watchfire

10 Critical Facts

to Succeed with Digital Billboards

Contents

Summary

When billboard operators decide to make digital a part of their advertising arsenal, **it's no small deal**. Given the investment required, it's critical to find a manufacturing partner that delivers a combination of image quality, durability and service while maximizing profit.

01

LED 101

A light emitting diode (LED) is an efficient, bright and rugged alternative to incandescent light bulbs. LEDs generate very little heat, which allows more of the energy to be directed toward generating light. Today's LEDs produce directional light up to 10 times more efficiently than incandescent bulbs. LEDs can very greatly in both quality and cost. Lower priced digital billboards likely contain inferior LEDs that will dim more rapidly, reducing the brightness of your billboard and causing noticeable color variations.

LEDs produce directional light up to 10 times more efficiently than incandescent bulbs.

02

Pixel 101

A pixel is a cluster of LEDs – typically three LEDs per pixel: one red, one green and one blue. Boards constructed with three high-quality LEDs per cluster have higher image quality and perform better in the field for longer periods.
An alternate design might use four or more LEDs per pixel to reach higher levels of brightness with lower quality and lower cost LEDs. This pixel configuration uses significantly more energy, tends to age with a pinkish tint and has many more parts and electrical connections.

The distance from the center of one pixel to the center of an adjacent pixel is the industry standard for measuring resolution, or pixel pitch. A lower number means less distance between pixels — resulting in crisper, sharper images.
The matrix of a digital billboard is the number of pixels along both the width and height. The number is shown dimensionally, like 208 x 752. Multiplying these numbers would give you the total number of pixels in an entire billboard. In this example, the number of pixels contained in a 14' x 48', 19mm digital billboard would be over 150,000.

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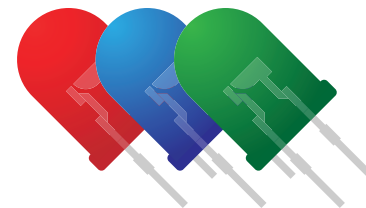
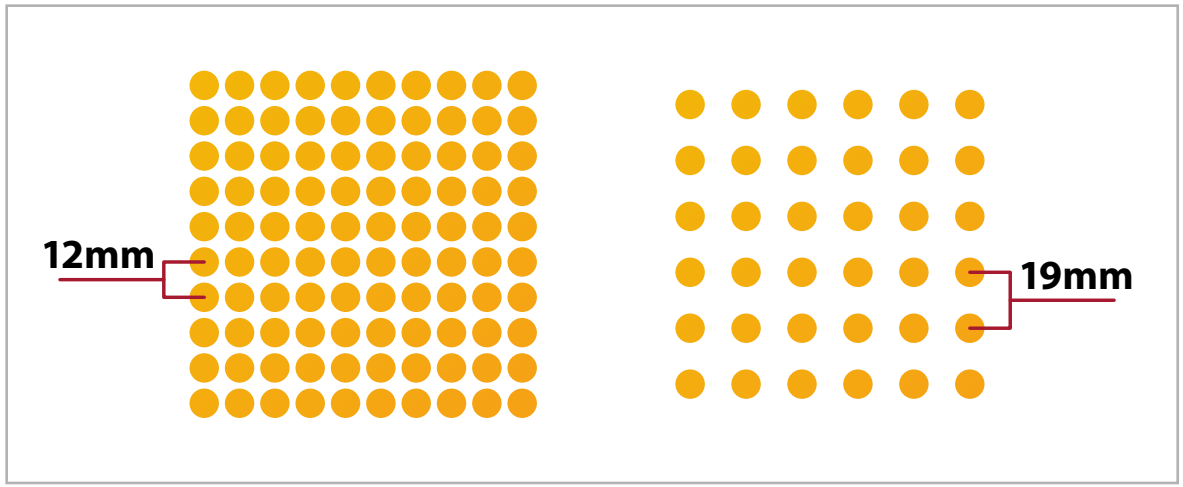




Pixel Pitch and Image Quality

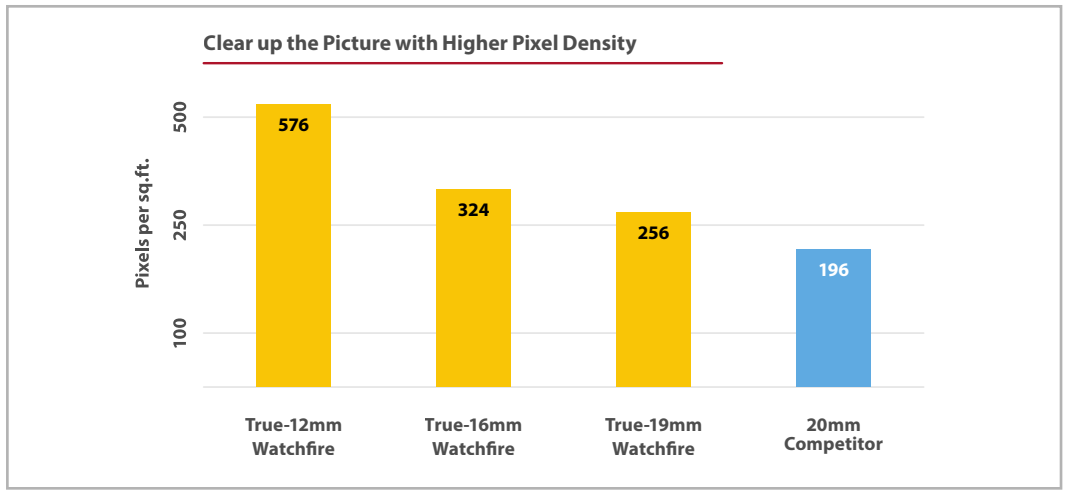
Pixel pitch is expressed in millimeters and is an indication of how far apart each cluster of three LEDs is located from an adjacent cluster. The smaller the number, the more LED clusters, or pixels, the billboard will have. More pixels increase the pixel density and improve image quality.

Beware of manufacturers who offer so-called virtual or optimized pixels. Pixel sharing reduces image quality and is a misrepresentation of the true pitch of the product.

PERFECT PITCH:
How to Use Viewing Distance and Pixel Density

The chart below represents the pixel density, in pixels per square foot, for several different pitches.

To understand the best pitch for your application, you'll want to consider how far away your viewers will be. Typical billboards on most roads and interstates are about 150 to 400 feet from passing traffic. At these distances, images will look great with a pixel density of about 250 pixels per square foot. In situations where viewers are closer than 150 feet, a board with more than 300 pixels per square foot, such as a Watchfire True 16mm, is recommended.



03

Choosing a High Quality Product

Premier digital billboard manufacturers buy the highest quality LEDs from world-wide manufacturers of commercial LEDs.

You can't determine the origins of an individual LED by looking at it, so it can be easy for fly-by-night manufacturers or importers to claim they use high quality components, even if they don't. The best way to protect your investment is to buy from a well-known, experienced billboard manufacturer. Low prices are hard to resist, but the risk can be great for those who don't do their homework.

Since LEDs are the single most important factor for how a billboard looks, ask your manufacturer if they test for LED aging and color uniformity.

Brightness Control

High-quality digital billboards have field-adjustable brightness capabilities of between 5,000 and 7,500 nits. This gives billboard operators complete control to dial-in the perfect setting that will optimize readability and energy efficiency. Many communities have brightness restrictions and will only consider a billboard from a manufacturer whose products make it easy to comply with local codes.

Most digital billboards offer automatic dimming at sundown. Nighttime brightness is typically set at about 3% of the daytime brightness level, reducing glare and promoting readability. The best digital billboard manufacturers provide a photocell option to measure ambient light and adjust brightness accordingly. High quality billboards are also designed to direct light downward and limit light pollution.

Adjustable brightness can help reduce a digital billboard's operating cost, enabling you to reduce your energy use by up to 40%.

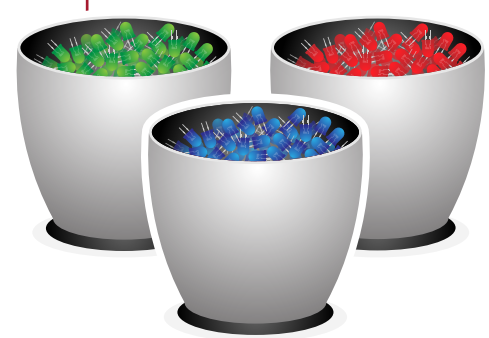
Whole-sign Calibration

Factory calibrating the entire display for both color and brightness is a state-of-the-art process done by only the best manufacturers. On a digital billboard that has been calibrated, it's almost impossible to see the edges of the individual modules. Whole-sign calibration is done to eliminate the patchwork effect of tiling or quilting on a digital display. The process is time-consuming, but important, particularly as a display ages.

Some manufacturers rely on their LED supplier to deliver fairly uniform color. LEDs are sourced in sorted groups known as "bins" based on color and brightness. The term 'single binning' means that all LEDs for a display come from a single bin, where the LEDs share common characteristics. Single binning can produce a decent image on day one, but it is a crude sorting process, and single-binned LEDs may still have noticeable differences in color and brightness.

To ensure you get the best possible display, Watchfire purchases only ½ and ¼ binned LEDs – a selection process that is up to 4 times more refined. This narrow selection alone makes our boards stand out compared to single-binned boards, and provides 20% more color uniformity than LED selection alone.

Careful selection of ½ and ¼ binned LEDs is only the first step in achieving true color calibration.



For high quality digital displays, the next step is whole-sign calibration. Each LED and each pixel are calibrated across the entire sign, taking into account considerations like viewing angle, so that the board has near perfect color and brightness uniformity. It takes expensive equipment and uses a lot of factory space, but results are worth the investment. Displays calibrated by Watchfire are 70% more uniform in color and 85% more uniform in brightness compared to manufacturers that rely on binning alone.

Watchfire pioneered whole-sign color and brightness calibration to ensure each display delivers uniform and accurate color, and we guarantee that uniformity for 10 years on our MX Class billboards.

04

Durability Is Critical to Your Investment

Image quality and durability go hand in hand because a billboard that looks bad or is constantly in need of service can cut into your profits. It's important to understand how the quality of a billboard's cabinet, modules, internal components and connectors can impact reliability.

Cabinet Construction

Key elements of well-engineered and manufactured cabinets include all-aluminum construction, solid welds (not pop rivets), and a heavy-walled, extruded aluminum frame (not sheet metal). A well-made cabinet should have tight tolerances, precise alignment and minimal gaps. Outdoor elements like rain, high humidity, thunderstorms, snow and extreme temperatures will test the integrity of your digital board, so a protective cabinet is important. One of the most telling indicators of a cabinet's strength is certification of compliance with International Building Code (IBC) 2012 regulations. Meeting IBC requirements is standard for the best digital billboard manufacturers.

Outdoor elements like rain, high humidity, thunderstorms, snow and extreme temperatures will test the integrity of your digital board, so choose a manufacturer who doesn't scrimp on quality in any part of the process.

Moisture Protection

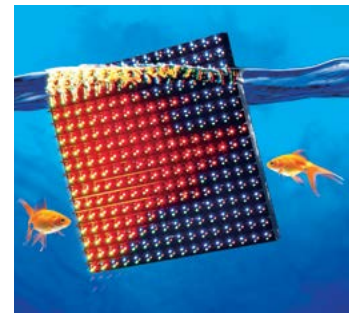
Moisture is the number one factor in LED failure, so a completely weather resistant seal is critical. The most rugged digital boards have silicone gel encapsulating each LED module to protect both the front and back from the environment. Some manufacturers seal the face of the module, but leave the back completely exposed to the elements. The best quality LED modules withstand direct contact with water; continuing to operate even when completely submerged. LED boards with the most complete moisture protection have the highest predicted durability.

Streamlined Design

The mean time between failures (MTBF) standards tell us that every single connection in an electronic device is a potential point of failure. When designing for quality and longevity, an electrical engineer looks to streamline the design and reduce connection points, which in turn increases the product's reliability.

One simple, yet striking example? Pin connections.
A Watchfire module contains just 11 connection pins. Compare that to a competitor whose modules require 68 pins. Using MTBF standards, the competitor's design increases the likelihood for failures in the first 9 months of operation by over 50%.

Low connection count and high quality cables and components make a digital billboard more reliable.



WITHOUT MULTI-CHANNEL DATA ONE FAULT AFFECTS AN ENTIRE LINE.

PATENTED MULTI-CHANNEL DATA ISOLATES SERVICE ISSUE TO A SINGLE MODULE.

Data Protection

Data, the transmission of messages to the LED modules, is the life-blood of any digital billboard. Choose a manufacture whose product provides safeguards to protect against data loss. By engineering LED modules to communicate across multiple channels, a quality board will prevent a single fault from affecting several modules at once. This multichannel data protection isolates a data fault to a single module so that your advertising remains readable until a repair can be made.

Watchfire billboards feature a patented multi-channel data configuration that keeps messages readable in the event of a service issue.

05

Warranty and Longevity in the Field

It may seem obvious, but a solid warranty is a good indicator of how confident the manufacturer is in its products and, in turn, how confident you should feel about the manufacturer. A longer warranty means the manufacturer has performed extensive testing on their products and will stand behind their billboards should anything happen in the future. It also means you can count on that manufacturer to have replacement parts, should you ever need them.

But warrantied parts and labor are only part of the picture. Look for brightness and color uniformity that guarantees to maximize your investment. Consistent brightness and colors that stay true in the field will add years to your digital billboard's performance and save you money.

Read the warranty completely and check references to investigate how a manufacturer delivers on warranty promises.

06

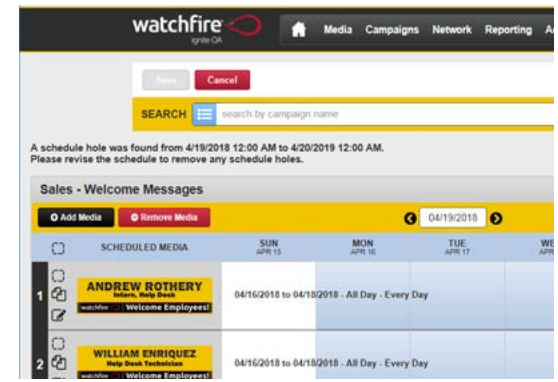
Software that Manages Your Content and Business

Digital billboards allow you to update ads, tailor messages and maximize the impact of outdoor advertising. When you choose the right manufacturer, all you need to run your business is a computer and an internet connection.

Choose a billboard manufacturer who provides software that has been designed specifically for the billboard industry and for the hardware you are buying. Reliable, cloud-based software should offer features for integrating with external data sources for real time updates. Digital billboards offer advertisers the ability to adjust ads immediately, so your software should include this functionality.

High quality software can also give you detailed, automated diagnostic reports to monitor multiple boards and alert you or your support team to service or communication issues in real-time. The best diagnostics software is highly automated, and increases digital billboard uptime. It can help prevent lost advertising revenue.

Software should be user friendly, with access levels that can be granted to users based on their roles.



Managing Your Inventory

When you work with a manufacturer who gives you the tools to integrate your entire business into one easy business solution, you'll be better able to maximize your inventory and make more money. Availability and occupancy reports, along with the ability to manage all facets of your business – marketing, proposals, contracts, sales, inventory and invoicing – will provide the most efficient operation and increase your return on investment (ROI). Software this robust will also help you retain advertisers by providing detailed proof of performance reports.

Watchfire's Ignite OA software helps you manage your inventory and maximize your profits.

07

Service and Support

More Uptime Means More Revenue

You've probably heard the old saying that the bitterness of poor quality remains long after the sweetness of low price is forgotten. This is especially true with digital billboards. Every billboard business is based on the simple premise that time is money, and when your billboard is not operating properly, you are losing money. When you invest in a high quality billboard, you extend the replacement+cycle and earn a greater return on your investment.

In today's global economy, it's fairly easy to import and resell LED modules, so there are a lot of fly-by-night companies doing just that. These distributors will struggle to support their product for more than a few years, and very quickly you'll find that parts are no longer available. Instead, partner with a company who keeps parts in stock for a minimum of 10 years, and who supports their products from the same facility where they are designed and built. Operators who installed first generation Watchfire billboards in 2007 are still earning revenue today.

Partner with a manufacturer who delivers a high quality product with unmatched service and support. Ask about remote monitoring, automated diagnostics, service dispatch and parts availability.

08

Finding a Site

If you haven't already secured a site, you'll need to do some research on the basic permitting and zoning rules in your area. Most communities set a required distance from other billboards, a setback from the road or a specific zone for the property. Understanding these rules will help you identify locations that meet the criteria so that you can begin to look for available land.

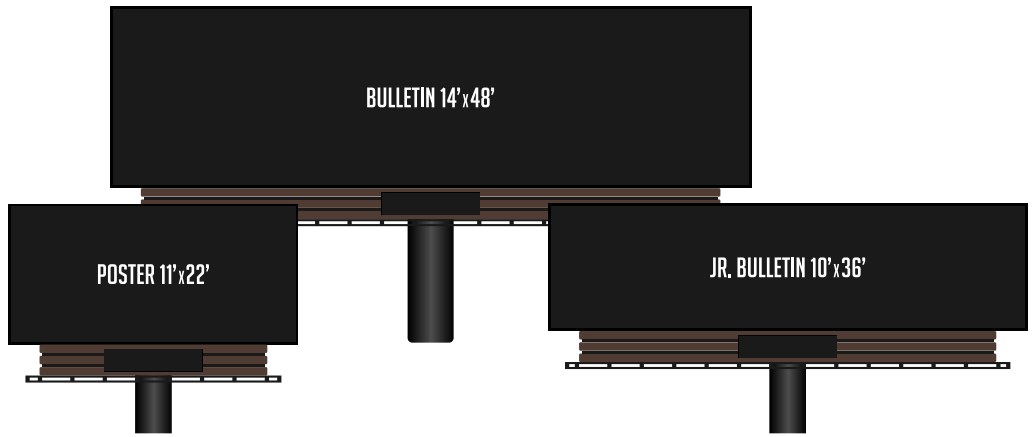
Many operators lease land from private property owners. Once you have narrowed your search to areas most likely to be permitted, the next step is to talk to property owners about leasing space for your project. A land lease can be a good deal for property owners, providing income for a small section of land and requiring little or no effort. Still, you will need to provide comprehensive details about your plan and a fair level of compensation as part of the lease negotiation process.

Some lease rates are based on how much traffic passes by the location. This usually factors in to how much you will be able to charge advertisers for space on the billboard. Use traffic statistics to help you identify how many impressions the site will deliver. From there, you can project your rates and set a target for overhead items like land lease costs. With traffic data, you can calculate the ROI to ensure your investment has a short payback period and is profitable for the long term.

In most cases, you will need a permit from the state DOT and the local municipality. Researching the rules in advance will help you narrow your site search.

09

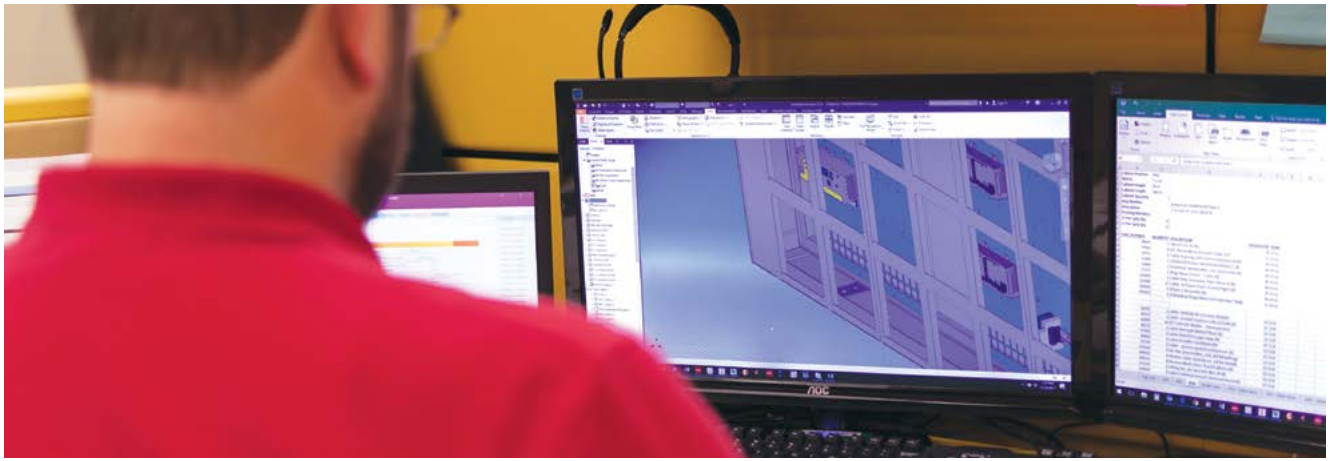
Size, Structure and Electrical Service



Once you have selected a location and applied for permits, you can move on to deciding what size billboard to purchase. If your site is along a major highway with traffic speeds over 60 mph, you'll want to consider a bulletin. Smaller sizes, such as a poster or junior bulletin are more appropriate with slower traffic or a site close to the roadway. Your manufacturer should be willing to assist you with recommending the best size and pixel pitch for your site.

You'll also want to consider the logistics of placing a billboard on your site. A standard bulletin can weigh anywhere from 6,000 to 10,000 pounds, depending on the manufacturer. The weight of the board can have a significant impact on the overall cost of the project, particularly if you are retrofitting an existing structure. Other factors, like accessibility for installation and service, and the availability of power at the site should also factor in to your decision.

Bulletin, junior bulletin and poster are common billboard sizes, but most manufacturers offer custom sizes as well.



Engineering for Success

It's a good idea to work with a structural engineer to review the specifications of the billboard and to review technical drawings. If an existing structure is already in place on your site, the structural engineer will visit it to measure columns, wall thickness, bolt patterns and other crucial aspects of the structure.

The overall goal is to make sure that your new billboard can be safely installed. Sometimes the existing structure is sufficient, or may need only a few modifications. Other times the structure will need to be replaced entirely. If you are starting from scratch on a new site, expert guidance from a structural engineer will save time and money.

Your manufacturer should be able to recommend a structural engineer to assist with your project.

Once the structural needs have been met, consider the required electrical service at the jobsite and the complexity of the electrical work. If you are replacing another digital billboard or a Trivision, the electric service at the site should be sufficient. When establishing a new site, it can be costly to obtain access to electric service.

The best digital billboards require less than 50 amps of service for a standard bulletin.

10

Making a Business Plan

When you're ready to put the power of digital outdoor advertising to work for your advertisers, put together a business plan. Consider all the soft costs (installation, site readiness, etc.) along with the cost of the digital billboard that will work best at your site. Look at rate setting options to determine your ROI. Most Watchfire customers find that their investment is paid off in less than 2 years - and some in less than 12 months.

Use your business plan and ROI projections when approaching financial institutions about financing your project. With finance terms of up to five years and simple, straightforward contracts and pricing, loan programs can cover all start-up costs for your project – including those identified soft costs.

Learn more about calculating your ROI and setting advertising rates at www.watchfiresigns.com/ROI.

Work with a manufacturer who can provide you with an operator's toolkit for sales proposals and presentations.

Call us at 800-219-0496 or visit watchfiresigns.com and let a Watchfire representative show you how.

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