

# Size Matters

*How a growing American audience affects the size and cost of performing arts spaces*

July 2010

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## Introduction

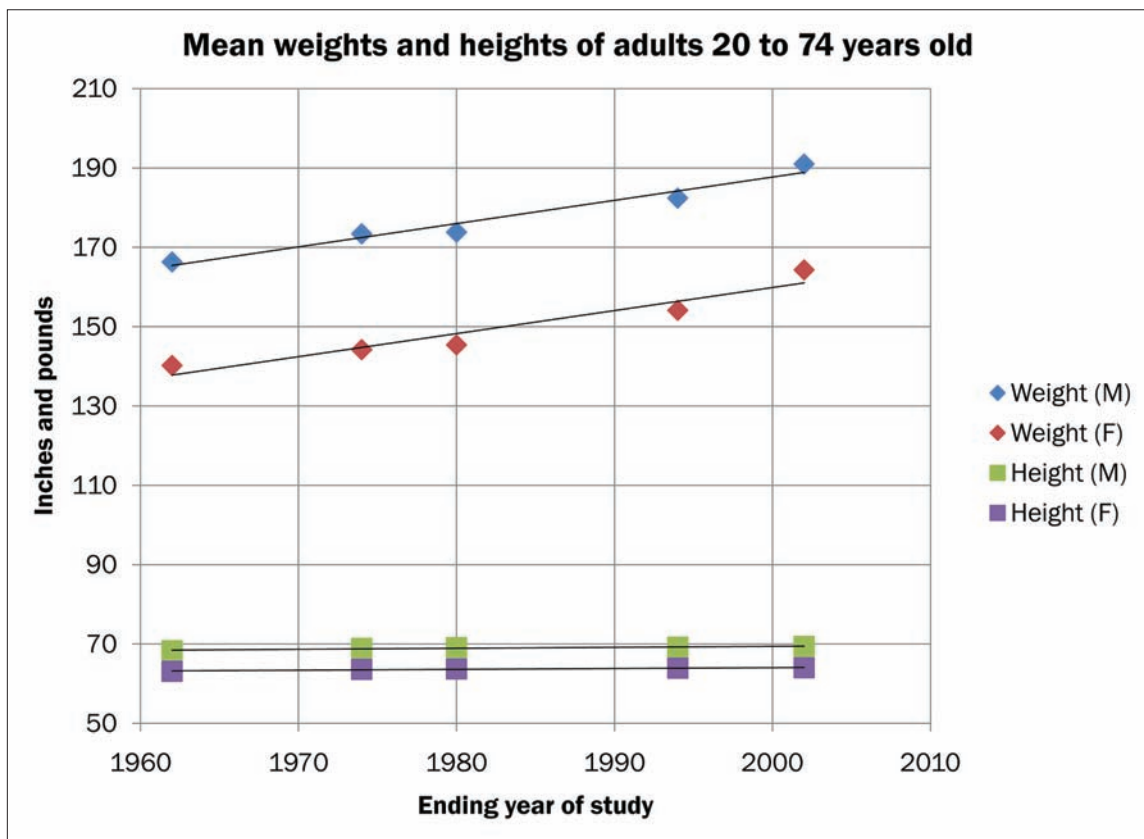
Since the time of ancient Greece, the size and proportion of the human body have affected the design of theatres. As the stature of the “average” person has increased, the requirements for auditorium seating have changed. This paper examines American theatre design from the late 19th century to the present. Americans have gotten taller and heavier, and as expectations for accessibility, comfort, and amenities have changed, seat spacing and auditorium size has increased. During the past 20 years the pace of change has accelerated, primarily due to what the Centers for Disease Control calls “a dramatic increase in obesity in the United States.”<sup>1</sup> These changes have both obvious and subtle consequences for the economics and aesthetics of live performance.

Theatre Projects has provided creative design solutions for our clients on more than 1,200 performing arts facilities in over 70 countries. Our observations in this report are drawn from an examination of the many American performing arts facilities Theatre Projects has designed in the past several decades.

## Contributing factors

### Human stature and weight

Americans are getting bigger. From the late 19th century to the 1970s the average height of native-born adult males rose from about 65 inches to almost 70 inches.<sup>2</sup> In the last half century, increases in height have leveled off, but average weights have increased dramatically.



Source: CDC<sup>3</sup>

## **Codes and accessibility**

The overall effect of building codes and accessibility legislation has been to make auditoriums larger, as measured by floor area per seat, though the detailed picture is more complex.<sup>4</sup> The Iroquois Theatre fire in Chicago in 1903 led to the development of codes governing the means of egress (that is, aisles and exits), creating lower seating densities in auditoriums. More recently the Americans with Disabilities Act of 1990 created an evolving standard of provision for patrons with disabilities, based on discussion, community norms, and case law. The effect over the past 20 years has been to improve access for all patrons, but also to increase auditorium size. In this same time period, the means of egress requirements in the building code have been completely rewritten, improving the quality of the means of egress (by, for example, requiring handrails on aisle stairs) while allowing much more flexibility in the arrangement of seats and aisles. This change in the building code has probably served to offset some of the impact of the ADA.

## **Comfort and amenities**

Theatre goers are more concerned with creature comfort than ever before. And theatre operators, seeing competition from a widening array of entertainment options, are anxious to respond. Speaking before the House of Commons about the experience of American tourists in London theatres, lawmaker Chris Bryant opined that “The seats were built for backsides of a Victorian era, not of a modern era – or indeed any American size – and many of the bars are dingy and overpriced, and haven’t seen a lick of paint since Oscar Wilde was last there.”<sup>5</sup>

In our own practice, we are seeing theatre operators increasingly emphasize services – from food and drink to Wi-Fi access – within their auditoriums. Twenty years ago cup holders were unheard of; today they are almost a requirement. Providing cup holders may add just inches to each row, but the cumulative effect can be the loss of an entire row of seats.

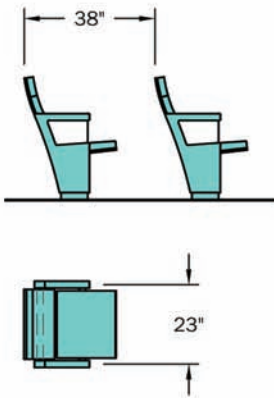
## Observed trends

### Chair width and leg room

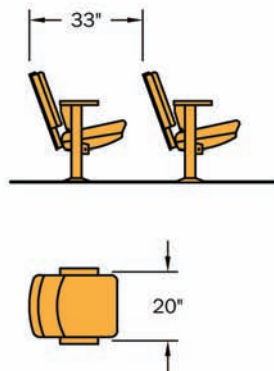
An examination of recommended chair widths and row spacing (that is, leg room) from published sources and Theatre Projects' American practice confirms that the increase in chair widths is accelerating. The charts on the next page illustrate the "standard" chair width and the minimum row spacing in design guides dating from 1896 forward. It took 100 years for the standard seat width to change from 19 inches to 21 inches. Yet in the last 20 years, it's changed from 21 inches to 22 inches. Row spacing has also increased dramatically, but at a steadier pace.

### Typical chair widths and row spacing

**2010**



**1990s**



**Late 19th century**

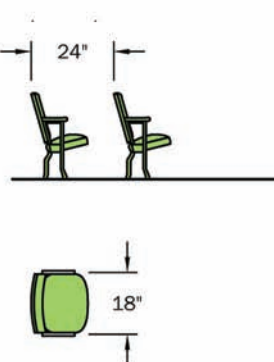
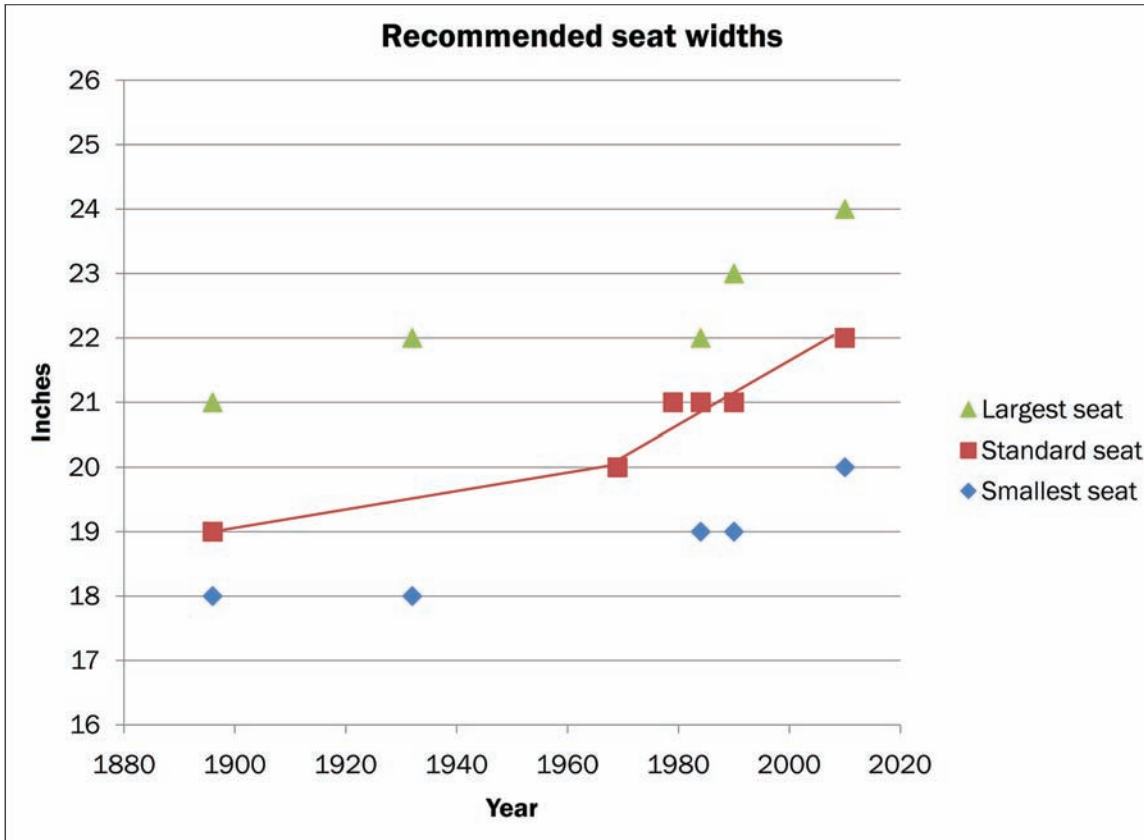
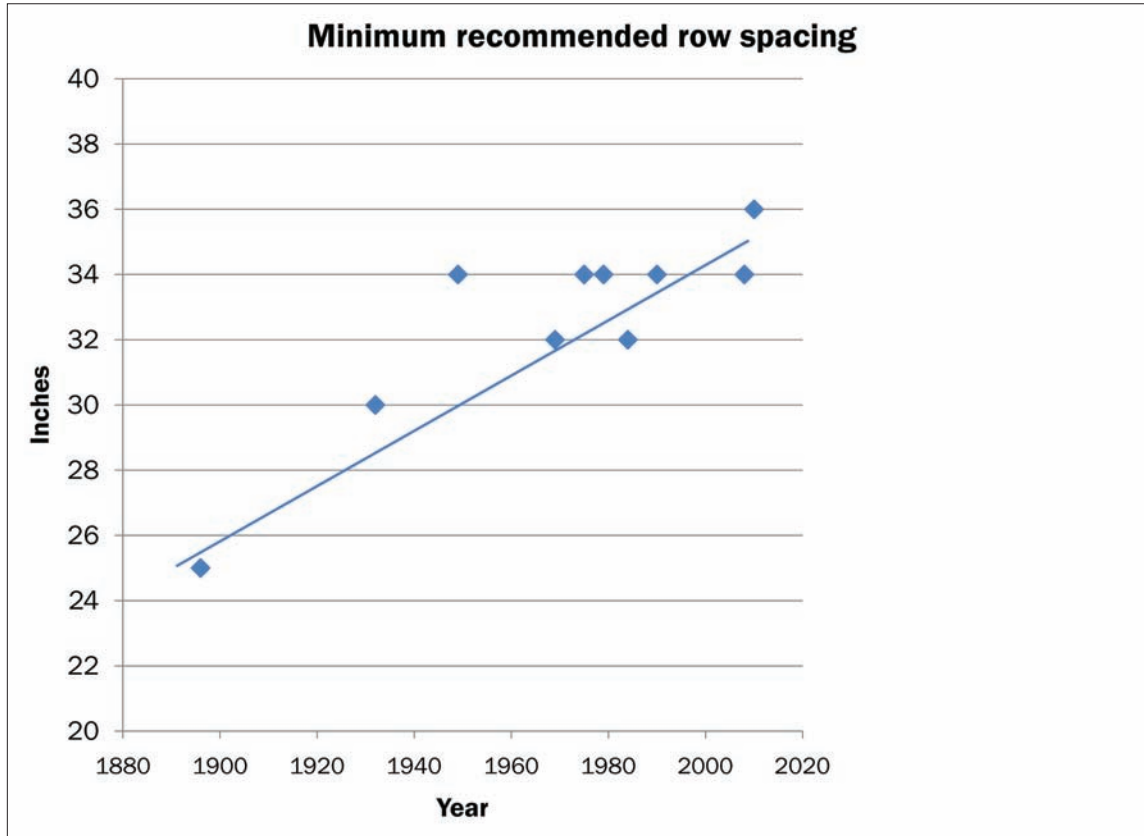


Figure: Theatre Projects

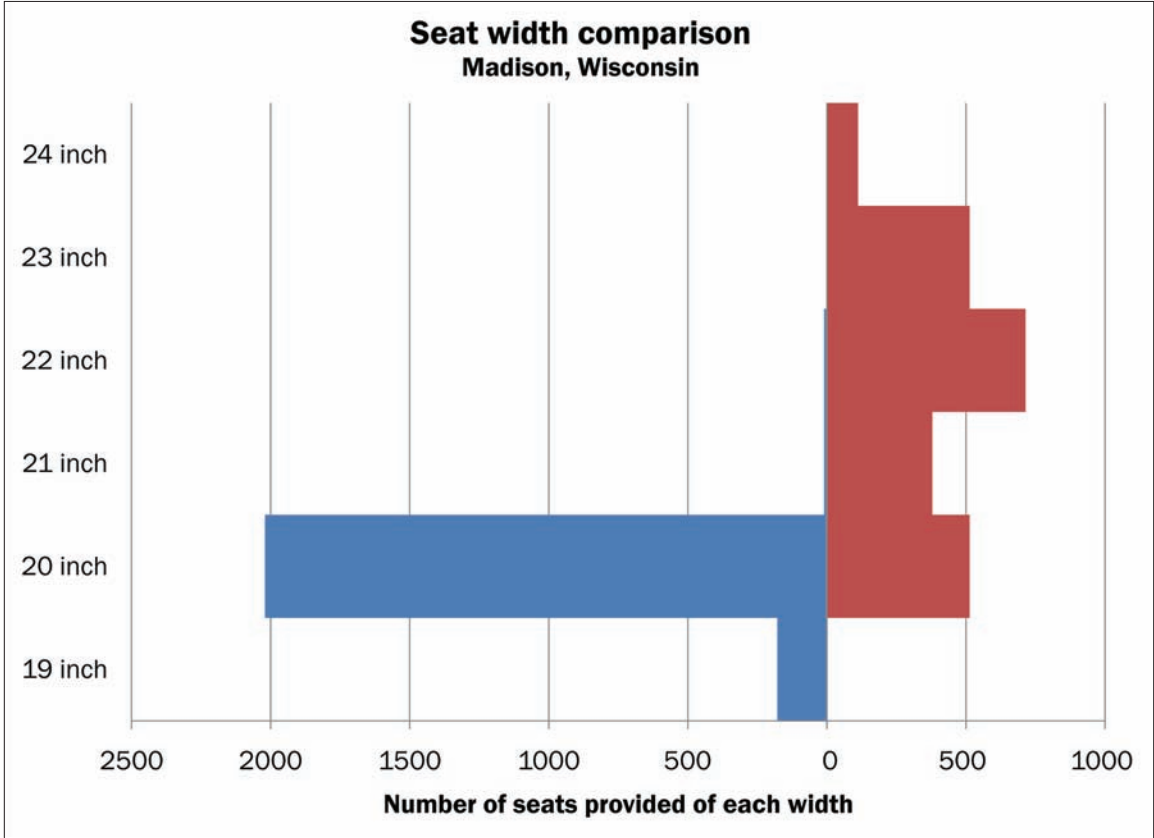


Source: Theatre Projects research<sup>6</sup>



Source: Theatre Projects research<sup>7</sup>

A dramatic example of the increase in chair widths over the past 20 years can be drawn from our experience in Madison, Wisconsin. We were the theatre design consultant for Overture Hall, a multipurpose theatre opened in 2004 as a replacement venue for the Oscar Mayer Theater. The Oscar Mayer was built in the early 20th century and substantially renovated and resealed in 1980 as part of the new Madison Civic Center. The histogram below shows the seat widths provided in the Oscar Mayer in 1980 (blue) and the seat widths provided 24 years later in Overture Hall (red).

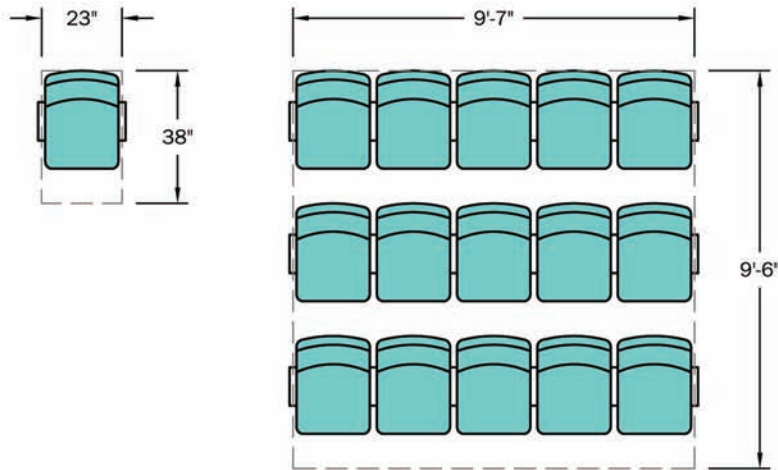


Source: Theatre Projects

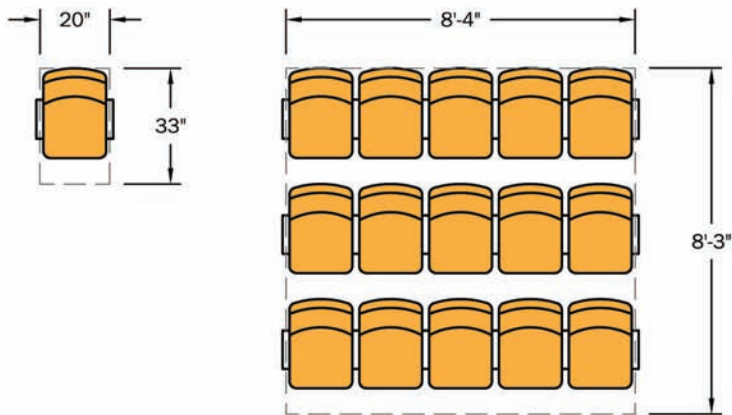
## Seating density

Naturally, as chair width and row spacing has increased, seating density has decreased. In fact, the floor area that holds ten seats today could fit about 13 seats in 1990 and about 20 seats at the turn of the 20th century. That is, seating density has halved in the past 110 years.

### 2010



### 1990s



### Late 19th century

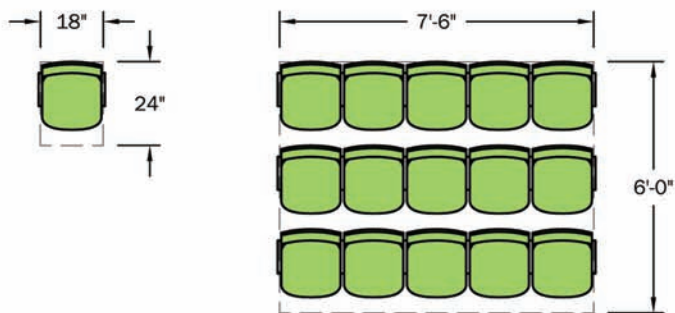
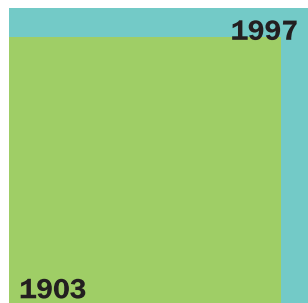


Figure: Theatre Projects



## Renovated spaces

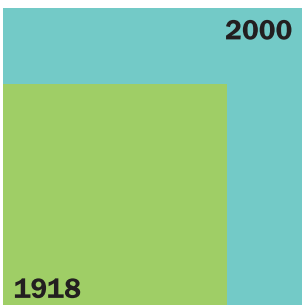
The long-term trend toward lower seating density can be seen in Theatre Projects' renovations of early 20th century theatres. In addition to increased chair size and spacing, improved accessibility and egress require more floor area per seat. The decrease in seating capacity that occurs when a historic theatre is renovated has become commonplace. Most renovated theatres reopen with many fewer seats, usually despite a strong economic imperative to maximize seat count – or more correctly, to minimize the loss of seats. These constraints usually result in smaller chairs and less floor area per chair when compared with newly built theatres.



**22%**  
**increase**

### New Amsterdam Theatre, New York

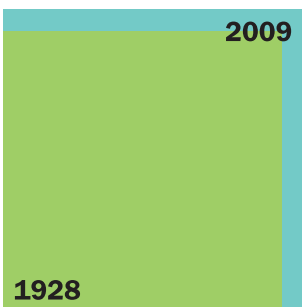
The New Amsterdam Theatre opened in 1903 with 1,702 seats – an auditorium area of 5.9 square feet per seat. The theatre was renovated and reopened in 1997 with 1,825 seats – 7.2 square feet per seat. Why did the seat count increase? Earlier studies had found that the existing auditorium could seat 1,600. However, seat count was so important to Disney that the auditorium was made bigger by pushing the orchestra level into former lobby space. An adjoining property was acquired to replace the lobby space.



**59%**  
**increase**

### American Airlines Theatre, New York

This theatre opened as the Selwyn Theatre in 1918 with 1,180 seats – 6.4 square feet per seat. The theatre was renovated for the Roundabout Theatre Company and reopened in 2000 with 740 seats – 10.2 square feet per seat. This is a high figure by Broadway standards, and is due to the Roundabout's non-profit "regional theatre" business model.



**17%**  
**increase**

### Carpenter Theatre, Richmond, VA

The Carpenter Theatre opened in 1928 with 2,028 seats – 7.2 square feet per seat. It was renovated and reopened in 2009 with 1,750 seats, and 8.4 square feet per seat.



New Amsterdam Theatre  
Photo: Whitney Cox



American Airlines Theatre  
Photo: Z. Jedrus



Richmond CenterStage, Carpenter Theater  
Photo: Robert Benson Photography

## New multipurpose theatres

The more recent trend toward decreased seating density is evident from a comparison of new Broadway-form multipurpose theatres built over the last 20 years. Here are three theatres that Theatre Projects has designed, very similar in form and use and almost identical in seat count.

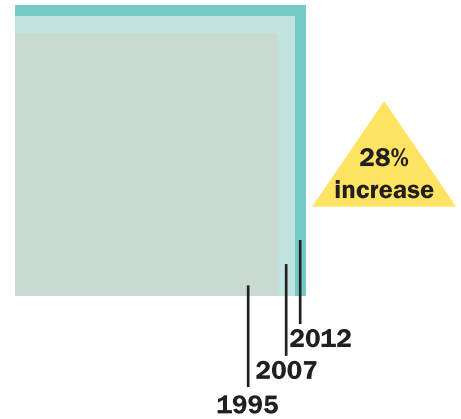
Project name & Location	Seat count	Chair widths	Row spacing	square feet/seat	Completion
Proctor & Gamble Hall Aronoff Center for the Arts <i>Cincinnati, OH</i>	2,719	19 to 22	35 to 42	7.5	1995
John A. Williams Theatre Cobb Energy Performing Arts Centre <i>Atlanta, GA</i>	2,750	20 to 24	36 to 41	8.5	2007
Disney Theater Dr. Phillips Center for the Performing Arts <i>Orlando, FL</i>	2,700	20 to 24	36 to 43	9.15	2012



Aronoff Center for the Arts, Proctor & Gamble Hall  
Photo: Jeff Goldberg/Esto



Cobb Energy Performing Arts Centre,  
John A. Williams Theatre  
Photo: Paul Warchol



## New drama theatres

The seating in the large multipurpose theatres above is highly efficient. Their large size and high seat count mean many seats are served by the system of aisles and exits at each auditorium level. A survey of smaller drama theatres designed by Theatre Projects, recently opened or in the planning stages, gives a more typical picture of floor area per seat in current design practice.

These theatres are similar in configuration and size. They are all small drama theatres with audience galleries – we call this form a “courtyard theatre.” Two have a proscenium form. The others can be configured in several seating layouts, but the data are for the end stage/proscenium form for “apples to apples” comparison. The theatres have similar users – mostly professional theatre companies or professional theatre training programs.

Project name & location	Resident organization & type	Seat count	Chair widths	Row spacing	square feet/seat	Completion
Suzanne Roberts Theatre <i>Philadelphia, PA</i>	Philadelphia Theatre Company <i>Regional (LORT) theatre</i>	360	20 to 22	35 to 38	9.8	2007
Dee and Charles Wily Theatre AT&T Performing Arts Center <i>Dallas, TX</i>	Dallas Theater Center <i>Regional (LORT) theatre</i>	566	21	36 to 44.75	10.2	2009
NYU Proscenium theatre <i>New York, NY</i>	Tisch School of the Arts <i>Training program</i>	203	20 to 21	36	10.4	TBD
Arthur Miller Theatre University of Michigan <i>Ann Arbor, MI</i>	School of Music, Theatre, & Dance <i>Training program</i>	292	21	36	11.1	2010
NYU Flexible theatre <i>New York, NY</i>	Tisch School of the Arts <i>Training program</i>	140	21	36	11.4	TBD
Strand Theatre <i>Brooklyn, NY</i>	BRIC Arts   Media   Bklyn <i>Non-profit arts organization</i>	242	20 to 21	36	11.5	2012
Theatre for a New Audience <i>Brooklyn, NY</i>	Theatre for a New Audience <i>Regional (LORT) theatre</i>	312	21	34 to 38	14.6	2011

Even the courtyard theatres have quite a spread – from 9.8 square feet to 14.6 square feet. Why? The tightest space, the Suzanne Roberts Theatre, was designed within a core and shell provided by a commercial developer. The low number reflects the design team’s efforts to maximum the use of the space available. At the other end of the scale, the Theatre for a New Audience has been designed with two audience gallery levels – for maximum intimacy and concentration of audience around the performance. But the extra gallery means a lot more circulation for just a few more seats. The other theatres all have one audience gallery, and fall between 10.2 and 11.5 square feet per seat, a typical figure in contemporary practice.

## Impacts

So, how do these changes impact patrons, performers, and theatre operators?

### **Comfortable yet engaged audiences**

More leg room, wider seats, and more “personal space” mean more comfortable audiences, and improved accessibility for all patrons is a real benefit. The introduction of food service in the auditorium reflects both the contemporary cinema experience and the pre-20th century theatre experience where audiences were very distracted by all manner of activity and commerce conducted during the performance.

But, theatres for live performance are very different than cinemas. In cinemas it’s expected that patrons will sink back in chairs as comfortable as Barcaloungers with their popcorn and Junior Mints. In live performance, the actors and audience create the performance together. A successful performance requires alert and engaged patrons. Therefore auditorium chairs are quite different than cinema chairs, with less “cush” and more upright posture. We’re reminded that director Peter Brook wrote that “the least important thing in the theatre is comfort.”<sup>8</sup>

The theatre designer can now fit half the seats (and patrons) in the same footprint as a century ago. Lower seating density means reduced intimacy, and less attention and “energy” returned to the performer. Our colleague Iain Mackintosh asks “What does this then mean for the actor?” and answers himself “It means that in a space loosely packed with expensive seats a full house gives the response received from a half house at the old densities.”<sup>9</sup>

Audiences can be comfortable within their personal space, but must be engaged in the creation of the performance. This balance between comfort and attentiveness is critical to the design of successful theatres. It’s the subject of much thought and many books, but unfortunately, a fuller discussion is beyond the scope of this paper.

### **Capital costs**

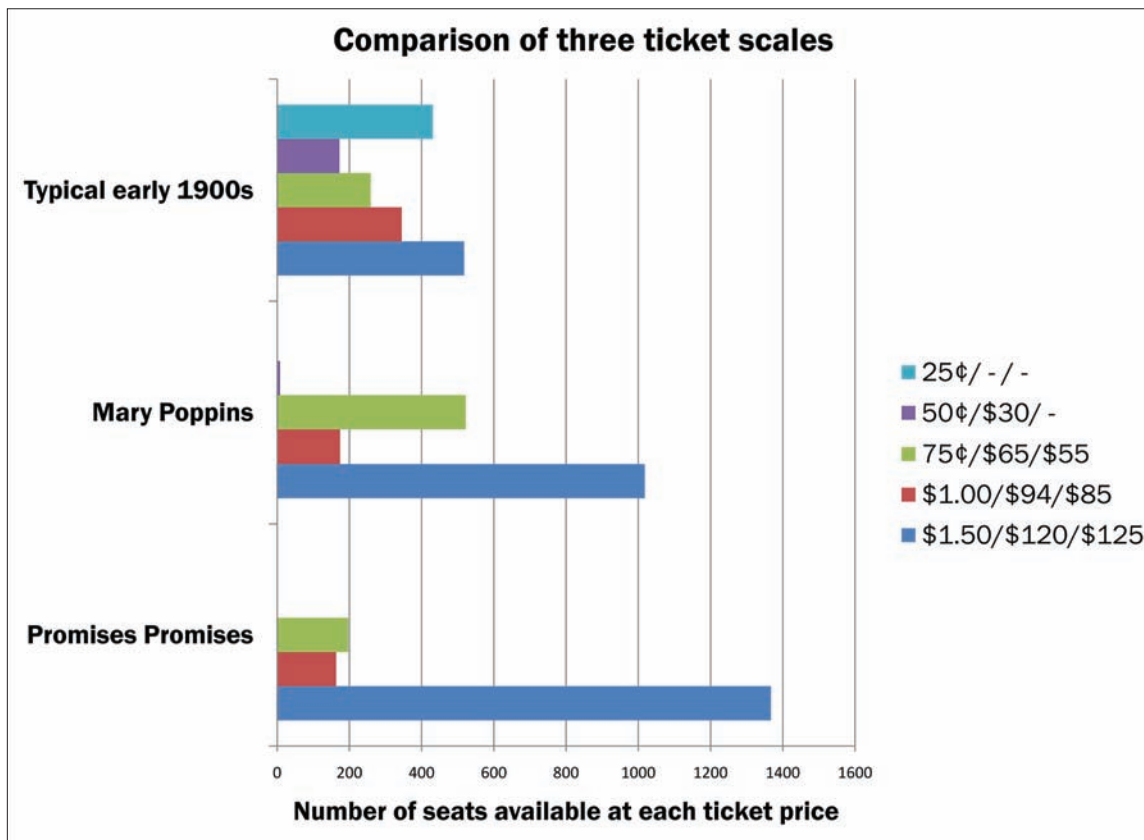
Obviously, as floor area per seat increases, so does the capital cost of providing each seat. Therefore one small part of the answer to “Why are performing arts buildings so expensive to build today?” is “The auditorium costs more because it’s bigger, and it’s bigger because people are bigger!”

An auditorium built today will hold half the number of patrons as one of the same size built a century ago. Or, conversely, a theatre of a given capacity would have to be twice as big. Looking back just over the past two decades the size and cost of auditoriums have grown almost 30 percent. This is before we account for the cost of providing the lobby space, bar counters, and numbers of toilets that patrons expect today.

## Demise of the cheap seat?

As the auditorium grows, the operating cost associated with each seat also increases, putting pressure on the operator's economic model. While the donors are focused on comfort, the operators are focused on maximizing the number of seats and the revenue from each seat. As a result, the very idea of "the cheap seats" is in danger.

In the early 1900s the typical Broadway scale (ratio of highest to lowest ticket price) was 6:1 – \$1.50 to 25¢ excluding premium seating.<sup>10</sup> Tickets for *Mary Poppins*, the current production at the New Amsterdam Theatre, range from \$120 to \$65 – a bit less than 2:1. (This range doesn't include premium seats available at \$160 or the eight seats available for each performance at \$30.)<sup>11</sup> Tickets for the revival of *Promises Promises* at the Broadway Theatre, a venue of similar size, range from \$125 to \$55 (higher for Saturday performances and not including premium seats costing from \$175 to \$295).<sup>12</sup> This scale is just a bit more than 2:1.



Source: Theatre Projects

Not only has the scale flattened – from 6:1 to 2:1 – but the number of seats available at the lower prices keeps shrinking. The chart above shows the seats available at each price level for a typical early 1900s performance and the current performances of *Mary Poppins* and *Promises Promises*. Broadway patrons are predominately white and affluent, and not reflective of American shifting demographics.<sup>13</sup> We recognize that the causes for this are many and complex, but the demise of "the cheap seats" surely contributes.

## The future

So where do we think theatres will be in 20 years? Will seats continue to widen at the same pace? Will the American public still be getting bigger? We think that seat widths will stay about the same, or perhaps even get smaller. This may sound optimistic, especially with what we've presented here, but we're hopeful that two other trends will make smaller theatres a reality.

The first is the growing movement to educate the public about healthy diet and the importance of exercise; let's call it America's fight against obesity. The second is society's growing awareness of the importance of sustainability, both environmental and economic. Larger theatres use more materials when they are built and cost more to construct and operate. The imperative to create sustainable and efficient theatres will eventually counter the current desire for more room.

And of course, we have our own reasons for seeing the future a little smaller. Theatre is about communication between the performer and the audience, and between members of the audience. It's important that the audience be close to the artist, and aware of each other. In the theatre, smaller is almost always better.

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<sup>1</sup> <http://www.cdc.gov/obesity/data/trends.html#State>

<sup>2</sup> Richard H. Steckel, "Health, Nutrition, and Physical Well-Being" in chapter Bd of *Historical Statistics of the United States, Earliest Times to the Present: Millennial Edition*, edited by Susan B. Carter, Scott Sigmund Gartner, Michael R. Haines, Alan L. Olmstead, Richard Sutch, and Gavin Wright. New York: Cambridge University Press, 2006. <http://dx.doi.org/10.1017/ISBN-9780511132971.Bd.ESS.01>

<sup>3</sup> <http://www.cdc.gov/nchs/data/ad/ad347.pdf>

<sup>4</sup> For background see John Ripley Freeman, *On the Safeguarding of Life in Theaters, 1906*, and the Board for Coordination of the Model Codes (BCMC) *Report on Means of Egress*, 1985.

<sup>5</sup> Associated Press wire story, February 15, 2003,

[http://news.google.com/newspapers?id=tNc\\_AAAAIBAJ&sjid=\\_SAGAAAAIBAJ&pg=1522%2C5390007](http://news.google.com/newspapers?id=tNc_AAAAIBAJ&sjid=_SAGAAAAIBAJ&pg=1522%2C5390007)

<sup>6</sup> Source materials include William Birkmire, *The Planning and Construction of American Theatres* (1896), *The Architectural Forum* (September 1932), Harold Burriss-Meyer and Ed Cole, *Theaters and Auditoriums* (1949, 1975), Eldon Elder, *Will It Make a Theatre?* (1979), Leslie Armstrong, *Space for Dance* (1984), Ian Appleton, *Buildings for the Performing Arts*, 2nd edition (2008), and Theatre Projects US practice standards (1990, 2010).

<sup>7</sup> Same source materials as above

<sup>8</sup> Peter Brook, *The Shifting Point* (1988).

<sup>9</sup> Iain Mackintosh, *Architecture, Actor, and Audience* (1993).

<sup>10</sup> Arthur Edwin Krows, *Play Production in America* (1916).

<sup>11</sup> <http://disney.go.com/theatre/marypoppins/broadway>

<sup>12</sup> <http://www.promisespromisesbroadway.com>

<sup>13</sup> [http://www.broadwayleague.com/assets/bway\\_demo\\_0809.pdf](http://www.broadwayleague.com/assets/bway_demo_0809.pdf)