



Aging Facilities and the Densified Workplace

WELCOME

Moderated by: **Mike Antill**, Chesapeake Chapter Co-Chair Professional Learning & Development; CORT

Hosted by: CQI Associates and IFMA Chesapeake Chapter

WEBINAR PRESENTER

Jesse Fisher – Design Engineer, WB Engineers + Consultants

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Upcoming Events:

IFMA Chesapeake Chapter Webinar

Date: Thursday, June 11, 2020

Time: 12:30 PM - 1:30 PM

Topic:

How Will the Workplace Change in a Post-Pandemic World?

How do we harness best practices from working from home and apply them back to the office? In this session, we will share findings from Gensler's new Work From Home (WFH) Survey research and roundtable discussions with clients across the globe.

IFMA Chesapeake Annual Awards Virtual Gathering!

Date: Thursday, June 25, 2020

Time: 5:00 - 6:30 PM

Location: Virtual Meeting from the Location of Your Choice

Join your colleagues to recognize the contributions of Chapter members during the past year!

The Board of Directors for 2020-2021 will be sworn in.



Visit the new chapter website for more details and to register to attend events

www.ifmachesapeake.org

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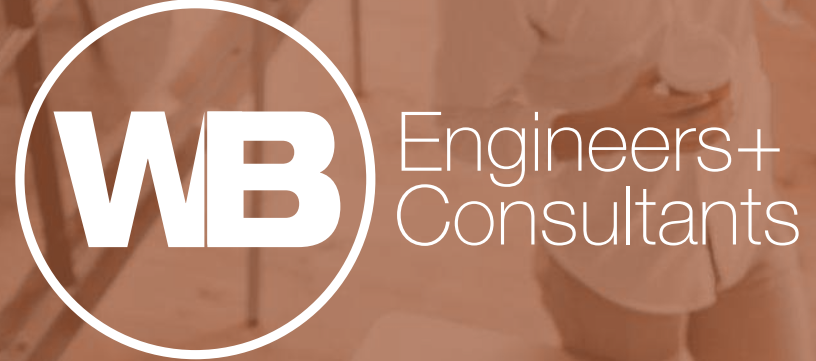
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facility impacts of **INCREASING OCCUPANT DENSITY**

presented by
Jesse Fisher

**density
then**

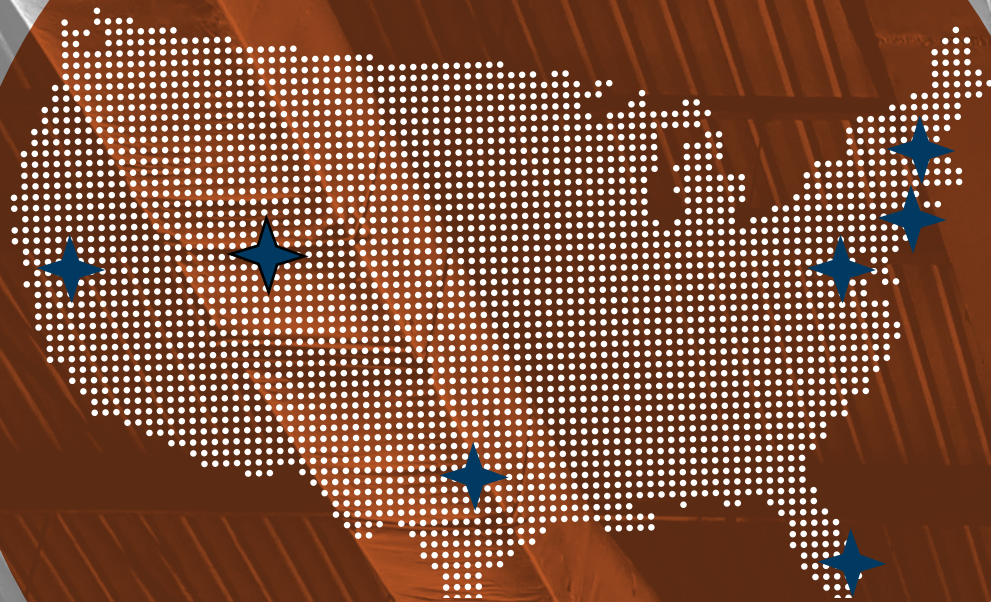




**density
now**

A modern office interior with a woman sitting on a light-colored sofa. The ceiling features a grid of wooden beams and several colorful, woven pendant lights. Large windows on the left offer a view of a city skyline. In the background, a glass-walled meeting room is visible, with text on the glass that reads: "Not having heard s", "heard it; having he", "it; having seen it is", "it is not as good a".

personal space



12 LOCATIONS

185
TEAM
MEMBERS

20
YEARS

MEP/FP
IT/AV/SECURITY
COMMISSIONING
ENERGY/LEED
SPECIAL INSPECTION
SCANNING



Engineers+
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about us

improving the way things are done™

Jesse Fisher, PE, CPD

Associate Principal
WB Engineers+Consultants

- + 15 years
- + adjunct professor
- + over 1,500 books



meet jesse

the big picture



electrical capacity



HVAC comfort & control



ventilation

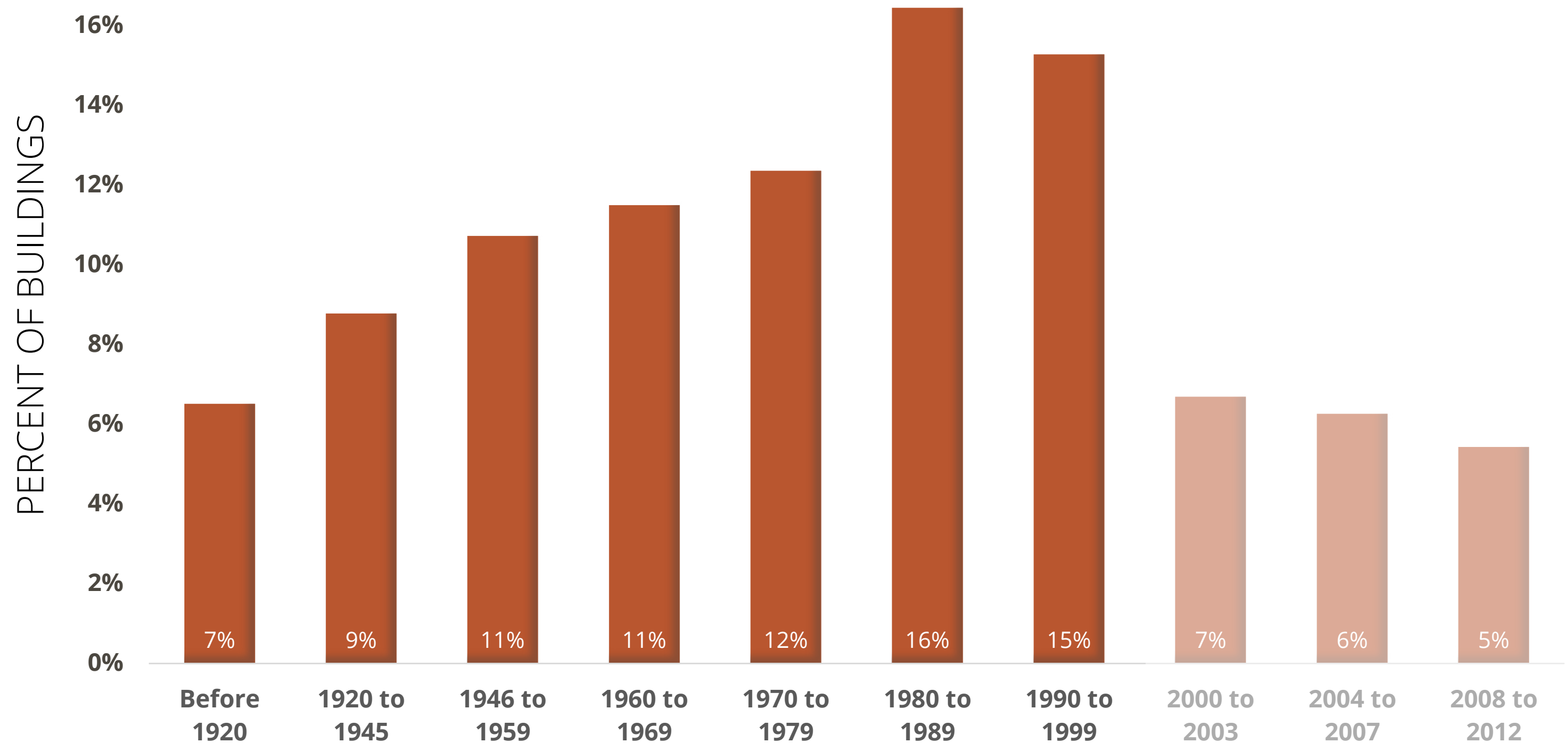


plumbing fixtures



egress

80% of all commercial building area was constructed **before 2000**



Data from the U.S. Energy Information Administration. 2012 Commercial Building Energy Consumption Survey

A modern office environment featuring glass-walled cubicles and open-plan workstations. The office is equipped with multiple computer monitors, ergonomic chairs, and contemporary lighting. The text 'increasing density' is overlaid in the center, flanked by horizontal lines.

increasing density



**200 sq. ft.
per person**



**100 sq. ft.
per
person**



**behind the
walls and
above the
ceilings**



the other 20% new buildings

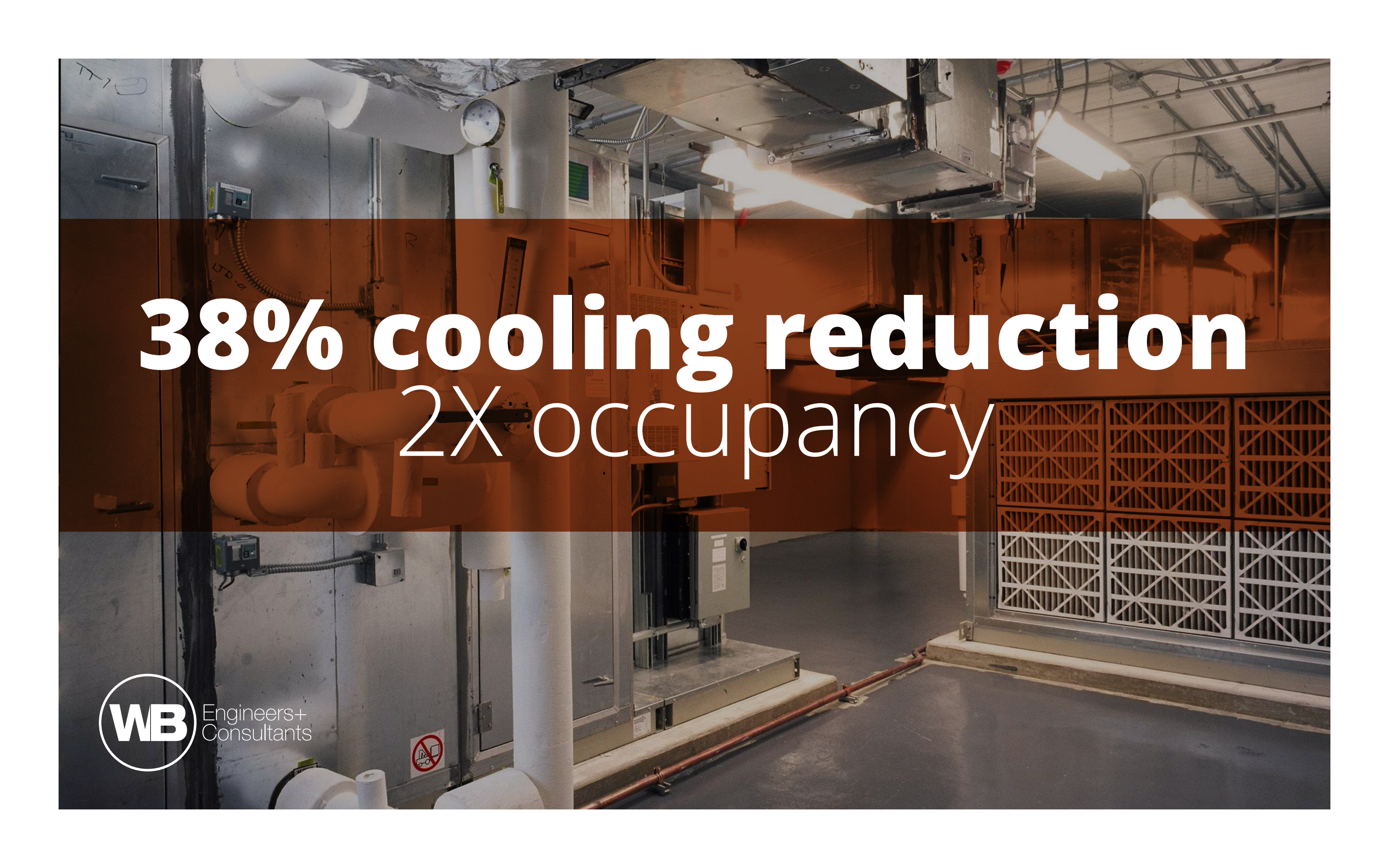
lease terms

electrical capacity



**reduced
power density**

HVAC comfort & capacity

The background image shows an industrial facility, likely a data center or manufacturing plant. It features large metal structures, pipes, and a large metal grate on the right side. The lighting is industrial, with bright overhead lights. A semi-transparent orange banner is overlaid across the middle of the image, containing the text.

38% cooling reduction
2X occupancy

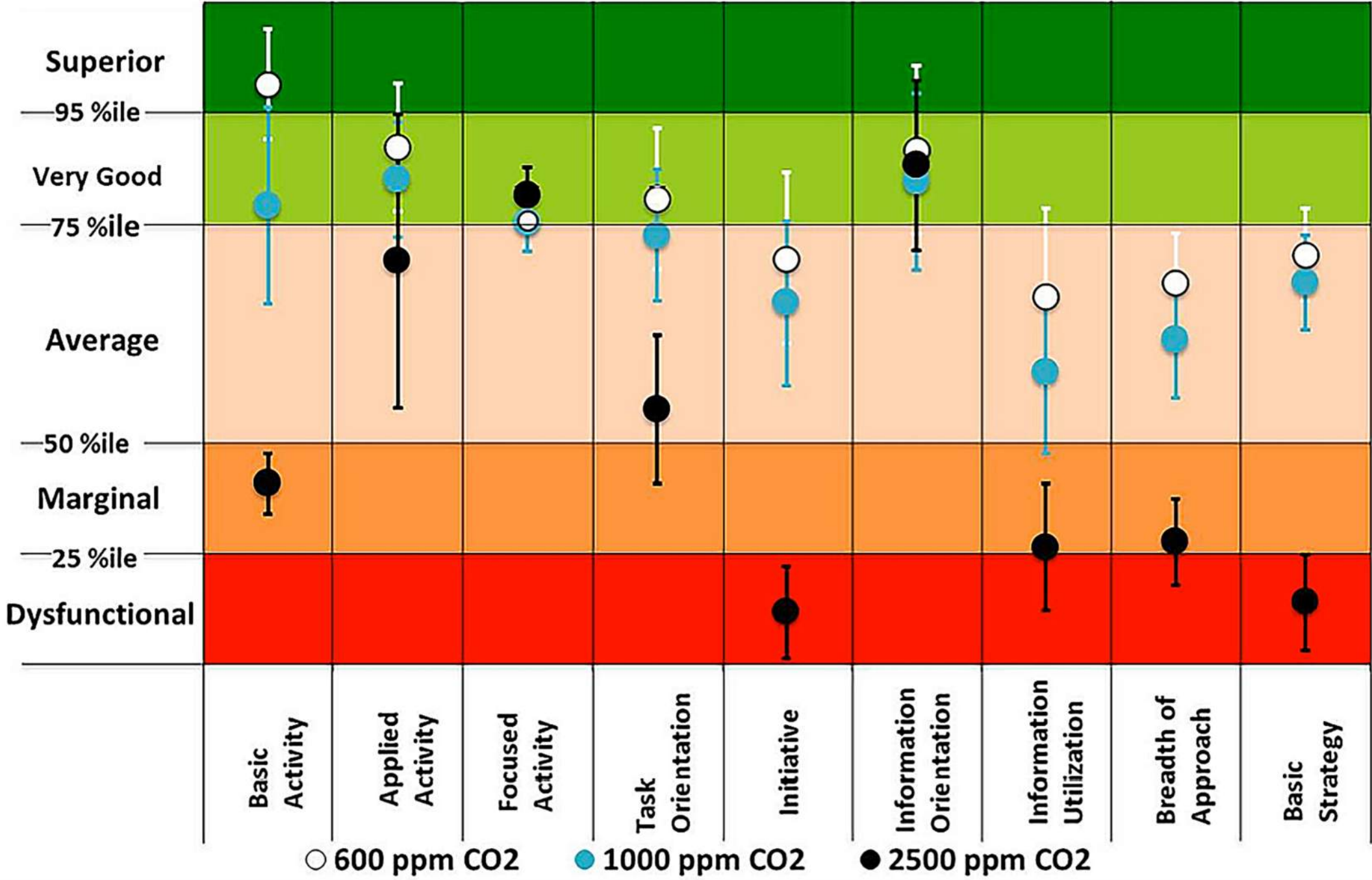
ventilation

WB

Engineers+
Consultants

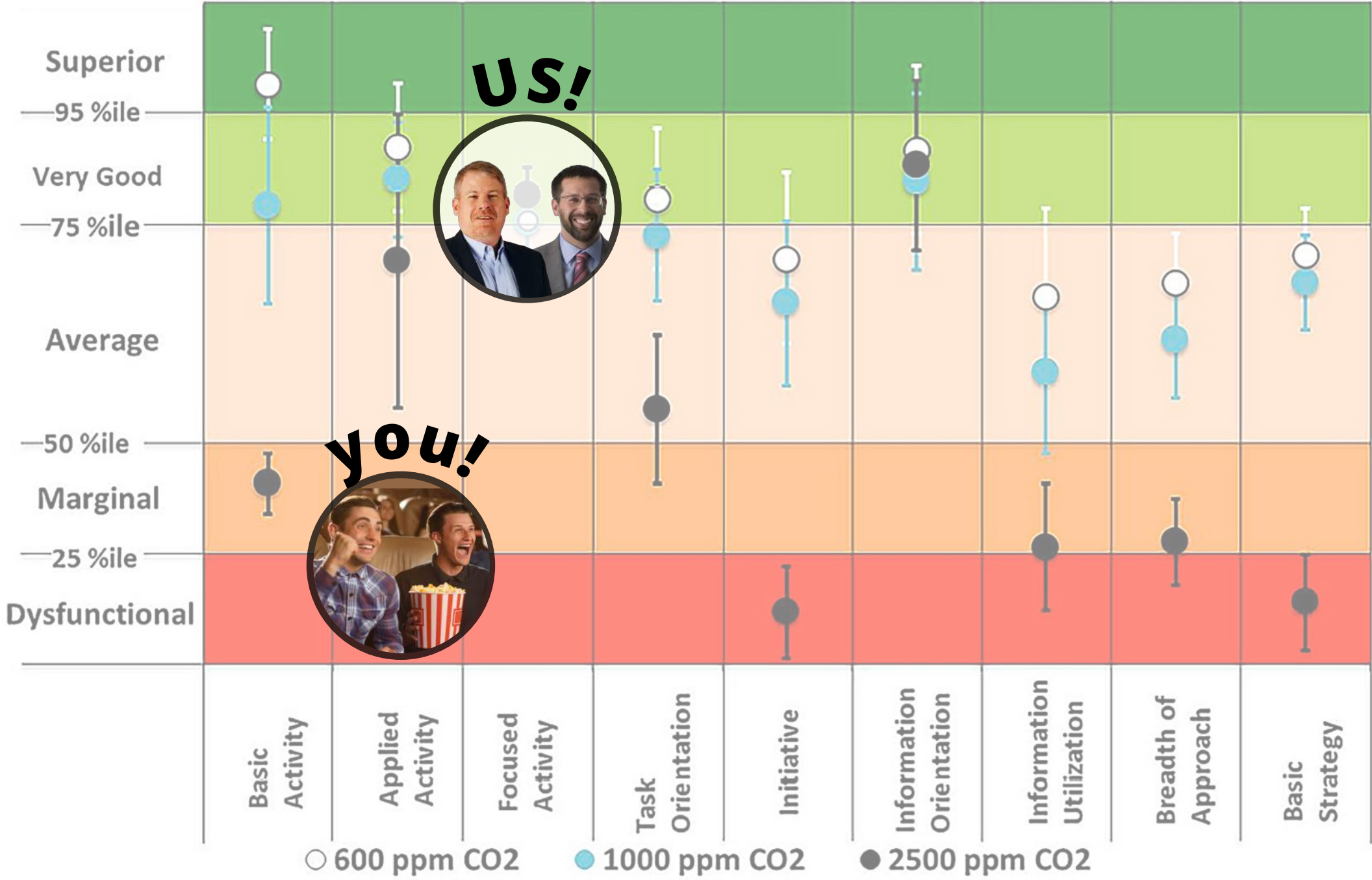
Zone	Type	Zone Floor Area	Known Occupancy	Default Occupancy	Zone Population	People OA Rate	People Outdoor Air	Area OA Rate	Area Outdoor Air	Breathing Zone OA	Zone Air Distribution Effectiveness	Zone Outdoor Airflow	Design VVS Box Airflow	VAV Box Type	VAV Box Minimum Aiflow	Zone Primary Airflow (Minimum)	Zone Discharge Airflow (Minimum expected primary airflow plus locally recirculated air)	Zone Primary Outdoor Air Fraction
		Az (sq. ft.)	(people)	(people)	Pz (people)	Rp (CFM / ppl)	Rp*Pz (CFM)	Ra (CFM / sf)	Ra*Az (CFM)	Vbz=Rp*Pz + Ra*Az (CFM)	Ez	Voz=Vbz/Ez (CFM)	(CFM)	(SFPB, PFPB, Shutoff)	(%)	Vpz (CFM)	Vdz (CFM)	Zp=Voz/Vpz MAX Zp
Totals		21,209			192		960		1,321	2,281		2,469	22,000			8,470		0.448
OFFICE - B14 (FPT 6-1)	31	225	2	2	2	5	10	0.06	14	24	0.8	29	360	SFPB	35	130	360	0.226
OFFICE - B13 (FPT 6-1)	31	161	1	1	1	5	5	0.06	10	15	0.8	18	260	SFPB	35	95	260	0.193
OFFICE - B12 (FPT 6-2)	31	157	1	1	1	5	5	0.06	9	14	0.8	18	230	SFPB	35	85	230	0.212
OFFICE - B11 (FPT 6-2)	31	152	1	1	1	5	5	0.06	9	14	0.8	18	230	SFPB	35	85	230	0.208
OFFICE - B10 (FPT 6-2)	31	159	1	1	1	5	5	0.06	10	15	0.8	18	230	SFPB	35	85	230	0.214
OFFICE - C10 (FPT 6-3)	31	159	1	1	1	5	5	0.06	10	15	0.8	18	220	SFPB	35	80	220	0.227
OFFICE - C09 (FPT 6-3)	31	152	1	1	1	5	5	0.06	9	14	0.8	18	220	SFPB	35	80	220	0.221
OFFICE - C08 (FPT 6-3)	31	155	1	1	1	5	5	0.06	9	14	0.8	18	220	SFPB	35	80	220	0.223
OFFICE - D07 (FPT 6-4)	31	152	1	1	1	5	5	0.06	9	14	0.8	18	220	SFPB	35	80	220	0.221
OFFICE - D06 (FPT 6-4)	31	150	1	1	1	5	5	0.06	9	14	0.8	18	220	SFPB	35	80	220	0.219
OFFICE - E05 (FPT 6-4)	31	152	1	1	1	5	5	0.06	9	14	0.8	18	220	SFPB	35	80	220	0.221
OFFICE - E04 (FPT 6-5)	31	152	1	1	1	5	5	0.06	9	14	0.8	18	220	SFPB	35	80	220	0.221
OFFICE - F04 (FPT 6-5)	31	148	1	1	1	5	5	0.06	9	14	0.8	17	220	SFPB	35	80	220	0.217
OFFICE - F03 (FPT 6-5)	31	147	1	1	1	5	5	0.06	9	14	0.8	17	220	SFPB	35	80	220	0.216
CONFERENCE - G02 (FPT 6-6)	22	203	5	10	5	5	25	0.06	12	37	0.8	46	635	SFPB	35	225	635	0.207
OPEN OFFICE - H03 (FPT 6-7)	31	293	4	-	-	-	-	-	18	38	-	-	-	-	35	155	430	0.303
STORAGE ROOM - I04 (FPT 6-7)	24	87	0	-	0	-	-	-	10	10	0.8	10	100	SFPB	35	60	160	0.218
OFFICE - J05 (FPT 6-8)	31	149	1	1	1	5	5	0.06	9	14	0.8	17	190	SFPB	35	70	190	0.249
OFFICE - J06 (FPT 6-8)	31	146	1	1	1	5	5	0.06	9	14	0.8	17	190	SFPB	35	70	190	0.246
OFFICE - J07 (FPT 6-8)	31	148	1	1	1	5	5	0.06	9	14	0.8	17	190	SFPB	35	70	190	0.248
OFFICE - K08 (FPT 6-8)	31	151	1	1	1	5	5	0.06	9	14	0.8	18	190	SFPB	35	70	190	0.251
OFFICE - K09 (FPT 6-9)	31	148	1	1	1	5	5	0.06	9	14	0.8	17	190	SFPB	35	70	190	0.248
OFFICE - L09 (FPT 6-9)	31	154	1	1	1	5	5	0.06	9	14	0.8	18	190	SFPB	35	70	190	0.254
OFFICE - L10 (FPT 6-9)	31	150	1	1	1	5	5	0.06	9	14	0.8	18	190	SFPB	35	70	190	0.250
CONFERENCE - L12 (FPT 6-10)	22	308	8	15	8	5	40	0.06	18	58	0.8	73	640	SFPB	35	225	640	0.325
CONFERENCE - L14 (FPT 6-11)	22	396	12	20	12	5	60	0.06	24	84	0.8	105	720	SFPB	40	290	720	0.361
RECEPTION - K15 (FPT 6-12)	32	482	12	14	12	5	60	0.06	29	89	0.8	111	630	SFPB	50	315	630	0.353
CAFÉ - K19 (FPT 6-13)	20	604	19	15	19	5	95	0.06	36	131	0.8	164	930	SFPB	50	465	930	0.353
CAFÉ - K19 (FPT 6-14)	20	688	4	17	4	5	20	0.06	41	61	1.0	61	350	SFPB	50	175	350	0.350
RECEPTION - K15 (FPT 6-15)	32	580	4	17	4	5	20	0.06	35	55	1.0	55	290	SFPB	45	135	290	0.406
CONFERENCE - I14 (FPT 6-16)	22	272	6	14	6	5	30	0.06	16	46	1.0	46	400	SFPB	40	160	400	0.290
CONFERENCE - I11 (FPT 6-17)	22	284	8	14	8	5	40	0.06	17	57	1.0	57	500	SFPB	40	200	500	0.285
CORRIDORS - K13 (FPT 6-15)	23	296	0	-	0	-	-	0.06	18	18	1.0	18	100	SFPB	45	45	100	0.395
STORAGE ROOM - G09 (FPT 6-18)	24	86	0	-	0	-	-	0.12	10	10	1.0	10	100	SFPB	40	40	100	0.258

ventilation impacts on decision making



Data from the Department of Energy's Lawrence Berkeley National Laboratory study

ventilation impacts on decision making

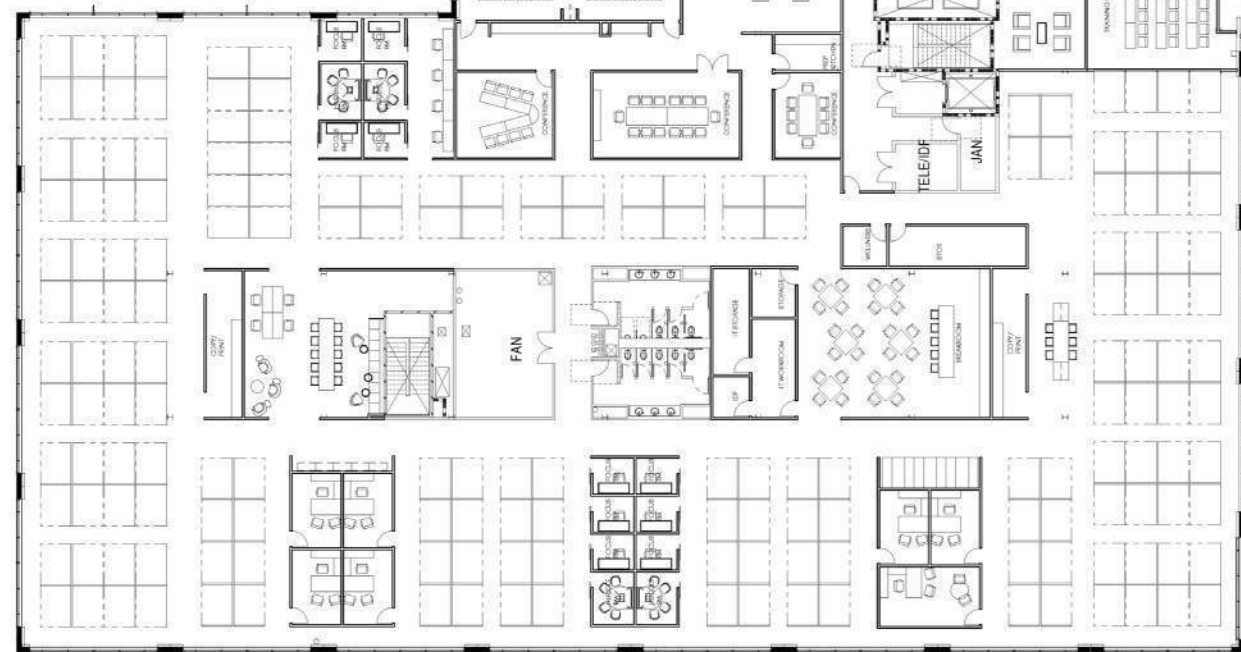


Data from the Department of Energy's Lawrence Berkeley National Laboratory study

- TEST FITS

high density might not
mean the same to all

HIGH DENSITY



← NORTH

CLOSED OFFICES	103
OPEN WORKSTATIONS	319
TOTAL	422



plumbing fixtures

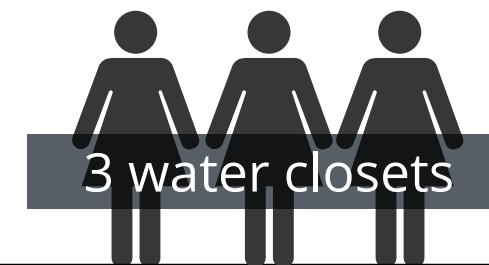
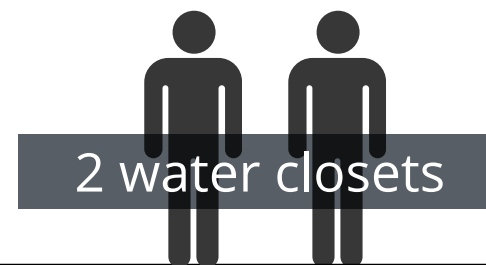
fixture counts plumbing code												
1	Assembly	A-4	skating rinks, pools and tennis courts for indoor sporting events and activities	1,500 and 1 per 120 for the remainder exceeding 1,500	1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink		
			Ice skating rinks, and indoor swimming pools, and indoor arenas for indoor sporting events and activities	1,500 and 1 per 120 for the remainder exceeding 1,500	1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink		
			Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50	1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80	—	—	—	1 per 100	1 service sink ^e		

No.	CLASSIFICATION	OCCUPANCY	DESCRIPTION	WATER CLOSETS (URINALS SEE SECTION 419.2 OF THE INTERNATIONAL PLUMBING CODE)		LAVATORIES		BATHTUBS/ SHOWERS	DRINKING FOUNTAINS (SEE SECTION 410 OF THE INTERNATIONAL PLUMBING CODE)	OTHER
				Male	Female	Male	Female			
1	Assembly	A-4	Coliseums, arenas, skating rinks, pools and tennis courts for indoor sporting events and activities	1 per 75 for the first 1,500 and 1 per 120 for the remainder exceeding 1,500	1 per 40 for the first 1,520 and 1 per 60 for the remainder exceeding 1,520	1 per 200	1 per 150	—	1 per 1,000	1 service sink
2	Business	B	Buildings for the transaction of business, professional services, other services involving merchandise, office buildings, banks, light industrial and similar uses	1 per 25 for the first 50 and 1 per 50 for the remainder exceeding 50	1 per 40 for the first 80 and 1 per 80 for the remainder exceeding 80	1 per 200	1 per 150	—	1 per 1,000	1 service sink ^e
3	Educational	E	Educational facilities	1 per 50	1 per 50	1 per 50	1 per 50	—	1 per 100	1 service sink
4	Factory and industrial	F-1 and F-2	Structures in which occupants are engaged in work fabricating, assembly or processing of products or materials	1 per 100	1 per 100	1 per 100	1 per 100	See Section 411 of the <i>International Plumbing Code</i>	1 per 400	1 service sink
5	Institutional	I-1	Residential care	1 per 10	1 per 10	1 per 10	1 per 10	1 per 8	1 per 100	1 service sink
		I-2	Hospitals, ambulatory nursing home care recipient ^b	1 per room ^c	1 per room ^c	1 per room ^c	1 per room ^c	1 per 15	1 per 100	1 service sink
			Employees, other than residential care ^b	1 per 25	1 per 25	1 per 35	1 per 35	—	1 per 100	—
			Visitors, other than residential care	1 per 75	1 per 75	1 per 100	1 per 100	—	1 per 500	—



potential out of pocket cost

200 sq. ft.
per person



120 sq. ft.
per person



\$ 30,000
potential cost
impact

80 sq. ft.
per person



\$ 60,000
potential cost
impact

A modern office interior featuring a prominent staircase with wooden steps and a glass railing. The space is bright and open, with large windows providing a view of the city. In the background, a lounge area with a sofa and coffee table is visible. To the right, a long wooden table serves as a workspace or meeting area, with three people seated at it. The ceiling is white with recessed lighting, and the floor is made of light-colored wood. The overall design is clean and contemporary.

egress

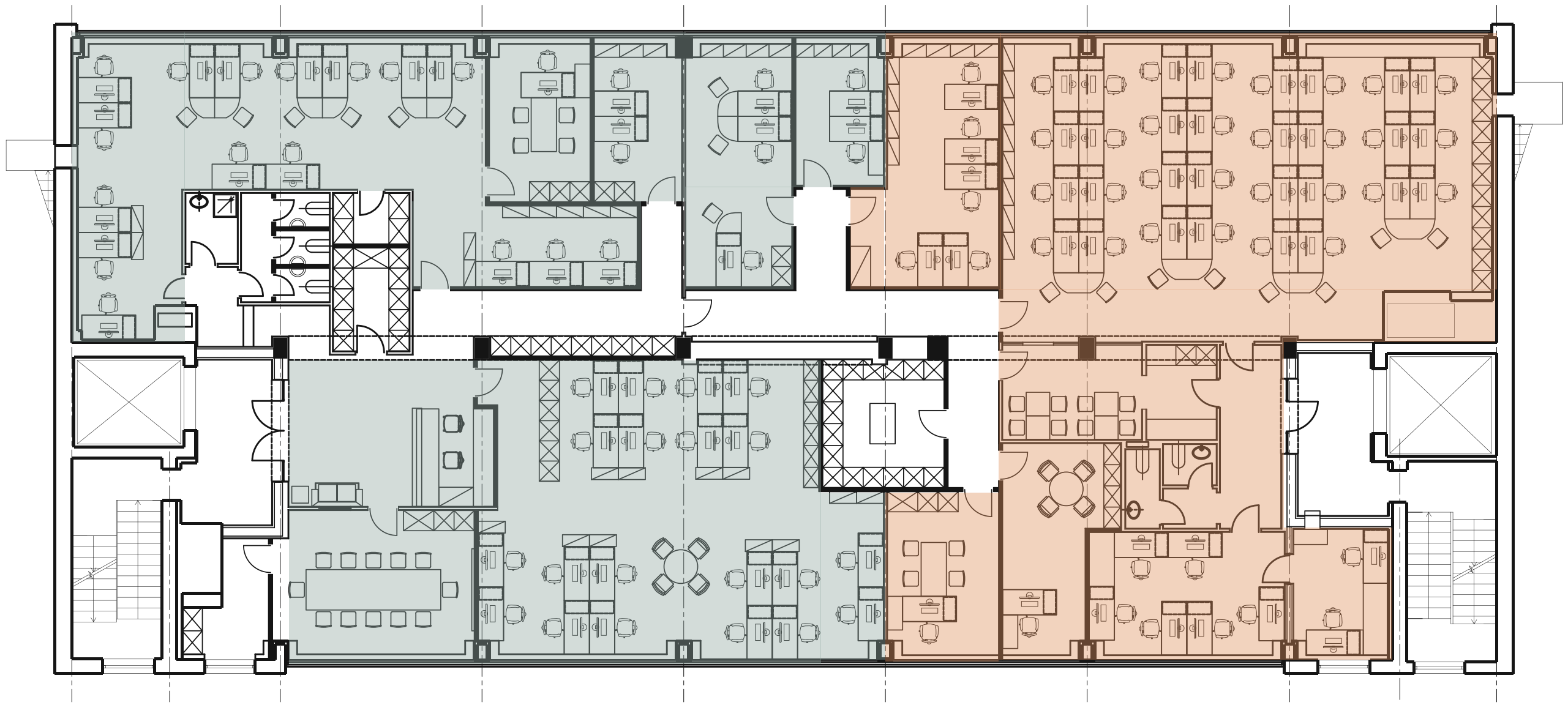
what are the **SOLUTIONS?**



horizontal exits

SIDE A 450 Occupants

SIDE B 250 Occupants



horizontal exits

potential impacts



horizontal exits

potential impacts



horizontal exits

potential impacts



horizontal exits

potential impacts



horizontal exits

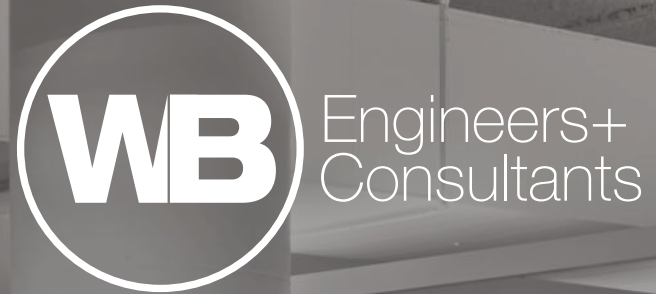
potential impacts



horizontal exits

potential impacts





Q&A

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visit us at **wbengineering.com**



This presentation on **Aging Facilities and the Densified Workplace** can be applied to:

IFMA CFM Maintenance Activities
AIA Registered CEU

Both to be self reported

1 hour attendance of the CEU can contribute toward
Category 1 – FM Related Education
self report points and activities on the IFMA website
under the CAMP Portal
www.ifma.org

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Thank you to the Presenters for sharing their expertise!

Thank you to the webinar Sponsors for their support!

For additional information about the Chesapeake Chapter please visit:

www.ifmachesapeake.org

Join us in June, from the comfort of your location choice, for:

- FM related Educational Topics
- Virtual Awards Gathering to celebrate and recognize the contributions of fellow Chapter members and see the new 2020-2021 Board of Directors inducted

Thank you for attending!

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