From retail chains and restaurants, to office buildings and airports, the type of entrance that you select plays an important role in customer comfort, corporate branding and, in some cases, generating more profit. This playbook illustrates the benefits of revolving doors across multiple verticals.
Sustainable Entrances are Trendy

Energy-savings, sustainability and renewable energy sources are top of mind. How will we be able to sustain ourselves into the future? Today, revolving doors more relevant than before; they are an essential component to an environmentally-friendly building design.
The Dilemma with Sliding/Swinging Doors

When sliding or swinging doors open they create a hole in the building, exchanging conditioned, comfortable air with the outdoors. They create frigid, unpleasant interior spaces during the winter and they “blow out” very expensive, air conditioned air in the summer. In both cases, the HVAC system must cycle more often to compensate for lost conditioned air and consume more energy. Double door vestibules are common, but during peak traffic times remain open and allow large amounts of air to be exchanged. When spaces are small or at a premium, they consume valuable floor space that can be devoted to displays, merchandise or seating.

An Invention to Reduce Air Infiltration

Invented by American-born Theophilus Van Kannel in 1888, the revolving door was introduced as an alternative to traditional hinged doors. Kannel’s patent states that the revolving door “is perfectly noiseless in its operation and effectually prevents the entrance of wind, snow, rain or dust either when it is closed or when persons are passing through it.” In short, revolving doors eliminate drafts, minimize noise and air pollution, keep out dirt and debris, and counter the effects of stack pressure. Overall, revolving doors offer a level of energy efficiency unavailable with traditional doors.
MIT Study - 8x Air Infiltration Reduction

In 2006, a team of graduate students at MIT conducted an analysis of door use in one building on campus, E25, where they found just 23% of visitors used the revolving doors.

According to their calculations, the swinging door allowed as much as 8 times more air to pass through the building than the revolving door.

In addition, they calculated that if everyone were to use the revolving doors in Building E25, MIT would save almost $7,500 in natural gas a year. That’s enough to heat five houses over the same time frame.

MIT published these findings to its students to encourage them to use the revolving doors whenever possible.

Are You Being Punished for Your Success?

Many establishments are revenue-driven and invest in their sales and marketing to increase traffic. With sliding or swinging doors, bringing in more traffic works against you. More traffic keeps the doors open longer, driving up energy costs.

Revolving doors stabilize energy costs regardless of the amount of traffic, the time of year, or weather conditions outside. This ensures a maximum return on marketing and sales investment and a faster payback on your entrance.

Energy Savings MIT Case Study

- Average heat transfer per swing door passage - 78Wh (267 BTU)
- 1.3 hours of light from a desk lamp
- 4.3 hours of light from a compact fluorescent bulb
- Driving a car 306 feet
- Half a mile jog

Energy Costs

Revenue

Money

Traffic

Sliding or Swinging Doors

Revolving Doors

With sliding and swinging doors, as traffic and revenue increase, so do energy costs.

Revolving doors stabilize energy costs regardless of traffic levels, creating a payback on the investment.
Revolving Door Benefits

Slash Energy Costs
Revolving doors result in lower energy bills that offer a 100% payback in just a few years. They also provide predictable, consistent energy bills no matter how much traffic flows through the entrance.

Elevate the Experience
Create an inviting, pleasant environment that encourages customers to stay a while - grab a bite to eat, sip a cup of coffee, and continue shopping!

Re-purpose Valuable Space
If you have a double door vestibule, you can reclaim valuable indoor space to entice customers with promotions or display merchandise, ultimately resulting in higher revenue.

Extend your Brand
Use customization to accentuate a door with your brand color or logos and create a premium impression for your customers. Endless flexibility and possibility.
Revolving doors were originally invented to reduce air infiltration in the 1880’s and have come a long way since then. Today’s technology has made them easy to push, comfortable and safer than ever. Let’s see what’s new today...

## Then vs. Now

### Customer Experience

<table>
<thead>
<tr>
<th>Then</th>
<th>Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Difficult to Rotate</td>
<td>Easy to Push</td>
</tr>
<tr>
<td>Completely manual operation is challenging to push, with door wing weight limiting the size of the door.</td>
<td>Today’s power assist technology allows for a gentle push to begin ‘hands-free’ rotation. Doors can now be larger than in the past.</td>
</tr>
<tr>
<td>Door Wings Stop Anywhere</td>
<td>Intuitive Use</td>
</tr>
<tr>
<td>Rotation could end with wings in any position, creating a challenge for the next user. Greater air infiltration may be allowed with certain wing positions.</td>
<td>Door wings stop in just the right position, creating a natural path for entry and exit, as well as maximizing the seal against air infiltration.</td>
</tr>
<tr>
<td>No Brakes</td>
<td>Controlled Speed</td>
</tr>
<tr>
<td>Without any braking system, old-fashioned, free-spinning doors are dangerous.</td>
<td>The door wings always rotate at a controlled speed ensuring safe and comfortable use for all types of people.</td>
</tr>
</tbody>
</table>

### Architectural Features

<table>
<thead>
<tr>
<th>Then</th>
<th>Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Small Compartment Size</td>
<td>More Space, Increased Comfort</td>
</tr>
<tr>
<td>Older doors without any power assist have to be smaller so they can be pushed easily. Smaller doors mean tighter compartments that users will shun, negating energy savings if swing doors are used.</td>
<td>Larger diameter doors provide each user with greater personal space.</td>
</tr>
<tr>
<td>Options at a Premium</td>
<td>Cost-effective Options</td>
</tr>
<tr>
<td>Yesterday’s doors tended to be more ornate but had fewer options for size and materials. Customizations came at a premium price.</td>
<td>Modern manufacturing offers a wide variety of design possibilities cost effectively: wider / taller doors, various canopy heights, etc.</td>
</tr>
<tr>
<td>Simple Connections to Building</td>
<td>Variety of Connections</td>
</tr>
<tr>
<td>Older doors are connected at the midpost or throat opening, restricting architectural creativity.</td>
<td>Keyhole connections enable putting the door entirely inside, entirely outside, at various angles, and more.</td>
</tr>
</tbody>
</table>

### Security Options

<table>
<thead>
<tr>
<th>Then</th>
<th>Now</th>
</tr>
</thead>
<tbody>
<tr>
<td>Manual Locking Only</td>
<td>Electronic Remote Locking</td>
</tr>
<tr>
<td>Staff had to physically push a slide bolt lock into the floor or ceiling.</td>
<td>At closing time, the door can be locked remotely at the push of a button or by an access control system. Interior sensors prevent user entrapment.</td>
</tr>
<tr>
<td>Limited Access After-hours</td>
<td>After-hours Access Control</td>
</tr>
<tr>
<td>Manually locked doors (slide bolts or espagnolet locks) require after-hours staff to enter via other doors.</td>
<td>Doors can be integrated with access control systems to allow for after-hours entry.</td>
</tr>
<tr>
<td>No Emergency Locking</td>
<td>Emergency Lockdown</td>
</tr>
<tr>
<td>In case of an emergency or threat outside, there is no way to quickly lock the door from a remote location.</td>
<td>In the event of a security threat or critical emergency, the door can be locked in position immediately at the push of a button.</td>
</tr>
</tbody>
</table>
Security Options

The front entrance to a public building, such as a hotel, office building, condominium, or municipal building should include security options. Whether there is a physical threat occurring immediately outside the door, a need for authorized entry after hours, or the facility manager is locking up for the night, revolving door security options allow for an added layer of protection.

Remote Locking (360 Nightlocking)

Remote Locking enables electric locking of the door either manually from a remote location or automatically in conjunction with an access control/building management system. Once initiated, overhead anti-entrapment sensors scan the compartments for user presence. When the door compartments are clear, it stops in the “X” rest position and the electric locks engage.

Access Control Option

An available upgrade option with Remote Locking allows after hours access through the revolving door via an input from an access control system (provided by others).

Security Lockdown (360 Locking)

In the event of an immediate security threat or critical emergency, facility staff can electrically lock the door wings in any position, at the push of a remotely located button.

Manual Floor / Ceiling Locks

To secure a revolving door with manual floor or ceiling locks, a staff member inserts a key and manually slides the bolt into the locked position.

Exterior Night Locking Doors

To completely enclose the revolving door after hours, bi-parting, curved sliding doors can be manually closed and locked over the throat opening to prevent access to the door’s compartments.
Storefront Connections

Revolving doors can be connected to virtually any facade in a variety of ways. Connections enable you to optimize a building’s space utilization, create a dramatic statement, or even provide additional shelter for people and the door from the outside elements. When choosing the appropriate manual revolving door connection it is important to consider the effects of having the door mounted on the interior versus the exterior of the building. A protective building overhang is required for any door that is exterior mounted, because left unprotected, a revolving door is susceptible to the weathering effects of rain and snow, resulting in increased maintenance costs and a shorter lifespan.

**Angled Keyhole Connection**
Angled keyhole connections utilize 45° angled extensions that bring the door away from the building, and can be mounted at the interior or exterior.

**Standard Keyhole Connection**
Whereas the throat opening connection involves joining the revolving door directly to the building, a standard keyhole connection uses extensions to bring the door away from, or into, the building.**

**Throat Opening Connection**
A throat opening connection is ideal for saving space. The revolving door joins directly to the building and will reside either completely inside or outside the building.*

**Mid-Post Connection**
The most common connection used by architects and building owners is the mid-post connection. Half of the door resides inside the building, while the other half protrudes beyond the building envelope.*

**Angled Keyhole Connection**
Angled keyhole connections utilize 45° angled extensions that bring the door away from the building, and can be mounted at the interior or exterior.**

Building facade by others
*No additional connection materials needed
**Boon Edam supplies all connection materials
Building Overhangs/Awnings

The weather can have an immense effect on the wear and tear of any door. For this reason, any revolving door that is exposed to the outside elements should be complemented by a building overhang or awning. The awning protects the revolving door from the elements, and keeps snow and rain from getting inside, keeping maintenance costs low and adding extra life to the door.

Flooring Options

Selecting the appropriate type of flooring for a revolving door is important to reinforcing safe and smooth operation. On a rainy day, a slip-proof flooring material around the door prevents stumbling and falling. An internal stainless steel floor grate can collect dirt and debris from shoes, helping to maintain a clean entryway. A different flooring inside the revolving door can be selected to signify to the user the actual footprint of the revolving door wings, making entry more intuitive and natural. There are numerous other flooring options and they should all be considered to achieve every unique entry’s need.

*Flooring materials are provided by others

*Awnings are provided by others
Convenience Stores

When conventional sliding or swinging doors open, unconditioned air infiltrates the building as conditioned air escapes. Customers feel a blast of hot or cold air from the outside in addition to sensing fumes and outside noise. Revolving doors create a constant seal that allows only minimal air infiltration, up to 8x, compared to swinging or sliding doors. Guests are comfortable and stay longer, equating to higher sales and elevation of your brand.

Environmental Loss Zone
Represents area of store subject to extreme temperatures or humidity due to a constantly opening sliding or swinging door, thus significantly driving up energy bills.

Reclaimed Environment Zone
Represents area of store with comfortable, consistent temperatures regardless of the number of customers entering, thus elevating the customer experience.
Retail Stores

For a high-end retail store, revolving doors create an inviting, comfortable shopping experience for the customer. Not only does a revolving door eliminate the infiltration of dirt and debris, but it keeps the outside air outside, creating a peaceful interior that encourages customers to stay and shop while slashing your energy bills. Retailers can also place more merchandise beside the door, maximizing space for promotions.

Environmental Loss Zone
Represents area of store subject to extreme temperatures or humidity due to a constantly opening sliding or swinging door, thus significantly driving up energy bills.

Reclaimed Environment Zone
Represents area of store with comfortable, consistent temperatures regardless of the number of customers entering, thus elevating the customer experience.
Restaurants

A revolving door can be used to open up a restaurant and drive immediate sales from valuable floor space while maintaining an ideal climate and customer experience. Instead of having customers wait, they can enjoy a beverage and an appetizer at the bar while they wait for their table. Getting customers involved in the dining experience right at the front door is key.

Revenue Loss Zone
Represents area of restaurant where customers are secluded from the rest of the building as they wait for a table. Sales revenue is postponed. The small area is uncomfortable due to constantly opening swing doors or doors propped open due to long lines.

Reclaimed Revenue Zone
Represents area of restaurant that is now open to the bar area where customers can get a drink and snack while they wait for their table. The entire floor space is revenue driven as well as comfortable and inviting.
Airports

Large capacity revolving doors at an airport entrance not only maintain a comfortable climate inside the terminal building, but they allow travellers with large pieces of luggage to comfortably and easily pass through. One-way security revolving doors inside the terminal are effective at shepherding passengers from the terminal gates to the baggage claim areas. If anyone attempts to go the wrong way, weight detection mats on the floor and overhead sensors signal the door to stop and an audible message instructs the person to back out of the door.

Revenue Loss Zone
Represents an area of the terminal subject to extreme temperatures or humidity due to a constantly opening sliding or swinging door, thus significantly driving up energy bills and consuming space. Guards are needed to ensure one way traffic to baggage claim area.

Reclaimed Revenue Zone
Represents area of terminal with comfortable, consistent temperatures regardless of the number of passengers entering and exiting. Space at and around check-in desks is not an issue. One way security doors lead downstairs to baggage claim area and prevent backtracking.
Hospitals

Revolving doors create a comfortable climate for otherwise uncomfortable patients at a hospital. Froedtert Hospital in Wisconsin has implemented a concept that includes an exterior sliding door and interior automatic revolving door. This combination restricts heat and cold from entering the lobby, but also rain, snow and dirt. A vestibule is created between the sliding doors and the revolving door that offers a protective waiting area for patients and guests that is outside of the elements.

Environmental Loss Zone

Represents a hospital entrance subject to noise and extreme temperatures or humidity due to a constantly opening sliding or swinging doors. This creates high energy bills, allows dirt and debris to enter and creates an uncomfortable zone in the lobby.

Reclaimed Environment Zone

Represents a hospital with comfortable, consistent temperatures regardless of the number of people entering. The result is a peaceful and comfortable experience with stable energy bills.
Hotels

Ideally, hotels are a respite from the outside world and a place of comfort for weary travelers. With sliding or swinging doors, this experience is compromised as guests lounging, working or enjoying a meal in the lobby area can experience drafts of unconditioned air, wind, noise and debris. Revolving doors eliminate all of these symptoms, stabilize energy bills and create the environment originally intended.

Environmental Loss Zone

Represents area of hotel subject to extreme temperatures or humidity due to a constantly opening sliding or swinging door, thus significantly driving up energy bills and discouraging guests to use the lobby.

Reclaimed Environment Zone

Represents area of hotel with comfortable, consistent temperatures regardless of the number of customers entering, thus elevating the experience for all guests.
Office Buildings

Revolving doors enable office buildings to create a comfortable and secure interior, while also reinforcing the upscale, premium brands of the commercial tenants inside. Tall office buildings are relieved from the stack pressure that causes large volumes of air to pull into the interior and drive up energy costs. Reception staff gain a comfortable work environment and can reap the benefits of the optional security features that allow locking of the door at the push of a button.

Environmental Loss Zone

Represents area of office subject to extreme temperatures or humidity and an influx of debris and noise due to a constantly opening sliding or swinging door.

Reclaimed Environment Zone

Represents area of office with comfortable, consistent temperatures and clean interior regardless of the number of people entering. Energy bills are significantly reduced, especially in tall buildings, due to relief from stack pressure.