

CHRISTIE®



TRANSFORM REALITY INTO ILLUSION

Projection mapping primer

WHERE ART MEETS SCIENCE

Behind great projection mapping projects is a successful combination of art and science. Fusing powerful ideas and compelling structures or landmarks with the right technologies, a talented team, and inspired content creates experiences that fill audiences with wonder.

Almost any surface can be masked with dynamic visuals, transforming reality into illusions of infinite possibilities. Discover what you need to know to build a projection system that will let you entertain your audience with the mind-blowing visual experiences they crave.



Traditional tea arts
Beijing, China
Partner: Diction
(Beijing), Science and
Technology
Development Co., Ltd.

Cover image:
GLOW Eindhoven
The Netherlands

Artist:
Dirk van Poppel

Partner:
Sahara Benelux

[Contact us](#)

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SET THE STAGE

Whether building a house or an amazing show, you need a solid foundation. You'll find that gathering fundamental information about your project pays off every time as it guides you toward choosing the right technology solutions.

Griffyn® 4K50-RGB
pure laser
projectors, Brazil

Partner: On Projecoes
Photo: Renatinho
Rodolfo

Audience and goals

No amount of investment in technology or content matters unless you understand your audience and define your goals. Whether you're looking to drive brand awareness or simply delight, there are a few questions to ask:

Who Who is your audience? What demographics, such as age, do you need to consider?	Where How far back will the audience be? How large do you expect the crowd to be? Will they be seated or standing?	What How wide is the viewing zone? How big is the projection surface? Does your show include audio?
When Is this a scheduled performance with a hard start and finish? Or is it continuous ambient material?	Why Is the content the right fit for your audience? Are you hoping the audience participates by interacting with the content through gestures, sound, or other means?	



Capital One Arena,
Washington, DC, US
Partner: Quince
Imaging

Ambient and site conditions

Your canvas is one of the earliest things to consider in your planning process. As you analyze the surface you plan to map onto, ask yourself what its characteristics are and how they'll affect your ability to deliver a visual spectacle. Some considerations include:

Complexity With every structure, whether it's ancient castles or modern buildings, there are endless variations in surfaces, color, and dimension. For example, a castle wall can have different types and shades of stone and features like rounded towers that need to be unified as part of a cohesive visual presentation.	Environment If your show is outside, you need to consider how the weather will affect your content. If it rains, the color of your canvas may change and make a light-colored surface darker and mute the colors in your projected content.	Structure Ultra-modern structures, like the sails of Sydney's iconic opera house, may have a uniform color palette, but they're anything but flat. A canvas like this requires precision scaling, warping, and blending.	Safety Projection mapping events require careful planning to ensure a smooth and secure experience for everyone involved. This includes conducting a thorough inspection of the venue to identify potential hazards, determining if you need barriers for crowd control, and training staff on equipment operation and emergency procedures to ensure a stable and adequate power supply. It also includes securing the projectors with the appropriate rigging frames and trusses. In addition, laser projectors must comply with government and municipal regulatory standards, which may require you to install physical barriers and display warning signs to respect hazard zones.
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A thorough site inspection is essential. The information your team should gather includes:

Who Does your show include performers? Is there a possibility of people moving in the projection path?	Where Is it an indoor or outdoor event? How much ambient light is there? Is there rooftop or line-of-sight window access? Are there any obstructions, like trees, streetlights, power poles, or pillars, to overcome?	What Is power available? Where will your projectors be positioned? What's the distance from the projection surface? This helps inform decisions about the brightness, resolution, and the number of projectors needed, as well as rigging requirements, lenses, and media devices. For complex projection mapping on intricate structures or irregular surfaces, using a 3D point cloud is recommended since it provides a highly accurate digital representation of the projection surface and captures all the nuances and variations, so you can align your digital content precisely and the projected visuals appear exactly as intended.	When What weather conditions do you need to prepare for? A few you should consider are wind speed, temperatures, and moisture. In many cases, you need to plan for projector pods or enclosures.
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Schlosslichtspiele
Festival, Karlsruhe
Palace, Germany

Partners: AV Active
GmbH, Maxin10sity
Photo: Maxin10sity

Approvals

Regulations

Planning to wow your audience in a public space? Then you know your project will likely be subject to local government regulations which can vary considerably – even within the same city.

Bylaws

The scale of the project — or if you're even allowed to proceed as planned — can be affected by bylaws that govern advertising, lighting, noise, temporary structures, public gatherings, traffic, and parking. You may need multiple approvals for one event. Having someone on your team who's familiar with local government regulations can make a big difference to your timelines and plans.

AV budget

Of course, no project gets off the ground without an approved budget. Some things you'll want to take into account are:

Technology

With the projectors and projection software on the market today, the costs of projection mapping productions are steadily coming down. Brighter projectors mean you can illuminate a larger surface with fewer projectors, while various projection tools and software help you automate or simplify tasks like projector setup and alignment.

The site survey gives producers the information they need to estimate requirements like the number of projectors needed and types of supporting infrastructure and they can contain capital costs by renting some or all of the gear required for the event.

Creative costs

The producer, creative director, and client need to collaborate and reach decisions on the breadth and complexity of the content to create an estimate.

Installation

Because of the complexity and uniqueness of projection mapping projects, each installation requires careful planning and budgeting to contain costs while still achieving a flawless show.

Return

The buzz from big events can result in a big return on your investment. This could be in the form of tangible returns in earned media from mainstream media, social media coverage, ticket sales, or sponsorship revenue.



M 4K25 RGB
pure laser
projector



CREATE A BRILLIANT SHOW

It's time to set your imagination loose!
The magic of projection mapping allows you to create illusions that transform what your audience thinks they know in visually wonderful ways they can't figure out.

Creating those illusions means you need to think big — because without those big ideas to wow your audience, there is no show.

The concept

Your big idea needs a clear concept — one that takes into account your project goals, like whether you aim to entertain or create brand awareness for a client. If you don't define your goals, your concept may fall flat. Once you've established your concept, you can begin building the visual narrative around it.

Storytelling

From the story of a city on a wide stretch of riverside grain silos to bringing an ancient Egyptian temple back to life, projection mapping offers enormous storytelling power and an equally huge creative outlet for digital artists.

When using ancient or landmark edifices as your canvas, a storyline may come relatively easy when the visuals are part of the history of the structure and its surroundings. Connecting your story with the building or landmark you're projecting on can create a big impact on your audience. For projects where the surface is chosen primarily for visual interest, location, or sheer scale, you may have more work ahead of you to tie it into an event, theme, or brand.

Al Wasl Plaza,
Expo City Dubai, UAE
Partner: Creative
Technology
Middle East

GET YOUR PROJECT OFF THE GROUND

You've got the idea, you've developed a story, you've obtained approvals, and you've secured a location. Now it's time to think about the team and the technology required to move your project from plans to reality.

Lotte World
Magic Castle,
Seoul, South Korea
Partners: Star
Networks, d'strict

Assemble your team

The “who” behind your project all depends on its scale and complexity. If you’re using a staging company or systems integrator, you may find all the expertise you need is under one roof. Here’s a list of the roles involved in bringing a project to life:

Client The client creates the initial request and sets the core requirements.	Producer As the overall project lead, the producer has both the creative and technical skills to handle the project at a macro level.	Project manager The project manager’s role is to oversee things at the micro level. They’re critical to managing the hundreds of details involved.
Creative director They drive the creative process, including concept development.	Content developer They conceive and produce the motion graphics and video.	Production designer The person or team with multiple design, media, and technical skills.
Lobbyist They navigate municipal regulations and obtain approvals for projection mapping on buildings and staging events in public spaces.	Technical director They’re in charge of technical scoping and project execution.	Installation team or systems integrator This team handles the setup of equipment structures, cabling, connectivity, and other onsite elements, and then does all the precision work to optimize the presentation.



What's in your tech stack?

Once you have a solid foundation and put together a great team, now comes the exciting part: Choosing the technology and software solutions that help bring your content to life.

Projectors

There's a lot to think about when choosing a projector. Some of your criteria are:

- Brightness and resolution
- Color reproduction capabilities
- Laser or RGB pure laser light source
- Processing power
- Size and weight
- Warping and blending capabilities
- Lenses
- Power requirements
- Rigging and mounting angles
- Ambient temperature and humidity range

Need help choosing the right projector?

Our [projection selection guide](#) can help.

Media playback and processing

Spectacular visual experiences call for robust and reliable media server software and hardware for real-time video playback and processing.

These tools let you create dedicated custom interfaces to interact with your system or create controls for your specific show needs.

Layer-based timeline composition helps manage your show schedules: Customize it for any display type, experience frame-accurate synchronization to any scale, and combine it with audio, lighting, and more.

Ready to explore your projection toolbox?

Creating a powerful visual experience takes more than a projector. It takes a complete solution. [Discover a range of projection solutions](#) that will help you impress, inspire, and immerse your audience.

Powerful software tools

Projection mapping often requires expert image configuration, alignment, and warping and blending. With camera-based alignment and calibration software, you can quickly install, align, stack and calibrate, and maintain multi-projector systems in minutes, with repeatable accuracy, and save hours of painstaking work.

Equipping yourself with monitoring and control software helps simplify the task of managing multi-projector systems. You can instantly identify projectors to view their health or shutter status, perform remote firmware updates, and access the Web UI of individual projectors — all from one central device.

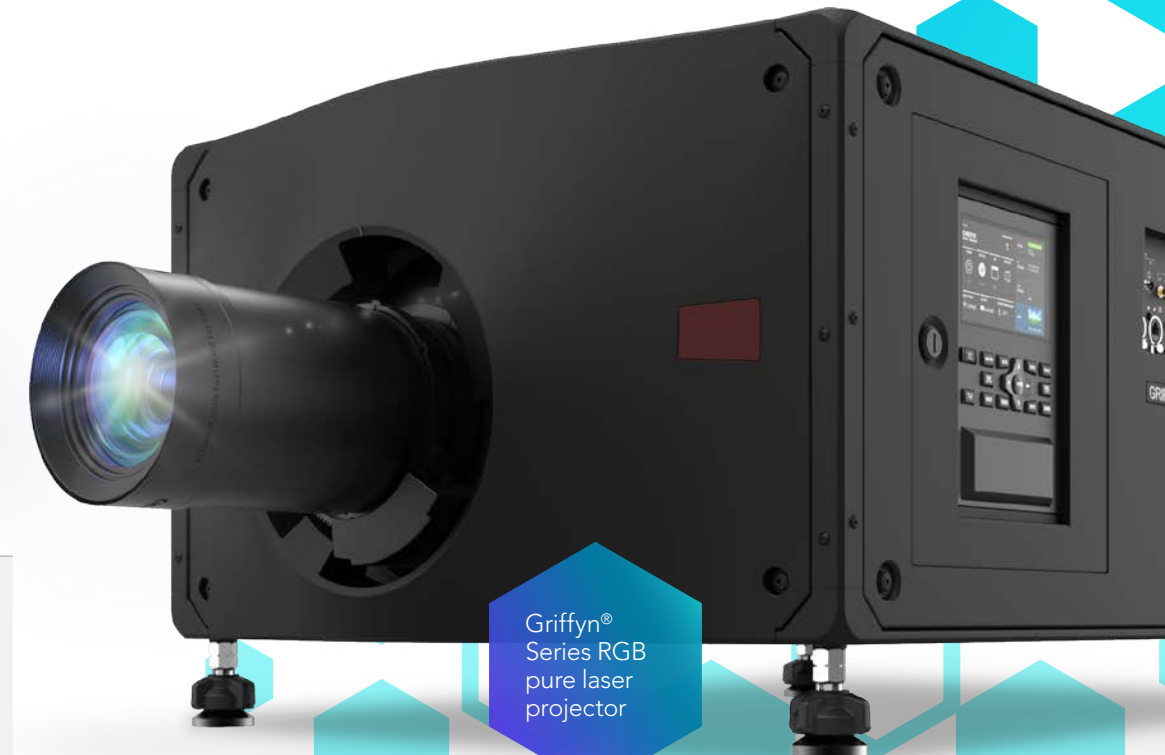
Equipment considerations

Some questions to ask as you build your tech stack:

- What's the distance from the mapping surface?
- What angle gives you the best quality image without disrupting the audience experience?
- Is there ease of access for maintenance?

You'll also need to consider the environmental factors in your project.

- What are the ambient light levels?
- What's the temperature? Are you dealing with a hot or cold environment?
- What weather conditions (rain, wind, and humidity) are possible in your location?
- Is dust a factor?



Griffyn®
Series RGB
pure laser
projector

Timelines

Projection mapping done well is much more than finding a massive surface to project on. The more time you give yourself for planning and development, the better the results.

While you can pull off a projection mapping project in as little as one week, if you ask an industry expert, they'll tell you they prefer to have way more time to fully deliver on objectives, control costs, and prevent chaos. The most ambitious projects can take a year or longer to turn an idea into reality.

The most time-consuming part of any project is the creative development of your content. Minutes of motion graphics and video can take weeks or months to move from the idea stage through storyboard concepts, drafts, revisions, rendering, and testing. In addition to the creative work, local approvals can also stretch timelines because of the paperwork, processes, and even public hearings required.

We've included a sample six-month timeline to give you a sense of the time it can take to pull off these visual spectacles.

<p>6 months out</p> <ul style="list-style-type: none"> • Initial project partner meetings and selection • Concept development 	<p>5 months out</p> <ul style="list-style-type: none"> • Initial site visits • Project and creative proposals • Project cost quotes • Partner selection and commission 	<p>4 months out</p> <ul style="list-style-type: none"> • Formal site survey • Start local government submissions and approvals • Select and engage creative and technical partners • Map, scan and photograph surface • Create a virtual model, then bring it into design software 	<p>3 months out</p> <ul style="list-style-type: none"> • First proofs of content are available for review • Creative revisions and additions 	
<p>2 months out</p> <ul style="list-style-type: none"> • Site planning complete • Approvals/permits complete • Reserve technology • Book site infrastructure 	<p>1 month out</p> <ul style="list-style-type: none"> • Final versions of content complete 	<p>2 weeks out</p> <ul style="list-style-type: none"> • Client sign-off on content • Content rendered • Site preparation starts 	<p>2 days out</p> <ul style="list-style-type: none"> • Equipment arrives on site • Final set-up • Onsite testing • Dry runs 	<p>The main event!</p> <p>Don't forget to take a moment to enjoy the results – you made magic happen for the audience!</p>

National Carillon,
National Reconciliation
Week, Australia
Partner: The Electric
Canvas. Based on
artwork by Nikita
Ridgeway

MAKE IT EXTRAORDINARY

This is it! You're ready to take your big idea and turn it into something truly unforgettable. With the right technology solutions in your toolbox, you can make it even better than you envisioned.

Warner Brothers
Burbank, US

Partners:
BARTKRESA design,
Pro One Stage



Simplify and save time

When you simplify the work that needs to be done, you can cut down on the hours it takes to build and run a show, reduce costs, and free up more time to make sure your project is just right.

Warping and blending for a seamless image

Whether you're projecting on a building, landmark, 3D object, dome, curved surface, or a simple flat screen, you want the images to be perfectly aligned and seamless.

Effective warping and edge blending tools help you harness the power of multiple projectors to create the bright, massive, seamless, incredibly high-resolution displays you're looking for with repeated accuracy and speed.

Keep your projectors humming

Automatically power-up or -down projectors. Remotely access interrogator logs. Seamlessly perform repetitive processes. Quickly diagnose and resolve issues in real time, even during a show. You can do all of this from your desktop with Christie Conductor monitoring and control software.

With Conductor's user-friendly interface, you can proactively perform remote firmware updates and health checks to keep your projectors humming and reduce the risk of downtime.

Strive for perfection

When it comes to projection mapping, it never hurts to be a perfectionist. That's why we created tools so you can let your inner perfectionist shine!

- **Real-time media playback:** Christie Pandoras Box Server unites state-of-the-art rendering technology in 10-bit color depth with Pandoras Box Software's intuitive media and show control so you can project stunning visuals onto any shape or surface with zero compression and no artifacts. You can upgrade the manual mapping workflow of Pandoras Box to an automated process by combining it with Christie Mystique.
- **Alignment for 3D projection mapping:** Achieve repeatable accuracy and save time with automated, camera-based, multi-projector alignment and blending on 3D surfaces such as buildings, landmarks, and objects. Included in Mystique Large Scale Experience Edition, this alignment feature uses markerless calibration for 3D projection mapping, eliminating the time-consuming and often costly need for screen or object markers.



CHOOSING THE RIGHT TECHNOLOGY MANUFACTURER

Choosing a technology solution is more than deciding on which projector to use. You want a manufacturer with the projection tools and the expertise to help streamline your project and take it to the next level.

GLOW Eindhoven,
The Netherlands

Artist: Dirk van Poppel
Partner: Sahara
Benelux

sendcloud

When you do your research, here are some questions that can help you narrow down a technology manufacturer for your project.

What are the project requirements?

Do you need a simple or complex solution? What's the surface size? What's the distance from the projector to the surface?

What level of expertise does the manufacturer have?

What kind of knowledge does their personnel have when implementing a project? Do they have experience with a wide range of projection mapping projects? Take a closer look at the types of technologies and software tools the manufacturer offers. Do they have all the right solutions for your specific project?

Ask for examples

What work has the manufacturer done? Case studies, demos, and interviews can help paint a full picture. Make sure to ask for recommendations from teams who have used their technology solutions.

What kind of support do they offer?

What resources, customer support, services, and training do they offer? Take a closer look at what's available to help you understand the technology needed for your project and become immersed in the details of what their technology can truly do beyond simple projection mapping. For example, at Christie®, we offer courses on our technology through Christie University, alongside professional services and extended warranties.



Palais des Beaux Arts, Video Mapping Festival, Lille, France
Artist: Felix Frank
Credit: Rencontres Audiovisuelles

READY TO GET STARTED?

We're constantly innovating to develop products and solutions that help our partners and customers create unforgettable experiences. From projection mapping onto the world's largest statue or onto the ice at an NHL arena to mesmerizing audiences at Europe's leading light festivals and delivering a unique gastronomic experience with a restaurant table mapping display, Christie® technology is behind some of the world's most impressive projection mapping experiences.

And we're here to help you choose the technology to bring your ideas to life.

Got questions?
Need help selecting
the tech for your
next project?

This is our passion,
and we're here to help!
Contact us, and we'll put
you in touch with one
of our tech experts

Vision Pavilion,
Expo City Dubai
Partner:
AVI-SPL

CHRISTIE®

christiedigital.com

United Launch Alliance's
Delta IV Heavy Rocket
Cape Canaveral, US
Partners: PaintScaping,
Nationwide Video

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