Client Enrichment Series

Welcome to today's presentation on:

Workplace Solutions, Acoustic Design, and their Impact

The presentation will start at 9:00 AM PDT

Note: Phones are automatically muted during the presentation. You have the ability to send questions to the host and presenters through the "questions" feature on your control panel located on the right of your screen. We will answer as many of the questions as possible at the end of the presentation. All questions will be captured, and answers sent to all participants within 2 weeks.

Client Enrichment Series

Tackling the No. 1 Complaint in the Open Office
Acoustic Comfort

Hosted by: David Lee, Regional Account Manager, GSA Region 9

Presented by: Kevin Kelly, Workplace Program Expert,
Center for Workspace Delivery

GSA

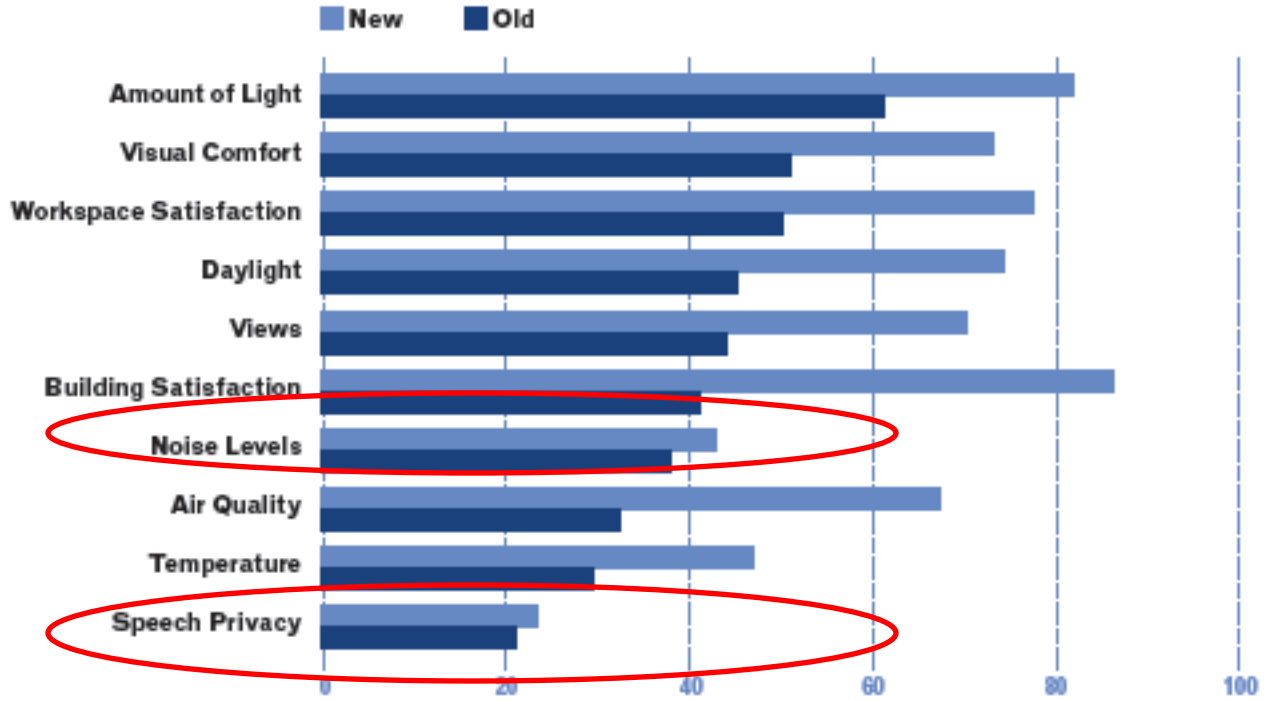
GSA Public Buildings Service

Client Enrichment =

"A well-informed consumer is our best customer"

Poor Acoustics is the Number 1 complaint in the open office

Pre- and post- results from seven federal offices that were redesigned to better align with each agency's business goals and missions.

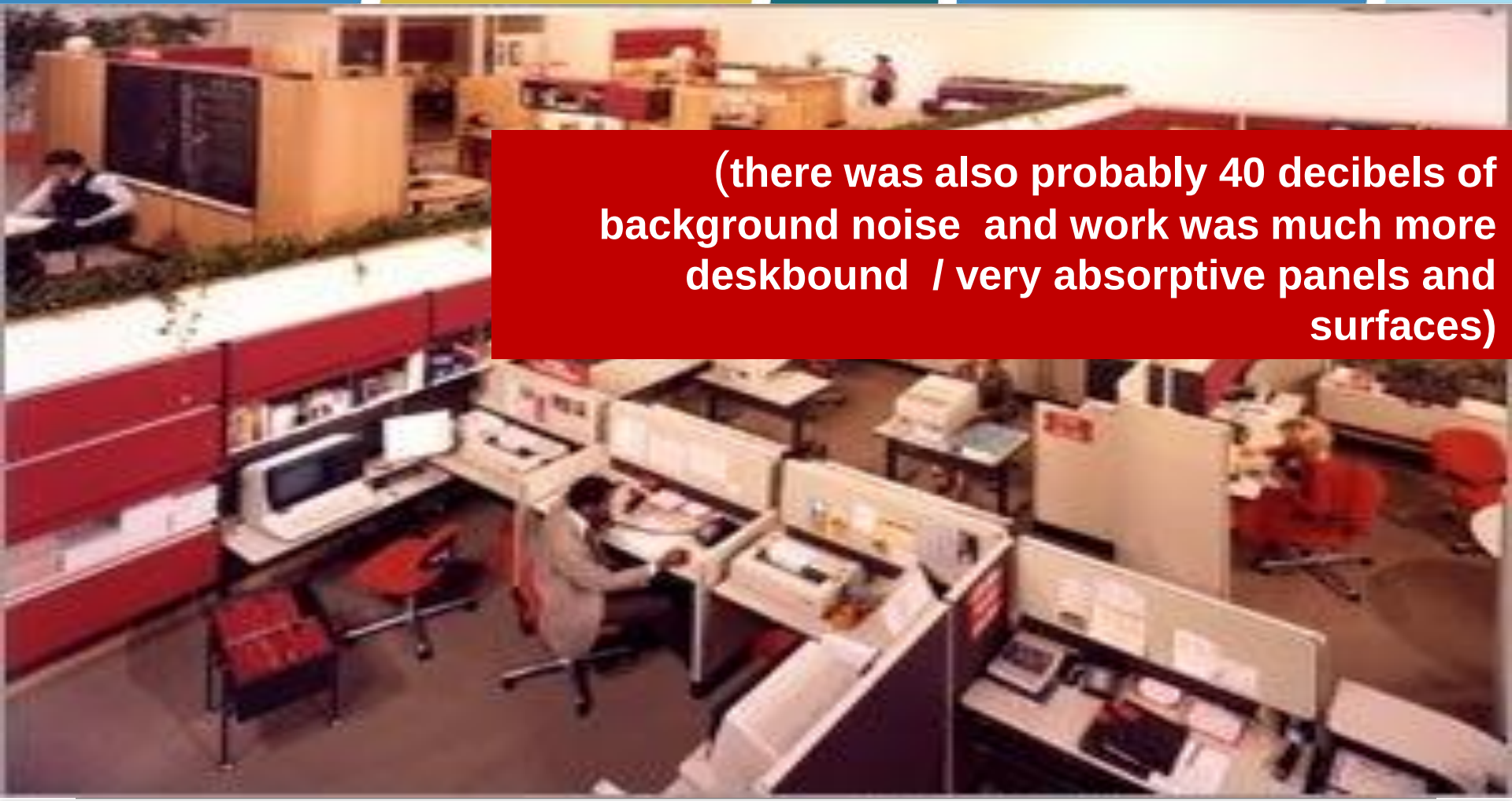


How we got here…

This was probably quieter than you think:
High background noise /no phones/ everyone doing the same routine/ interaction elsewhere

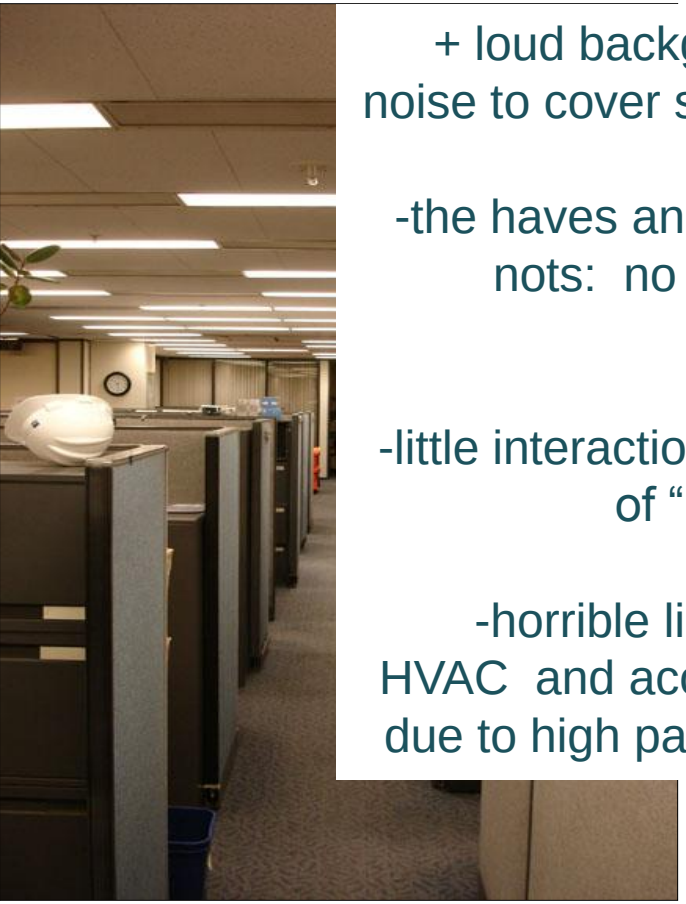
Understanding the evolution of the office illuminates present challenges

Look at the size of them cubicles!



Action Office, Herman Miller, circa 1969

Circa 1980 Same Space! Circa 2007



+ loud background noise to cover speech

-the haves and have nots: no spatial equity

-little interaction / lots of “hiding"

-horrible lighting, HVAC and acoustics due to high partitions

+ more light and view for every one

+ seated privacy but standing awareness of others

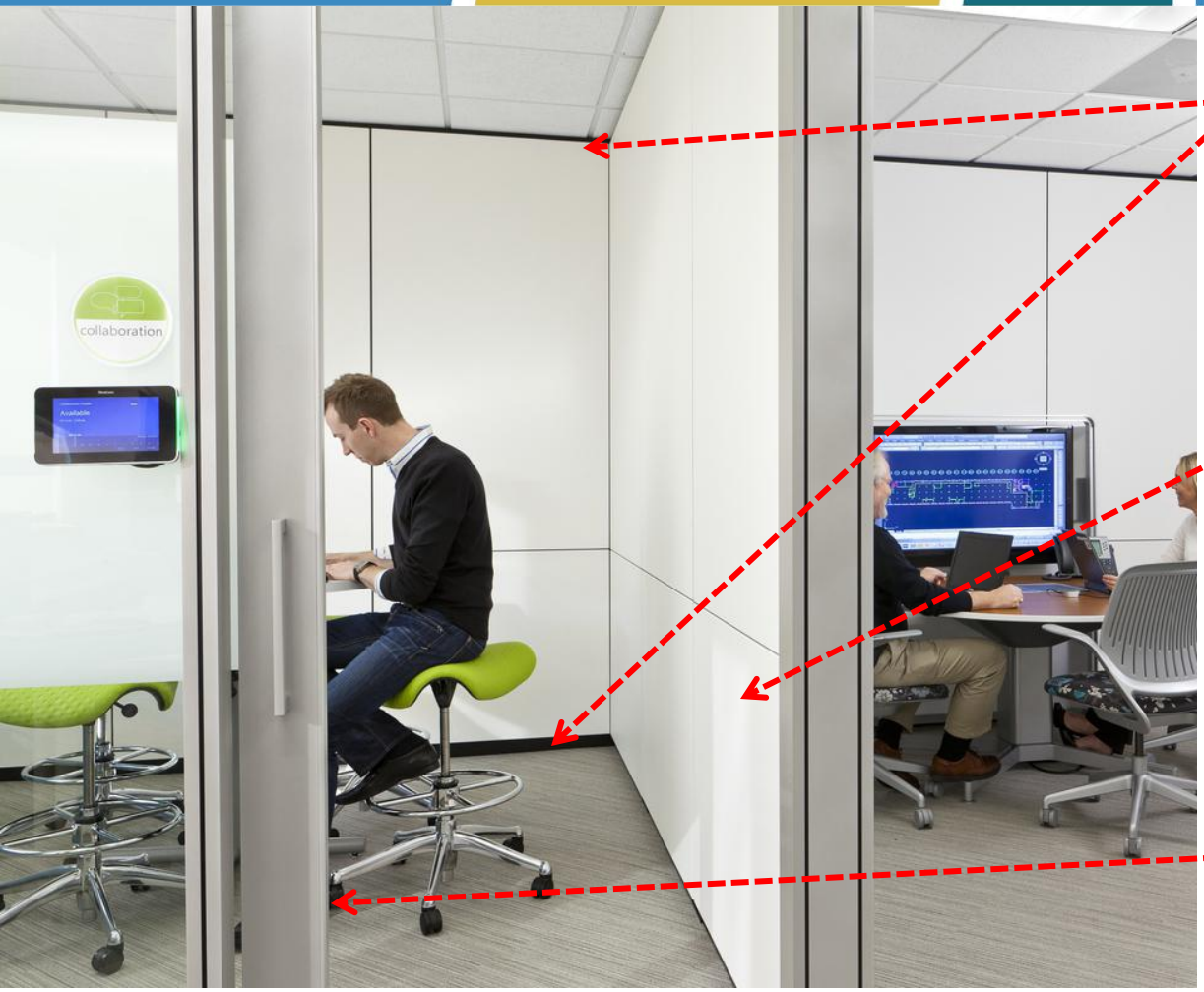
+ higher quality ceiling absorbs more noise

+ more interaction which is in organization’s interest

- glass and all of the reflective surfaces means more noise

As the new workplace becomes denser and more varied, acoustic design wisdom is *key*

Huddle Rooms: Part of the new, more collaborative workplace



Caulking at top and bottom is necessary to contain sound. (Think of it like water!) Correct sound absorption of surfaces can also help.

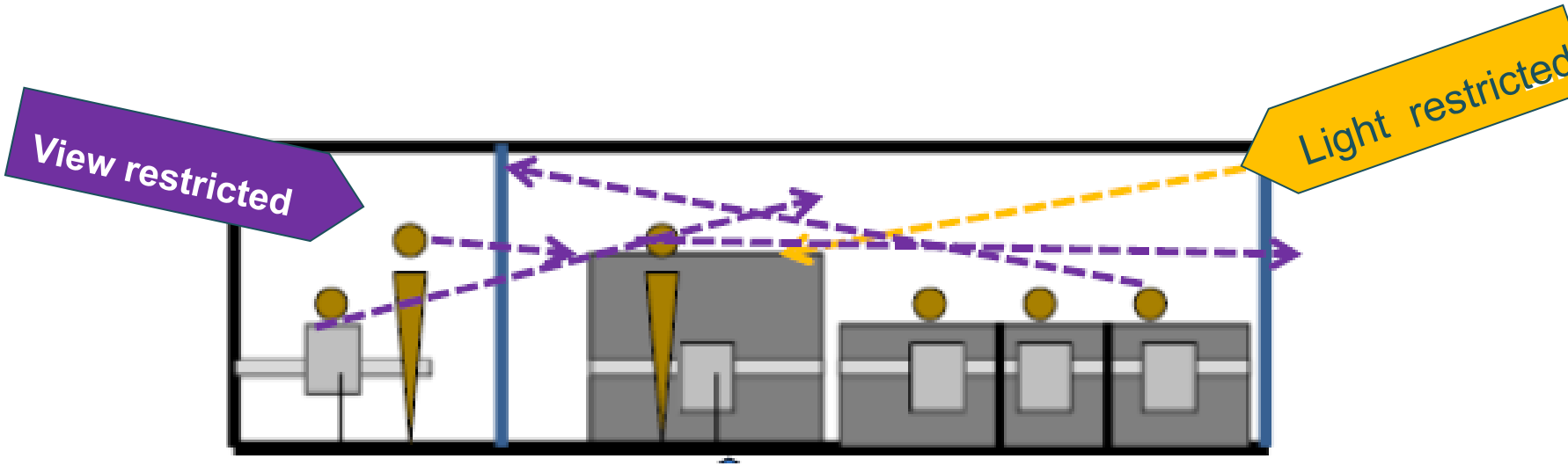
NIC Noise Isolation Class measures sound from room to room in the BUILT condition: MUST specify the desired NIC in specifications.

Sliding doors are cool: But all too often they lack gaskets/ are noisy and are a source of poor acoustics.

Sometimes the counter-intuitive is true

Even with all the partitions, the “privacy” is fictitious.

The (tragic) organizational results of a *flat earth* view of acoustics …

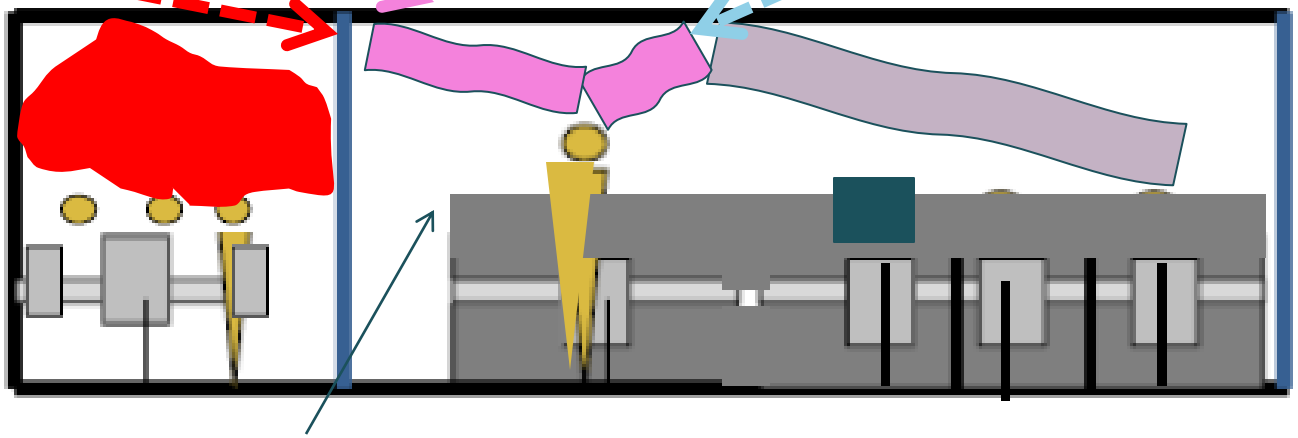


The agency made the decision that managers who didn't "rate" an office should have a workstation with higher partitions.

The *Earth is Round* view of Acoustics

1. Voice is modulated because there is greater awareness of proximity
2. A highly absorptive ceiling reduces distraction still further

3. Collaborative work can continue at full voice without disturbing, especially when private offices become conference rooms that have correct acoustic separation



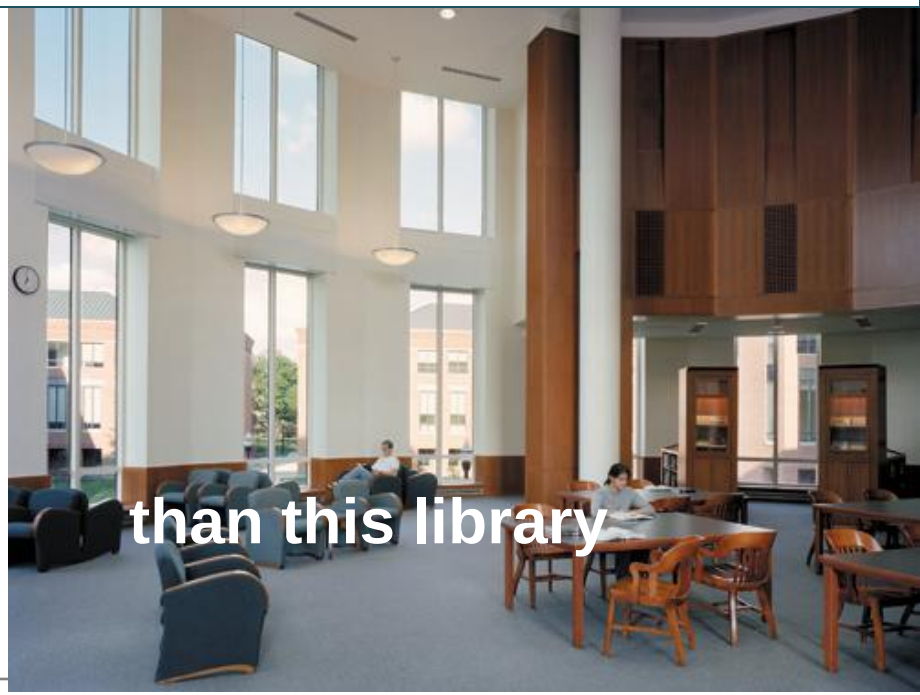
51-54” seated privacy

Spatial equity tends to reinforce organizational effectiveness

Acoustical privacy - simple but not intuitive

Participant poll:

Which has better speech privacy?
VOTE!



The "wicked problems" we need to address to have a 21st Century workplace:

The conundrum:

- **Collaboration and *concentration***
  - Interaction and *solitude*
- **Being available and *having privacy***
- Getting ***group*** work done and getting ***individual*** *tasks done*

Sound Matters:
simple – and intuitive acoustical guide

GSA sponsored an acoustics workshop with acoustics experts, manufacturers, workplace strategist, psychologists and clients to produce understandable acoustic guidance.

GSA

SOUND MATTERS

How to achieve acoustic comfort in the contemporary office

Produced by GSA Public Buildings Service

September 2011

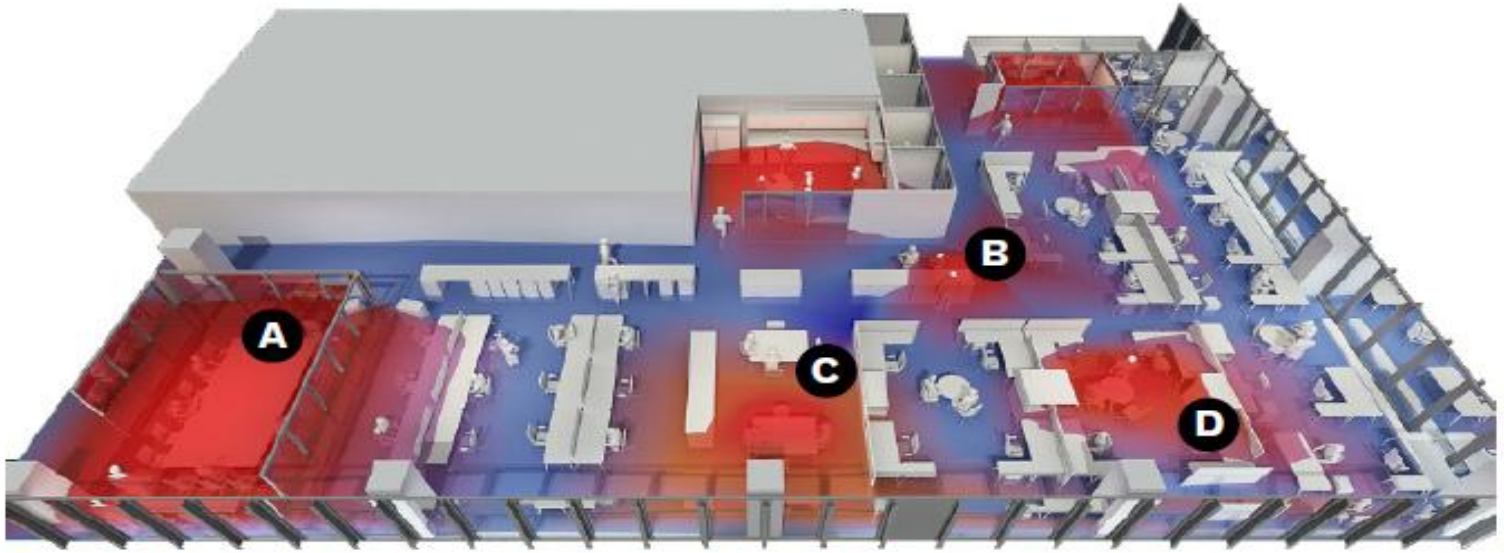
PART 1

PART 2

GSA U.S. General Services Administration

GSA Public Buildings Service

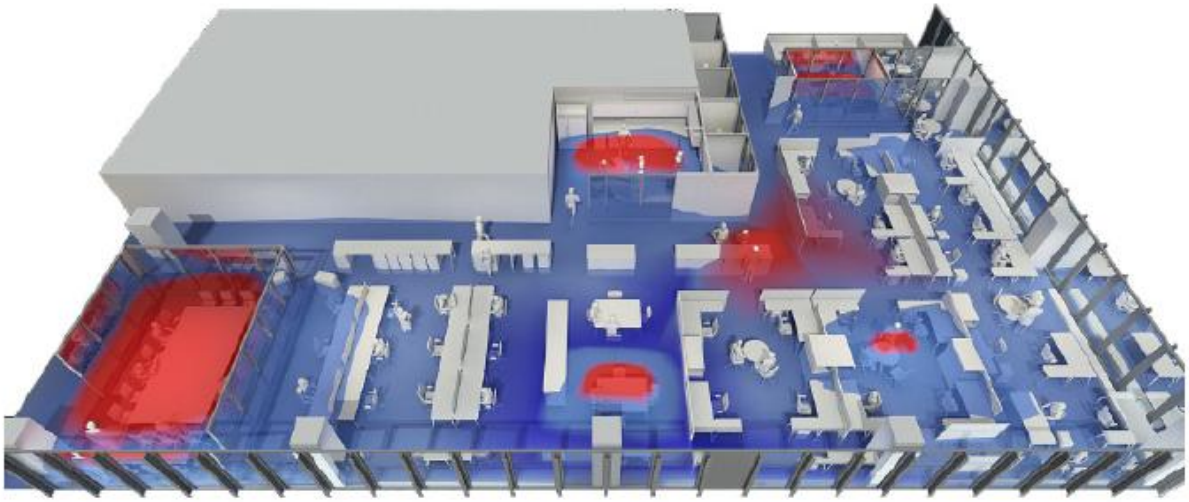
Sound Matters shows how to go from acoustical distraction…



Workplace Distractions (letters refer to plan above)

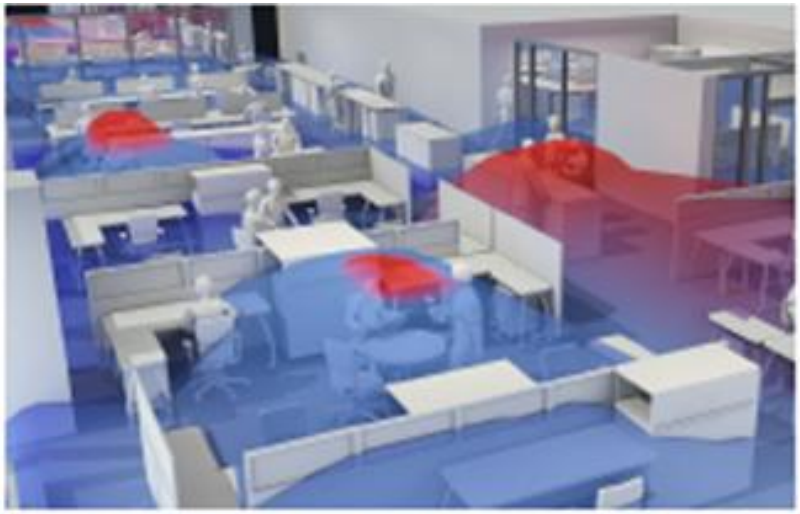
A. Conference room/teleconference.*
B. Hallway discussion near workstations
C Informal meetings and conversations
D. Employees on the phone (especially standing above the acoustic absorption of the workstation or on a speakerphone)

…to acoustical comfort



Improved Acoustic Features

1. Low workstation partitions but with adequate seated privacy and acoustic absorption of NRC 0.7 in partition material located in front of the worker when seated, typically in any furniture partition.
2. High noise reduction coefficient (NRC) in the ceiling and/or on walls
3. A sound masking system
4. Enhanced employee awareness of co-workers



Understanding Acoustical Principles

Audience Vote:

Who's most satisfied?

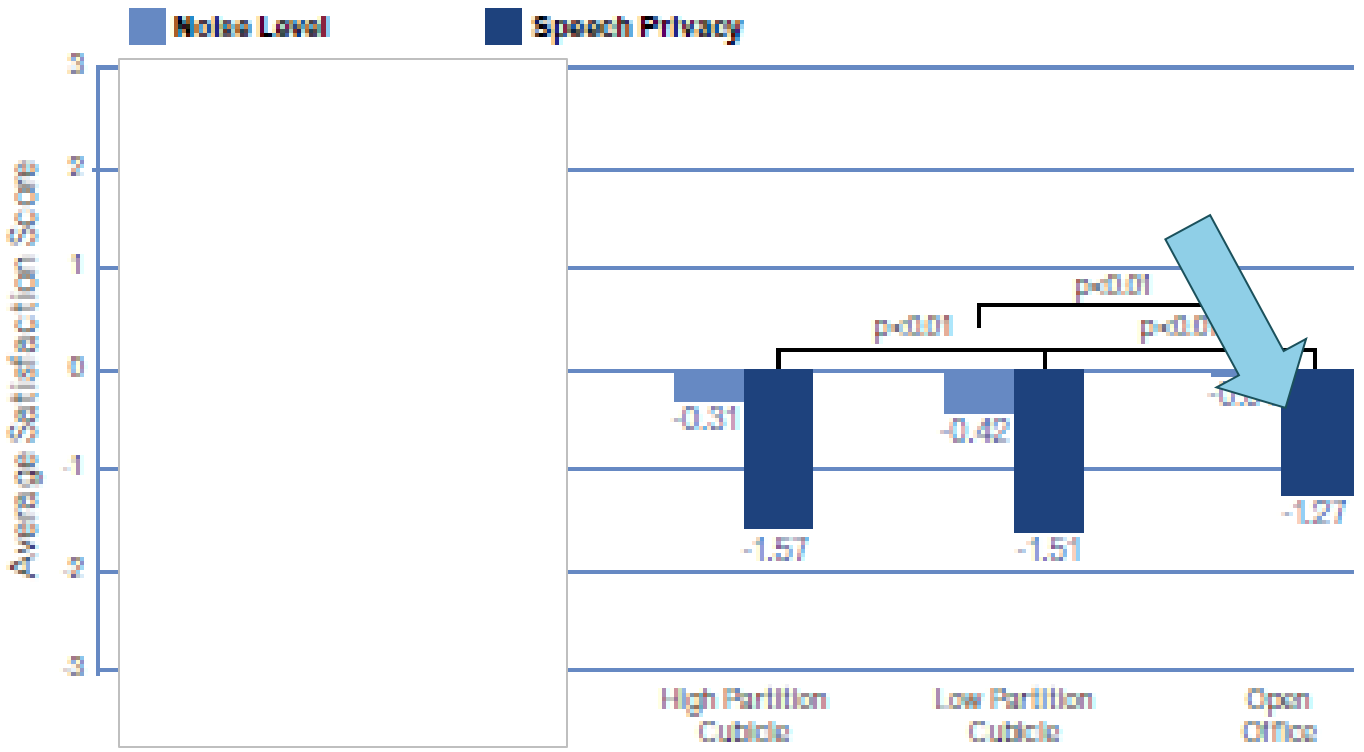
People who have high partitions?

People who have low partitions?

People who have no partitions?

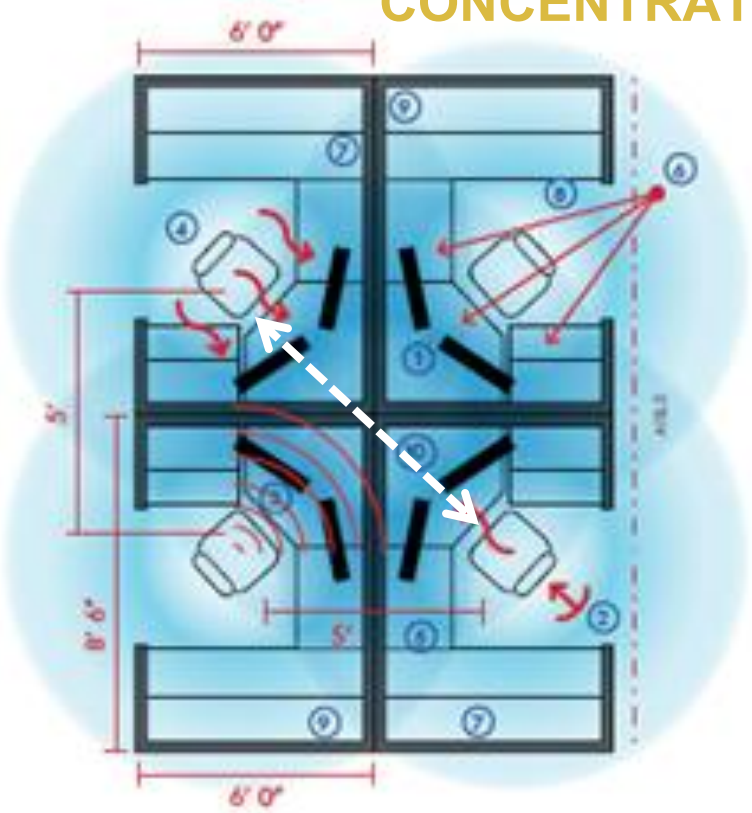
Understanding acoustical principles

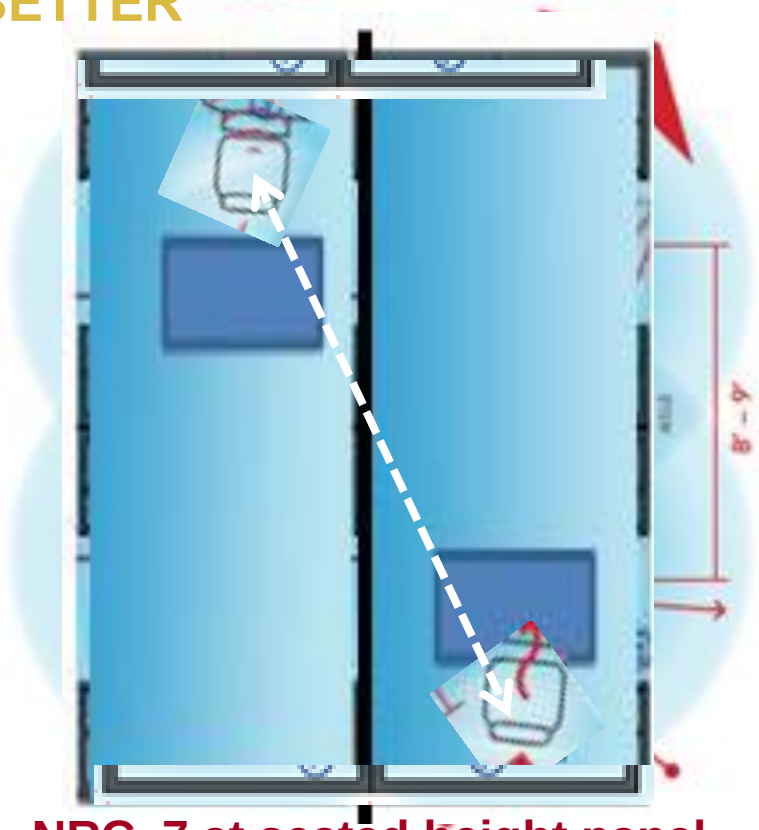
24,000 respondents to CBE survey of typical office space workers



Sound Matters dispels acoustical myths

“IF ONLY MY WORKSTATION WHERE BIGGER, I COULD CONCENTRATE BETTER”





NRC .7 at seated height panel

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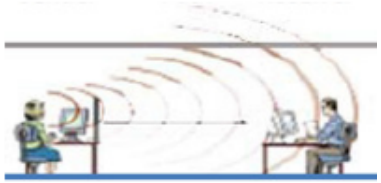
A DROP OF (MAYBE) 5 DECIBELS:
“A DROP IN THE BUCKET “

How to Control Sound (Before it controls you)!

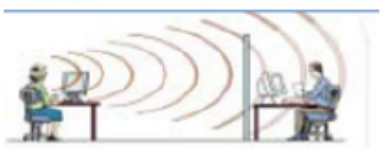
SIGNAL.....PATH.....RECEIVER



$

Absorb
Surfaces which absorb sound, particularly in the ceiling* diminish the strength of the sound from the sender as it travels across the path to the receiver. Walls and floors are also potential sound absorbers. With reflective floor finishes, such as marble, footfall can be especially annoying to workers.

*since it serves as a reflector

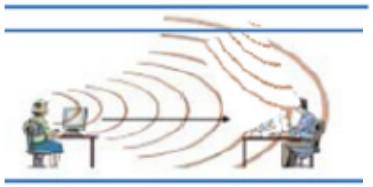


Doesn't work

Block (inadequately)
This is the typical way that high workstation partitions are arranged and it illustrates why this arrangement is doubly ineffective: 1) Sound, being like water, leaks into the receivers' work area and 2) the sender cannot visually gauge the effect of their voice level on coworkers who are not in their line of sight.

$$$

Block
The strategy illustrated is very effective and very expensive. It requires that the ceiling be interrupted, requiring significant labor since the partition continues to the structure above the ceiling. Where the partition only stops at the ceiling which is typical commercial office construction, the blocking action is not nearly as effective because sound leaks are inevitable at the ceiling plane.



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Cover (Mask)
Another important mitigation available for the open workplace is to supply additional sound, either through "white noise" or background noise such as mechanical equipment, which counteracts the typical quietness of a modern, open workspace. Masking helps to cancel the sound disturbance emanating from the sender.

GSA's Work Pattern Methodology helps *zone the workplace* for acoustic comfort:

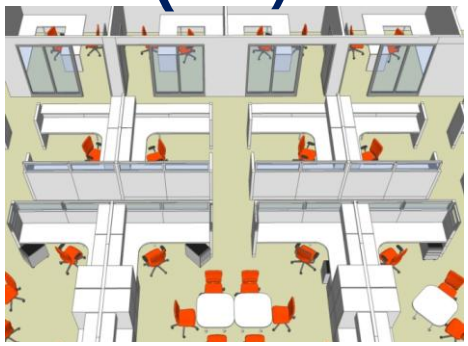
Desk Bound

Internally Mobile

Externally Mobile

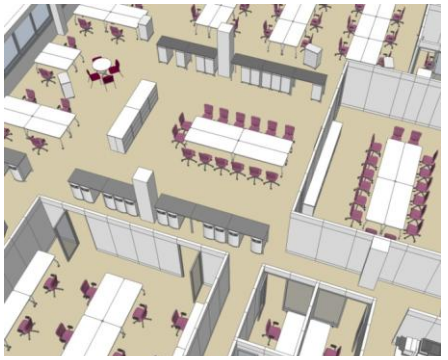
(interactive or concentrative)

(I / C)



(I / C)

(I / C)



Each Pattern is further distinguished as either Interactive or Concentrative

Zoning the Office:
(To limit incompatible adjacencies)

Zoning map of Paris

Zoning map of an office with all 6 work patterns

- Internally-mobile Interactive
- Externally-mobile Interactive
- Desk-bound Interactive
- Internally-mobile Concentrative
- Externally-mobile Concentrative
- Desk-bound Concentrative

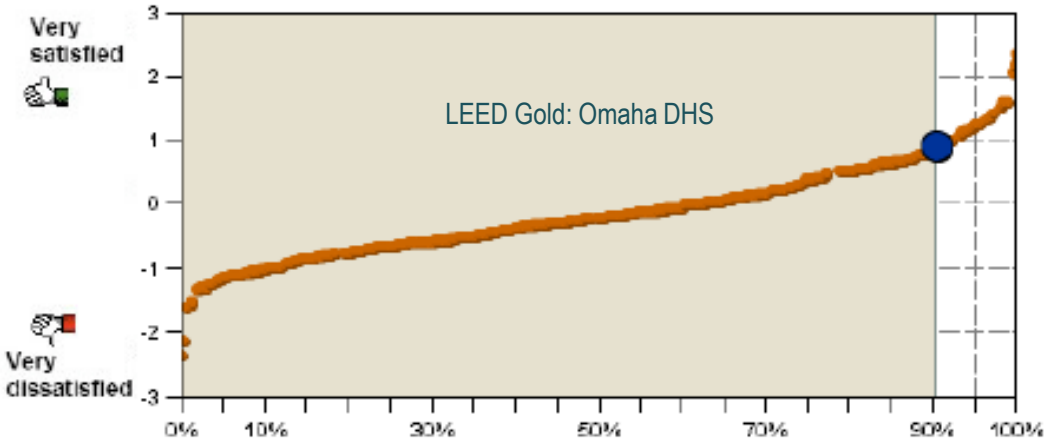
HOW GSA CAN HELP?

Setting targets: if you don't ask for what you need, you won't get what you want

Acoustic Quality

90%

Percentile



0.9

Mean Response

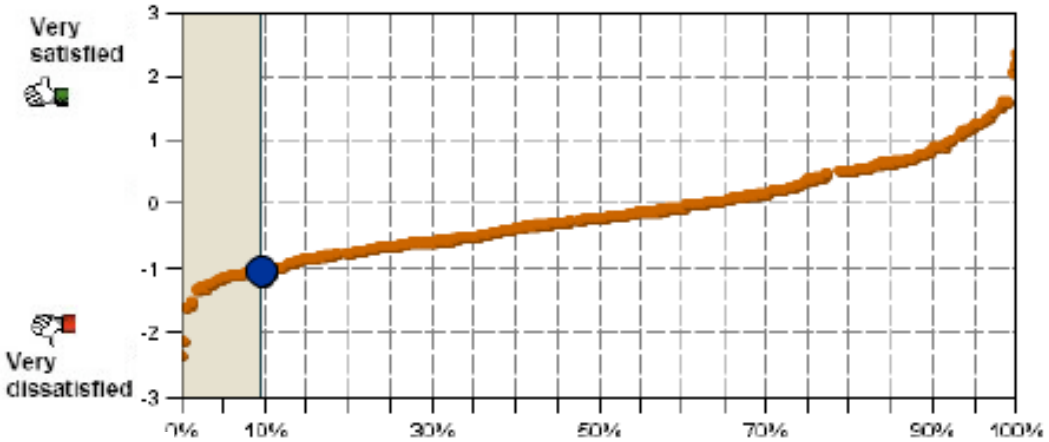
60%

Satisfied

Acoustic Quality

9%

Percentile



-1.03

Mean Response

24%

Satisfied

GSA U.S. General Services Administration

LEED Gold: Omaha NPS

I could have had a V-8!

Or (again) "A well-informed consumer is our best customer…"

A. General Building Requirements

6. A variety of inexpensive and moderately priced fast food and eat in restaurants should be located within three blocks.

7. Services, utilities and maintenance will be provided daily, from 7:00 a.m. to 5:00 p.m., except on Saturday, Sunday and federal holidays.

8. The space shall be accessible 24 hours a day, seven days a week, and include use of elevators, restrooms, lights, and normal office equipment.

9. Cleaning shall be performed during

If you don't tell us how important acoustics is there is no way we can transmit its importance to the offeror !

Range of Costs

$5.42 sq ft for a acoustically useless .55 NRC ceiling

$6.97 sq ft for an acoustically superb NRC.90 ceiling

$1.80 sq ft * Sound Masking System

$312.00 sq ft -Average Employee Costs (annual)**

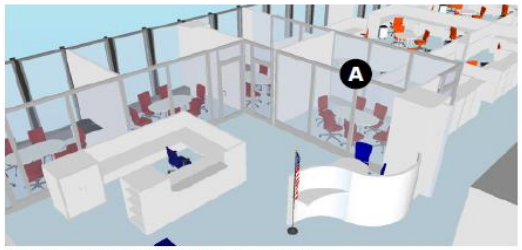
Poor Acoustics = unbelievably poor business decision

* 2012 prices; one time cost

** Per Michael Pessina, Product Development, Lutron Electronics (2010)

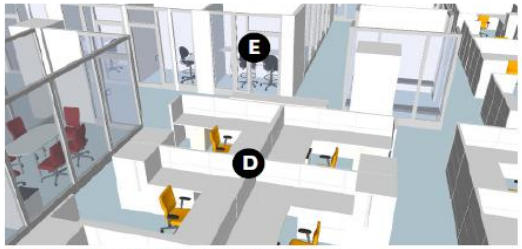
Sound Matters Provides Detailed Guidelines and Cost Comparisons

FIG 16. ACOUSTIC DESIGN AND ZONING DETAILS



DESK-BOUND CONCENTRATIVE

INTERNALLY-MOBILE CONCENTRATIVE



EXTERNALLY-MOBILE INTERACTIVE

A Other partitions for offices and conference rooms, STC 40-45. Acoustic treatment on vertical surfaces recommend to increase sound absorption. Attenuate open plenum return diffusers.

B High isolation: slab to slab (caulked at sill and head). The partition achieves a minimum of STC 53. This high level of isolation is more expensive than some other partitions, but may be necessary to allow for concentration. Personnel costs far exceed the cost of this mitigation! (Example justification: workplace next to child care or cafeteria).

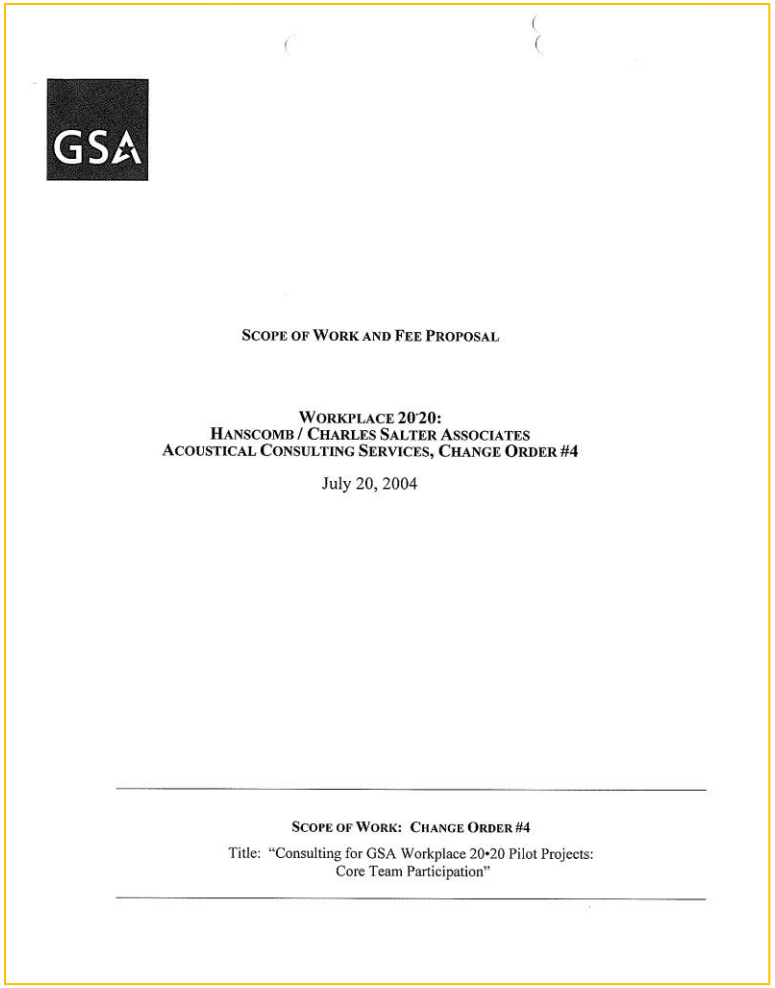
C Minimum: sound absorption of enclosing workstation partition: 0.8 NRC

D Workstation, maximum 66" tall, with seated privacy recommended at 51" maximum. Use of glass panels above 51" strongly recommended (this will achieve 1 LEED interior point; possible additional points for even lower partitions, see LEED).

E Speaker phones in open areas not provided and should only be located in enclosed offices and conference rooms with STC 45 min enclosures. Locate entrances to conference rooms away from work areas, especially where large groups may be able to congregate before entering.

FIG 20. COSTS

CONSTRUCTION	DESCRIPTION	COST INFORMATION
Wall Type #1	12' high 20 gauge studs slab to slab, 24" o/c, 5/8" gypsum board each side, Level 4 finish, painted STC 30-35	$154.30/lineal foot $12.86/sq. ft.
Wall Type #2	Same as Wall Type #1 plus R-11 fiberglass insulation, in stud cavity, wall penetrations and perimeter sealed with acoustical caulking, low voltage devices placed in outlet boxes and sealed with outlet box pads, electrical outlets sealed with outlet box pads STC 40	15% more than Wall Type #1 $176.69/lineal foot $14.73/sq. ft.
Wall Type #3	Same as Wall Type #2 plus one layer of 5/8" gypsum board added on each side STC 45	31% more than Wall Type #2, 50% more than Wall Type #1 $231.66/lineal foot $19.30/sq. ft.
Wall Type #4	Same as Wall Type #3 except only one layer of gypsum board on one side and 1 3/8" resilient channels isolating gypsum board on the other side STC 53	3% less than Wall Type #3, 45% more than Wall Type #1 $224.56/lineal foot $18.71/sq. ft.
Sound absorbing wall panel (NRC 0.8 minimum)		$22.30/sq.ft. installed
Lay-in acoustical tile ceiling in 2x4 grid (no rating)	NRC 0.55	$5.42/sq. ft. Installation of grid and tile, not including lights, sprinklers, etc.
Lay-in acoustical tile ceiling in 2x4 grid (NRC 0.9)	NRC 0.9	$6.97/sq. ft. 28% more than standard acoustical tile ceiling
Sound masking system		$1.81 per sq. ft. installed



SCOPE OF WORK AND FEE PROPOSAL

WORKPLACE 20·20:
HANSCOMB / CHARLES SALTER ASSOCIATES
ACOUSTICAL CONSULTING SERVICES, CHANGE ORDER #4

July 20, 2004

SCOPE OF WORK: CHANGE ORDER #4

Title: "Consulting for GSA Workplace 20•20 Pilot Projects:
Core Team Participation"

We can advise on scopes for improving existing spaces

Top Level Guidelines

Page 11, *Sound Matters*

TEN STEPS TO ACHIEVING ACOUSTIC COMFORT

BEHAVIOR

☐ 1. Work pat…

…group, aimed
…reducing distractions and
appropriate use of space use.

…support
…oral adaptations with
mobile technologies, multiple work
spaces, and policy.

Identify work patterns to determine level of quiet or interaction work requires / identify level of speech privacy required – confidential?/ Institute behavioral protocols agreed on by the group

DESIGN

☐ **5. Zoning –** After determining the work patterns, (see #1 above, under "Behavior"), develop a layout strategy which will locate incompatible functions apart from each other. Locate conferen… and focus roo…

…ate incompatible
functions.

☐ **6. Planning –** Carefully consider the effect on neighboring workstations when locating supporting activi… such as copier …

…Select furniture which complies with LEED NC credits EQ 8.1 and 8.2 to obtain 1 or 2 LEED credits. The low partitions required will achieve the desired access to

natural light and vie… allowi…

…icient (NRC)
…partition should be .07 so that speech is not reflected backward when the worker seated at his or her desk speaks. Where possible, the layout should locate the desks so that workers will not be speaki… directly "at" each …

Zone work activities/ careful layout planning/ wise furniture selection

ACOUSTIC TREATMENT

☐ **8. Sound Absorbing Ceilings and Walls –** Specify ceilings hav… a minimum NR…

…panels on 25% of walls
with a minimum NRC of 0.8.

☐ **9. S…**

…masking systems.

…ows:
…63 minimum to isolate video conference and training rooms.
>STC 45 minimum to separate conference rooms and executive office areas requiring confidential speech privacy.
>STC 40 minimum to separate private offices required in

Sound absorbing ceilings (and some walls)/sound masking/ correct partition specifications

For more information

http://gsasoundmatters.com

http://www.ted.com/talks/julian_treasure_why_architects_need_to_use_their_ears.html

- The *SOUND MATTERS "Acoustic* Posse":

GSA
Michael Bloom
Patricia Cheng
Judith Heerwagon
Diane Juba
Kevin Kelly
Kevin Powell

Business Place Strategies
Paul Heath
Clark Sept

Charles M. Salter Assoc.
Charles Salter

Gensler
Gervais Tompkin

Haworth
Jay Brand

Place Coach
Sally Augustin

IA Interior Architects
R. J. Brennan

IDEO
Beau Trinicia

Arup
Nick Antonio

BRC Acoustics
Dan Bruck

Acoustics Research Council
David Sykes

Armstrong
Ken Roy

US Social Security Administration
Donna A. Ellis

US State Department
Thierry Rosenheck

US Coast Guard
Leo Lozano

Wait! Wait! There's more!

http://simplynoise.com/

(thanks to David Lee)

Questions?

Kevin Kelly, Registered Architect

kevin.kelly @gsa.gov