Auditoria Design

Walt Disney Concert Hall
Gehry

Full Range of Acoustic Issues

- Sound/Sight Lines
- Reverberation Time
- Electronic Enhancement
- Multipurpose Halls
- Noise Isolation
- Absorption
- Adaptation

Your Cultural Showcase

Three types of symphony halls

A. Shoebox—Boston
B. Wide—Amsterdam
C. Surround—Denver
Boettcher Hall, Denver surround

Hardy Holtzman and Pfeiffer

2750 seats, none more than 85 feet from stage

Convex “clouds”
Diffusing balconies
Reverberant chamber
Result is satisfactory $T_R$
Wide Halls

Orpheum Theatre, New Orleans

Uses electronics to enhance $T_r$. 
Massay Hall, Toronto

Carnegie Hall, NYC

How do you get to Carnegie Hall?

…or practice

1986 remodel
1995 concrete slab discovered

$T_R = 2.15 \text{ sec}$

Carnegie Hall Section

- Studios
- Ductwork
- Main Hall
- Small Hall
Good balcony experience

Not so good balcony experiences

Mayor Bob Carr Auditorium, Atlanta

Original 1950s Hall
- $T_R = 1.1\ sec$
- Folding Chairs on Slab!

1970s Remodeled Hall
- $T_R = 1.6 - 1.7\ sec$
- Raked Seating
S6 million remodel vs. Eugene’s $25 million new building

Abraham Goodman House, NYC
500 seats
sound reflection
adjustable “shell”

TR = 1.3 – 1.7 sec

Sound isolation

East Wing Auditorium, National Gallery of Art
I. M. Pei
Auditoriode Tenerife, Canary Islands
Calatrava

Classic Shoebox Hall
Boston Symphony Hall, McKim Meade & White, 1900

Wallace Sabine, acoustician

Before and after 2009 renovation...

Renovation to open clerestories and illuminate niches
$T_R = 1.7 - 2.1 \text{ sec}$

Peoria Civic Theatre

Uses assisted resonance to tune $T_R$

John F. Kennedy Center, Washington DC

Symphony Hall – Opera House
Thanks to Gary Madaras, Acoustician, The Talaske Group
Because “there were no acoustic tests in the concert hall. The schedule did not allow the architectural and technical requirements be respected.” —Jean Nouvel

You can see why he was concerned…

The Grande Salle sounds rather wonderful. The acousticians, Marshall Day, enclosed the auditorium within an interior shell, which adds reverberation without making instrumental voices indistinct. The result is an acoustic at once precise and warm.

—Alex Ross, The New Yorker

Seiji Ozawa Hall, Tanglewood, Mass.
Schermerhorn Hall, Nashville
Earl Swenson Associates, 2006

Special feature—open back wall
Special feature: Converts from concert hall to ballroom:

...uses raked seating 'wagons' to roll sections of seating in or out.

Joseph Mayerhoft Symphony Hall, Baltimore
Paramount Theatre, Aurora, Illinois

Former Movie/Vaudeville House
Now a Symphony Hall