

A Case Study:  
Cerritos Center for the Performing Arts  
**Entirely Reconfigured in  
Just One Day**



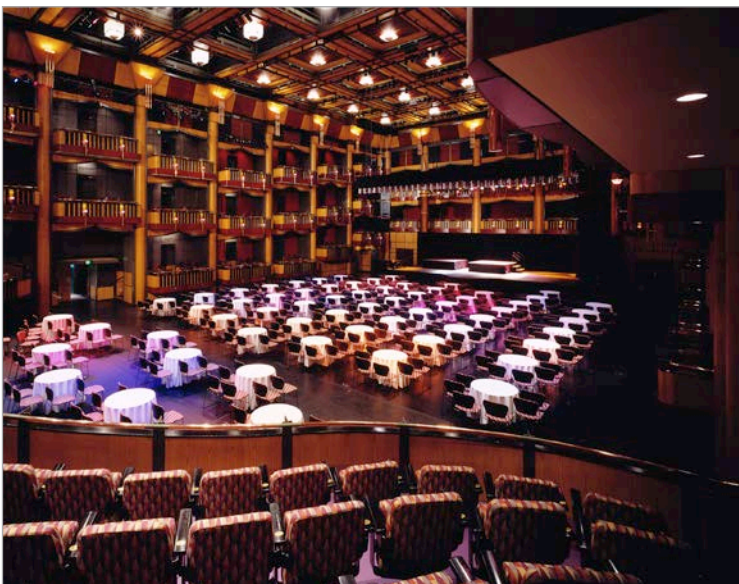
September 2017

Innovative Load Moving Solutions

## Background

As one of the entertainment centers of the world, Southern California is home to a number of live performance theaters in both Los Angeles (think Hollywood) and Orange Counties (think Disneyland). So in 1986, when the City of Cerritos wanted a theater that was different from other Southern California theaters, the first reaction from some was that there were already enough entertainment venues to go around. Cerritos officials did not agree. A city of visionaries and risk takers, they sought out and brought in experts from overseas to conceive and design a new type of theater—something that would be a departure from what existed in the area, something that would attract both funding and theatergoers.

To that end, Cerritos contacted David Staples and Wally Russell of Theatre Projects Consultants from London. These experienced designers brought details of an entirely unique concept, the Derngate Theatre in Northampton, England. That theatre ('re' ending in England) was outfitted with blocks of seats on casters (called seat wagons in the U.S.) that could be rearranged or removed completely. Named a “flexible” theatre, the Derngate could be tailored to many different performance types under one roof. At the time, nothing like it existed in the United States.



Once satisfied that this type of theater in the United States could be a draw for both investors and audiences, Cerritos and the architect team of Barton Myers Associates had to find the best way to build a theater in which the seat wagons, very tall seating towers, and heavy theater equipment could be moved safely and relatively quickly to accommodate the flexibility demanded by the concept.



## Cerritos Center for the Performing Arts

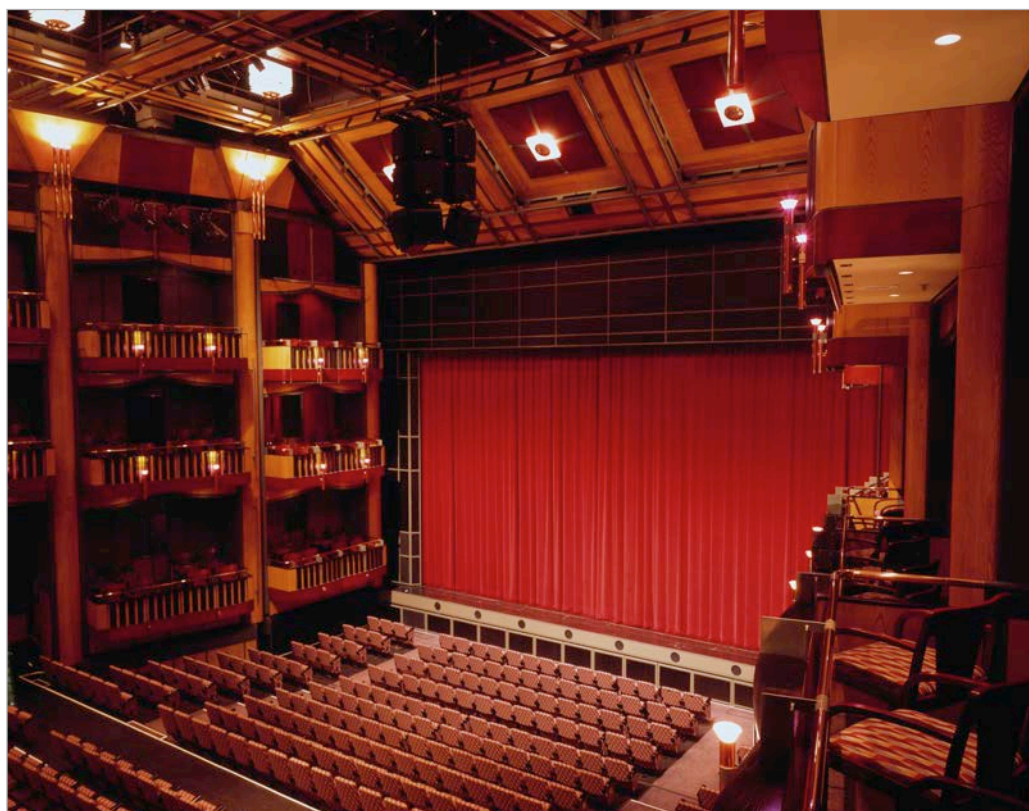
Known as “the world’s most flexible multi-configuration performing arts center,”

the Cerritos Center for the Performing Arts (CCPA) is a 154,000-square-foot (14,300 m<sup>2</sup>) entertainment and music venue located in Cerritos, California.

It is owned and operated by the City of Cerritos, and it opened its doors to the public on January 9, 1993 with a performance by Frank Sinatra. The theater has hosted opera, cabaret, jazz, dance, magic, drama, musicals and comedy performances as well as private functions and provides sets for films.

The center’s six “official” sitting configurations ranging from 921 to 1934 seating capacities are supplemented by “custom” seating arrangements for extraordinary performances and movie sets, proms and other events. The six main formations—Arena, Concert, Lyric, Cabaret, In-the-Round, and Recital—handle performances from pop music to chamber music, Broadway shows, and more.

Because of the venue’s location in California, the CCPA needed to address the safety issues that occur with the inevitability of earthquakes. The seating towers are



equipped with seismic blocks that stabilize the 3-story-high towers to ensure safety of the crew and patrons of this iconic theater. The City of Cerritos, according to Alan Strickland, House Manager for the Cerritos Center for the Performing Arts “has a unique ability to seek the unusual and at the same time to take care of its employees. After the 2008 recession, other cities made huge cuts. Cerritos did not do that.” Also, a visit to Cerritos’s public ‘Millennium Library’ (it was the first building to feature an exterior clad with titanium panels in the United States) and various other venues will show this city’s experimental spirit and artistic soul at work. Strickland continues, “Even for the CCPA design, the entire complex is comprised of separate yet connected buildings retrofitted with architectural ‘cushions’ between them to keep the building sections from being crushed against each other during earthquakes”—for which California unfortunately is famous. Like cartilage between bones, these giant cushions are an example of practical design borrowed eloquently from nature.



## Challenges

Determined to make the Cerritos Center for the Performing Arts (CCPA) a truly flexible theater, the City had to convince the backers that a flexible theater could still be built at a reasonable cost and that it would be a profitable endeavor. To accomplish this goal, the architects had to find a company whose product(s) would safely accommodate moving the loads and



offer the relatively quick changes required for a variety of programming. The idea of using air casters for this purpose was introduced, but was still new to the City and its architects.

In other theaters, railroad wheels and railroad-type tracks had been the only answer, but were unsatisfactory. The pieces could be moved only forward and back along one plane, which was limiting. Another alternative, overhead cranes to move seat wagons and towers, was impractical, slow and expensive.

In addition to moving over flat surfaces, there were foreseen occasions when the heaviest items, the seating towers, would have to move over slight, unavoidable gaps between stage pieces. Even taping over the gaps would not prevent the possible tipping of the seat tower, which could cause damage to the surface beneath (the very expensive stage, for example), or present a safety problem.



Rogan Girard, Master Carpenter at the CCPA since before it opened explains, “The heaviest seating towers weigh 286,000 pounds. That’s 143 American tons or 129.7 metric tons. We have some seating towers we move on hinges with automated aircraft cables. Others we move with the help of several stagehands gathered around the base of the tower. Three huge air compressors create enough air pressure that is forced through the air casters so we can move the towers on what’s sort of like a floating air cushion. Either way, without the air casters we could not move the seating towers or the seat wagons.”



## The Solution

All the stakeholders involved in the development process agreed there was only one cost-effective way that moving the seating towers and the seating wagons could be accomplished: the air casters would have to be built into the equipment from the start. Moving heavy objects with air casters mitigates the forces of weight and friction. Using air, there is less than 2% friction coefficient when moving up to 286,000-lb seating towers. A big plus—movement using the air casters is omnidirectional, which further enables the signature flexibility of the theater.

The city of Cerritos and the architects sought a responsive partner that not only had a product to do the job, but one that would also incorporate safety training, repeat visits, and problem solving as new opportunities arose. AeroGo, Inc. has that reputation. In fact, Steve Walker, Professional Engineer (PE) for the performing arts and theater design expert says, “AeroGo is one of the best in the industry for good follow up and trouble shooting after their products are installed.”



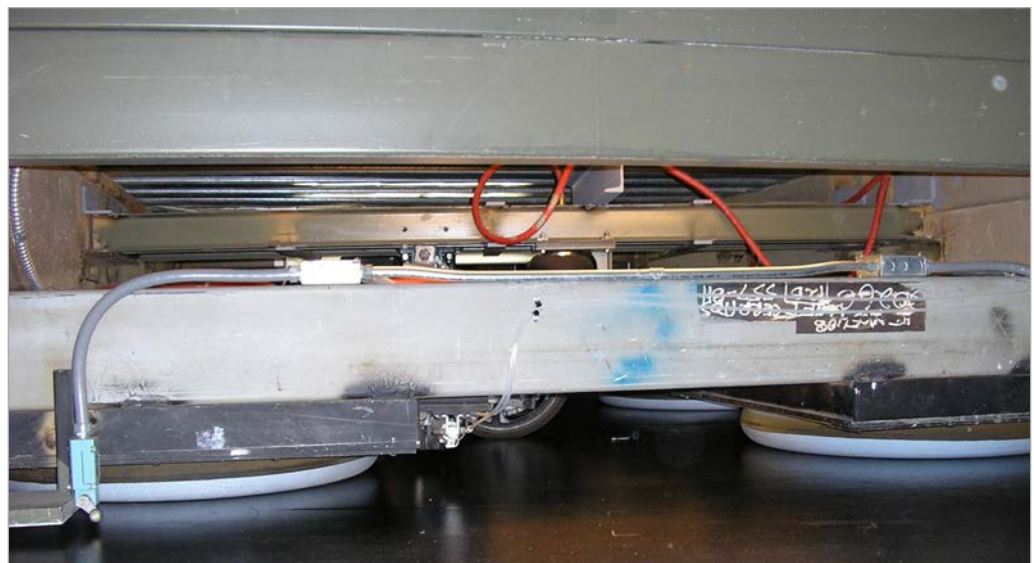
Back to the planning stages: At the time, AeroGo was (and still is) the only company in the world that makes an air caster that travels safely over small (1/4") vertical and horizontal gaps in the surface. In fact, its Gapmaster™ is the only air caster that has this capability. The City of Cerritos and the architecture firm approached AeroGo, and the rest is history.



## Secrets to Enhancing Gapmaster™ Durability

Taking care of the stage floor is one of the keys to maximizing the longevity of the air casters and reducing cost of replacements. The CCPA crew installed the original Gapmasters™ with the date and their initials noted on each one dating back to 1993. Many of the Gapmaster™ installations have lasted since the theater opened 24 years ago. Another secret to lengthening the life of the Gapmaster™ includes having a redundancy of casters under heavier loads to enhance stability and reduce wear.

CCPA Stage Crew Supervisor Paula Eagleman also added, “Hiring the right people to assure safety and proper maintenance is very important. Most people have been here for a long time, but the newbies get trained correctly from the bottom up.”



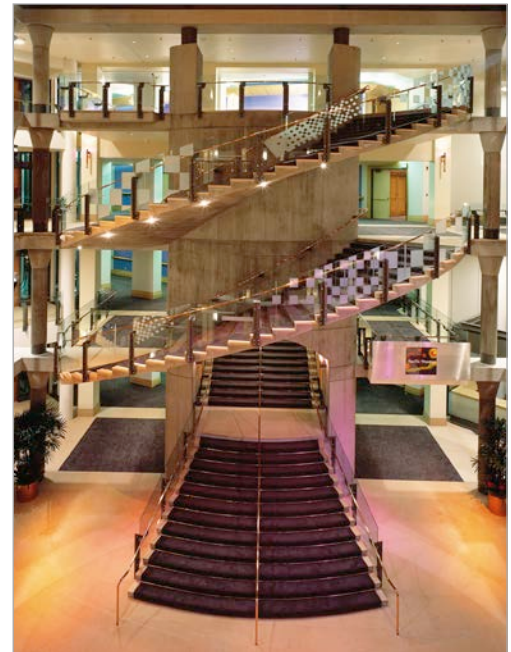


## Results and Awards

**Real Cost Savings:** With the example of the originally installed Gapmaster™, it's easy to see how "CCPA has spent only \$70 thousand since 1993," says Girard, "on replacement casters." He continues, "You just have to take meticulously good care of the casters and the surfaces beneath them." The alternative of building five separate theater houses shows the huge cost savings by investing in the air caster system. Furthermore, labor costs are greatly reduced by needing fewer people to move the heavy and large items over and over through the past 24 seasons.

Using AeroGo technology, CCPA can also configure custom venues for special programming and unusual movie and stage sets, local schools' proms, business meetings, and non-profit fundraisers and galas.

**Awards:** The Cerritos Center for the Performing Arts was voted into *Amusement Business Magazine's* Top 10 Venues—5,000 seats or less in the United States from 1993-2001. *Performance Magazine* awarded the CCPA the "Theater of the Year" honor in 1995.



## Other Entertainment Options

Besides performing arts centers, the AeroGo air casters and Gapmasters™ have been used around the world in stadiums, movie sets, theme parks, casinos, cruise line shows, television series, live theater, musical performances, film special effects and more.

There's no doubt: "We couldn't do this without the AeroGo Gapmasters™," Eagleman says. "Even our performers like to come here because it's so easy to move our equipment out of the way and put theirs in."

"I never tire of watching the seating towers being moved," says House Manager Strickland. "I've been here 19 years, and it's still a thrill to see the arena transform...on a cushion of air and puffy casters. This is my third theater company, and this is the most exciting because of the diversity of performances we can handle."





## About AeroGo

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The company AeroGo, Inc. belongs to a surprisingly small niche industry specializing in the uncomplicated movement of very heavy, and usually very valuable items. It is surprisingly small because of the size and nature of the large items and equipment the company can move—anything from 500 pounds to 5000 tons and from equipment, machines, ships, airplanes, satellites, Hyperloop test pieces, stadium and arena seating, to movie sets, special effects trappings, and other gigantic ‘problem’ loads across many industries in countless countries worldwide.

The company’s innovative load-moving products (18 main products plus untold customizable systems) are made exclusively in the United States of America in Seattle, Washington. With 60 employees and a sales force that includes distributors and dealers, the company sells its products around the globe.

The basic AeroGo, Inc. product is 70 years old, and the applied air-bearing (hovercraft and wheels) technology was brought to market in the 1950s. Still to this day, there are only six companies (per Wikipedia August 21, 2017) in the world that make a similar product. Moreover, AeroGo makes the only Gapmaster™ version of the air casters that allow the movement of heavy loads across small (1/4”) horizontal and vertical gaps in the underlying surface without damaging it in the process.



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TOLL FREE: 866-749-5352 • Phone: (001) 206-575-3344 • FAX: (001) 206-575-3505  
Email: [Info@AeroGo.com](mailto:Info@AeroGo.com) • [www.aerogo.com](http://www.aerogo.com)