



Smooth Passenger Flow

A Guide to Planning Your Queuing Strategy



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Introduction

Queues play a salient role in everyday life. According to some estimates, in a lifetime the average person spends two years waiting in line. Frequent fliers and dedicated globetrotters may spend even more time waiting. The impact of waiting lines on profits, passenger satisfaction, and even public safety can be profound. For managers, “waiting in queue” implies a series of challenges and concerns, including productivity, customer service, and lost revenue. For travelers, “waiting in line” can imply anxiety, boredom, and wasted time, among other feelings. And in the transportation industry, time is even more crucial – delays can have a cascading effect with serious consequences for passengers.

As a manager of operations, facilities, marketing, merchandising, or the like, you are faced with addressing why the queue is filling up and what you can do to make it faster. This guide is designed to help you answer these two key questions by crafting a queuing strategy that fits your transportation-oriented facility. If the people you serve must wait in line to be served, this guide is for you.

What’s Covered in this Guide:

- Key Considerations for Planning Your Queue
- Single Line vs. Multi Line Queuing Systems
- Tips for Setting Up Your Line

Let’s get started!



Planning Your Queue: Key Considerations

In planning your queue you need to be mindful of the elements that make up a line and the service level you want to provide to the travelers waiting in your queue.

Key Consideration #1 | Elements of the Line

Airport, train terminal, subway station... wherever you go, chances are high that you're going to be waiting in line to get the attention you want (unless you time your visit very carefully). Most people approach lines similarly – with a sigh. That reaction might be followed by the “craned neck” phenomenon which has them looking in every direction for a shorter line and minimized wait time. How long a person waits in line, however, has little to do with how astute they are at choosing the “best” line and more to do with factors like how many people are being served before you, the number of servers who are working at that time, and the time it takes to attend to each customer.

Wait time is also affected by the design of the line in which you're waiting. Organizations that fail to think about the efficiency of a queue and the people who will be standing within its bounds are more likely to suffer the consequences than not. What are the consequences of a poorly constructed queue? Balking and reneging are two of the worst results, but let's further examine the elements of a waiting line first.

Element 1: Passenger Population Source

Before you can manage the efficiency and organization of a queue, you have to understand its source. There are two types of lines: finite and infinite.



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A finite line has an end – there is a point when it can get no longer. For example: Pre-sold tickets to a high-speed rail journey mean a set number of passengers will be standing in line come departure time (the train can only hold so many). Once the ticket holders have made it into their seats, the line officially ends.

A queue is considered infinite when the number of travelers already waiting in line doesn't affect the rate of potential new passengers – in other words, there is no control over how long a line will get (think subway stations), and there is no way to end it unless you close your doors and don't let anyone else into the building! But an infinite line isn't necessarily a bad thing – it's just unquantifiable.

Regardless of the type of line they're standing in, a person in a queue may take a number of different actions to improve their time or position in line. Some people may enter a space, assess the situation, and balk at the length of lines or shortage of service agents. So they leave, which means they may or may not come back later. They may choose to pursue a different method of transportation. A traveler who reneges has chosen to wait in line but, if they're dissatisfied with the pace of the line, they ultimately leave. Then there are the passengers who jockey, changing from one line to another, hoping to procure for themselves the shortest wait time.



Element 2: Service System

Depending on your type of travel center, you may choose to have a single-line or multiple-line queue. Everyone who runs a transportation center involving the presence of a queue has an opinion on why one type of line is better or worse than the other. It has been found, however, that single-line, multiple-server systems have a better performance in terms of wait times than a multiple-line system with one server for each queue. For example, most airlines that opt for multiple-line queues do so when space is an issue and would make a single line inconvenient, or when there are specialized servers available (like the “executive VIP flight services” line).



The single-line queue brings with it a feeling and perception of fairness which makes for happy, relaxed travelers.



You're more likely to see a single-line queue (SLQ) at an airline counter or bus terminal. There may be more than one service agent working, but there is only one line to stand in, meaning each traveler gets served when the next agent becomes available. The single-line queue brings with it a feeling and perception of fairness which makes for happy, relaxed passengers. They might still be impatient, but

they can't complain that someone received preferential treatment or cut in line. Everyone has the same wait, relatively speaking, and a wayfarer doesn't feel like they're being penalized, or having a really unlucky day, by opting for the wrong line. Jockeying behavior is eliminated in a single-line queue and a feeling of equitableness reigns supreme. As you design your queue, it's important to consider the number of servers you plan to have available to people at any given time. Rural train depots may only have one server. A major metropolitan train station may opt for multi-server systems. The arrangement of your servers is also a relevant element of your queue. For instance, airports usually have a multiphase system – ticketing, baggage check, security – which means three different stops and, typically, two or three different servers. Lines that operate on the single-phase system complete their transactions all at one time – think the car rental counter at a small airport or the currency exchange counter.

Element 3: Arrival and Service Patterns

Travelers who don't really spend much time thinking about queuing may assume that your business regularly has the same number of servers available – but a wise businessperson has analyzed the arrival rate of passengers in a line (meaning they are aware of the average number of people they are likely to receive and service in a given time period) and staffed their queues accordingly. If the number of passengers that you serve in any block of time is less than the average number of people who are arriving in that queue, the line will grow and grow and grow, making it close to impossible for supply to catch up with demand.

But there is no way to make X number of people head to your checkout at regular intervals throughout the day. The pattern of a line varies and a queue is more likely to form when there is a surge of passengers at one time, temporarily flooding the service system you have established. There are mathematical probabilities and formulas that can aid you in determining how your line may or may not pan out on any given day, but you don't have to be a mathematician to keep people calm as they wait in your queue – digital signage and other diversions can minimize a wait, which means the length of a line becomes less relevant to the person in the queue if their anxiety is being managed or distracted.



Element 4: Priorities Used for Controlling the Line

Most people can get behind the “first come, first served” mantra when it comes to lines – this is known in the queuing business as a priority rule. It’s one of several other priority rules (like “best customers first” or “quickest service requirement first”) and typically the rule that the majority of people consider the fairest option. But “first come, first served” isn’t always the best option depending on the nature of your establishment – the goal should be to abide by the priority rule that best supports your business and queue strategy.

In a multi-line queue, a traveler can inadvertently make the unfortunate choice to get in line behind someone with a great deal of baggage to check, taking them some time to get to the service agent. Meanwhile, in the neighboring queue, the traveler who gets behind someone who has one small carry-on bag will zoom through their exchange. A preceding passenger can be the element that affects another passenger’s wait time – and some people take that as a personal offense (especially if they’re already having a bad day). So it’s your job to keep everyone happy as they stand in the queue.



The goal should be to abide by the **priority rule that best supports your business and queue strategy.**

Key Consideration #2 | Desired Service Level

The Cost-Benefit of Waiting in Line

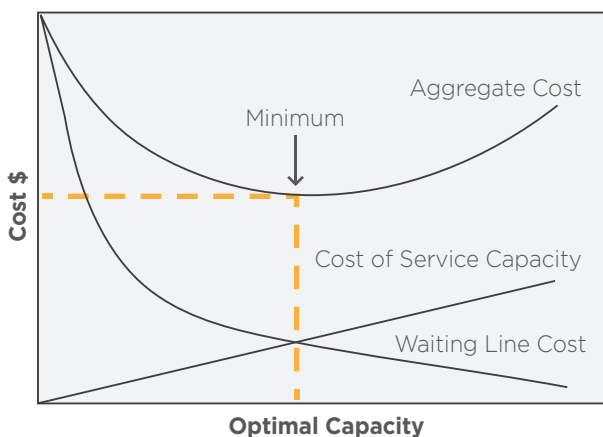
You want to do the right thing when it comes to your queuing strategy. You want to be a good steward of your organization’s budget and you want to provide a quality experience to the travelers in the waiting line. The trick is establishing a desired service level for your queue that meets both objectives.



Peter J. Sherman, a certified Lean Six Sigma Master Black Belt and quality engineer, described the problem in virtually every queuing situation as a trade-off decision. “The manager must weigh the added cost of providing more rapid service (i.e., more ticketing counters, more baggage handlers) against the inherent cost of waiting,” he writes.

Insufficient service will drive away passengers. At the same time, adding more service personnel can be costly. The right balance is defined in part by the culture of your organization (the value placed on quality customer service), the financial impact of turning passengers away, and the cost to improve the queuing system.

The relationship between service capacity and queuing cost can be expressed graphically as shown on the next page. It shows that the cost of waiting in line is at a maximum when the business is at minimal service capacity. As service capacity increases, the number of travelers in the line and their wait times decline, which reduces cost. The optimal total cost is found at the intersection between the service capacity and waiting line curves (the bottom of the “U”).



Queuing models exist to analyze and describe queuing system behavior. These models help managers make decisions by assessing the optimal service level (queue length), optimal number of servers, or the optimal policy that minimizes total queuing cost while improving service level. The “U-Shape” cost curve shows that there is indeed an optimal level.

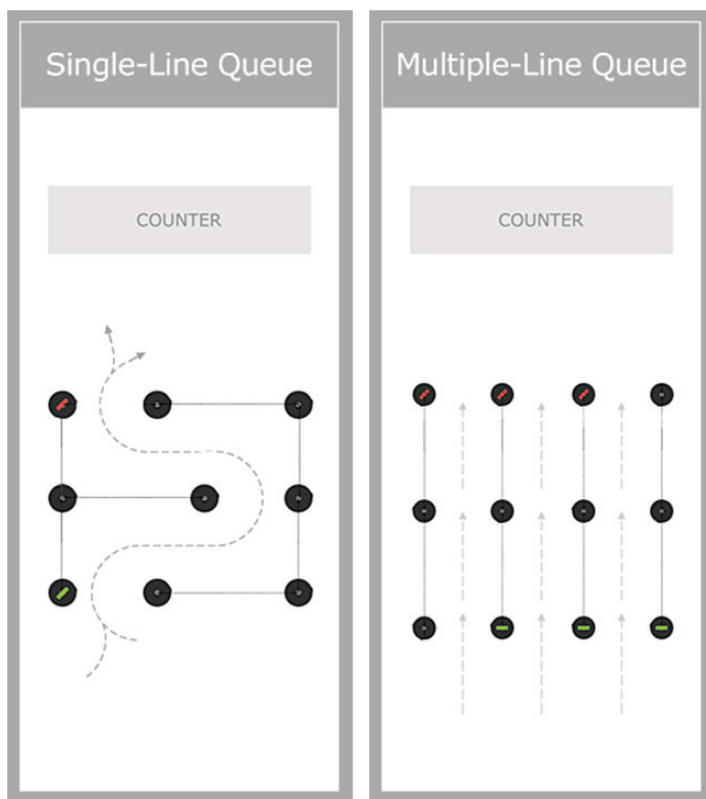
What you’ll find, however, is that these models fail to account for the “soft” factors that affect queuing. We discussed, in an earlier guide, the Five Tenets of Queuing. These tenets point to ideas for managing the passenger experience in the queue to reduce perceived wait times and increase customer satisfaction despite deficiencies in the measurable queue performance.



Single Line vs. Multi Line Queuing Systems

There are a variety of waiting line systems but the two most common are the single line and multi-line single-stage queues.

The single line queue (SLQ) with single-stage service is common in airports (you'll also see this type of queue in banks, post offices, and bookstores). The single-line queue has the great advantage of fairness as travelers are taken care of on a first-come, first-serve basis. Plus, a single line eliminates the need for customers to hunt down the shortest, fastest line and avoids the anxiety of figuring out if they've indeed chosen the right line. It also reduces "cutting in line" problems and eliminates "jockeying" or line switching.



Aside from improving the passenger experience, the single-line queue can serve as an effective loss prevention technique as it makes sweethearting far more difficult. Dishonest employees have less of an opportunity to give friends, family, or whomever unauthorized discounts or "free" upgrades in a single line since passengers can no longer self-select their "favorite" service agent.

The multiple-line queue with single-stage service is not common in transportation applications as it can become confusing when dealing with large crowds. It features two or more lines that coincide with a particular service counter (cashier, attendant, etc.).



Summary Comparison

Single Line Queue:

- Fairness (first come, first served)
- Eliminates anxiety over choice of queue
- Avoids “cutting in” problems
- Avoids line-switching
- Greatly reduces sweethearting

Multiple Line Queue:

- Gives customer greater flexibility
- May deter “balking” behavior

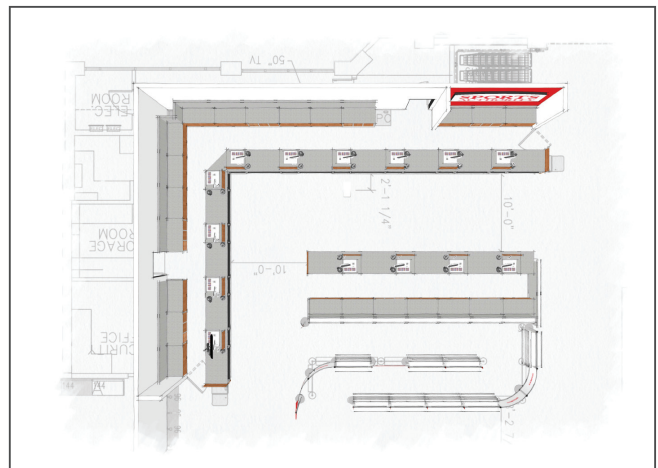
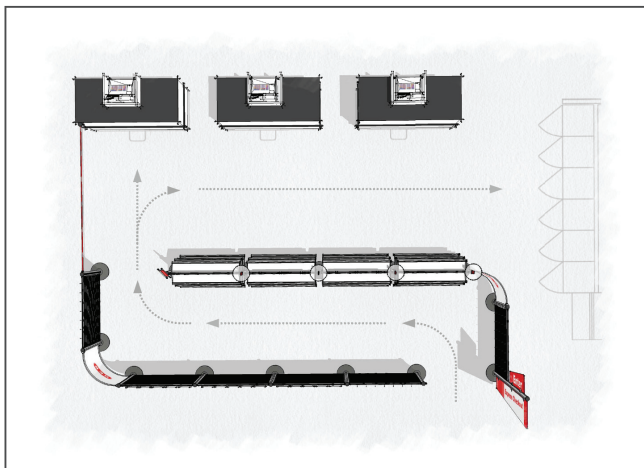
Tips for Setting Up Your Line

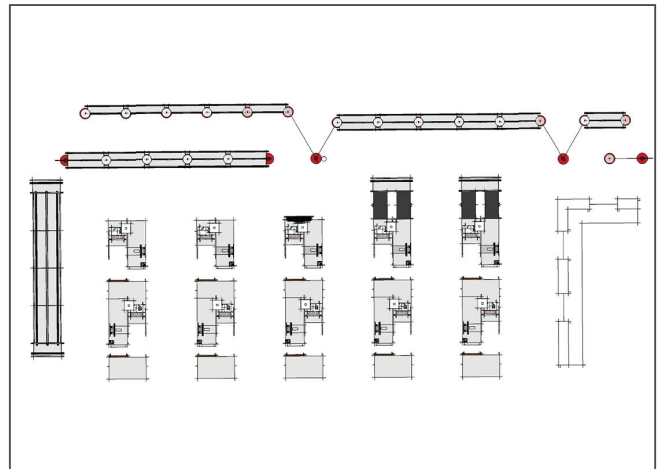
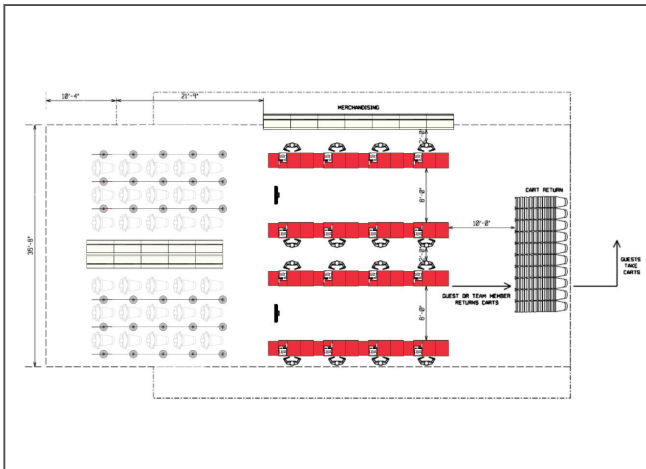
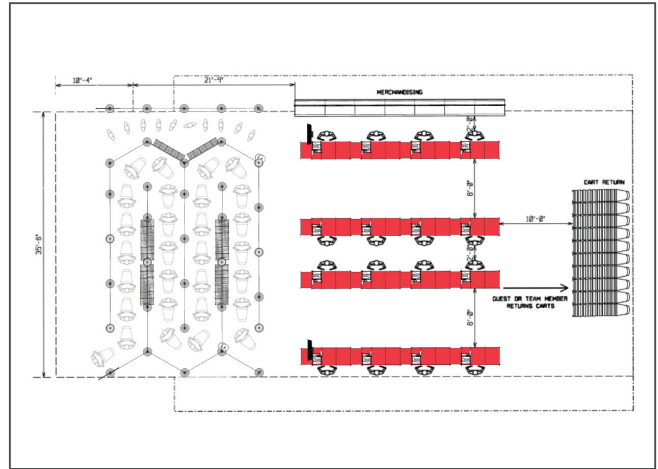
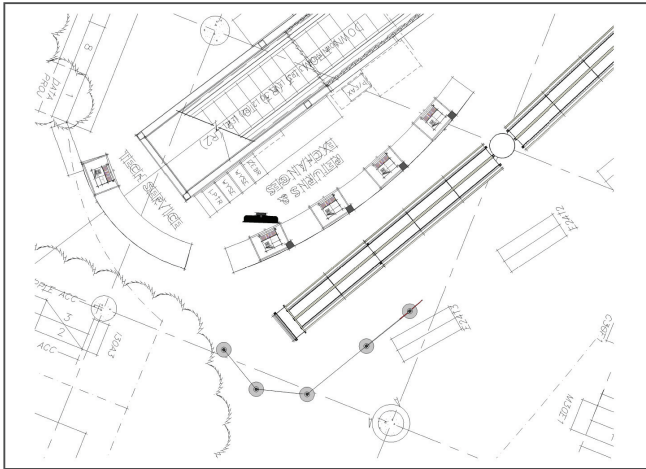
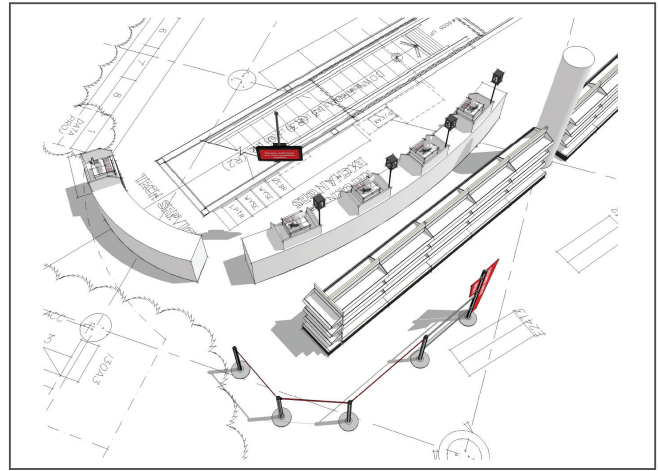
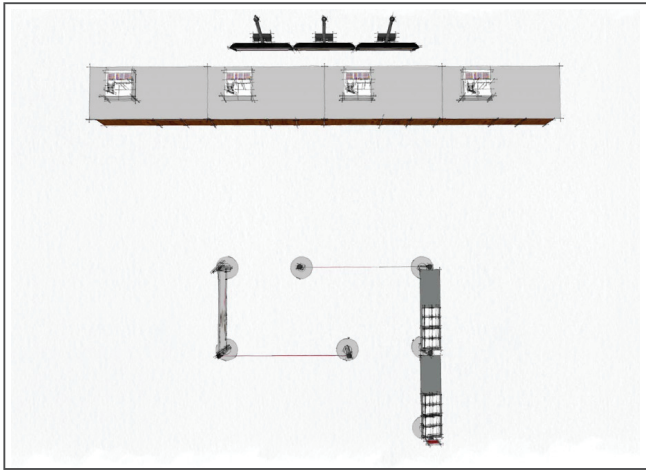
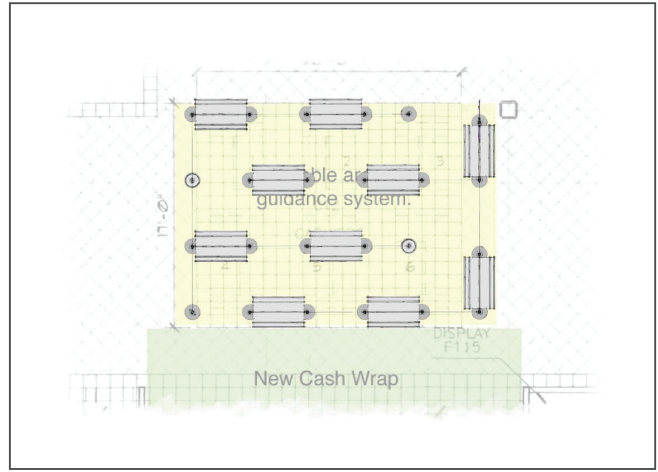
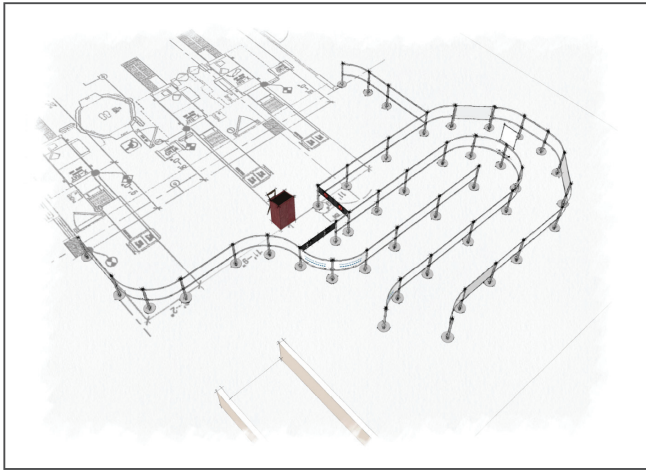
The quality of your queue is just as important as the availability of your flights, or the end-product for which a traveler is standing in line. Your line is a significant pathway to revenue. Your goal should always be to make the wait as pleasant, efficient, and safe as possible for all guests.

Plan it Out

If you were throwing a party, hosting a reception, or organizing a conference – all events involving a great deal of people – you would spend time planning it carefully, making sure everything runs smoothly. The same attention must be paid to any queues associated with your business – the people you entertain might not arrive at the same time, but nevertheless you must be prepared to provide individual service to the masses and keep them safe in the process. The physical design of a line will either calm or infuriate the passengers waiting within its bounds. Poor planning of a queue can be the difference between success or failure, repeat travelers or dreadful reviews, contained chaos or crowd surge.

Sample Queuing Configurations





Consider Spacing

Everyone welcomes a wide lane on the highway. And everyone appreciates when other people respect their personal space. So don't crowd your line. A lane that is generous in size allows travelers to relax, feel comfortable standing next to others (even if they're carrying a number of large bags or items), and stay calm and cool (literally and figuratively – there are no fun times to be had when you're standing in a hot line that isn't moving).

Consider the Length and Shape of the Line

The physical shape of a line can affect your travelers, for better or worse. A longer queue makes for more room for the passengers waiting in line and allows more passengers to have a place. Just don't extend your queue to the detriment of service in other areas – a line that snakes through a main thoroughfare or baggage pick-up is inconvenient for travelers who have not yet reached the queue and awkward for the travelers who are already standing in line. A serpentine-shaped queue will hold a larger number of passengers in a smaller square footage because the people line up single file in long parallel rows. It's a wise choice when serving people one at a time.

Consider the Stanchions



Too many stanchions equal a cluttered queue. Not enough stanchions equal a less-than-sturdy queue. A disproportionate number of posts also limit your possibilities for reshaping your line when necessary. A zig-zag or serpentine queue, as discussed above, is convenient for a large number of travelers. But when your queue is not crowded, zig-zagging back and forth between belts and posts can make a traveler's head spin (especially if they're already jet-lagged!). Retractable belts enable you to section off portions of the line so travelers can bypass the more roundabout way of getting to the front of the line in the interest of time and convenience.

Make It Easy for People to Navigate

A simple “Please Enter Here” sign can do wonders for the morale of the travelers in your queue, limiting their angst that they might be doing the wrong thing or going in a direction that could actually extend their time in a line rather than minimize it. Signs keep people moving in, through, and out of your facility safely and in an orderly fashion.



Use signage to keep travelers flowing in an orderly fashion.

In fact, any signage offering instructions or more information can go quite a long way to appease passengers waiting in a queue – a list of the paperwork or identification a passenger will need once they reach the service counter gives people the opportunity to get prepared ahead of time. While their time in line may not get any shorter, it will feel as if it had, as they were preoccupied organizing their personal information, tickets, what have you. A sign offering instructions through photos and words can calm someone who perhaps speaks a foreign language – like a little suitcase on “Baggage Claim” signs at the airport.



Signage also gives you an opportunity to break up your queues into more specialized lines like the E-Z Pass lane on the toll road. Secondary queue areas, such as express lanes, empower your travelers and shorten the general queue. Just be sure to make clear the intention of these unique lines – you don’t want anyone to experience injustice or feel that others are getting preferential treatment.

You can also use signage to encourage waiting passengers to be nice to others and have a little patience as they anticipate their turn at the front of the line. Avoid signs like one on display in an especially busy doctor’s office: “It’s called a waiting room for a reason.” You can certainly be more clever and kind about conveying your message of peace, harmony, and good times in line.

Take Advantage of a Captive Audience

Let us entertain you! People in line can find plenty to keep them busy on their smartphones, but there is no better time to try to pull their eyes away from the latest bells and whistles of handheld technology.





In-line merchandising and digital instructions can create some eyes-wide-open – especially if you surprise travelers with a video about how to use a particular product that happens to be on sale at a duty-free shop, or encourage them to download an app that

could simplify and speed up their next travel experience with your hub! Whatever you're selling – be it a physical item or a service – there is a video or photo montage that can be created and on display in your queue to inform travelers and intrigue them.

Whether the information you provide to waiting travelers results in a sale or not, the other important element of an effective queue has ideally been reached with your efforts: distraction. The art of distraction is crucial to a good queue – digital signage can make perceived wait time feel much shorter than it would without a diversion. And everyone wants to feel like their line is moving quickly.

Keep it Safe

Your waiting line is intended to establish a clear order and progression, which can naturally enhance the safety of your facility. But safety can be taken even further when you consider the types of people and various ways in which your queuing products will be poked, played with, leaned on, and rubbed against. Kids are inevitably drawn to the barriers that surround them – and aren't afraid to test them out. A slow-retract belt mechanism on your retractable belt stanchion will keep curious little folks safe when a belt that is fiddled with “snaps” back from its stanchion. For double security, though, belt locks can keep a belt from dislodging in the first place and guard against post-top signs falling onto a child's head.

Wary of signage in an angled frame? Opt for sign frames with rounded corners to further enhance the safety of your line. And be prepared for the people who will rely on your stanchions for support – especially the exhausted travelers or those lugging stuffed bags. Heavy-based stanchions or bases that attach to the floor via bolts or magnetic bases prevent tipping from being a hazard.

Expecting an especially large crowd and some chaos? Rigid rails do not stretch and they prevent travelers from flowing out into traffic – they're the secure choice for holding back a surging group at the perimeter of your queue or the start of a checkpoint. Bright-colored belts printed with safety or directional messages can also enhance the safety of your line.

These and many other safety considerations should be accounted for in your queue planning process.



Conclusion

An efficient and well-managed queue is one of the quickest and most cost-effective ways a business can increase operational efficiencies and squeeze additional revenues from existing real estate. Moving passengers in, through, and out of waiting lines with effective queue management is proven to reduce traveler walk-aways, increase revenues per square foot, stimulate impulse sales, and enhance the overall customer experience. It pays to do it right.

If you're looking for help on planning your queue in your facility, selecting the right queuing products, stanchions and crowd control barriers, electronic queuing, and more, we invite you to speak with the public guidance experts at Lavi Industries.



Let's Plan
Your Approach

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