

# Urban Journeys

KONE References 2017

The background of the entire page is a photograph of several people practicing Tai Chi in a large, open public square. The scene is captured at sunset or sunrise, with the sky transitioning from a pale blue to a warm orange and yellow. The silhouettes of the practitioners are dark against the bright sky. In the background, the city skyline is visible, featuring prominent buildings such as the Oriental Pearl Tower on the left and the Shanghai Tower in the center. The ground is wet, reflecting the low sun and the silhouettes of the people.

Improving cities  
one project at a time





## The shape of things to come

Our customers offer remarkable examples of how life and work in cities is evolving. With the world's urban population expected to increase from 3.5 billion today to 6.3 billion by 2050, there are new needs for buildings and infrastructure, for living standards, for safety and for the creation of sustainable societies. These needs and trends are defining the shape of things to come.

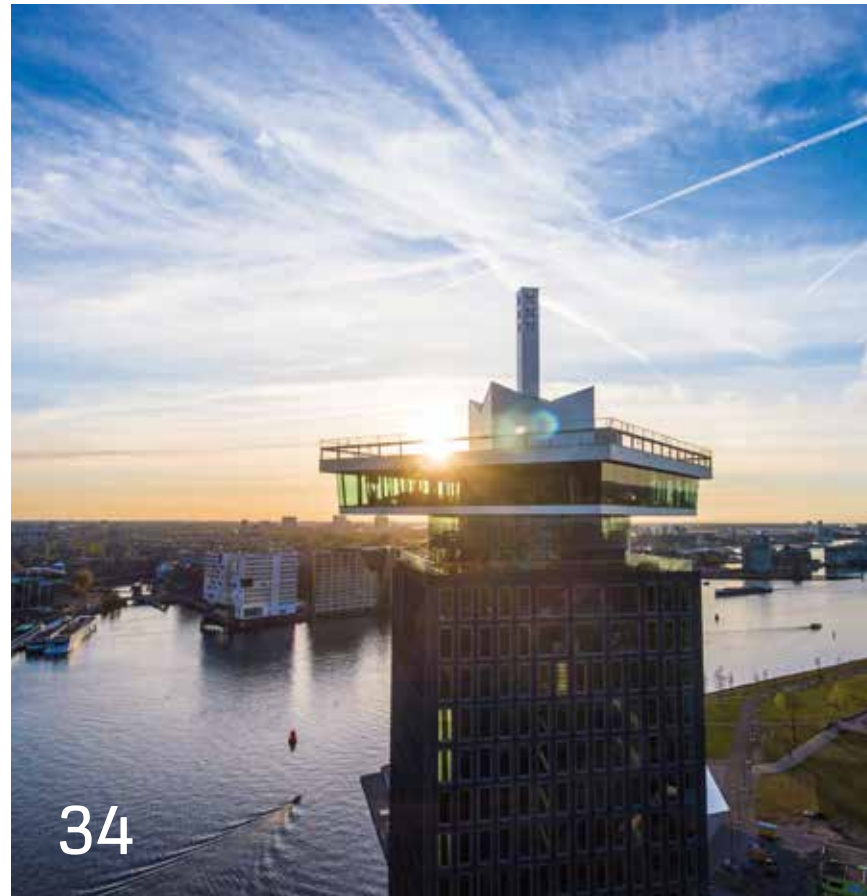
Changing demographics show that this is already happening. People are forming families later, living longer and choosing not to move into suburbs. Societal patterns like this also have an impact on how cities need to function. Therefore it becomes important to consider what is happening outside of the building as well as on the inside. We need new thinking and ideas for the nature of infrastructure, accessibility and how people can move around safely and smoothly. Our customers see the value in improving and modernizing existing cities and buildings, as well as new developments, all of which bring potential for innovation.

At KONE, we are excited and proud to work closely with our customers in these urban journeys, and it is an honor to showcase some of our joint projects in this new reference collection.



**Henrik Ehrnrooth**  
president & CEO, KONE Corporation





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## Rise of the cities

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**WITH OVER TWO-THIRDS OF THE WORLD'S POPULATION** set to live in urban environments by 2050, cities have no option but to go vertical to accommodate rising numbers. It is essential that the flow of people in these future cities be streamlined and directed in a smooth and seamless manner, to ensure their comfort and happiness.

High-rise buildings dominate Hong Kong's skyline.  
PHOTO Mike Van Schoonderwalt





# Building tall

TEXT Steve Roman PHOTO Martin Adolfsso

**T**all buildings can be viewed as valuable pieces of real estate, works of art or symbols of prestige. For **David Malott**, founding partner in the New York-based architectural firm AI and chairman of the Council on Tall Buildings and Urban Habitat, they're nothing less than humanity's future.

"From a planetary perspective, as the world's population grows, we need to compact the footprint of civilization," he says.

Urbanization, Malott points out, continues to be the global trend. Even in the developed world, cities that were once defined by post-manufacturing blight are now seeing a renaissance as they become hubs for technology and service-based economies. "People want to live in the cities again. That's where the energy is. That's where the opportunities are."

That, says Malott, has already led to the ramping up of high-rise construction as well as a massive interest among technologists in ways to build taller, smarter and more user-friendly buildings than ever before.

"I think we're still just at the beginning of it all. There are more tall buildings built in the last 20 years than in the preceding 100 years, and the pace of it only seems to be accelerating.

*In 2020, the world will see the completion of its first 1,000-meter-plus building, the Jeddah Tower in Saudi Arabia. While the achievement is guaranteed to evoke wonder and bold headlines, the real story lies in how demographic shifts and groundbreaking innovation could soon cause the number of skyscrapers in urban centers to mushroom.*

The overall trajectory is one of moving upwards, not outwards," he says.

**IN TERMS OF ENGINEERING**, Malott says, we can soon achieve buildings that are a mile high (1,600 meters) using the same fundamental technology that has been in use for the past 40 years. Incremental improvements in steel and concrete, the construction materials of choice, have been nudging the height ceiling upward over the decades, but now surpassing the current threshold would require what he calls a "quantum leap in innovation."

Malott cites the advent of KONE UltraRope, a carbon-fiber replacement for steel elevator cable, as one such leap.

He believes that other radical advances, only a year or two away, will similarly involve moving from steel and concrete to organic, carbon-based materials. One example is the renewed interest in wood, specifically wood combined with concrete to make composite structures, as a construction material for tall buildings. It has already been used to create buildings of up to 20 stories, he says.

Likewise, advances have been made in using crushed mushroom stems mixed with wood chips as a hardened, insulating material. Malott predicts that further in the future, perhaps in a couple of decades, buildings will feature bacteria-infused fabrics that can

respond to heat by becoming porous.

"It's much more sustainable to grow materials instead of mining materials, and it's more sustainable to spin fabrics together into stronger structures than it is to melt steel," he says.

"I want to heal and repair our planet because we're beyond the point of simply sustaining what we have. We have to do something radically different. Growing and harvesting buildings is definitely going to be something of the future."

**FORTUNATELY, DEVELOPMENT** in tall buildings isn't just about setting new height records, but involves making the buildings themselves more capable with the help of improved computer power.

Malott predicts that, as machine learning and AI advance, an abundance of sensors, which are now cheaper and better than ever, will act as a building's central nervous system, making it far more responsive than before.

Not only will the building be able to measure and adjust for changes in light or check structural soundness, but also get to know its users, providing each with a customized experience, Malott says. "There's going to be a more intimate connection between building and user. Just like with our apps and our music, buildings will be able to tailor themselves to each individual user, and that is going to be a game changer." /

## High-rise building facts from around the world

# 125

super tall (over 300 meters) buildings and 3 mega tall (over 600 meters) buildings have been completed globally.

# 530m

Guangzhou CTF Finance Centre became the tallest building to be completed in 2016.



### TYTYRI: The world's only underground elevator testing facility

- 1 KONE's Tytyri test lab is the only underground elevator testing facility in the world.
- 2 Built in an active limestone mine, the facility is used to test elevators for heights up to 350 meters.
- 3 The facility contains 11 elevator shafts with a combined length of 1.6 kilometers.
- 4 KONE can test elevator speeds up to 70 km/hour or 19 meters per second in this facility.
- 5 The unique free-fall tests conducted here to test deceleration and braking see elevator speeds reach up to 90 km/hour or 26 meters per second.
- 6 Advanced products including the KONE UltraRope®, which has effectively doubled the height to which a building can be constructed, are tested in this facility.
- 7 Elevators used in some of the world's tallest buildings, including the Jeddah Tower, China Zun and Marina Bay Sands, have been tested at the Tytyri facility.

# 11

buildings measuring over 200 meters were built in Shenzhen in 2016, the most in any single city.

# 84%

of buildings measuring over 200 meters were built in Asia. China topped the ranks for the ninth year running with 66% of these buildings.

# 53%

of tall buildings were built with composite structural systems that optimize the use of steel and concrete.

# 128

buildings of 200 meters' height or greater were completed around the world at the end of 2016.

# 1,168

buildings measuring over 200 meters have been completed around the world so far.

Source: Council on Tall Buildings and Urban Habitat 2016





TEXT Aaron Ites  
senior vice president, New Construction Business, KONE Americas

PHOTO KONE

## Who dares wins

**T**he power of technology is redefining how we travel, socialize, get entertained and pretty much how we live. In the last two decades, we've also got a lot smarter. It isn't an aberration, but an evolution of an era of smart generation driven by gadgets that offer comfort and connection.

The construction industry, though, hasn't been quite ahead of the curve in digital technology. In fact, as per a recent McKinsey report, the industry is among the least digitized. But as urbanization fuels new construction, there is a growing need to have smarter solutions. This is because we're no longer in the business of just transporting people within buildings. We're now in the business of providing them with an experience.

**AT KONE, TECHNOLOGICAL** innovation is something we're deeply passionate about. It is prominently on display in the high-growth areas of the United States. Seattle, the Bay Area, New York, and Dallas are all in the race to be known as the high-tech hubs of the US. These are also the hotspots where our New Equipment Business is thriving.

To meet and exceed expectations, we give our customers the technological edge right from the start. Take for instance our KONE JumpLift technology. It is a beaming example of how we are helping builders cut construction time with smart solutions that drive schedule compression and save costs. We are not only accepting the new way in which buildings are being designed, built, and

managed, we are also getting involved in the process. Mindful of the fact that fixes are hard and expensive when things are physical, but a lot simpler when they are digital, we are integrating Building Information Modeling (BIM) in our systems and working closely with architects right from the design phase. The idea is to get a pulse on the varied demands of different environments.

So while in an uber-cool neighborhood, safety, speed, comfort, and visual appeal of people flow solutions become paramount, in a fast-paced office environment, time is of great essence over and above the other aspects. Getting passengers in and out of elevators at the right time in the latter would be critical. This is why our guidance and destination dispatch technologies – which group passengers for the same destinations into the same elevators – thereby reducing waiting and travel times – are increasingly taking precedence over speed.

**THE ROAD AHEAD IS EVEN** more interesting. The proliferation of mobile, Internet of Things, cloud computing, and sensors and big data will challenge the status quo in the industry and make room for interesting innovations.

According to the McKinsey report, new building materials, such as self-healing concrete, aerogels, and nanomaterials, as well as innovative construction approaches, such as 3-D printing and preassembled modules, can lower costs and speed up construction while improving quality and safety. So why not give it a chance? After all, it's a brave new world out there, and we can be its trailblazers. /



*“We’re no longer in the business of just transporting people within buildings. We’re now in the business of giving them an experience.”*



# A harmony of design and technology

Since its launch in November 2016, Hamburg's Elbphilharmonie has come to symbolize the unique relationship between design, technology, culture, and above all, limitless ambition. The arched escalator built here is testament to that.

TEXT Ronak Kotecha PHOTO The Elbphilharmonie & KONE







The Elbphilharmonie – Germany



### Poetry in architecture

**KONE installed the world's first arched escalators at the Elbphilharmonie in Hamburg, Germany.**

**The two arched escalators are more than 80 meters in length and are the longest in Europe.**

**These arched escalators were specially designed for the Elbphilharmonie music hall and climb to a height of 21.43 meters.**

**They are designed in the shape of an arch, giving users the experience of travelling in an 'endless' escalator since they cannot see the other end.**

**Several small drive units were used instead of large central drives to make these arched escalators possible.**

**The weekend after the Elbphilharmonie opened, nearly 13,000 people traveled on these escalators each day.**



## Summary

### CHALLENGE

- Provide solutions capable of transporting the thousands of people who visit the center every day.
- Develop an escalator worthy of the Elbphilharmonie, one of the unique music and events centers in the world.

### SOLUTION

- Work closely with the architect to ensure that the final product meets his vision for the Elbphilharmonie.
- Develop the world's first arched escalator that will enhance the travel experience of the people visiting the center.
- Work closely with the developer to ensure that all building schedules are met.

### FACTS

The Grand Hall, the heart of the Elbphilharmonie, can seat 2,100 guests.

Architect and main developer: Herzog & de Meuron

Contractor: Hochtief Infrastructure GmbH

### KONE SOLUTIONS

2 KONE arch escalators

20 year, full-service maintenance contract

**H**amburg is a city which celebrates art, music and the finer things in life. A great example of a structure that symbolizes the city's spirit is The Elbphilharmonie.

From the outside, Elphi (as the locals affectionately call it) is a brick-and-glass high rise that looks like a swanky ocean liner docked in the city's harbor. Nestled inside this 110-meter-high, 26-story mega structure, is one of world's top ten concert halls, mixed use apartments, and even a five-star hotel.

**THE BUILDING HAS BEEN DESIGNED** to give an acoustic experience like no other, helping visitors revel in an aural extravaganza. A journey that starts with an elaborate entry into the auditorium via a unique 80-meter-long arched escalator. The two-and-a-half-minute ride on this moving work of art sets the pace, slowly building up anticipation, as the passengers cannot see the other end thanks to the arch.

"The escalator is an innovation in design and technology that has never been built so far," declares Dr. **Heiner Zeiger**, project manager – Escalator R&D at KONE Germany, who was behind its creation.

As such, the design and installation of the arched escalator was an epic task. The first task was to make the escalator look visually appealing, befitting a structure as elegant as the Elbphilharmonie itself.

The KONE team used glass to give a mirrored effect, while stainless steel cladding and colors were used to mimic the atmosphere of the concert hall.

But that was just the outside. The inside presented an even greater challenge to the KONE team consisting of Dr. Zeiger, mechanical designers **Winfried Lanzki** and **Alfred Thiel** as well as electrical designers **Andreas Tautz** and **Rolf Carsten**.

**"FIRST, WE HAD TO UNDERSTAND** the loads and forces, the reactions not only between the escalator and the building design but with the concert hall itself," explains Dr. Zeiger. In doing this, they had to ensure that the noise from the escalator was in balance with the Elbphilharmonie concert hall's acoustics.

The opening week of the Elbphilharmonie saw over 30,000 people visit the building, and depending on the season, these numbers would still range from 14,000 to 20,000. That's a tremendous amount of pressure borne by a machine that runs almost non-stop. The team had to ensure that the equipment was of the highest quality, to handle the sheer capacities that the arched escalator would have to endure.

That's not all. Technologically, the biggest challenge was to distribute power to the arched escalator evenly and consistently, a task that, says Dr. Zeiger, involved a lot of out-of-the-box thinking.

"To achieve this, we used multiple sectional drives through a modular drive system operating the step band of the escalator with specially designed sprockets."

All this planning and work finally came together to make the arched escalator a stunning and vital component of the Elbphilharmonie. Taking us into a future where technology and culture takes center stage. /





# Onward and upward

The pull of the global urban magnet is drawing the workforce toward the heart of big cities. This means building upward instead of outward. This trend is clear in Mexico City where demand for office spaces is growing. Read on to see how intelligent solutions are transforming the traditional office building.

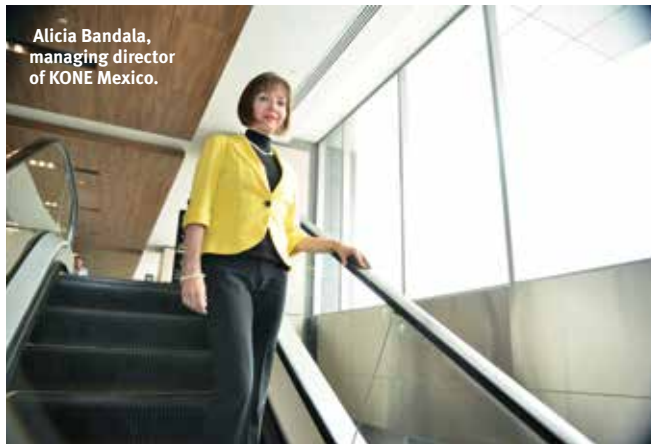
TEXT Tim Bird PHOTO iStock & Irina Minaeva







Carlos Salame  
of the Cinsa  
construction  
group.



Alicia Bandala,  
managing director  
of KONE Mexico.

*“Torre Anseli is representative of the steadily growing Mexican office space market.”*



**M**exican developers are busy building public transport networks, schools, hospitals, malls and other services within urban districts, rather than on its peripheries. Vertical construction is the name of the game in the Mexican capital and in cities like Monterrey, Guadalajara, Tijuana and Chihuahua.

The up-and-coming trend lies in the office space segment, though.

Coldwell Banker Commercial has estimated that between 2016 and 2020, about 500,000 square meters will be added annually to the national total.

“Office space in the capital can be categorized into 10 main corridors for major projects,” says **Alicia Bandala**, managing director of KONE Mexico. “A related trend has been the growth of smaller office buildings on secondary streets within main office corridors, usually offering less than 20,000 square meters each. At the beginning of 2017, some 54% of 39 office blocks under construction in Mexico City were smaller units.”

Torre Anseli in the Avenida Revolución is representative of the steadily growing Mexican office space market. It is a new office building where KONE was called upon to provide optimal vertical transportation without sacrificing maximum rentable space.

**TO AID PEOPLE FLOW IN THESE** buildings, while maximizing rentable space, KONE teamed up with first-adaptor developers to produce high-tech solutions for vertical transportation in their buildings. Torre Anseli, for instance will be the first building in Mexico City to have KONE’s double-deck elevators installed. This

coupled with KONE’s People Flow Intelligence solutions will provide tenants with easy, smooth transit in the building.

“The turnstiles and card readers match in a minimalistic and elegant style that provides visual comfort and a safe, enjoyable user experience,” says Bandala. “And a cherry on the top of the cake is the fact that users with special permits can be provided with remote call access through their mobile phones, so they can request an elevator even as they enter the facility.”

**KONE’S PEOPLE FLOW SOLUTIONS** optimize traffic, reducing the size and number of elevators needed in a building, and they’re seamlessly integrated with existing systems to provide maximum security while ensuring smooth people flow.

“Elevators in this building are customized pieces of

equipment that are not from a standardized catalogue. Each one has to be designed carefully and adapted to the demands of the architect and the engineer’s projects,” points out Bandala.

Which is why KONE was involved from the very start of the project as both a consultant and an advisor, supporting the customer’s executives in their decision making while providing attractive solutions. KONE’s proven ability to provide solutions in landmark projects across the world gives customers the reassurance that they are in good hands, notes Bandala.

The customer agrees. “Torre Anseli is an iconic project for Mexico,” says **Carlos Salame** of the Cinsa construction group that developed the project. “It is the first building with a complete set of KONE Access solution. It has increased our rentable area to our satisfaction.”

If the feedback from the customer in this case is anything to go by, KONE is definitely in for the long haul.

“We have clearly demonstrated our status and experience in important and complex projects such as Arcos Bosques I and II, Plaza Carso, and Pabellon M. And we have some other very interesting projects coming soon in Mexico City, in which we are delivering the best People Flow experience, including Torre Manacar, Torre Reforma 509 and Torre Latitud,” emphasizes Bandala.

The real estate market in Mexico looks bright in the coming years, with many old buildings offering opportunities for redevelopment. And KONE is also preparing for increased digitalization of its maintenance services, including offering customers predictive maintenance solutions. /



*“Torre Anseli is the first building in Mexico with a complete set of KONE Access solution. It has increased our rentable area to our satisfaction.”*

## Summary

### CHALLENGE

- Find a way to fit enough elevators and increase rentable area.
- Create a solution that makes VIP tenants feel special.

### SOLUTION

- Integrate KONE's entire People Flow Intelligence portfolio to optimize traffic and reduce the size and number of elevators needed in the building.
- Integrate KONE's equipment with existing solutions to provide maximum security while ensuring smooth people flow.

### FACTS

Height: 130 meters

Developer: Moises Farca & Salame Family

Architect: Colonnier y Asociados

### KONE SOLUTIONS

Integrate elevators with access control and turnstiles

16 KONE Double Deck elevators

2 KONE MiniSpace™ elevators

12 KONE MonoSpace® elevators

2 KONE TravelMaster™ escalators

KONE Destination control system

16 KONE KT turnstiles

KONE Access™

KONE Remote Call™ smartphone application

KONE InfoScreen communication solution

KONE E-Link™ monitoring system



**A**bu Dhabi has gained great wealth from its oil and gas resources, but authorities have worked hard to diversify their economy and make it more sustainable. Investments have been made in a variety of sectors, including tourism. The number of tourists is currently growing at about a 15 percent annual rate and the region is expected to have 7.9 million annual visitors by 2030.

To meet this demand, transport infrastructure has been upgraded, retail stores have been opened, and new malls, museums and art galleries are springing up throughout Abu Dhabi. All these tourists need places to stay, so hotel construction is also booming, with an estimated 74,000 hotel rooms required to meet expected demand.

Yet space is limited. Like Manhattan, most of the city of Abu Dhabi is on islands and the best way to expand is upward.

The luxurious and ultra-modern Four Seasons Hotel perfectly illustrates this. Commanding the waterfront of Al Maryah Island, the newly opened hotel plays a vital role in meeting the growing tourism market in the United Arab Emirates. A task in which it has been aided by the vertical solutions provided by KONE.

“THE FOUR SEASONS WAS A DEMANDING undertaking,” says KONE project manager **Hammed Feroz**. “Our customer needed solutions which were fast and efficient, and they needed to be provided in a high-end luxury environment, with proper care taken to deliver the best experience for guests.”

KONE’s vertical solutions were making a difference even before the hotel was completed. During construction KONE elevators were used to quickly and safely move workers and materials, but the real value is in the completed building. A variety of elevators and escalators are used to provide specific vertical transport solutions to match the client’s needs.

The KONE MonoSpace® and KONE MiniSpace™ elevators in the hotel make an efficient use of space, as the KONE MiniSpace

only requires a small machine room and the KONE MonoSpace doesn’t use one at all. More space is therefore available for the guest facilities in the hotel. The solutions are also highly energy efficient, an important consideration for the hot climate.

All of the Four Seasons’ elevators and escalators are monitored and managed by KONE’s E-Link monitoring system. This gives hotel management an accurate view of the status, demand, performance and availability of the equipment. Staff can remotely activate or deactivate elevator functions and respond immediately in case of any issues. Detailed reports show the history of waiting times and availability so managers better understand the movement of people and can plan accordingly. The entire system is designed to make the flow of people as efficient for the operator and as enjoyable for the guests as possible.

**THE FOUR SEASONS HOTEL ABU DHABI** is a good example of how the hospitality industry is developing in the region. Tourist demand is growing at an extremely rapid rate, and hotels need

to be built quickly to keep up. Efficient construction elevators can be invaluable for getting structures completed on time and on budget.

Moreover, the finished product has to meet or exceed customer expectations. Vertical transport is considered to be one of the main factors for customer satisfaction. A good design can also maximize usable space. More of the top floors and roofs can be used for high-value areas like restaurants or suites.

Contractor **Al-Futtaim Carillion** points out that vertical solution technology in hotels is continually improving and the Four Seasons has a very advanced management system. They say that new technology is essential for providing access in the building, not only for the guests but also for the staff such as through service elevators.

“KONE delivered high-tech and efficient solutions as promised and I’m very happy with how the hotel turned out,” says **Joykutty** who was employed by Al-Futtaim Carillion during construction. “So much so that we are already working with KONE on new projects.” /

# An oasis in the desert

Abu Dhabi, the capital of the United Arab Emirates, has invested in several major projects to transform itself into a tourist paradise. Hotels in the region are expanding and investing in new technologies to meet this rise in demand. The Four Seasons Hotel is setting a new benchmark.

TEXT David J. Cord PHOTO iStock & KONE



## Summary

### CHALLENGE

- Move workers and materials safely during the construction phase.
- Complement the building with energy-efficient and stylish elevators matching the high-end luxury environment.
- Provide an advanced people flow management system.

### SOLUTION

- KONE worked closely with the Four Seasons Group to understand their requirements and create tailor-made solutions.
- KONE’s long history of working with the contractor – the Al-Futtaim Carillion Group helped in keeping up with the schedule.

### FACTS

Height: 144 m  
 Floors: 34  
 Consultant: AECOM  
 Main Contractor: Al Futtaim Carillion  
 Developer: Mubadala

### KONE SOLUTIONS

7 KONE MiniSpace™ elevators  
 19 KONE MonoSpace® elevators  
 5 KONE escalators  
 2 KONE Motala™ 2000 elevators  
 KONE E-Link™ monitoring system



# Making hospitals better

Modern hospitals are expansive, efficient, and buzzing with technology that improves every aspect of the time spent in the building. The New Royal Adelaide Hospital in Australia exemplifies this, with KONE helping bolster patient experience through smart vertical transportation.

TEXT Sarah Hudson PHOTO Alice Healy & iStock





## Summary

### CHALLENGE

- Build a hospital that remains operational immediately after an earthquake or other disastrous event (Importance Level 4 rating).
- Make AGVs an integral part of the building to ensure that staff can focus on patient care.

### SOLUTION

- Plan and design solutions to meet the highest technical standards and requirements to withstand even extreme conditions.
- Install innovative solutions to increase efficiency and enable the best people flow in the hospital.
- Work with AGV providers to ensure smooth system integration.

### FACTS

Building size: 175,000m<sup>2</sup> / 800 single beds  
 Developer: SA Health  
 Builder: Hansen Yucken / Leighton Contractors  
 Architect: STH Health Architecture

### KONE SOLUTIONS

16 KONE MonoSpace® Special 3000S  
 7 KONE TranSys™ goods elevators  
 2 KONE helipad elevators  
 14 KONE MonoPlus AGV elevators  
 2 KONE MiniSpace™ goods elevators  
 KONE Automated Guided Vehicles (AGV) interface

KONE's team installed cutting edge solutions that would ensure seamless movement through the hospital.



*“Our solutions are an integral part of the building, ensuring that the staff can focus 100% on patient care.”*



**W**

ere he alive today, Hippocrates, the father of modern medicine, would have been astounded by the progress made in medical science and medical care. Nowhere is this more evident than in today's modern hospitals, which treat thousands of people in state-of-the-art environments.

However, even among hospitals, there are some that are leagues apart from the rest, and the New Royal Adelaide Hospital (NRAH) is clearly one of them. During construction, it was the most expensive building in Australia and the third most expensive in the world.

Eleven stories high and spread across ten hectares, hosting

800 beds and 6,000 staff, the NRAH sees an estimated 85,000 inpatients and 400,000 outpatients every year. Its innovative design uses cutting-edge technology to set new standards in conservation and environmental management.

**SPECIALLY DESIGNED PATHWAYS** and entry points allow patients to bypass certain departments and be admitted directly into services like cardiology or mental health, depending on their requirements. A clear indicator that one of the main objectives in designing the hospital was to ensure the most effective flow of patients to the care they need.

KONE was brought in to install solutions that would ensure patients flow seamlessly through the hospital once admitted. An enormous task indeed considering the sheer size and scale of the facility.

“It was daunting,” admits KONE project manager **Glenn**

**Jones.** “It’s the leading edge of this kind of facility being built in Australia. When we came on board, there were 27 elevator shafts ready for us and they wanted to start installation soon.”

Adding to the challenge was a demanding construction deadline that required having almost 50 technicians on site at any one time. Project administration was going to have to be absolutely on-point and incredibly to keep on top of all the potential variations. KONE’s decades of experience helped ensure that the team was in absolute control over all facets of the project.

**“THE SIZE AND THE EXPECTATIONS** – we’ve had to grow or you get left behind,” Jones says of the experience.

Through careful co-ordination and planning, KONE successfully installed an extensive list of solutions that helped the hospital meet its ambitious goal of achieving smooth

people flow. This included no less than 41 elevators, including helipad lifts and a network of Autonomous Guided Vehicles (AGVs), a novel feature that yielded rich rewards for the facility.

“One AGV can replace the back-breaking labor of some one hundred employees,” explains Jones.

The AGVs reliably cover up to 700km a day delivering up to 500 kilograms of supplies, food and equipment to different people across multiple stories. Not only does this cut hospital labor costs – imperative in a sector that is constantly battling to keep services accessible – but also, when designed and implemented well, helps create a more tranquil and less hectic experience.

The South Australian government will finish paying off the NRAH in 2046, yet the quantum of savings achieved by installing the very best makes it an incredibly worthwhile investment. /



# Making the impossible possible

China's transformation over the past two decades has been nothing less than astounding. Over 60% of the 128 skyscrapers – measuring 200 meters or more in height – completed around the world in 2016 were in China. Critical to the construction of these super-tall buildings have been innovative technologies without which reaching these heights would be impossible. Let's find out what made Beijing's future tallest tower, China Zun, a reality.

TEXT Nikhil Narayan Sivasdas PHOTO KONE

## Summary

### CHALLENGE

- Find a fast, safe and reliable vertical transportation solution during construction for 2000 to 4000 construction site workers.
- A durable people flow solution for a super tall building with over 30,000 occupants.

### SOLUTION

- Install construction-time elevators to shorten construction schedule and to fasten movement of workers and materials.
- Equip 11 elevators with ultra-light hoisting technology leading to substantial weight reduction to help improve energy efficiency.

### FACTS

Completion: 2018

Height: 528 m

Developer: CITIC Group

Architect: Kohn Pedersen Fox, Beijing Institute of Architectural Design, CITIC Architectural Design, Arup and Parsons Brinckerhoff.

### KONE SOLUTIONS

79 KONE elevators

21 KONE Double Deck elevators

39 KONE escalators

KONE JumiLift™ construction-time elevators

KONE UltraRope™ high-rise rope technology

KONE Destination control system

China Zun, though under construction, is already the tallest building in Beijing.



In the heart of the bustling Beijing business district, thousands of construction workers are working on the contours of a building inspired by a Zun, an ancient Chinese wine vessel. The China Zun tower, once completed, will stand 528 meters high comprising 108 floors.

“More than half the construction has been completed, and we are already the tallest building in Beijing,” exclaims **Wang Wuren**, deputy chairman and general manager, CITIC Heye Investment CO., LTD. “We started construction on the tower in 2013, and we will complete the tower in 2018. It is being constructed faster than other similar projects, which is very important from a profitability point of view.”

KONE’s JumpLift™ technology has a big role to play here. The technology helps shorten construction schedules by several months, which means quicker return on investment. How? It uses a temporary machine room inside the permanent hoist way. Its self-climbing feature ‘jumps’ upward as the construction work progresses, and also reduces the downtime of elevator installation to a minimum. This is because when the building is complete, the JumpLift can be swiftly transformed into a permanent elevator.

The installation of the JumpLift has paid off big time for the developer, in terms of both costs and, more importantly, time saved.

“My calculations show that we are saving about 320,000 work hours per year at China Zun, which is a big saving,” says Wuren.

**WUREN IS RIGHT. SINCE JUMPLIFT** is also used to move men and materials in a way that’s faster, safer and more economical, it has a cascading effect on traffic capacity, improving people and material flow efficiency by between 15% and over 50%.

“I’ve traveled to America, worked on big projects in Shanghai

and seen how essential vertical transportation solutions for workers in a high-rise building are. But it is expensive to install that many elevators,” says Wang Wuren pragmatically. “For example,” he continues, “a contractor might use around 35 elevators to shift workers and material around, and they would have to alter it each time to suit construction, which of course means more costs.”

But the problem was duly addressed. For a project the size of China Zun, which employs between 2,000 to 4,000 at peak times, the JumpLift system was the need of the hour.

“Thanks to JumpLift, we only need to use about 10 elevators now during the construction phase,” says Wuren.

**Chan Kwok Leung**, project director, Major Projects, KONE China is very pleased with Wuren’s choice. “The JumpLift is indeed a very efficient solution for high-rise buildings such as

China Zun,” he says, mindful of the growing popularity of the technology.

Wuren agrees. He is quick to acknowledge the fact that JumpLift is the workers’ preferred choice on site, owing to its reputation of being safer and faster.

**ANOTHER KONE TECHNOLOGY DRIVING** China Zun’s height is KONE UltraRope® – a super-light rope with a carbon-fiber core and special high-friction coating. UltraRope is superior to conventional steel cables in every way. It reduces weights by up to 80%, allowing elevators to move farther and faster than ever before.

“Eleven units at China Zun will be equipped with the UltraRope system. This technology will dramatically reduce the moving mass of the elevator and provide several efficiencies

that are beneficial to the customer,” says Kwok Leung at KONE.

Wuren, too, is all praise. “In the case of a fire, UltraRope is more durable and it lasts two to three times longer than steel cables,” he says.

“Add to this the savings in electricity because of the reduced weight and it becomes more competitive. Therefore, I made the decision to use UltraRope in China Zun,” he concludes with confidence.

China Zun is setting a beaming example for other up-and-coming skyscrapers in the country. A report by the Council of Tall Buildings and Urban Habitats (CTBUH) states China dominated the world for the ninth time in a row in 2016 in building skyscrapers. With the growing popularity of technologies such as JumpLift and UltraRope, it would be no surprise if China leads the pack this year as well. /



*“My calculations show that we are saving about 320,000 work hours per year at China Zun, which is a big saving.”*

China Zun is under construction, but already the tallest building in Beijing.



# Redefining Amsterdam's skyline

The creative capital of Europe – Amsterdam – is renowned for its artistic heritage. It is now reinventing itself by transforming older buildings into iconic structures, symbolic of the fusion of technology and tradition. A'DAM illustrates this balance.

TEXT Thessa Lageman PHOTO A'DAM tower

**W**hen you step into the 'experience' elevator in the iconic A'DAM tower, the lights turn off, and electrifying music starts to play. Then, the all-glass elevator shoots up. In the 22 seconds before you reach the 20th floor, you are treated to a colorful light show perfectly synchronized with music. And once you reach the top, you gaze in awe at the unrivaled panoramic view of Amsterdam from the observation deck, called the Lookout.

"The ride up is part of the experience. People love it," says **Eric-Jan de Rooij**, partner at Lingotto, the company which (developed and) manages the 100-meter-tall tower.

**A'DAM ORIGINALLY STARTED LIFE** in 1971 as 'Toren Overhoeks.' Located just across the harbor from the Central Station, it was once part of a private complex of laboratories, offices and buildings. When city authorities rezoned the area for both commercial and residential development, this tower turned into prime waterfront property almost overnight, and was among the first buildings here to be redeveloped.

The new name A'DAM is the abbreviation of Amsterdam

and also stands for 'Amsterdam Dance and Music,' which reflects the business of the owners and main tenants. It has become a major tourist destination containing top-notch bars, restaurants, offices, a hotel and of course the wildly popular spectacular observation deck.

"We wanted the building to be like a festival, a great experience," explains de Rooij. Two years of renovations were needed to turn the 1970s interiors into a more contemporary, stylish, and sustainable design while maintaining its celebrated modernist complexion. "However, there were quite a few challenges in terms of logistics, fire safety, ventilation, and electronics," adds de Rooij.

Originally a mono-functional office tower for 350 employees, A'DAM is a multi-functional building now, visited by around 3,000 people each day, nearly 10 times the number it was originally designed for. In order to handle these capacities, the developers decided to completely modernize the elevator management and destination control systems. A task for which they turned to KONE.

**"THE BIGGEST CHALLENGE WE HAD** to deal with in transforming the office building into a vertical one was logistics. The developers had many creative ideas which they wanted to see

in action. Add to this the fact that there were so many people using the building and relatively few elevators. We had to look at out-of-the-box solutions for this project," explains **Mike deWit**, project manager at KONE.

The first step was to expand the number of elevators available. In the past there were only four elevators in the core to give access to all of the tower floors. Now there are five in the core and they are mainly used to carry people. Another five extra elevators have been added outside the core to connect the parking, the club, the basement and two small kitchen elevators.

Next was to customize the design of each elevator. Public elevators were given different themes – while one was designed as a disco elevator, another was equipped with cool music and changing colors. Some elevators contained large photos and art images and others had prints of song texts and matching psychedelic music. Many nonstandard details, such as the elevator's push buttons that are in the same diamond shape as the A'DAM logo, were added too.

In addition to all this, KONE's People Flow Intelligence systems were deployed to ensure smooth movement of people inside the tower. For instance, KONE's Access and Destination Control system was introduced in the building to minimize unnecessary stops. This was done by allowing users to have access passes for specific floors only. The usage patterns of the elevators were tracked using KONE's E-link monitoring system, which continuously collects relevant data.

"We analyze these data regularly and discuss them with the developers each month. This helps us make improvements when needed. What we did in A'DAM can be used as a model in other buildings, as well," deWit says.

Together, A'DAM and KONE's solutions are a shining example of what can be achieved using state-of-the-art technology, while breaking away from convention. /

## Summary

### CHALLENGE

- Handle a ten-fold increase in visitors.
- Provide an access control system to handle an extremely complex people flow originating from the three firms in the building.
- Provide non-standard, creative and innovative designs for the elevators.

### SOLUTION

- Installation of additional elevators to handle increased people flow.
- Integration of KONE solutions to minimize unnecessary stops.
- Customized elevator design and décor to meet client specifications.
- Installation of light and audio systems to complement elevator designs.

### FACTS

Building size: 22 floors  
 Developers/Owners: Lingotto, Sander Groet, Duncan Stutterheim, and Hans Brouwer  
 3000 daily visitors  
 Holds Europe's highest swing

### KONE SOLUTIONS

KONE MiniSpace™ elevator  
 KONE MonoSpace® elevators  
 KONE Destination control system  
 KONE E-Link™ monitoring system  
 KONE Access™  
 KONE automatic building doors with fire resistance capabilities

*"The biggest challenge we had to deal with in transforming the office building into a vertical one was logistics."*





### Elevator ride like a rocket launch

“Designing elevators for the future begins with an outside-in perspective,” says KONE’s design director Timo Tiainen. “When we begin the design process, we first look to the external environment. We study events and phenomena in different parts of the world, and look for inspiration in our surroundings.”

This principle was also applied at A'DAM, where KONE delivered an experience elevator which runs from the main floor directly to the roof. The elevator is provided with a full glass roof combined with glass side walls. The idea was to create an unforgettable ride experience resembling a rocket launch with special light effects during acceleration and deceleration.





# Flying high

Over the past three decades, airports and airport design have evolved dramatically to handle vast numbers of passengers and handle far greater traffic, while ensuring that millions can travel safely and comfortably. See how the Oslo airport in Norway managed to crack this system with flying colors.

TEXT Ronak Kotecha ILLUSTRATION Avinor PHOTO Nadia Frantsen





*“Airports are the first and the last impression of any country.”*

Is it a mall? A cinema hall? Maybe even a spa or health care center? These are the questions that are sure to come to mind when you see a modern airport for the first time.

“Airports are the first and the last impression of any country,” declares **Bjørn Olav Susæg**, architect of the Oslo International Airport – one of the busiest airports in Europe, which has seen passenger traffic grow steadily over the years. Almost 26 million passengers travelled through the airport in 2016, and an ongoing expansion will see capacities increase to handle 28 million passengers in phase 1 and a whopping 35 million in phase 2.

This massive expansion is only natural considering the pace at which the aviation industry is growing. The prevalence of low-cost carriers has seen an increasing number of people take to the skies, and today’s traveler often ends up spending more time at the airport than in the aircraft itself. In such a scenario, it is crucial to keep passengers comfortable, occupied and secure, all factors that are major considerations in the Oslo airport’s expansion.

**THE EXPANSION WAS BY NO MEANS** an easy task, and called for collaboration from all stakeholders invested in the project. One of the main tasks was to figure out ways to help people travel safely and comfortably, right from the time they entered the airport to the time they took off and vice versa. A particularly challenging task, considering that the Oslo airport is one of the most ambitious transport hubs in Europe. But the KONE team, which was actively involved in the project right from

the start, was up for the challenge. A crack team with experts from different departments across geographies was quickly put together to come up with radical ideas for the airport’s modernization.

In any airport, efficiency of operations and security are right at the top of the list of priorities and the Oslo airport was no exception.

“With regards to infrastructure, the Oslo airport project had the strictest requirements regarding environment and space efficiency,” recalls **Tor Engen**, project manager at KONE Norway. For instance, all elevators including the large goods elevators in the airport had to be built without machine rooms. This was a valuable space-saving measure, one which KONE handled easily thanks to its range of KONE TranSys™ and KONE MonoSpace™ elevators, designed to function without dedicated machine rooms.

This was in sync with the architect’s vision, which was to have clarity, comfort and open flexible spaces. “Just like a city masterplan, we work a lot with dimensional criteria and try to keep distances to a minimum,” reveals Susæg, adding that compact buildings are more sustainable and easier to navigate. The idea was to build small but enough – a trait that is generously displayed at the Oslo airport that is almost half the size of other airports yet handles the same volume of traffic. “Bigger isn’t always better,” he quips matter-of-factly, adding that passengers should be made to feel safe and not isolated in a huge space.

**AND TO AID THIS VISION CAME A WIDE** variety of People Flow solutions from KONE that include elevators, escalators, an autowalk and more, all strategically placed and easy to use.

“Our solutions not only met all demands from a specifications and design perspective, but also fulfilled all the requirements for safety, maintenance and regulation. We had the highest project certifications, including the likes of BREEAM, which is one of the most significant environment assessment methods across the globe,” declares Engen. “Right from the start, our focus was to find sustainable solutions for the future,” he adds.

Environmentally, the Oslo airport has made massive strides in keeping energy levels low. Among the many groundbreaking innovations used in the airport, adds Susæg, is a ‘Snow Depot’ to keep it cool.

“They are used to maintain low temperatures and bring in cool air, thus cutting down the use of energy. Further, to reduce the CO2 footprint, ash has been added into the concrete and wood for cladding the roof,” he explains.

KONE too used groundbreaking technology to maximize energy efficiency. Technology such as the regenerative drive that converts an elevator’s excess energy into electricity, which can then be reused elsewhere in the building. Very unlike conventional drives, which convert energy into heat that must be removed by air conditioning systems.

Besides these, other KONE improvements included the use of LED lights in elevators that reduce energy consumption by up to 80% as against halogen lights and last 10 times longer. What’s more, as much as 90% of the material content of KONE elevators consists of metals that can be recycled at the end of the product’s life cycle.

But all of this is just the beginning. As the Oslo airport readies itself to expand further, it’s time to fasten your seat belts for a ride into a jet-setting future. /



Tor Engen, project manager at KONE Norway.



## Summary

### CHALLENGE

- Designing a successful vertical transportation system for one of the busiest airports in the world.
- Keeping to the strict schedule to ensure that there are no delays.
- Provide customer-built solutions as per the customer's specifications.

### SOLUTION

- Worked with the architect and consultant right from the early phases of design.
- Studied customer's requirements to provide the right solutions to give the desired outcomes.
- Provided good maintenance in the existing areas of the airport.

### FACTS

Completion: 2016/17

Developer and contractor: Avinor

Architect: Nordic Office of Architecture

### KONE SOLUTIONS

46 KONE elevators including KONE MonoSpace™ and KONE TranSys™

22 KONE TravelMaster™ 110 and 120 escalators

1 KONE TransitMaster™ 120 autowalk



TEXT Hugues Delval  
executive vice president – Maintenance Business KONE

PHOTO Marja Väänänen

## Harnessing the power of change

**W**e stand at the brink of a new age fueled by the process of urbanization. In fact, the United Nations estimates that over two-thirds of the world's population will live in cities by 2050. That is not a small number by any stretch of the imagination and care must be taken to ensure that urban centers are able to handle these capacities. More and more people in urban centers are traveling to work every day, to pick up their children at school, or are using airports or other public transportation to visit families and friends. More and more aging citizens are looking at improving their life by moving to accessible urban environments. Our cities have to be great places to live, work and commute in. And for this to happen, investments must be made in high-end technologies and services.

At KONE, from data collection, analytics and mobile solutions provided directly to customers to digital tools that support our own employees in keeping customers satisfied, we are staying at the cutting edge of possibilities. With 24/7 Connected Services, for example, we can not only make sure elevators or escalators are effective, transporting users as safely, reliably, comfortably

and quickly as possible, we can predict and prevent problems before they occur. Establishing instant communications channels with our customers gives them the ease of keeping their own customers, the end users, informed in real time. Today we are also seeking new technological solutions to create a more enjoyable experience for users as they move between and inside buildings.

**IN EUROPE AND AMERICA**, ongoing construction is both creating new customers and changing the needs of existing ones. The same holds true in the Middle East, Africa and Asia – particularly in China – which have been riding a wave of impressive development. As urbanization brings new equipment into the picture as well as places increased demands on existing equipment, customers worldwide are becoming much more farsighted about the role of maintenance services. More than ever before, they are taking into consideration the value of their equipment over the entire lifetime of the building – a pro-maintenance mindset that, of course, helps lay a positive foundation for working with KONE services.

The strategy for keeping pace with this expansion has been to maintain a razor-sharp focus on our service culture, continuously investing in the

capacities and capabilities of our people to ensure that the customers' needs remain central. The value of these efforts is already clear. Not only has customer feedback been overwhelmingly positive, our service business has recently been growing faster than the markets themselves. In meeting these expectations, we remain committed to providing the best People Flow services – ease, effectiveness and experience – over the full life cycle of the building.

**THE VALUE OF WORKING** side by side with customers is illustrated in the four cases that follow: Staples Center, an events arena in Los Angeles; Humlegården's high-end office buildings in Stockholm; and ISS Global's headquarters in Copenhagen. These examples highlight both the diversity of our customers and the importance of understanding their specific needs.

Technology will continue to be a key enabler, but what these stories also show is that the service business is ultimately a people business. Our adoption of new technologies has helped us gauge the needs of each customer in a holistic manner. Armed with this deeper understanding of our customers' needs, we can work with them to develop and provide truly tailor-made solutions. After all, as the saying goes, one size does not fit all. /



*“Customers worldwide are becoming much more farsighted about the role of maintenance services.”*



# Cruising ahead

Cruise ships house thousands of passengers and crew, taking them on voyages around the world while ensuring that they are able to relax and enjoy the finer things in life. Find out how KONE's marine expertise makes this happen in a seamless manner.

TEXT Nikhil Narayan Sivasdas PHOTO Royal Caribbean & Nick Garcia



## Summary

### CHALLENGE

- To build the world's largest cruise ship.
- Minimize the amount of space required for elevators, thus allowing the ship owners to build more cabins.
- To ensure equipment reliability and energy efficiency and smooth people flow around the vessel.

### SOLUTION

- Support the shipyard and the ship owner over the entire life cycle of the vessel from design, manufacturing, and installation to maintenance.
- Work closely with the shipyard to ensure that all designs and installations are in accordance with their requirements.
- Install machine-room-less elevators equipped with energy-saving technologies, allowing for more space to be freed up.
- Provide fast and reliable maintenance through KONE's global service network.

### FACTS

Class: Oasis  
Tonnage: 227,000 GT  
Capacity: 8880 passengers and crew members  
Shipyard: STX France  
Owner: Royal Caribbean Cruises Ltd.

### KONE SOLUTIONS

28 KONE Minispace™ elevators  
14 KONE Monospace® elevators  
2 KONE escalators  
3 easy-access (impaired mobility) platforms





**T**hink of a cruise ship and what comes to mind is a city, and the Harmony of the Seas, the newest addition to the Oasis Class fleet of Royal Caribbean Cruises Ltd. certainly fits the bill. Displacing nearly 227,000 gross tons, she is the largest passenger ship in the world, able to accommodate over 8880 passengers and crew. The vessel contains over 2,700 rooms spread out over multiple decks and contains facilities like water slides, surf simulators, rock climbing walls and even a miniature golf course. A veritable floating city indeed.

But unlike a city which has various modes of transport to help people get around, cruise ships are almost totally dependent on vertical transport solutions like elevators and escalators to get around. And not just any elevator either, as these massive vessels require specialized marine elevators to function properly.

“They need to be rugged enough to withstand the constant motion of being at sea, while also being able to minimize vibrations and ensure that passengers don’t get nauseous,” says **Nicolas Huguet**, project manager at KONE Marine. “On top of that, they need to be compact since the space on cruise ships is very limited, unlike in buildings. Cruise ship operators need to maximize the space available for cabins and other attractions.”

KONE has developed several solutions that can help with this, including the KONE MonoSpace™ elevators, an innovative technology that eliminates the need for a machine room, allowing Cruise Ship operators to use this space for other purposes. These specially designed marine elevators take into account factors such as the ship’s movement in the water, its pitch and roll, to ensure that rider comfort is looked after.

**HOWEVER, HAVING THE PERFECT** product for a cruise ship is just one part of the challenge. The biggest challenge, emphasizes Huguet, is to keep up with the pace of construction. Unlike

## A day in the life

David Tracey is a service technician at KONE and has been with the company since 1999. He started working with KONE Marine services in 2012, an experience that has taken him on board a myriad of vessels and platforms.

“We’re not on board 24/7 since there are so many vessels out there. Instead, we have a schedule of all the vessels on which we have to conduct maintenance. In between that schedule, if a vessel somewhere has a problem with a unit, they’ll request assistance and we’ll go,” he says.

So, what does a typical day at work look like? Tracey says most of his time is spent on doing manual inspections, maintenance, repair and modernization work on marine elevators. This can take up to a day or even a week to complete depending on the nature of the requirement. A process that he says is both challenging and rewarding.

“You would have just finished one job and then you’ll get another call to go to another site,” emphasizes Tracey. “A year ago, I had to fly to Mexico and take a four-hour bus ride to catch up to a ship where a laundry elevator had broken down. I got on board in a relatively short time and repaired the unit. This made the customer very happy and that is what matters.”

Tracey’s favorite part of the job is the fact that he gets to travel and meet new people. Something he credits solely to his job at KONE Marine services.

“I think I’ve visited between 20 to 30 countries so far. While I mainly work in and around the US, I have also worked in Asia, South America, Europe – quite a lot of places. I don’t think I’d have ever been to Alaska if I had not taken up this job,” he says. “I’ve developed friendships with a lot of people working on these ships. It helps when you come back to work on the ship that you know these guys personally.”

Marine elevator technicians, says Tracey, have the scope to do a lot of work and they do not get typecast into any one role.

“In that sense, I got to forward my education and work skills, while getting to see the world at the same time. For me, that is a win-win,” he says happily.



David Tracey, service technician, KONE

*“A cruise ship is built using a system of blocks, almost like a giant puzzle.”*

normal buildings where elevators are installed once the elevator shaft is in place, cruise ships require coordination right from the beginning of the project.

“A cruise ship is built using a system of blocks. A block can weigh more than a thousand tonnes and contain all the parts needed for a particular portion of the vessel. The shipyard then assembles hundreds of these blocks, almost like a big puzzle, into a complete ship,” explains Huguet. “This means we have to have the designs, the equipment and all materials ready right at the beginning so that we can install them as the assembly of the blocks progresses. Something we refer to as the plug-in method.”

That is doubly true for a project as complex as the Harmony of the Seas, emphasizes Huguet, as he recalls a time when they had to redesign their plans completely.

“The ship owners wanted to increase the height of the cabins by 15 centimeters. That may not seem like a big number, but we had to re-evaluate all our plans to make sure that all the requisite height clearances were in place, which meant

going back to the drawing board,” says Huguet. “Since we were working closely with the shipyard from the beginning, this was not a problem and we managed to change our plans accordingly.”

In fact, KONE’s ability to adapt to circumstances and the proactive way in which its team carried out its tasks led to the shipyard giving KONE an award.

“**THAT WAS THE FIRST TIME** that the shipyard had ever given an award to a supplier,” recalls Huguet. “We received the award for long-term cooperation and one of the directors even talked about how he had never heard any complaints about KONE’s work. On fact, he even commended for anticipating every need the shipyard had.”

That is only natural when you consider KONE’s decades of expertise and that fact that it has installed solutions for both Allure of the Seas and Oasis of the Seas, the two sister ships of the Harmony of the Seas. What’s more, KONE has also won the contract to outfit two forthcoming Oasis-class vessels, cementing its relationship with the RCCL.

KONE has also installed advanced solutions to ease the flow of passenger traffic in cruise ships; with technologies like boarding mode and luggage mode, which can be activated to ensure that all elevators automatically go to the deck earmarked for this purpose. And if that wasn’t enough, all of KONE’s elevators come equipped with energy-saving technologies like KONE EcoDisc which have regenerative drives that transfer 90% of the elevator’s braking energy back into the network.

Another factor that makes KONE the supplier of choice for the world’s biggest cruise operators is its extensive service network, says Huguet, and KONE has technicians located in major ports around the world, including North America, Europe and Asia.

The Cruise Lines International Association (CLIA) estimates that a little over 24 million people travelled in cruise ships in 2016, and they are expecting this number to increase to over 25 million in 2017. KONE is certainly ready to help cruise ship operators handle these numbers. /



# IoT makes its mark

The Internet of Things (IoT) has captivated the attention of the technology and business community, who are eagerly waiting for its potential to be finally unleashed. While the promise is spectacular, mass-market applications of the concept have yet to appear, IoT, however, is quietly breaking ground for companies like Humlegården in Stockholm, in an early-phase pilot for KONE's 24/7 Connected Services.

TEXT Steve Roman PHOTO Samuel Unéus







**W**hen businesses look for top-end office rentals in Stockholm, Sweden, they turn to Humlegården Fastigheter, the go-to property owner for space in some of the city's most exclusive buildings. Humlegården's clients expect only the best. Needless to say, elevator hassles are not part of the equation. "This is one of our biggest issues," says **Per Rosén**, the

company's head of operations and maintenance. "When an elevator isn't operating properly, our tenants get really annoyed and it's a big problem for us. If we have a high-end building and we only have one elevator and that elevator breaks down, you can imagine the difficulty," he says.

In early 2016, Humlegården approached KONE with a simple but challenging request, recalls **Jaakko Kaivonen**, managing director, KONE Scandinavia. "The brief from Humlegården's side was actually rather clear: 'We don't want to have any call-outs or breakdowns ever again. We want to use intelligent technology to predict issues before they happen.'"

It was certainly a tall order, but as it happened, KONE was

in the early stages of developing what would become 24/7 Connected Services, a system that uses the IBM Watson IoT platform to process data from elevator monitoring devices in the cloud, analyzing and predicting equipment problems before they occur. Humlegården, for its part, had already been one of KONE's key clients for over a decade and was a keen adopter of new technologies. Those factors led to what would be one of the first pilots of 24/7 Connected Services, with KONE, Humlegården and IBM working together to develop this powerful new application for IoT.

**TRADITIONAL ELEVATOR MAINTENANCE** is calendar based, with various components serviced or parts replaced based on estimated times of wear and tear. Its main drawback is that in the real world, elevators don't always behave according to estimates. This new approach, by contrast, collects data from these units 24/7 through remote-monitoring devices, analyzes the data to understand the needs of each individual unit and predicts when a problem is approaching to allow all maintenance to be carried out in a pre-planned fashion with minimal disruption.

For the Humlegården project, KONE began by connecting sensors to dozens of elevators, in each case measuring about



## Summary

### CHALLENGE

- Enable preventive maintenance to minimize downtime and repairs.
- Utilize smart solutions to minimize the number of unplanned stops.
- Maximize the life cycle of the installed equipment.

### SOLUTION

- KONE worked closely with the customer to understand their requirements.
- Capitalized the long relationship built up with the customer to suggest innovative new solutions.
- Installed KONE 24/7 Connected Services, an IoT-based system to provide predictive maintenance services.
- Provided customer with real-time information on their equipment, helping them decide on future upgrades and repairs.

### KONE SOLUTIONS

KONE 24/7 Connected Services  
KONE Monospace® 700 elevators  
KONE Minispace™ elevators

*Self-learning systems using IoT and AI are predicted to be the future of the property management business.*





*“No building can afford to have an elevator or escalator break down, causing problems for its people.”*

### Limitless possibilities

Andy Stafford-Clark, master inventor at IBM, takes the notion of Connected Services even further, saying that its development will have a positive, knock-on effect beyond the sphere of elevator maintenance.

“It generates a lot of efficiency and allows for better service, but as we move on, collect more data, get more infrastructure in place, we can turn up the knob on AI and do some really smart things about the way people interact with elevators, for example, sensing when someone is leaving their hotel room and having the elevator standing ready. We are seeing huge quantifiable benefits from applications like these, which will then propel AI to be integrated into applications in other industries as the technology improves,” he said.



200 points of data, which are sent to the 24/7 Connected Services cloud in real time. It was at this stage, Kaivonen says, the real challenge came. Namely, finding useful patterns in the immense volumes of data being gathered.

“Everyone talks about IoT – it’s a big buzzword. You connect things to a cloud. I’m not sure if that’s exciting. You just get a huge amount of data. When it really gets exciting is when you start to put some intelligence on it, and this is where IBM Watson comes into the picture,” he notes.

IBM’s AI-driven analytics was the key to finding the useful, complex patterns within the data stream, Kaivonen says. For instance, if component A is showing certain vibrations while the temperature rises 0.5 degrees in component B, it is likely that component C will break in about a week. These types of conclusions have allowed KONE to draw sets of rules on how respond to the IoT data and generate maintenance requests when needed.

The experiences and analyses developed here will naturally be applied to other Connected Services projects as well, and used for the benefit of customers.

**ROSÉN SEES THESE TYPES** of self-learning systems as the future of the property management business, particularly in Sweden, where environmental concerns are a priority and thus saving energy by extending the lifetime of installed equipment is a well-understood goal.

**Markus Huuskonen**, KONE’s head of maintenance processes, notes that KONE’s 24/7 Connected Services will become better as more users connect. “We are improving all the time, so the more data we get, the better our service will be. The analytics engine is self-learning, so these kinds of connected services will definitely come into bigger play in the future,” Huuskonen said earlier this year.

For now, though, the Humlegården project is creating the biggest waves among other property managers in Sweden who are intrigued by the prospect of a predictive maintenance scheme. “This idea has actually received quite a lot of interest from our customers,” says Kaivonen. “If you think about it fundamentally, instead of us just selling services, we’re selling safety, availability and uptime. We’re selling people flow. And I think that’s an interesting vision for many.” /



# Building the A-team

The look of the A-team in business is changing. Since the need for knowledge and perspectives is often greater than what is found in one company, could a network of co-creation deliver competitive advantage? KONE and ISS together strongly believe in this.

TEXT Kati Leuschel PHOTO KONE & ISS

**T**he core of co-creation is to involve external stakeholders and turn customers, competitors and experts into partners. KONE is following through on that concept by working with ISS, a global facility services company, to help provide services to their customers around the world. "I think operationally, real partnerships are becoming more and more important. Today, it is not about being a supplier, it is about being a partner, and for us – and me – it is very important to work with like-minded people who want the same things, and have the same ambitions," says **Troels Bjerg**, ISS regional CEO for Northern Europe.

This collaborative model has been used by other industry leaders, including Apple Inc. for instance, which teams up with certified repair companies to service its products. By doing so, the tech giant provided repair services to its wide customer base, without having to massively expand its resources. Similarly, the underlying shared company value of precise service delivery feeds and guides the collaboration between KONE and ISS.

**WITH A CROSS-BORDER CONTRACT** covering 21 countries, KONE and ISS are playing to their strengths, using their reach, local knowledge and expertise to effectively expand their

operations. While ISS's focus is to provide quality services, the collaboration will see KONE brought on board to look after vertical transport solutions and maintenance, helping ISS provide superior quality, speed and efficiency to its customers.

"ISS is in a business just like KONE, where efficiencies are constantly sought after. When we think of such companies together, we will actually change how these services are delivered in the future," explains **Thomas Hinnerskov**, executive vice president, North and Central Europe, KONE.

In the shared KONE and ISS venture, analyzing intelligent data and taking full advantage of new technological solutions for building and machinery management is central. Both companies are actively working in the IoT field and see a lot of opportunities that would benefit the thousands of buildings jointly with KONE in locations around the world. KONE can help ISS provide consistent services, across geographies and bring in transparency to services allowing ISS to know in real time how the equipment is performing.

The local knowledge and expertise KONE has built up over decades across its wide geographical footprint is a clear benefit to the association. ISS ensures KONE is involved right at the start of a project and is working closely with the customer to customize solutions and decide what solutions need to be put into place to secure the desired outcomes.

"Local knowledge and uptime are very important to our customers. Having access to a local supply chain and the ability

Thomas Hinnerskov, executive vice president, North and Central Europe, KONE (left) and Troels Bjerg, ISS regional CEO for Northern Europe (right).



## Summary

### CHALLENGE

- To deliver consistent services to ISS's customers in 21 countries covering Europe and Israel.
- Have access to transparent and real-time information and maximize equipment uptime.

### SOLUTION

- Close cooperation and early involvement with ISS and ISS's customers to ensure their needs are met.
- Leveraging local knowledge accumulated by both companies.
- Co-creation in the area of innovation and digital technologies.

### FACTS

- ISS is a Danish-headquartered world-leading provider of catering, cleaning and facility management services.

### KONE SOLUTIONS

- KONE Online
- KONE Care™ Maintenance

*“Operationally, real partnerships are becoming more and more important.”*

to be on the spot very quickly and to have very short reaction times is a prerequisite to that. And we know that KONE is in the same geographies as we are and that is key,” emphasizes Bjerg.

**CO-CREATION AS A PROCESS** does not limit participation to a select few. For instance, KONE regularly organizes Hackathons where participants are asked to come up with new services based on Internet of Things (IoT) technologies. The most recent event attracted more than 2,300 teams ranging from university students to established start-ups, with several innovative ideas being explored.

Similarly, ISS uses a system called N.O.S.E to understand each of its customers' needs and then provide the outcomes and solutions that will facilitate those needs. New strategies are tested out in the Corporate Garage, an independent unit for innovation within the company. In this space, there is freedom to aim for a big impact with entrepreneurial fervor.

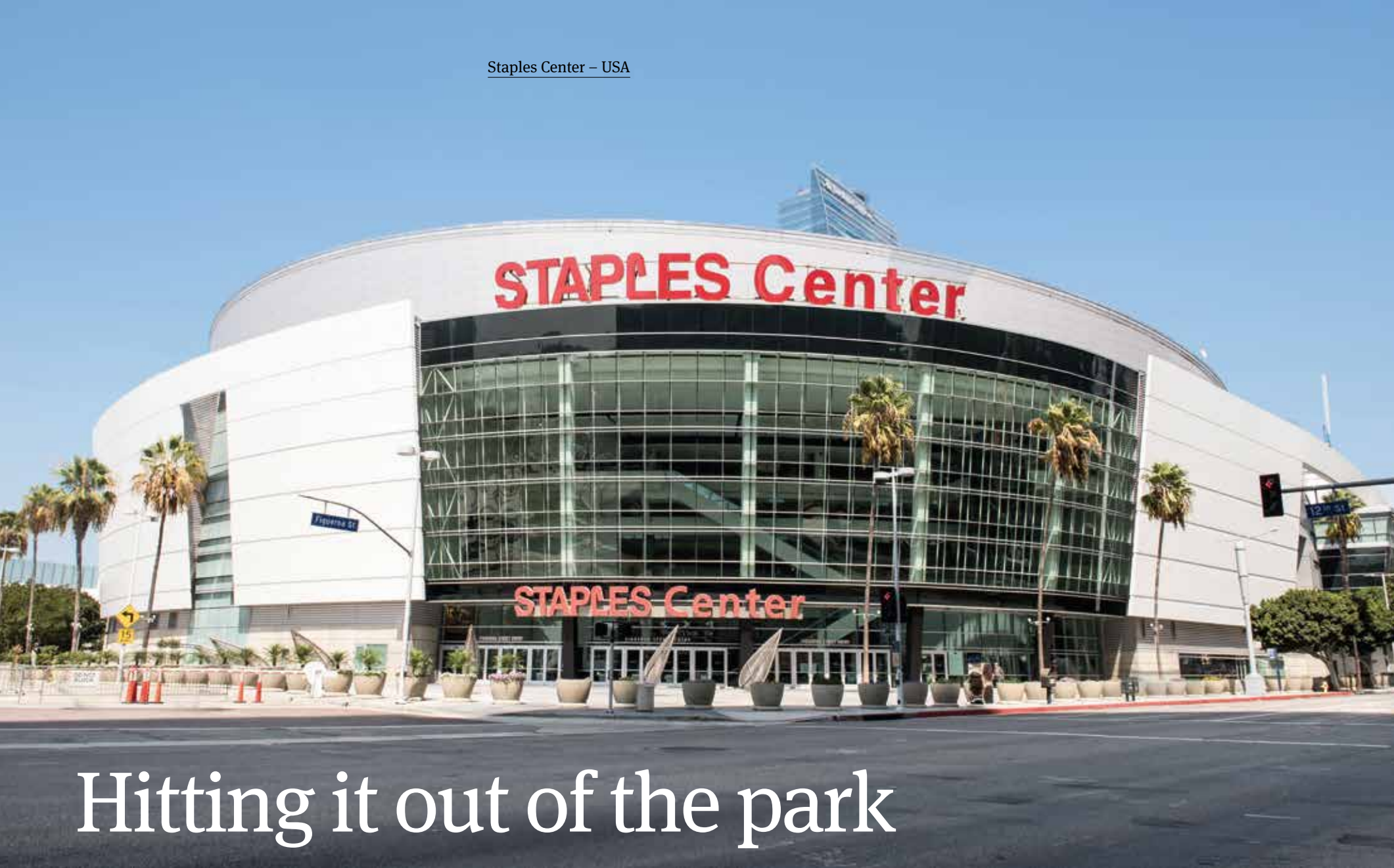
"We customize our service by making sure that both ISS and KONE are completely aligned with the outcome that the customers want and how that outcome is delivered," says Bjerg.

**A GOOD EXAMPLE OF ORCHESTRATING** a positive outcome can be seen in Norway. ISS and KONE worked together with telecom company and ISS customer Telenor, which in turn resulted in connections being made with a KONE customer, the Oslo airport. The result saw positive discussions and insights covering topics ranging from equipment maintenance to accessibility and safety, in a crowded environment such as an airport.

"The next step in all of this is that, thanks to the partnership with IBM Watson, we are able to predict when equipment will fail before it actually does. We can actually change the component before it needs to be changed," says Hinnerskov. "This again means that ISS' customers will have more efficient buildings with higher uptime. We can do the maintenance before things happen and at a time convenient to the customer."

There is a constant drive to be more efficient and improve the experiences in the industry, and with co-creation, both ISS and KONE are able to constantly stay ahead of the curve and take advantage of new technologies, providing ever better products and services to their customers. /





# Hitting it out of the park

The Staples Center is one of the busiest sports and entertainment centers in the world, with its saucer-shaped structure being an iconic part of the Los Angeles landscape. Keeping the guests visiting the center moving is a big task, one that KONE has helped accomplish through its services. Read on to learn more.

TEXT Lakshmi Sivadas PHOTO Ed Carreón

**F**rom the LA Kings' winning the Stanley Cup in 2012 to Michael Jackson's memorial service in 2009, or that fact that it has been the venue of the Grammy awards for twelve years, the Staples Center in Los Angeles has played host to some of the greatest moments in sporting and entertainment history. Add to this the fact that it is also home to four major professional sports franchises including the Lakers and Clippers, and it isn't hard to guess why this multi-purpose arena holds pride of place in the hearts and minds of the people of Los Angeles.

Established in 1999, the events showcased at the Staples Center draw in a staggering 4 million people every year. And one of the many factors that have helped cement the arena's success is the

focus placed on visitor comfort and safety, especially when it comes to the installation of escalators and elevators.

"Being LA's number 1 entertainment venue, we host over 250 events and have over 20,000 guests visiting the center at any time," says **Bill Pottorff**, vice president – engineering at AEG Staples, the company that operates the Staples Center. "The eyes of the world are on us, and so it's vital to assure the safety and reliability of the vertical transport equipment."

Which is why KONE was brought in to design and provide the best solutions. KONE's decades of experience were soon put to the test. After all, providing efficient elevator and escalator solutions for sporting venues like Staples is very different from installing them in buildings and cruise ships. The sheer number of people who gather for the various events makes it essential that logistics and transportation services be tough enough and fast enough to handle the pressure.



## Summary

### CHALLENGE

- To ensure smooth and secure people flow to various levels of seating.
- Provide safety and reliability of escalators and elevators to maximize equipment uptime.

### SOLUTION

- Preventive maintenance and proactive component upgrades with the aid of KONE maintenance technicians.
- KONE Online provides customers with online access to performance history details and the ability to monitor service requests.

### FACTS

**Building Name:** Staples Center, Downtown Los Angeles  
**Building Owner:** Anschutz Entertainment Group  
**Building Size:** 954,000 SF  
**4 million annual guests**

### KONE SOLUTIONS

**KONE Online**  
**11 KONE escalators**  
**10 KONE elevators**



Dennis Vitt, primary service mechanic, KONE.

"**EVERYTHING HAPPENS ALL AT ONCE** here, unlike a museum or a cruise line," explains KONE's **Dennis Vitt**, primary service mechanic for the Staples Center. "Your crowds are completely different as they don't saunter around looking at exhibits. They are hyped up because it's either a sporting event or a concert happening here. The schedule of events is almost non-stop as well and therefore the equipment undergoes tremendous pressure every day."

That's not all. The escalator and elevator solutions used at the Staples Center revolve around one major aspect – the flow of people in the arena. In the case of most other buildings, when equipment breaks down, there is downtime until spare parts are received and repairs are begun. However, for a facility like Staples, any amount of downtime can severely impact operations, leading to thousands of disgruntled guests. Ensuring minimal breakdowns was essential for smooth operations.

"During the season, you can go thirty days in a row with an event every day of the week. On the weekends, you can have hockey in the morning and basketball in the evening, followed by a concert the next day," explains Vitt, "There's never a day where it's all right to have a unit down."

**PREVENTIVE MAINTENANCE IS THEREFORE** the buzzword to help avert major breakdowns at the arena. For this, the Staples

Center relies heavily on regular maintenance to spot potential breakdowns.

For instance, KONE Online is used to provide customers with online access to performance history details and the ability to monitor service requests. In the event of equipment needing repair, KONE proactively installs new components to help extend the life cycle of the equipment.

"It is important to conduct routine checks on escalators and elevators every day. The equipment gets beat up and it's crucial to spot a repair or breakdown even before it happens," says Vitt. "Unlike other facilities, we have every part to rebuild an elevator out here and we don't need to wait for spare parts to begin repairs. We stop at nothing to keep the elevators running for every event."

KONE's extensive experience in providing smooth people flow solutions was also used to install equipment that would ensure that people would be able to travel from point A to point B safely and quickly.

"KONE designed the solution to ensure that our guests can move around the facility in a secure manner toward their seating areas," explains Pottorff.

With all of this, KONE has ensured that the Staples Center continues to deliver on its promise to be the best sporting and entertainment center in the industry./





TEXT Ilpo Marjamaa  
senior vice president – Modernization Business, KONE

PHOTO Marja Väänänen & KONE

## The future beckons

**C**ities are arguably the ultimate symbols of civilization. The size, nature, and culture of a city signifies how advanced a particular society’s scientific and technological capabilities are and how well its citizens are cared for.

The key to ensuring cities keep pace with advances in technology and design is modernization. Let’s take a look at India, for instance, where the government is pursuing an ambitious program to build 100 ‘smart cities’. The hope is that these cities will act as engines of growth and spur economic activity within and in the regions surrounding them.

While the idea is sound, building new cities is an enormously expensive and complicated task. Which is why the Indian government is focusing on improving existing cities by modernizing them through the application of smart technologies and intelligent design. Similar trends are being seen in cities across the world.

This will translate into modernizing building structures, which will have a direct impact on the elevator and escalator units.

**ACCORDING TO ESTIMATES** by Research and Markets, the Global Elevators

Market is poised to grow around 5.4% over the next decade to reach approximately \$13.92 billion by 2025. This scale of modernization will see vast quantities of machinery being replaced to improve stability, reliability, eco-efficiency, and the visual aspects of the equipment. There is immense opportunity for KONE in the years ahead, especially in markets like Europe and North America, which have a combined total of over 6.5 million elevators and escalators, more than half of which are over 20 years old. Looking forward, Asia-Pacific, especially greater China, will also provide the best growth opportunities as their huge number of units grow old and require modernization.

Millions of people move around high-rise buildings every day. They expect security, comfort and convenience; while building managers require services and technology that will help them manage the building efficiently. Owners face the challenge of keeping their property competitive when new buildings are being built all the time.

If you think about the lifetime of a building, they last a very long time. And while elevators and escalators last a long time as well, the biggest challenge is to figure out when and what to modernize. This is where we step in.

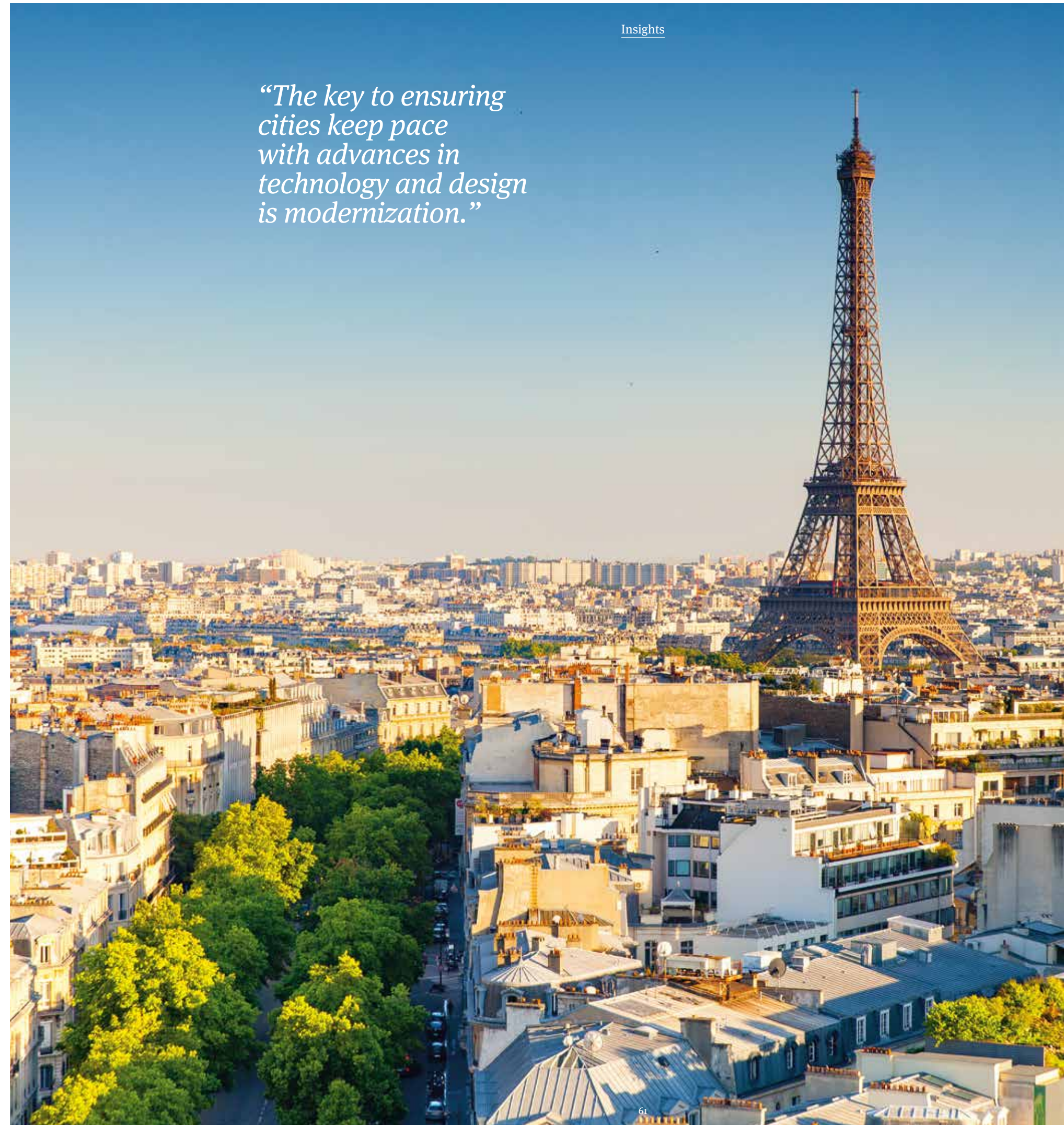
We work closely with our customers to identify their needs and design solutions that provide modernization upgrades. So when we propose solutions, we take into account the use of the buildings and the needs of its residents.

**TAKE THE CASE OF A RETAIL** building, for example. If access to equipment is restricted for a long time while modernization-related work is ongoing, it is bound to affect the businesses operating there. In such cases, depending on access, there is a need to be selective about proposing either a full or partial modernization so that disturbances are kept to a minimum.

From next-generation elevators that consume significantly less power than elevators made in the 1990s, to innovative regenerative drives that feed energy back into the system, to advanced, IoT-based, remote-monitoring systems that can be used to effectively monitor equipment, KONE has been on the forefront of the modernization wave.

Our customers rely on the decades of experience that KONE has built up. And true value comes from our capability to consult with our customers on how to go about their modernization. The future beckons and we are definitely geared up to meet it. /

*“The key to ensuring cities keep pace with advances in technology and design is modernization.”*





# The city that never sits

China's economic growth is best exemplified by Shanghai, one of the most populous cities in the world and a global financial center. In its rise to becoming a megalopolis, the city is retrofitting old buildings and structures, transforming them into modern office complexes. Let's see how this is being made possible.

TEXT Sunanda Jayaseelan PHOTO iStock



*“We have reduced operational costs, increased rental value for the owners and enhanced user safety with minimal disruption to tenants and visitors.”*

**T**here is a popular saying that while New York may be the city that never sleeps, Shanghai doesn't even sit. And if you visit modern-day Shanghai, you could quite easily see why that's true. A shining example of China's economic might, the city is one of the country's best-performing economies with its gross domestic product (GDP) growing by 6.8% last year.

And city authorities are sparing no effort to ensure that Shanghai's growth continues. The government has announced a series of measures to boost innovation and upgrade its manufacturing base. There is also a strong focus on technology with the city looking at setting up advanced industries such as integrated circuits, IoT-based applications and devices, aircraft manufacturing and even bio-pharmaceutical solutions.

**Chen Mingbo**, director of the Shanghai Commission of Economy and Information Technology, was recently quoted as saying that “Shanghai needs manufacturing and industrial enterprises, and we are making them innovation-driven, high-value-added ones.”

**THIS AND OTHER ANNOUNCEMENTS** have seen investment in the city soar as corporates set up shop and expand their businesses. Demand for commercial office space has gone through the roof, with international property consultancy Jones Lang LaSalle (JLL) expecting the city's Grade-A office space to hit 11 million square meters by 2020.

Shanghai is meeting this growing demand by refurbishing old buildings, and China Plaza 66 is an example of this.

Located in the Jing'an District, a prominent commercial area, the China Plaza 66 hosts numerous Fortune 500 companies and has been setting trends from the time it was built in 2001. However, time has taken its toll and the property has faced stiff competition from newer, more modern office buildings that have been coming up. Which is why its developers decided to upgrade the building. They focused on modernizing the elevator system to reduce operational costs and improve people flow – a feat made all the more challenging by the fact that this was a fully operational building.

“Renovating an office building is not difficult for us if the building is not in operation,” explains **David Ho**, senior manager of project construction at China Plaza 66. “The challenge lies in renovating the building while all the tenants continue their business as usual and there's no more space to add new equipment.”

**KONE, WITH ITS INNOVATIVE** technologies, deep-rooted expertise and global experience, was uniquely positioned to turn this challenge into an opportunity. The team started by surveying the existing equipment and gathering mechanical and electrical information on them. Then, KONE applied a design aesthetics-based solution to this problem, giving the buildings a contemporary look-and-feel while enhancing user experience.

“All this, including the subsequent construction work, was done at night, so as to not disturb the tenants,” emphasizes **Lu Tian**, project manager, KONE. “Our solution was designed to shorten the construction period and fit perfectly with the existing design aesthetics of the property.”

While this kept disturbance to tenants and users to a

minimum, KONE also used its innovative products to address other challenges, namely increasing energy efficiency and improving people flow. For instance, KONE's ReGenerate800 solution provided greater reliability and safety as compared with the older elevators, while recovering up to 30% of the energy consumed. Additionally, KONE's Destination control systems were installed, shortening waiting times, reducing the number of intermediate stops, and increasing handling capacity.

Throughout the process, KONE worked closely with the property owners, using numerous models and prototypes, to ensure the solutions they had provided worked seamlessly with existing facilities. And the results are clear to see.

“The people flow was acceptable during modernization, as both old and new elevators were easy to access,” says Ho. “The passengers feel that the new elevators are quicker than before, as the whole process has become more efficient.”

China Plaza 66's success in its modernization sets an example for other landmark buildings in Shanghai to follow suit, secure in the knowledge that there is a way to upgrade their facilities without having to temporarily shut shop.

“We have reduced operational costs, increased rental value for the owners and enhanced user safety and comfort, with minimal disruption to tenants and users. This kind of solution will greatly benefit similar properties across Shanghai,” concludes Tian, confidently. /

## Summary

### CHALLENGE

- Upgrade China Plaza 66's facilities to help it remain competitive in the market.
- Increase operational efficiency and energy savings of people flow systems.
- Upgrade interior design features.
- Carry out all the work without disrupting existing tenants and users.

### SOLUTION

- Designed custom-made solution for China Plaza 66 with active inputs from the property owners.
- Installed innovative technology packages to increase efficiency, reduce costs and upgrade designs.
- Did much of the work at night to minimize disruption to existing tenants and users.

### FACTS

- 66 Floors with an area of 159,555 square meters
- Shanghai Hang Bond Property Development Co. Ltd.

### KONE SOLUTIONS

- ReGenerate800 modernization package
- ReNova M3 elevator doors
- KONE Destination control system







*“Space was an issue. Taking the escalators in and out for a full truss replacement would be challenging.”*

## Summary

### CHALLENGE

- To replace existing escalators without major modifications or the removal of museum installations.
- Prevent any disruption to the flow of museum visitors, while ensuring the highest standards of safety.

### SOLUTION

- KONE retained the existing truss, while using KONE EcoMod to modernize the escalator.
- Since the truss was retained, costs were reduced, visitor flow was not disrupted and there was minimal impact to the museum.
- KONE EcoMod units have the ability to reverse direction, giving the museum more flexibility to control visitor flow.

### FACTS

Building owner/operator: City and County of Denver. Building operated by The Denver Museum of Nature & Science.

Building size: 66,528 square meters

Completion: March 2016

### KONE SOLUTIONS

Two sets of KONE EcoMod escalators

KONE modernized the Denver Museum’s escalators without demolishing any floors or building facades.



# A night at the museum

What’s it like to replace four sets of escalators in a century-old facility that sees over a million visitors a year? Talk about a tough job. Yet, that is exactly what KONE managed to do at the Denver Museum of Nature and Science, with no disruption to the flow of visitors. Here is how they did it.

TEXT Lakshmi Sivadas PHOTO Denver Museum of Nature & Science

**F**rom dinosaurs and Egyptian mummies, to a recreated gem mine as well as space exhibits, the Denver Museum of Nature and Science offers a compelling view of history, nature and science. Established in 1900 and housed in a 66,528-square-meter building, the museum contains over a million objects in its collection, and over 1.6 million people visit it every year in order to be amazed and fascinated.

However, every building, especially the popular ones, have to modernize periodically to keep up with the changing times. And the Denver Museum of Nature and Science was no exception, especially when it came to its escalators. The life of a well-maintained escalator is usually about 25 to 30 years old, and the ones at the museum were about 28 years. They were clearly starting to show signs of stress.

“Our units were getting a little bit older, and we had a couple of successive issues with some step chains,” explains **James Calder**, building services manager at the museum. “Once, on one of our most heavily used units, a step chain broke and it took a month to get it repaired. That was too much downtime for a unit that is so important for circulation of guests throughout our facility.”

## A ‘Living’ museum exhibit

The installation of KONE’s EcoMod escalators happened as the Denver museum was running. At no point were any of the museum operations stalled. This led to a number of amusing situations where visitors assumed that the work on the escalator was part of the museum’s many exhibits.

“In fact, a guest said that he was on his way to the exhibits when they stopped to admire the work on the escalators. His kids were so thrilled when the man working answered their questions and called himself a “living exhibit” of the museum,” remarks **James Calder**, building services manager.

During the course of the installation, a number of visitors directed questions to the KONE technicians installing the escalator, all of which were answered. Many were pleased with what they considered an interactive exhibit

“We had visitors remarking that it was the best exhibit at the museum so far, and that they would come back and see the progress of the project,” says **James happily**.

**THE DENVER MUSEUM OF NATURE** and Science is open 364 days a year, with activities going on at all hours of the day and night. Nearly 500 employees and 1200 volunteers work to keep the museum running for the nearly 1.6 million people who visit it annually.

With so much activity, it is easy to understand why any equipment failure or downtime can severely interrupt the movement of people from one part of the museum to the other. The museum chose to modernize their equipment to solve these problems, but the time taken to install the new equipment was also a big factor to consider.

“The escalators are right in the heart of the museum. We knew the time had come to replace them, but closing off the building was out of the question. We gave a lot of forethought about all the logistical and safety considerations before undertaking this project,” explains **James**.

KONE had won the contract to upgrade the escalators, and they gave the museum two options – either rip out and fully replace the entire truss assemblies of the existing escalators, or upgrade their existing escalators with KONE’s EcoMod – a complete modernization solution that allows for escalators to be upgraded without any need to demolish floors or building facades. Unsurprisingly, the museum chose the EcoMod option.

**“SPACE WAS AN ISSUE.** Taking the escalators in and out for a full truss replacement would be challenging, especially since the escalators connect three floors,” explains **Kevin Wigley**, regional escalator sales manager at KONE. “KONE EcoMod is turnkey, reuses the existing truss, and retains existing architectural and aesthetic elements. This helps reduce disruption, making it a compelling proposition.”

Additionally, the KONE EcoMod escalators also gave the museum the ability to reverse direction, a feature that was lacking in their existing escalators. This gave the museum operators much-needed flexibility to switch locations and manage people flow better, during the numerous exhibits and events that take place there every year.

The KONE EcoMod escalators at the Denver Museum of Nature and Science were completed three weeks ahead of schedule. During the period in which the escalators were being modernized, the museum registered a record-breaking 1.8 million visitors. Yet the level of disruption was minimal.

“I never heard a peep of dissent about the construction,” says **James happily**. Further testimony to KONE’s years of experience in providing efficient people flow solutions, experience that has helped one of America’s premier museums educate and enthrall thousands without a hitch. /



# Mission modernization

Across Europe, thousands of buildings are being refurbished and modernized. A process that will enable them to handle more people, operate different functionalities, and utilize more modern technology. We tell you how Germany's Westend Gate high-rise building was revamped.

TEXT Rachel Stern PHOTO Bernd Perlbach

## Summary

### CHALLENGE

- Ensure minimal disturbance to the occupants of the hotel.
- Maximize amount of space available to the hotel by using space-saving products.
- Install tailor-made solutions to fit the hotel's particular requirements.

### SOLUTION

- Get involved right at the design phase of the project to develop appropriate solutions.
- Designed a solutions package that kept the customer and the tenant's needs in mind.
- Installed eco-efficient solutions to improve building's green rating.

### FACTS

Completion: 2017  
Developer: Rudy Becker & Dörflinger Elektrotechnik  
Size: 159 meters tall

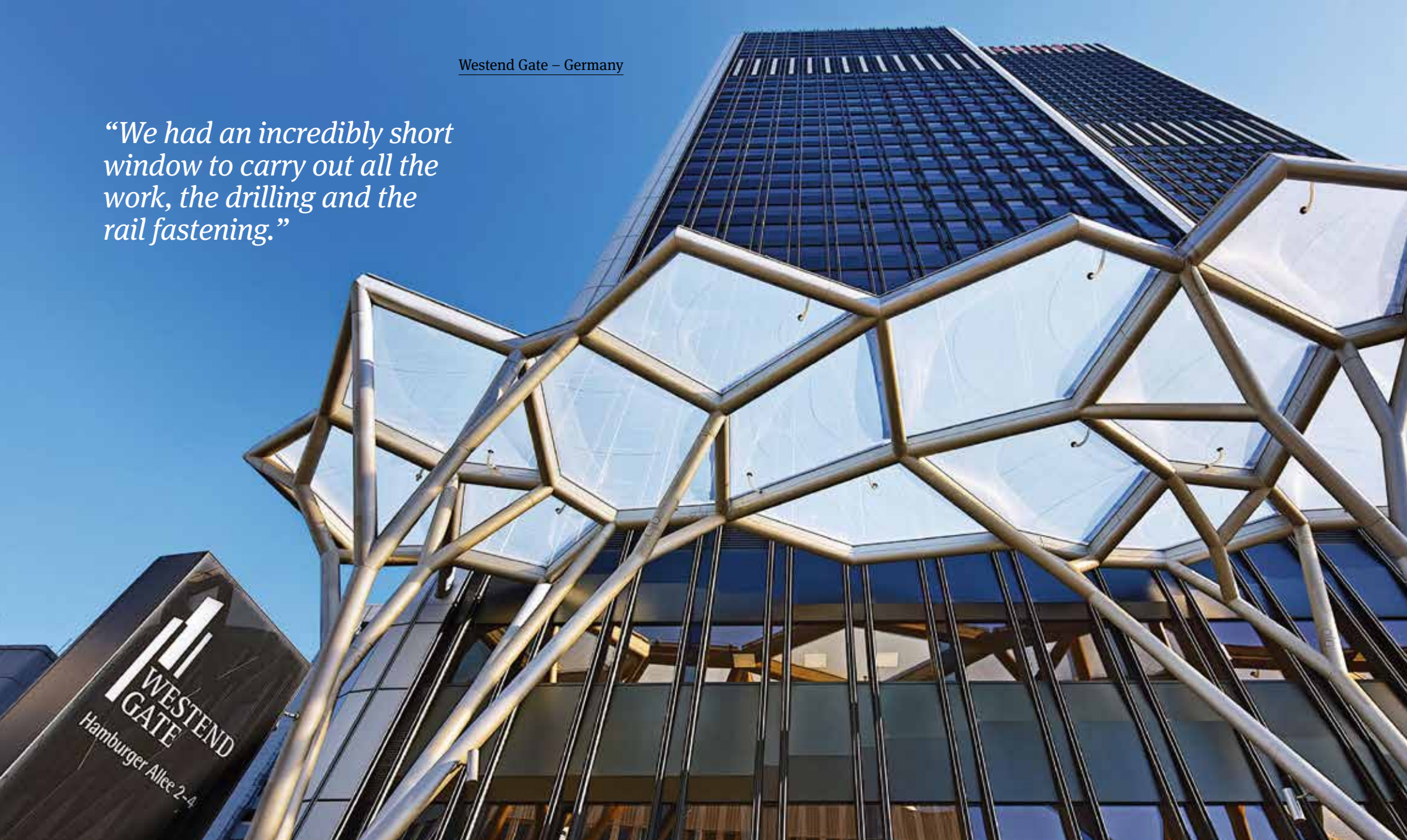
### KONE SOLUTIONS

KONE ReGenerate™ 800 modernization solution  
KONE Destination control system  
KONE Access™  
KONE MonoSpace® 700 elevators





“We had an incredibly short window to carry out all the work, the drilling and the rail fastening.”



**A**t first glance, it might have seemed like Mission Impossible. The elevators of the Westend Gate building, which offers both hotel and office space in Frankfurt, were modernized between September 2015 and January 2017, a task that involved scheduling several hours of intensive work on-site without disturbing the many people staying and working within the complex,

especially the Marriott Hotel, which has been the main tenant of the Westend Gate since 1989.

“We had a short time window to carry out drilling and rail fastening,” says KONE sales person **Lothar Franke**, pointing out that the construction required close and speedy cooperation with the management. Often meetings were held in the building’s courtyard in order to not disturb the hotel guests. The noise from the construction too was kept to minimal levels.

Through the successfully completed upgrades, the sleek and tech-savvy space not only gained features such as a service elevator and up-to-date elevator technology for increased comfort and speed, but also official European Union (EU) Green Building Certification.

**BUT WHY ARE MANY BUILDINGS** in the EU being modernized? Primarily because the stock of buildings in the EU is relatively old, with 40 percent having been built before 1960. Simply tearing down old buildings and replacing them with new ones is not possible, according to **Rob Williams**, a senior consultant at Trinomics, an economics policy consultancy.

“There are too many buildings involved, it would be too resource intensive and it would lead to the destruction of too many buildings of architectural merit,” he says.

Keeping all this in mind, from an economic point of view it makes more sense to refurbish a building than to replace it – especially since most existing buildings are expected to last until 2050. The Westend Gate is one among thousands of buildings across the EU that is being modernized, turning them into contemporary, efficient structures.

So how did KONE go about modernizing the equipment at the Westend Gate? To minimize time and save resources, KONE began by improving ease of access to the building. They refurbished the building doors and improved the secure entrance to the building. KONE’s Access Control systems were integrated with the building elevators to improve security and efficiency.

**THE ELEVATOR SOLUTIONS WERE ALSO** designed to make people flow smooth and seamless. For instance, two elevators were

dedicated to connect the 1st with the 5th up to the 11th floor, while four elevators were dedicated to connect the 1st with the 12th up to the 24th floor.

KONE’s Polaris Destination Control system was installed to analyze the number of waiting passengers and the desired destination, in order to provide the fastest and most efficient routes. For VIP service for special tenants, these elevators could also be made to travel to the basement parking areas, a unique service provided by KONE for the Westend Gate. In order to access the underground parking area, two elevators were extended two floors underground, an extremely difficult task which hasn’t been carried out often, but which KONE managed successfully.

Additionally, a fireman’s elevator in the hotel was modernized. For deliveries, a MonoSpace 700 lift was put in to move goods quickly and discreetly. For its installation, a 54-meter-high shaft was added to the façade – an extremely

challenging task that KONE carried out successfully nonetheless.

KONE’s elevators were also equipped with advanced technology to conserve energy. While the old elevator drives, for example, had an estimated power consumption of 35 kw per hour, the new elevators clocked only 7.5 kw per hour – an impressive reduction by any account.

**Irati Artola**, sustainability advocate and a consultant at Trinomics, says that while technology for energy efficiency in buildings is already available, it is the uptake of this technology that is often an issue.

“This is related to a lack of awareness, knowledge and suitable implementation of these technologies as well as to the need for behavior change,” she says.

The successful implementation of new solutions will help create more awareness and act as a model for modernization of more buildings across Europe. It’s time to catch the wave. /



TEXT Sascha Brozek  
senior vice president – Major Projects, KONE

PHOTO Tim Franco

## Asian flavor

**A**sia – populated, energetic, colorful, and exotic – is home to 60% of the world’s population and has a share of 40% in world GDP. As it rises up the league tables, the landscape of Asian cities, as we know them, will change dramatically.

Every week, 1.5 million people, chasing better economic prospects, move to urban areas. Estimates suggest that two-thirds of the world’s population is set to live in cities by 2050. A large part of this incremental growth in urban population is expected to come from Asian cities as they have the highest densities and growth rates in the world. Of a total of 30 megacities globally, 20 are in Asia, and each of these megacities has large living and housing requirements. This explains why Asia is an exciting place for KONE.

But China, in particular, is uniquely positioned in this dynamic and fast-moving region. It represents over 70% of the world’s high-rise market for new construction and 62% of the global elevator market. It also has the largest number of high-rise projects. Last year 128 buildings that were over 200 meters tall were completed around the world. Of these, 107 were in Asia and 84 were built in China alone.

**THE GROWTH IN THE CONSTRUCTION** market in China has been driven by remarkable speed of construction, strong project management in terms of the flow of people and materials, and a continuous development

of competence and capacity in construction and operations. The China Zun project is a case in point. It is a fast-track construction with over 4000 construction workers on-site. KONE’s UltraRope and JumpLift technologies have played a key role in the development of this project.

Going forward, efficiencies are expected to improve with increasing digitalization in urbanization. Armed with this knowledge, KONE is riding the digital wave. While its smart building technologies provide better information about the performance of building equipment, its condition-based maintenance – powered by monitoring, smart sensors and data analytics – ensure better system performance and lead to optimized cost of operations with much lesser downtime.

**THE ASIAN MARKET HAS GIVEN** us the opportunity to expand our horizons and service new customers and segments in a better and more holistic way. Not only are more and more people aspiring to live and work from taller and better buildings, they are also demanding safe, reliable and efficient infrastructure for public transportation (airport, metro and railways, transit centers, etc.). We at KONE, hear them. We believe we can play a crucial role in shaping both the construction market and the infrastructure sector in these economies.

We are equipping ourselves to innovate and offer a host of new and effective solutions to keep pace with this spectacular growth story of the region. Our Asian journey is underway. /

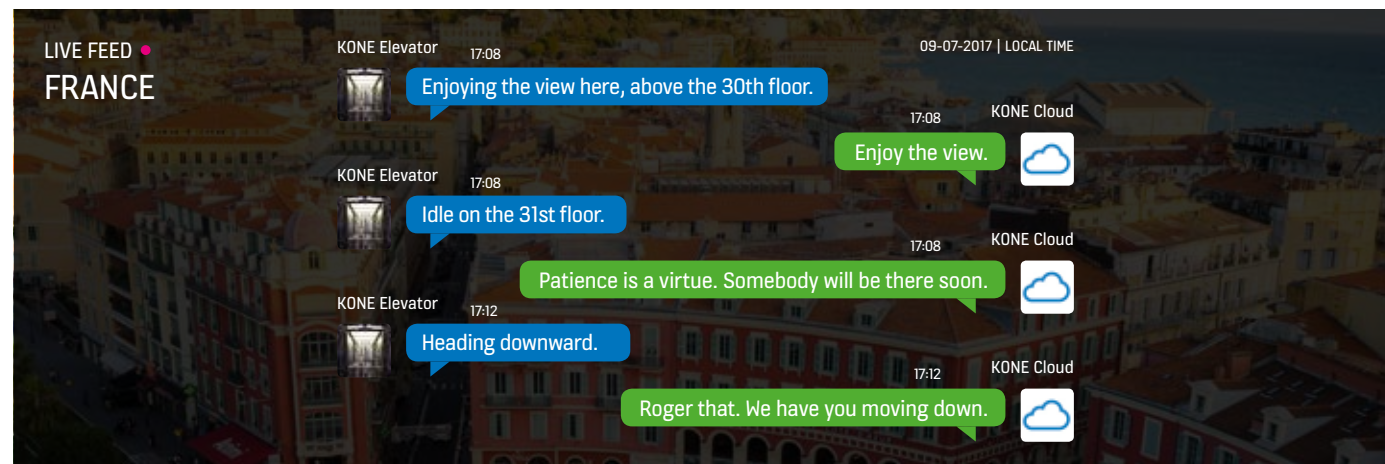
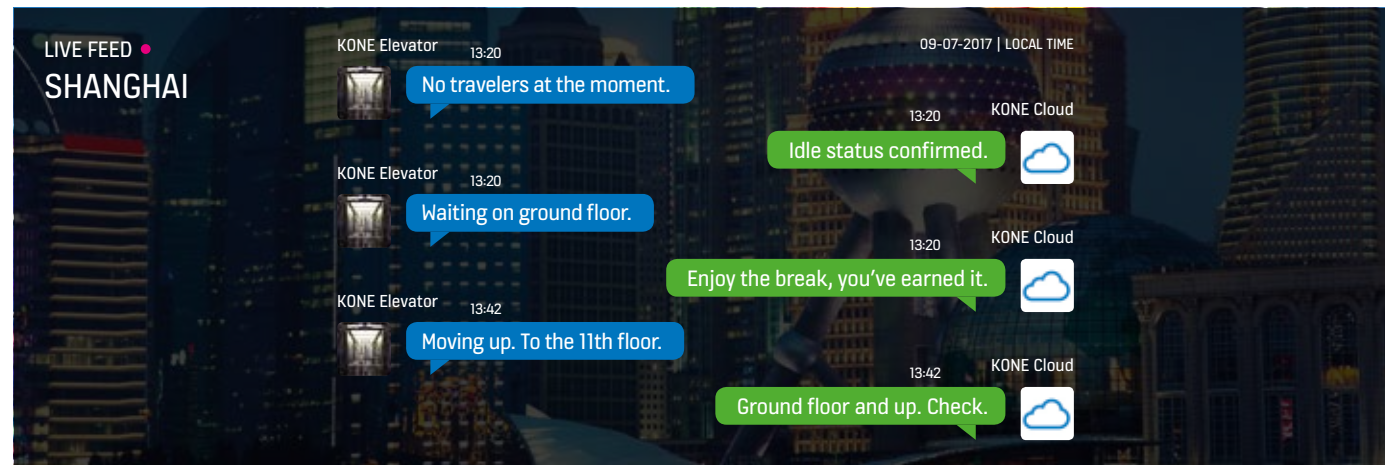
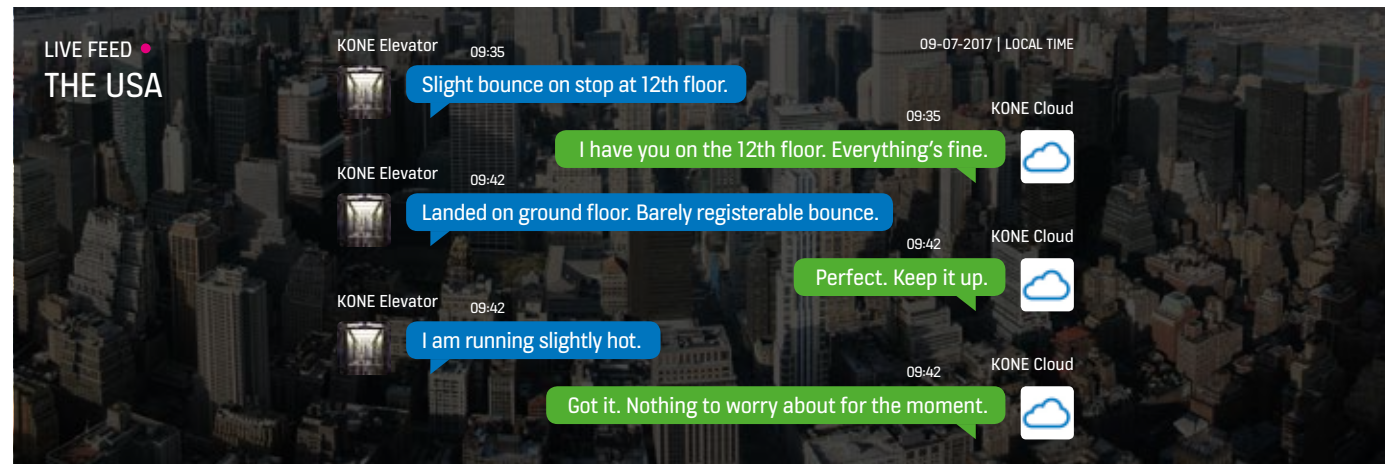


*“Of a total of 30 megacities globally, 20 are in Asia.”*



# Listen to machines talk

Ever wonder what your elevator is thinking? You no longer need to. KONE and IBM teamed up to show what KONE's 24/7 Connected Services would be like if elevators had a voice. Take a look for yourself!



For more fascinating live conversations between two machines, head over to <http://machineconversations.kone.com>





Dedicated to People Flow™



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