delivering air at the proper CFM to each cabinet is a hit and miss proposition when distributing air by flooding the room. That's because the approach cools at the aisle level; not the cabinet level. The CFM within a row can vary anywhere from 17% to 41%, if cabinets all draw the same load. If cabinet loads vary, the CFM delivered has to meet that of the cabinet with the highest demand. That's really inefficient! With the Interstitial system the CFM is controlled at each cabinet the CFM variation within an aisle is only 6.8%.

## MECHANICAL EQUIPEMENT BENEFITS

7) Does your distribution choice deliver true N+1 redundancy?

AC units in each mechanical room at the end of an aisle can only impact the aisle in front of it in a Flooded Room approach. The positioning of the units in relation to the aisles prevent effective redundancy. Conversely, having fewer AC units in the single Mechanical room of an Interstitial distribution design all feed into a common header. One AC unit can back up any of the AC units to achieve true N+1 redundancy.

8) A data center designed with Interstitial will have all the mechanical equipment in a common room, and opposing rooms at the other side of the white space for electrical equipment. Therefore, the A/C equipment can supply both the white space and the electrical room(s) saving A/C equipment and having effective N+1 redundancy—unlike a flooded room that requires individual cooling units with back-up units in each electrical room.

## STRUCTURAL ADVANTAGES

9) Does the distribution approach drive structural re-enforcement measures?

The considerable weight of services distributed overhead when cabinets are installed on the floor slab would require the roof structure to be reinforced. Additionally, it would be necessary to distribute chilled water over the top of cabinets raising an issue with code compliancy in most jurisdictions. Distributing under the Interstitial floor requires no special reinforcing measures.

10) Interstitial's unique truss like design distributes the load of cabinets and equipment over a much larger area so the slab load is lighter—unlike a flooded room that has the load directly on the concrete slab driving a thicker slab than necessary

How core services are distributed will severely impact the sustainability of your Data Center. The true costs attributed to a distribution choice are not always evident or understood leading to the wrong choice. We at Interstitial can help identify the savings and improvements over alternative distribution approaches.

**With Interstitial you'll have a well-built "functional"  
facility that's also "sustainable"**



Sustainability Follows Functionality



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