

# HOW THE PANDEMIC ALTERED HOTEL GUEST BEHAVIORS AND ROOM OCCUPANCY PATTERNS

Insights and opportunities

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CASE STUDY

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**Honeywell**

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# Abstract

The COVID-19 coronavirus pandemic has had a profound and lasting impact on the global travel and hospitality industries. This case study investigates the effects of the pandemic on hotel and (rented) guest room occupancy in the U.S. and discusses key insights and implications for hoteliers and other stakeholders in hospitality. In the five years prior to the pandemic, U.S. hotel occupancy consistently averaged above 65%, and most guests would vacate their rooms in the morning, leaving most rooms unoccupied during the daytime.

Following the emergence of COVID-19, hotel occupancy plummeted to historic lows, and room occupancy patterns changed dramatically, with most guests remaining inside their hotel rooms throughout the day. These dramatic shifts in guest behavior and new room occupancy patterns present hoteliers with new challenges and opportunities with both short and long-term implications for hospitality technology, operational efficiencies, guest satisfaction, and brand loyalty.

# HOSPITALITY ENERGY MANAGEMENT

Energy management in hospitality combines aspects of both residential and commercial climate control systems. Climate controls in hotels must provide comfort and convenience to an ever-changing variety of end users while also reducing excess energy usage and enabling other operational efficiencies for hoteliers.

Since these objectives are often at odds with each other, energy management in hospitality requires a system that can maintain this delicate balance. Hotel guests are given direct control over the temperature of their spaces; however, most guests are not directly paying for the utilities used during their stays (as these costs are included in the room rental rate) and are likely to prioritize their comfort and convenience over cost reduction or sustainability efforts. Although hoteliers (and many guests) would like to reduce excess guest room energy usage, savings cannot be achieved at the expense of the guest experience – which takes priority in hospitality. Another challenging dynamic in hospitality energy management is the inability to predict occupancy. Unlike in residential, commercial, or industrial applications where occupancy is more consistent and can be scheduled, occupancy patterns in hospitality can vary greatly from season to season, and room occupancy patterns can vary greatly from guest to guest. As such, climate controls designed for residential, commercial, or industrial applications do not sufficiently address the unique conditions and challenges facing energy management in hospitality.

Occupancy-based energy management systems (EMS) are designed specifically for hospitality, and there are a variety of system designs and configurations to meet the climate control needs of most any hotel, military housing, student housing or assisted living facility. “Energy-management technologies can reduce hotel energy consumption 25 percent to 35 percent by automatically responding to guestroom occupancy patterns and adjusting the thermostat to conserve energy for heating and cooling needs when a guest is not in the room, which, according to industry statistics, is about 50 percent of the time in most hotels.” (Hertzfeld, 2018).<sup>1</sup>

Today, approximately half of all U.S. hotels have installed some form of energy management system (AHLA, 2016),<sup>2</sup> and most major hotel brands require hoteliers to install individual guestroom HVAC controls with occupancy detection capabilities as part of their brand standards and in support of corporate strategic planning and sustainability goals.

While most hospitality energy management systems include some combination of thermostat, occupancy sensing capabilities and climate control logic, not all energy management systems are created equal. A Standalone EMS, such as a self-contained thermostat with a built-in motion sensor, follows a localized occupancy logic that initiates energy-saving climate control strategies (e.g. temperature setbacks) when its sensors can no longer detect motion in the guest room.

More advanced EMS thermostats can interface with a door switch sensor or wireless door lock to integrate door status (open/close) into its occupancy logic, which enables the EMS to declare the room unoccupied faster and more accurately, further increasing guestroom energy savings. Further, when integrated with a hotel's property management system, a Networked EMS incorporates real-time guest check-in and check-out information into its occupancy logic, enabling the system to initiate deeper temperature setbacks more quickly and maximize energy savings from unoccupied hotel rooms. A Networked EMS with PMS integration can enable up to double the potential energy savings versus a Standalone EMS. (Honeywell, 2020).<sup>4</sup>

Many Networked energy management systems also include supervisor software with system status, performance monitoring, and reporting capabilities to provide hoteliers with key insights and analytics, such as the guestroom occupancy patterns discussed in this study. Outside of the hardware and software components of a hotel's EMS, other factors can impact a property's energy savings, including the EMS maintenance, settings and configurations (such as temperature bands and setbacks), climate and weather (temperature and humidity), and the hotel's occupancy levels.

Hospitality energy management systems are designed to adapt to changing occupancy conditions to maximize energy savings. At lower occupancy levels, for example, a hotel's EMS has more opportunities to reduce heating and cooling runtimes (i.e. more unoccupied rooms in which to initiate temperature setbacks), so energy savings will typically be much higher. When occupancy levels are high, there are fewer opportunities to generate energy savings from unrented hotel rooms, and the hotel's EMS can only reduce heating and cooling runtimes when (rented) rooms are unoccupied, e.g. when guests vacate their rooms during the daytime. Over the past year, most hotels with a PMS-integrated Networked EMS reported more than a 50% reduction in guestroom HVAC runtimes (versus prior year), with this above-average energy savings performance being driven by historically low occupancy rates during the pandemic. In a recent article from Smart Energy Decisions, "data shows that customers' HVAC electric consumption is 7 to 15 percent lower than before COVID entered the picture. This reduction in electric usage is largely driven by reduced hours of building utilization, fewer employees and customers in the buildings, and less equipment operation." (Hensley, 2021).<sup>5</sup> Hospitality energy management systems maximize savings during times when guest room utilization is low – when hotel rooms are unrented as well as when guests vacate rented rooms.

## UNDERSTANDING "OCCUPANCY" IN HOSPITALITY ENERGY MANAGEMENT

For the purposes of clarity in this study, Hotel Occupancy, Room Occupancy, and Guest Occupancy are defined as follows:

**HOTEL OCCUPANCY** represents the proportion of all available rooms in a hotel that are actively rented by guests at any given time. This is the most common use of the term "occupancy" within the hospitality trade. (The average U.S. Hotel Occupancy rate for 2020 dropped below 45%, a decrease of more than 33% versus prior year (Lock, 2021).<sup>3</sup>)

**ROOM OCCUPANCY** represents the proportion of all available rooms in a hotel that are physically occupied at any given time. While the vast majority of the measured Room Occupancy is from guests occupying their rented rooms, a small portion of Room Occupancy (up to 30 minutes per room per day) may be attributed to housekeeping or other staff entering and occupying the hotel room during the day (although many hotel's cleaning protocols have changed during the pandemic, reducing this figure). Room Occupancy is one of the core metrics analyzed in this study. (A Networked EMS with an on-premises or cloud-based software supervisor is typically required to monitor and record Room Occupancy data.)

**GUEST OCCUPANCY** – or rented-room occupancy – represents the proportion of *rented* hotel rooms with a person physically in the room. When a rented hotel room is physically occupied by a guest or staff, the status of the room is often referred to as "**Rented|Occupied**"; and when a rented room is vacated by the guest, the status changes to "**Rented|Unoccupied**". (PMS integration with a Networked EMS is required to monitor and record Guest Occupancy data.)

## TRADITIONAL GUEST OCCUPANCY PATTERNS (2019)

Prior to emergence of the COVID-19 novel coronavirus outbreak and subsequent global pandemic, Guest Occupancy rates followed a relatively predictable hourly pattern throughout the day. While the Room Occupancy pattern may vary by location and season, most rented hotel rooms would be left unoccupied during the daytime, with roughly half of guests leaving their rooms in the morning (typically between 6:30AM and 10:30AM) and returning in the evening (most often between 8:30PM and midnight), where most would remain in their rooms until the next morning. At most U.S. hotels, guest check-in begins around 3:00pm, resulting in a slight increase in the hourly Guest and Room Occupancy during the late afternoon (up to around 6:00PM) before declining once again around dinnertime. In the example property highlighted in Figure 1, the average hourly Room Occupancy rates were plotted for each month. (The data in this study was measured and recorded by Honeywell International, Inc. using INNCOM INNcontrol supervisor software from U.S. hotels with a Networked EMS with PMS integration.) During the 12-month period in this sample, the property averaged approximately 78% Hotel Occupancy, with individual monthly occupancy rates ranging from about 65% to 95%; the highest occupancy rates were seen during the spring months, and the lowest were seen in the autumn. While the property's Hotel Occupancy was above the national average, the hourly Room Occupancy pattern is common across most U.S. hotels throughout the year.

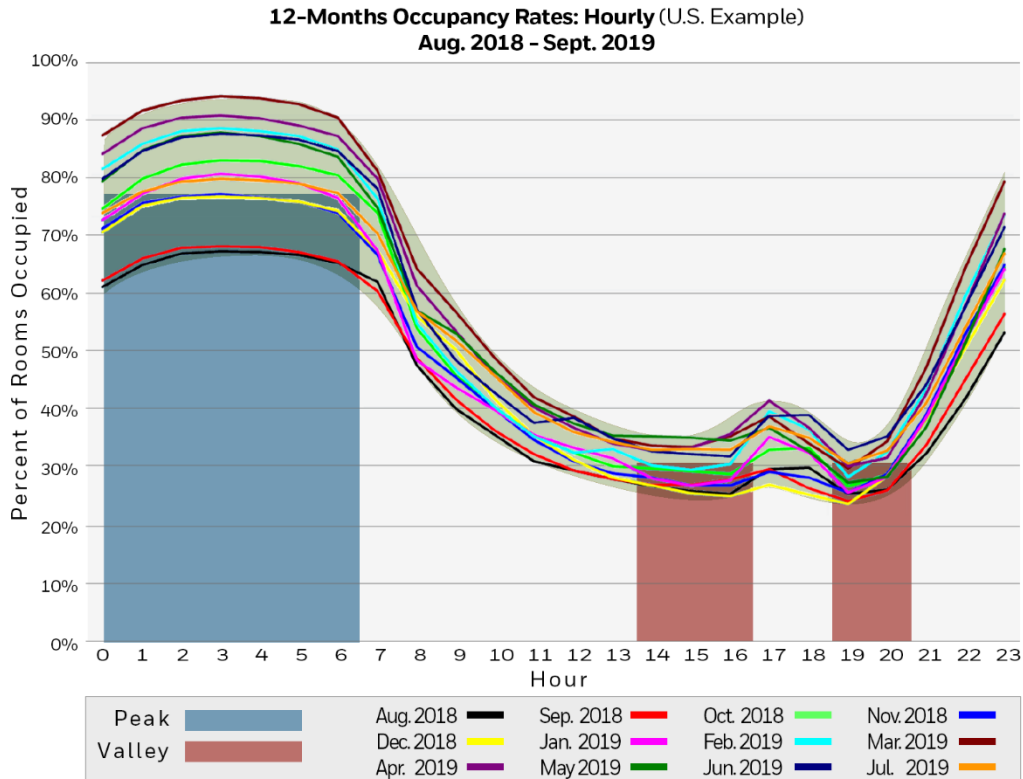


Figure 1 – Hotel Room Occupancy: Hourly (historic)

## PANDEMIC GUEST OCCUPANCY PATTERNS (APR. 2020 – MAR. 2021)

The COVID-19 pandemic drove a significant decline in Hotel and Room Occupancy rates in the spring of 2020, and the hospitality industry has since been enduring a slow recovery. In April of 2020, the U.S. Hotel Occupancy rates in most major markets had dropped below 25% to about one-third of their normal levels (STR, 2020).<sup>6</sup> Key hospitality metrics – such as Hotel Occupancy, Average Daily Rate (ADR) and Revenue Per Available Room (RevPAR) – declined almost instantly to historic lows and have only recovered about half of the losses in the year since the emergence of the pandemic (Weinstein, 2021).<sup>7</sup> In the months following the arrival of the pandemic last year (April through December 2020), U.S. hotels (that remained in operation) averaged only 41% occupancy (compared to 66% in 2019).

After the pandemic arrived in the U.S., Room Occupancy dropped proportionally with Hotel Occupancy; however, the Guest Occupancy rates changed dramatically beginning in April of last year. While Hotel Occupancy was at historic lows, Guest Occupancy was at historic highs. At hotels across the U.S., the hourly Room Occupancy curve flattened significantly as most hotel guests remained inside their rooms throughout the day. The upper and lower limits – or peaks and valleys – of the hourly Room Occupancy curve stayed within a narrow band,

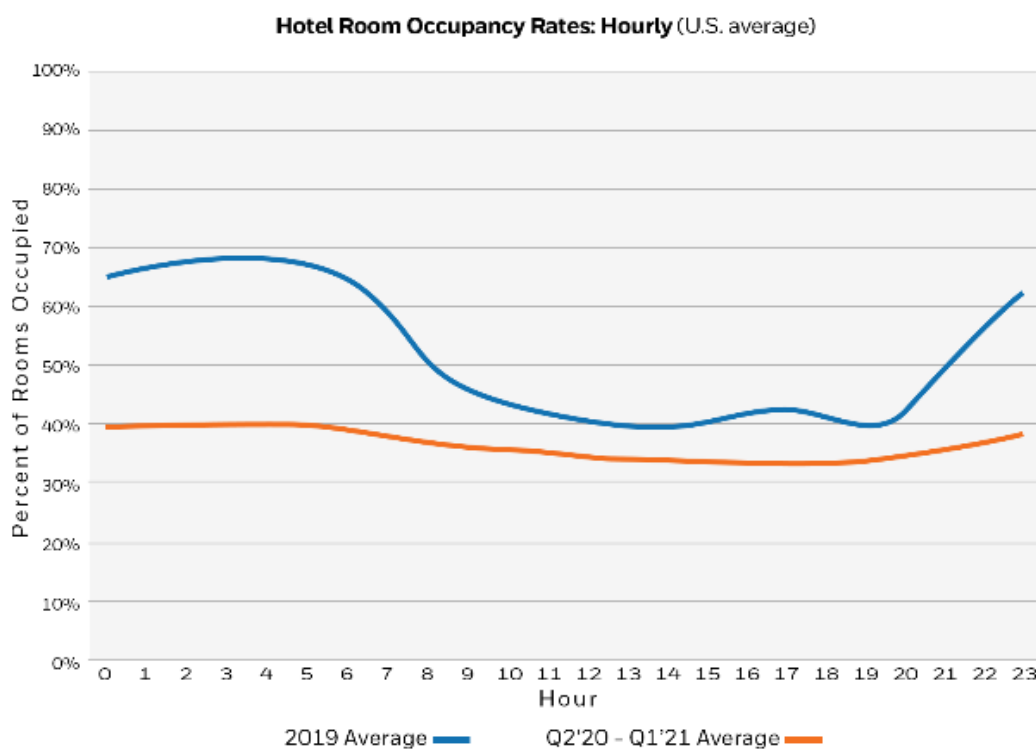


Figure 2 – Hotel Room Occupancy: Hourly (U.S.)



indicating that few guests have been vacating their rented rooms during the daytime. During pre-pandemic times, the majority of guests would leave their hotel rooms unoccupied during the day; however, over the past year, the hotels sampled in this study reported less than 15% of rented guest rooms were left unoccupied during the daytime hours. In summary, when the pandemic emerged, Hotel Occupancy dropped and hourly Room Occupancy leveled off, as Guest Occupancy rates (in rented room) increased significantly. While the authors recognize the limitations of a small sample set, the properties sampled were located in major cities across the U.S., and each reported the same drastic shift in their Hotel, Room, and Guest Occupancy patterns immediately following the emergence of the pandemic. Further research should be conducted with an expanded sample set to validate this trend and identify other potential variables, such as property type, category, or brand.

# TRACKING THE RECOVERY

Hotel Occupancy began to show signs of improvement in early 2021, however, Guest Occupancy rates remained relatively high and unchanged throughout the past year.

Guest Occupancy rates were at their highest between April and December of 2020, when Hotel Occupancy was at its lowest. U.S. Hotel Occupancy increased to 46% in Q1 2021 and continues to improve each month, with occupancy averaging above 55% in April (STR, 2021).<sup>8</sup> While these results are encouraging, most hotels are not expected to fully return to pre-pandemic occupancy levels (above 65%) until 2023 (CBRE, 2020).<sup>9</sup> The hotels sampled in this study reported a similar increase in Hotel Occupancy and reduction in Guest Occupancy rates in the first quarter of 2021, as more guests are leaving their hotel rooms during the daytime; however, a full recovery could take years. As Hotel Occupancy rates continue to recover, the amount of time guests spend in their rooms is expected to decrease, and the Room Occupancy pattern should begin to return to its pre-pandemic curve; however, further tracking of these key occupancy metrics will be needed to validate this trend and correlation.

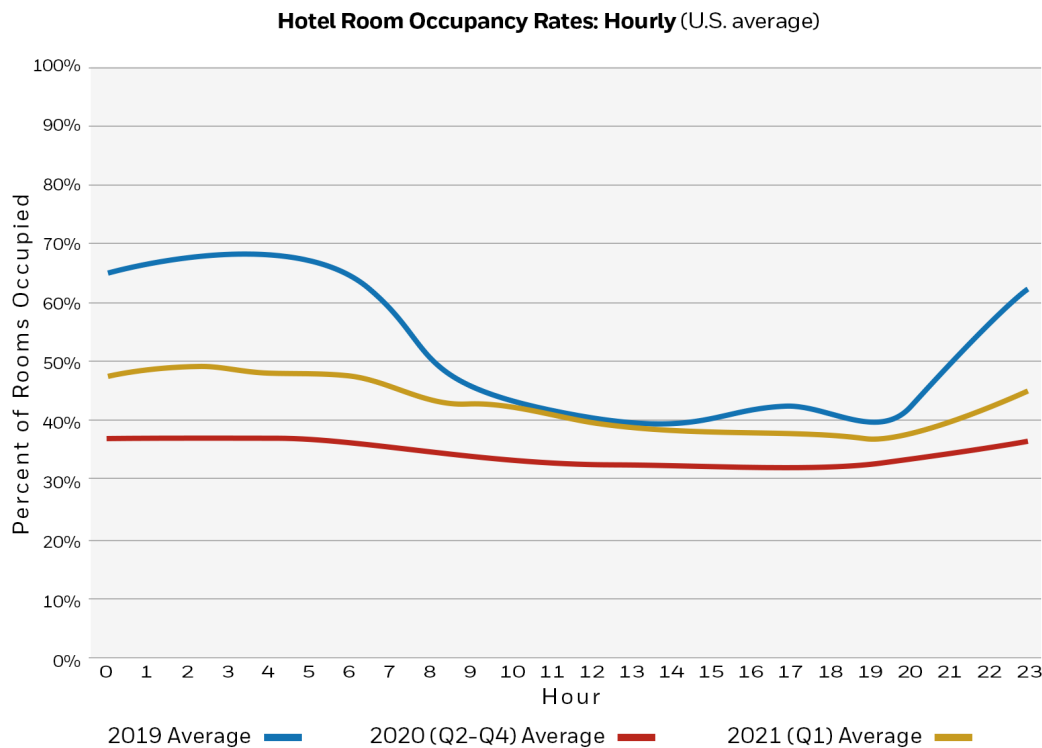


Figure 3 – Hotel Room Occupancy: Hourly (U.S.), Q1 2021

# REGIONAL VARIANCES

Although the sample set for this case study was limited, the authors did observe some regional differences in Room Occupancy in Q1 of 2021. In Figure 4, the sampled property in California reported a small increase in Hotel Occupancy while Guest Occupancy remained relatively unchanged in Q1. Similar results were reported from hotels sampled in Colorado and Washington, D.C. The sample property in Florida, however, reported a much larger increase in Hotel Occupancy along with a much bigger decrease in Guest Occupancy rates through March of 2021. As a result, the Room Occupancy curve for the Florida sample appears to be experiencing a more accelerated recovery and returning to its pre-pandemic curve much faster than the other properties surveyed. Figure 5 shows the hourly Room Occupancy curves for the Florida hotel sampled in this study, comparing 2019, 2020, and Q1 2021. In Florida, the Q1 Room Occupancy curve tracked more closely with the pre-pandemic curve than with the 2020 curve (Q2-Q4), which suggests hospitality in that region may be much closer to a return to normal. Regional differences in occupancies may be driven by seasonal shifts, local events, and/or social distancing policies; however, this suggestion is purely speculative and outside the scope of this study.

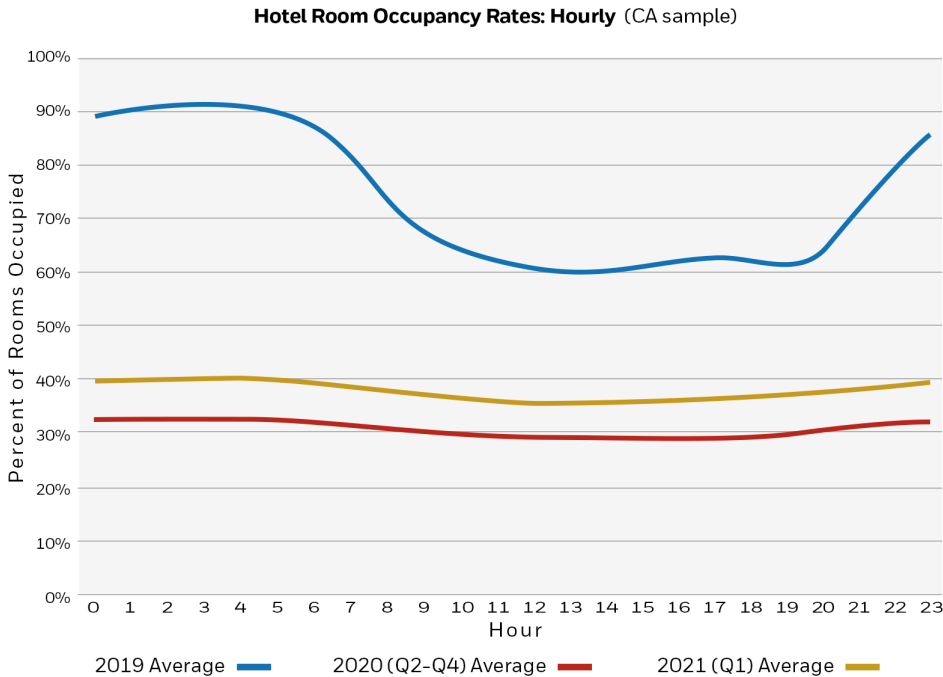


Figure 4 – Hotel Room Occupancy: Hourly (sample California hotel)

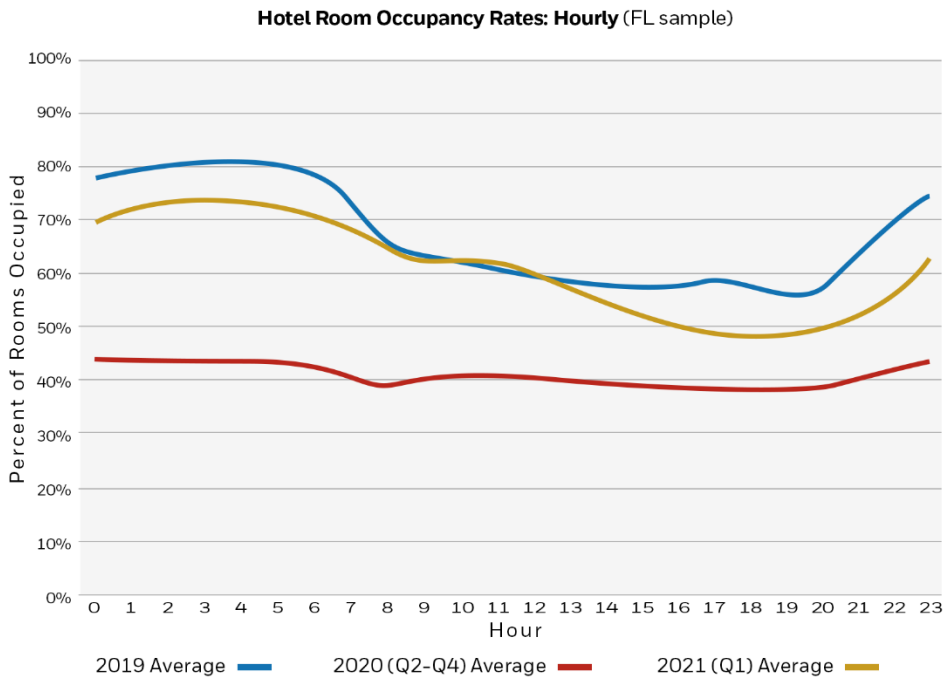


Figure 5 – Hotel Room Occupancy: Hourly (sample Florida hotel)

Hospitality occupancy metrics should continue to be monitored as possible proxies or key performance indicators for regional tourism activity and/or local economic recovery. In general, most tourism (spending) happens outside of the hotel room. While Hotel Occupancy closely correlates to the financial performance of a hotel, Guest Occupancy may be inversely related to the (economic) activity happening in the local community; however, this theory would require further investigation and is outside the scope of this study. As Hotel Occupancy continues to recover in 2021, Guest Occupancy patterns will continue to provide key insights into the changing attitudes, behaviors and mix of today’s hospitality guests.

## INSIGHTS AND IMPLICATIONS FOR HOTELIERS

A year has passed since the emergence of the COVID-19 pandemic, and the hospitality industry has recovered about half of what it lost. The “new normal” for hospitality remains to be seen, and hotel guest personas, attitudes, and behaviors are constantly changing. “The hotel industry will need to continue to evolve to meet the ever-mercurial demands of guests as part of what has become a ‘quarantine culture’” (Mogelonsky & Mogelonsky, 2021).<sup>10</sup> Hoteliers must continue to monitor and adapt to their guests’ needs to ensure their hotels are structured to drive profitable growth through and beyond the recovery. The pandemic has challenged hoteliers, both financially and operationally, but it has also helped identify opportunities for new operational efficiencies for the future. As such, hoteliers need new and innovative hospitality offerings and capabilities to meet the needs of both guests and operators as they continue to define the new normal for hospitality.

Although the new normal is yet to be fully defined, hoteliers are already beginning to examine hotel designs (including floorplans, layouts, and general use of space), technologies, amenities, and other guest-facing features both inside and outside the guest room. Hoteliers are evaluating new “in-room amenities that focus on wellness, fitness, beauty, entertainment or productivity” and socially-distanced, low-cost-to-serve food and beverage services, such as employee-served buffets and expanded grab-and-go offerings (Mogelonsky & Mogelonsky, 2021).<sup>11</sup> Many full-service and luxury properties have been enhancing premium amenities, such as additional upscale room service offerings, fine dining experiences, and even a mobile apps for more convenient ordering (Gibson, 2021).<sup>12</sup> Indoor air quality (IAQ) is also becoming a fast-growing need for hoteliers, especially as guests are spending more time inside their hotel rooms. Hospitality technologies, such as Wi-Fi networks and building controls, also require further infrastructure upgrades and additional investments into more versatile and efficient solutions. While these new unmet needs may have been prompted by the pandemic, many changes are expected to become permanent moving forward, as both hoteliers and guests are learning – and redefining – value in hospitality.

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