Demystifying Digital Scenery, Step by Step

Above: Broadway Media's StagePlayer software, displaying set projections for Anastasia

By Stephen Peithman

Digital projections use images, animations or video to create backdrops and visual effects in theatrical productions. Their increasing use is tied to several key advantages.

Key advantages include:

- *Versatility:* Scenic projections can display a wide range of images, from static backdrops to animated sequences, creating diverse and engaging visual experiences.
- *Cost-effectiveness:* For many theatres, especially smaller venues, projections can be more affordable than building and painting elaborate physical sets.
- *Time-saving:* Digital scenery can significantly reduce the time needed for set construction and allow for faster scene changes.
- *Enhanced storytelling:* Projections can establish specific locations and moods, enhancing the narrative of a play or musical.
- *Special effects:* Projections can simulate natural elements like rain, snow, or fire, and create fantastical or magical effects.
- *Integration with other stage elements:* Projections can work in conjunction with physical sets, props, and lighting to create a cohesive, visually-enhanced production

In community theatres, projections are most useful when venue limitations preclude hanging drops, or make conventional set changes difficult. They also help establish location or time period (e.g., *Harry Potter and the Cursed Child*, *Anastasia*) or when "magic" is called for, as in *The Little Mermaid* or *Matilda*.

Melissa Kratish, of Broadway Media, which offers scenic projection packages and digital backdrops, is also a board member for a community theatre company in central Florida. She has seen, first hand, how even small theatres are using the new technology.

"Our projections for *Singin' in the Rain* were piloted at a community theatre production in 2022," she explains, "and included many custom video elements. Projected rain was used because the theatre didn't allow water on stage. When paired with sound effects, the audience thought it was real."

Kratish notes that audiences are familiar with the original films or Broadway versions of big-name shows, and often expect similar production values in their local theatre. In a musical like *Young Frankenstein*, for example, there are scenes inside and outside the castle, as well as special effects such as lightning bolts and an nighttime carriage ride through a forest. Special effects also are essential in Disney musicals that involve magical transformations.

And while she points to the advantages bullet-pointed at the beginning of this article, she also understands that digital scenery may not always be appropriate.

"It might distract from the author's intent or the story's message in *The Fantasticks*, *Our Town*, and other smaller, classic shows that have been around for decades and haven't needed projections. However, a classic musical like *The Sound of Music* might benefit from projections that could help move between settings more quickly, and make the opening scene more expansive. And sometimes, a director just wants the focus to be on something else, like lighting effects. "

The Long and Short of It

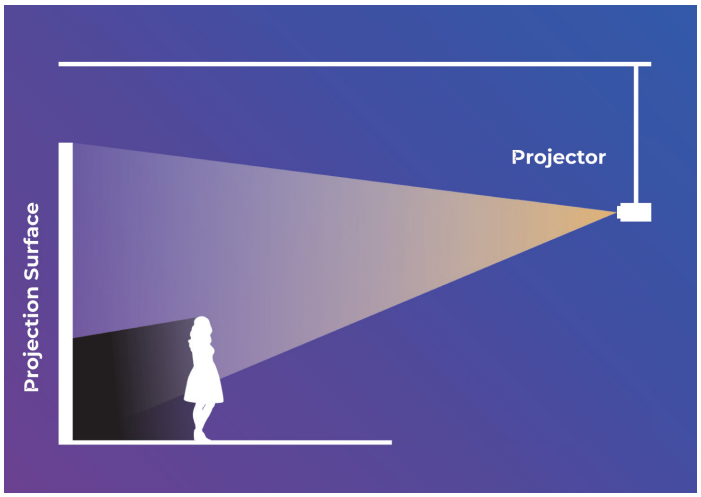
These elements are needed to run digital scenery:

- *A computer with playback software* like QLab and Watchout. (PowerPoint is cost-effective but not designed for high-resolution animated files.) QLab and Watchout can be costly and have system limitations. Another option is Stage Player from Broadway Media, which comes pre-cued with their show packages.
- *A projection surface:*
  - Cyclorama
  - Flats
  - Light-colored surfaces
  - LED Walls (prevalent in professional spaces but costly)
- *A projector.*

There are many types of projectors available," Kratish explains, "but not all are designed for the stage. Image size and clarity depends on throw distance, as well as the capability of the projector."

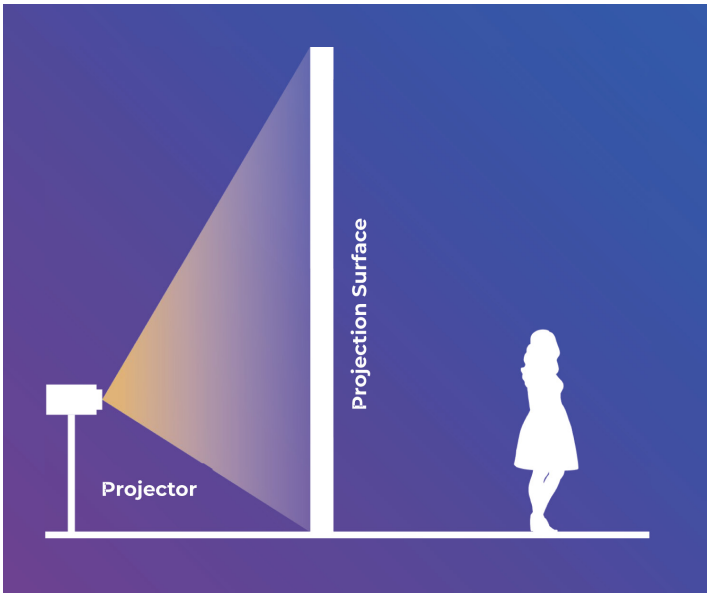
There are three basic configurations for a stage projector, depending on what works best in a particular venue: Long-throw front projection, rear projection, and short/ultra-short front projection.

Left: A basic stage projector, with 7,000 lumens and a .35 ultra short-throw lens



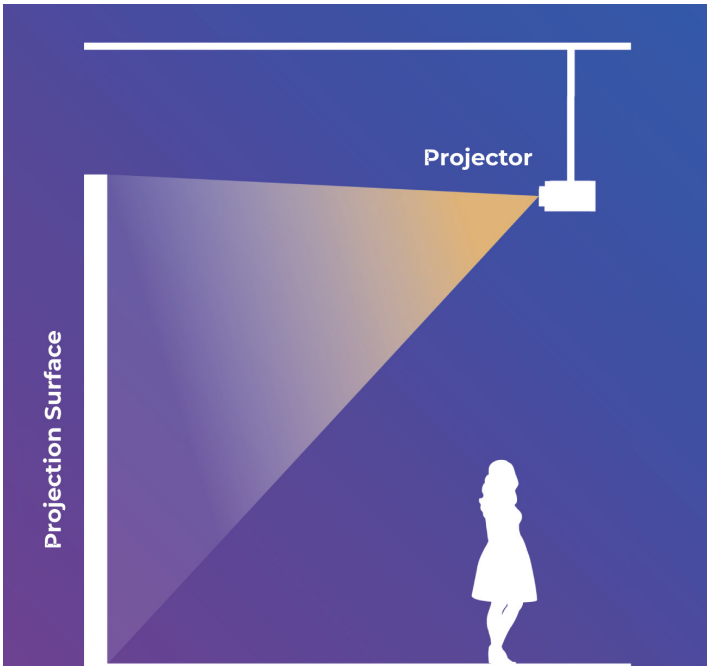
Long-Throw Front Projection

While this is the most common installation, a projector at the back of the house will throw the image on the actors as well, produce shadows, and wash out stage lighting (above). That said, it can be useful in a scene where projecting on the actors is part of the designer's vision, as with the subway window reflections in the Woodland Opera House production of *Amélie* (see article online at aact.org/woh).



Rear Projection

Here, the projector is placed backstage and the image is projected onto the back of a special translucent projection surface. This avoids the shadows that may come with front projection, but it also requires 8-15 feet of dedicated space behind the projection surface.



Ultra Short-throw Front Projection

This is an increasingly popular method, with the projector rigged directly above the stage to avoid casting shadows. It's often used for backdrops on a cyc or scrim, or the rain effect for *Singin' in the Rain.*

Throwing Light On the Subject

Ultimately, the size and brightness of the projected image is dependent on the placement of the projector.

"Projectors are like flashlights," Kratish explains. The closer they are to a surface, the brighter they'll be, but also the smaller the output will be. The equipment needed is dictated by the size of your projection surface and the control and conditions of your lighting.

Projectors come in three basic configurations:

- A standard-throw lens has a ratio of either 1:1 (an image will be one foot wide from a projector placed one foot from the projection surface) or 2:1 (producing an image two-feet wide from the same position.)
- A standard short-throw lens, with a 0.5:1 throw ratio, can be half as close, projecting a foot-wide image from a projector placed just six inches away from the projection surface
- Ultra short-throw models do even better, with throw rations as high as 0.24:1 to 0.35.1.

To find how far away your projector needs to be to cover a specific area, multiply the throw ratio of the projector by the desired image width. For example if the projector has a 0.35:1 throw ratio and the desired projected width is 40 feet, the projector should be placed 14 feet from the projection surface: 0.35 (throw) x 40 (width) = 14 feet.

Projectors can be expensive, especially those with ultra-short throws, which start at around $15,000. Renting a projector is a good option if you're just getting your feet wet, Kratish says, like those offered by Broadway Media.

This production of *The Wizard of Oz* (Horizon West Theater Company, Windermere, Florida) handled backdrops via a projector enclosed in a black box on the stage floor, eight feet from the drop. (The box sits on the floor, directly in front of Dorothy in the photo.) An ultra short-throw lens was able to produce a 40 foot-wide image. In the interests of safety, wires were taped down and made a line on the stage that performers knew not to cross. Note that with a projector on the floor, images may bounce during high-energy dance numbers.

Projections can replace painted drops, offering unlimited scene settings and animation. Integrated sets can reduce the projection surface area, resulting in sharper images.

Getting Off on the Right Foot

Digital scenery does not replace the need for a scenic designer. It's simply another tool for the designer.

"Projections can replace painted drops, offering advantages like unlimited scene settings and animation," Kratish says. "Integrated sets can reduce the projection surface area, leading to brighter and sharper images."

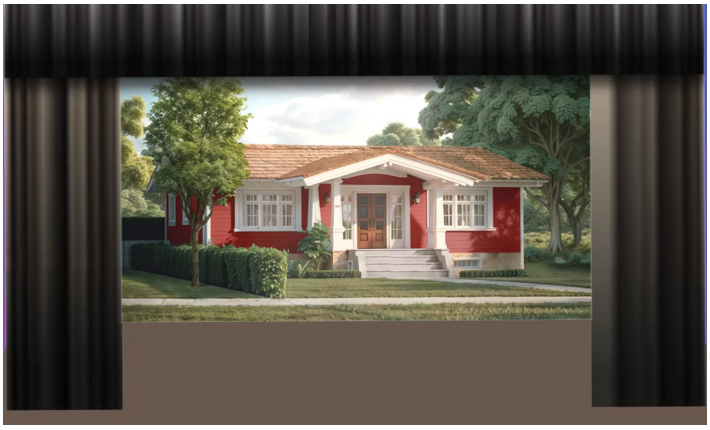
A production of *Almost Maine*, for example, used an integrated set of layered prosceniums, painted scenery, and projections of snow and the Aurora Borealis. The Aurora Borealis was also projected on the sides of the auditorium to surround the audience.

Overall, there are three basic options:

1. Integrated set, combining scenic projections with physical set elements, such as flats..
2. Full set replacement, using only projections.
3. Projection mapping, which might include scenic projections at the rear, plus individual image projections on flats along the side or on stage.

Integrated Set

For Mamma Mia!, *above, physical sets were integrated with scenic projections, some of which were projected onto the set pieces. (Grays Harbor College, Aberdeen, Washington)* *See page 6 for a larger view.*



Full Set Replacement

Above, a digital backdrop serves as the entire set.

Projection Mapping

Above, a single projector casts different scenic elements on side and rear panels in a production of Matilda. *(Green Valley High School, Henderson, Nevada)* *See page 6 for a larger view.*

Projection mapping is a particularly useful tool, letting you control multiple projection areas on stage with a single projector. (It also requires specialized software and programming time.)

Kratish cites a production of *Rudolph the Red Nosed Reindeer* at the Titusville Playhouse in Florida, which used a combination of supplemental props, scenic pieces, and layered projections (including a front-throw projector) to achieve the look and feel of a snowstorm.

"Be sure to review your projection ideas ahead of time for how it might affect blocking," Kratish advises, and "ensure your lighting designer is collaborating with projection needs. For example, blues, purples, and greens are complementary, while

whites and yellows wash out projections. Be mindful of reflective floors and the impact of follow spots, which can dull a projected image."

Looking at the Big Picture

Using AI or Google for images to project is an inexpensive option, but raises copyright issues, and images may lack continuity and contextual accuracy.

Hiring an artist/designer requires sufficient time for completion, review, and programming. (Cueing the digital scenery is its own discipline and needs a dedicated operator.)

"Scenic Projections from Broadway Media have the advantage of being script-accurate and approved by licensing entities like MTI, Disney, Broadway Licensing Global, and TRW," Kratish says. "In many cases, these projections are the same ones used on Broadway, and provide solutions for tricky stage business. In *Anastasia*, for example, projections can display location and year titles. In *Disney's The Little Mermaid*, projections handle the magic of Ariel's transformation. In *Spamalot*, it's used for the killer rabbits, and in *Mean Girls* to integrate social media and text messages."

Another option—especially for those theatres who want to go slow into projections—is using projections for backdrops only.

The most commonly used projection software programs include QLab [qlab.app] and WATCHOUT [dataton.com/watchout]. Broadway Media offers its own software, which may be an easier way for some. A professional license with direct integration into QLab is also available. [broadwaymedia.com]

Some theatres have used PowerPoint or Keynote on a laptop can to trigger slides, with QLab for sound. However, these systems aren't equipped to handle higher-res imagery or animated sequences, and could crash mid-show if the digital files are too large.

Final Thoughts

Clearly, digital projection offers numerous advantages, including enhanced visual appeal, increased flexibility, and potential cost savings. It also encourages creativity and experimentation by designers and directors. The best way to discover how to make projections work for your theatre may be to get your hands on the best projector, screen and laptop and software that you can, set it up in your theatre, and explore the possibilities.

For more examples of the creative use of digital projections, see our article on California's Woodland Opera House, at aact.org/woh.

We thank Melissa Kratish and Broadway Media for the photos and illustrations used in this article, as well as the use of digital scenery in community theatre.

A shorter version of this article appeared in the Fall 2025 issue of Spotlight *magazine.*

Melissa's Tips & Tricks

- Think of projections like painted scenery and drops. However, don't think of projections just as an image. Also, think of them as texture and movement.
- Consider the audience's expectations and how projections can enhance the show.
- If you're worried that using projections can limit the vision of the director and designers, you might consider a hybrid model, incorporating the designer's vision and simply adding texture with projections.
- Be creative. Raw images can be edited to match the design. Videos can be reversed or manipulated to create movement. Basic animation can be added, even if using PowerPoint or Keynote.
- Alternative projection methods can be useful. One theatre used onstage TVs instead of a projector, due to limitations involving access to areas above the stage. This allowed them to create backdrops and establish the scene for the audience.
- Pre-built projections can open up a world of shows, especially for small theatres. Some packages have options to toggle certain settings on or off. For example *Joseph and the Amazing Technicolor Dreamcoat* has two versions of the Sphinx—with or without sunglasses.
- Packages from some companies include watermarked demo packets for rehearsal. This lets you plug a laptop into a TV so the director and staff can review, select and sequence projections before getting to the theatre.

Mamma Mia! *(enlargement of image on page 4)*

Matilda *(enlargement of image on page 4)*