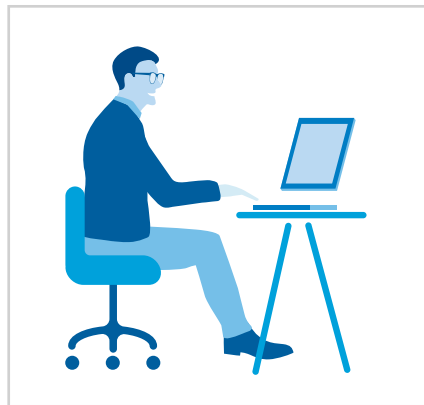




# ELEVATOR PLANNING

A HANDBOOK FOR ARCHITECTS

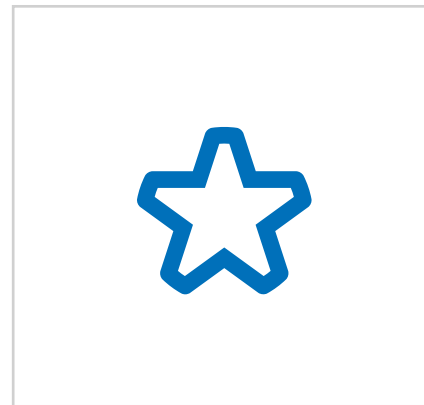
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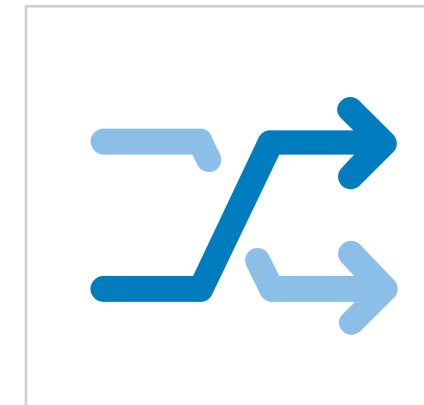
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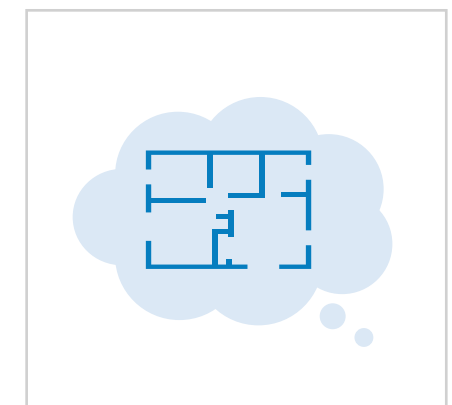
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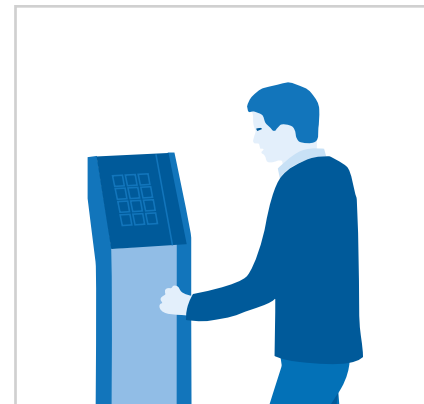
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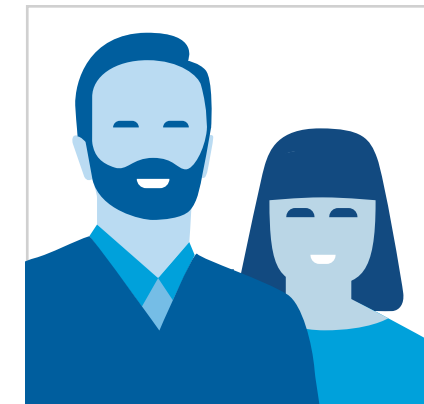
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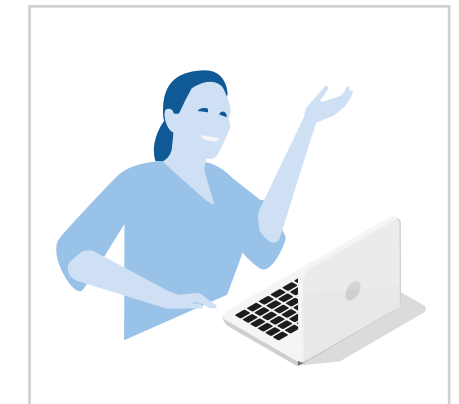
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# BECOME A PLANNING EXPERT

The best elevator solution for your building is one that saves space, meets the required specifications and moves people as efficiently as possible – all while keeping costs down.

It's not always obvious how to achieve all this, so we're here to help. This handbook is packed full of information and tips that will help you become an elevator planning expert.



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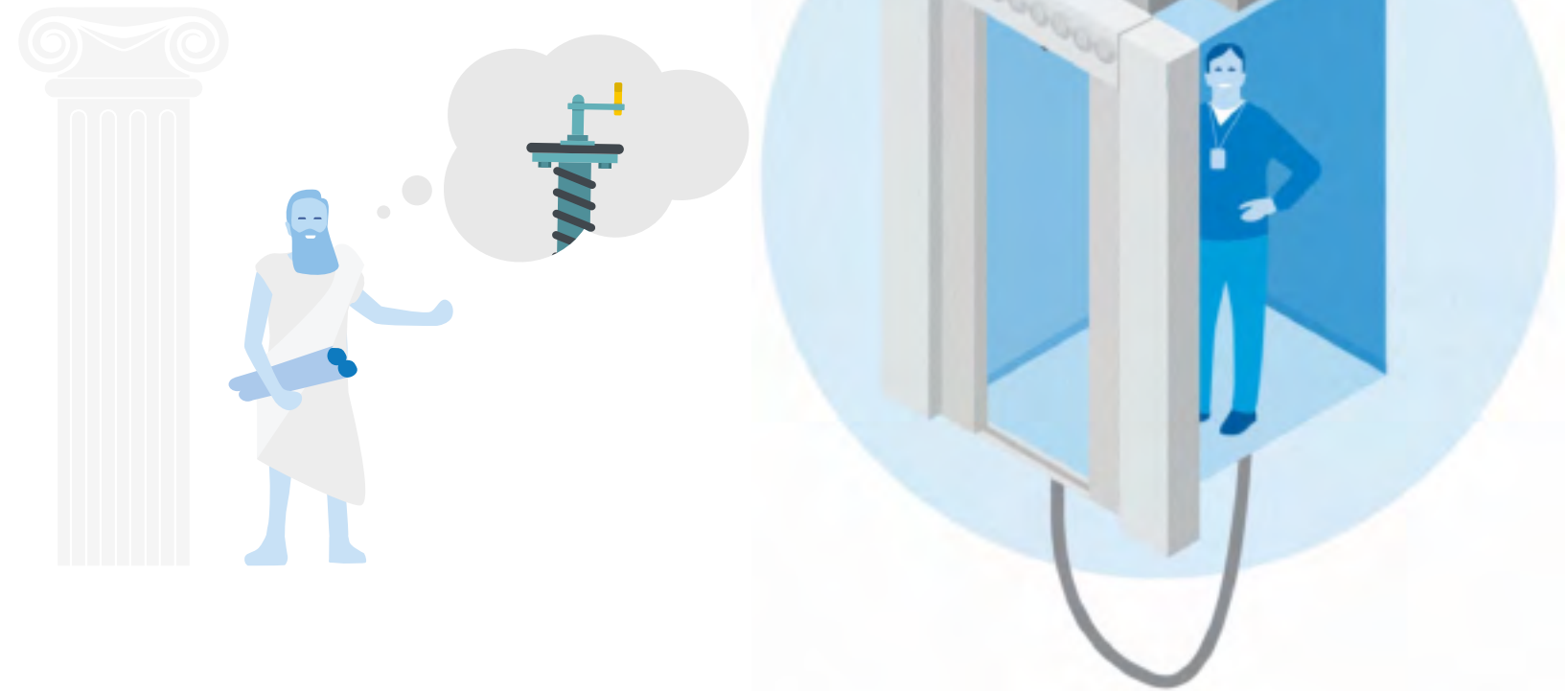
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# REIMAGINING VERTICAL TRANSPORTATION



Elevators have been around for a very, very long time. The first elevating device was developed as early as 236 BC by Archimedes, a Greek mathematician, physicist, astronomer, engineer and inventor. But his invention didn't really take off until the 19th century, when electricity came into play. Since then, the elevator has been reimagined many times.

Some of the first types of elevators included self-climbing, pneumatic and hydraulic, but from the 1880s onwards, electric traction elevators became the standard for most applications. It wasn't long before the lifting device became ubiquitous in taller buildings.

Elevators periodically achieve new standards of speed, safety and efficiency. In 1996, KONE introduced a brand new concept: the KONE MonoSpace®. It was the world's first machine

room-less elevator and is still one of the most space and energy-efficient elevator designs in use today. Machine room-less elevators do not have a fixed machine room on top of or beside the hoistway; instead, the traction hoisting machine is installed either at the top or in the bottom of the hoistway.

Modern elevators can go higher and faster, and may also include intelligent routing technology to cut waiting and travel times during peak hours. Architects should be aware of these capabilities since they affect the number and type of elevators a building needs and what those elevators can do.

For example, did you know that you can provide direct penthouse access without adding a single extra elevator? Read on to learn more.

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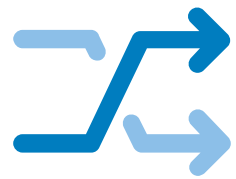
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# The top five things to consider

1

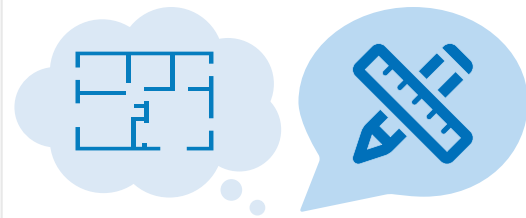
## MOVING PEOPLE



Different user groups flow through buildings in different ways at different times. Make sure you have a clear understanding of how people will move through your building throughout the day.

2

## ELEVATOR SPECIFICATIONS



Creating accurate specifications early in the planning phase for the equipment you want to install can help you achieve cost predictability and optimize valuable space.

3

## COST



Cost is a factor when choosing an elevator solution. You can often keep costs down by sticking to a manufacturer's standard offering. Certain things, like non-standard entrance heights or heavy interior finishes, may lead to a custom, more costly solution.

4

## ONLINE TOOLS



Online [tools and calculators](#) from elevator manufacturers can save you a lot of time when planning your building. Use them to generate specifications, CAD drawings or even BIM files.

5

## CODE REQUIREMENTS



Elevator code requirements vary from place to place, and are regularly updated. Involve a manufacturer during the design phase to help ensure that elevators will be fully code-compliant.

# PEOPLE FLOW

At KONE we think that improving the flow of urban life is pretty important. It reflects global trends, especially increased urbanization. As the world moves towards bigger, more densely packed cities, the smooth flow of people becomes more and more important. KONE has developed a body of knowledge and a set of tools around this that we call People Flow®. People flow means people moving smoothly, safely, comfortably and without waiting in and between buildings.

For building users, there is a strong connection between the quality of people flow and the quality of the building. Quality is also reflected in the overall experience from front door to final destination—for example when the lobby and elevator experience complement one another.

There's no one-size-fits-all approach to people flow planning, but timing is important. Starting early, in the concept and design stage, can help save time and money.

## GETTING PEOPLE FLOW RIGHT

Good people flow doesn't just 'happen'. It's the result of careful planning and analysis. Getting people flow right involves the use of technology to provision equipment in the most efficient way while eliminating bottlenecks. Using the right planning tools is the best way to kick-start this process. Start with a traffic [planning tool](#) and an [elevator selector](#). Both can support you decide which equipment will help you achieve your desired people flow parameters.

## PEOPLE FLOW PLANNING

Getting people flow right is crucial to achieving efficiency and user satisfaction. There are many parameters to consider, with one of the most important being total journey time. This is defined as the time it takes a user to travel from the building's main entrance to their destination.

## IN-DEPTH PEOPLE FLOW PLANNING

For more precise planning, look for manufacturers that can apply vertical and horizontal analysis and planning to your new or existing building.

### ELEMENTS OF GOOD PEOPLE FLOW



SHORTER TRAVEL TIMES



CLEAR GUIDANCE AND TIMELY INFORMATION



AVOIDANCE OF CROSS-FLOWS



EFFORTLESS NAVIGATION



QUICK AND SECURE ACCESS



REAL-TIME PERFORMANCE



REDUCED FULL-STOP POINTS



PREVENTION OF CONGESTION

### SOME EXAMPLES OF PLANNING TOOLS IN ACTION:

- In-elevator camera-based people mapping for existing buildings
- Heatmapping of congested areas for horizontal flow patterns
- Animated simulation of people movement based on real-life data

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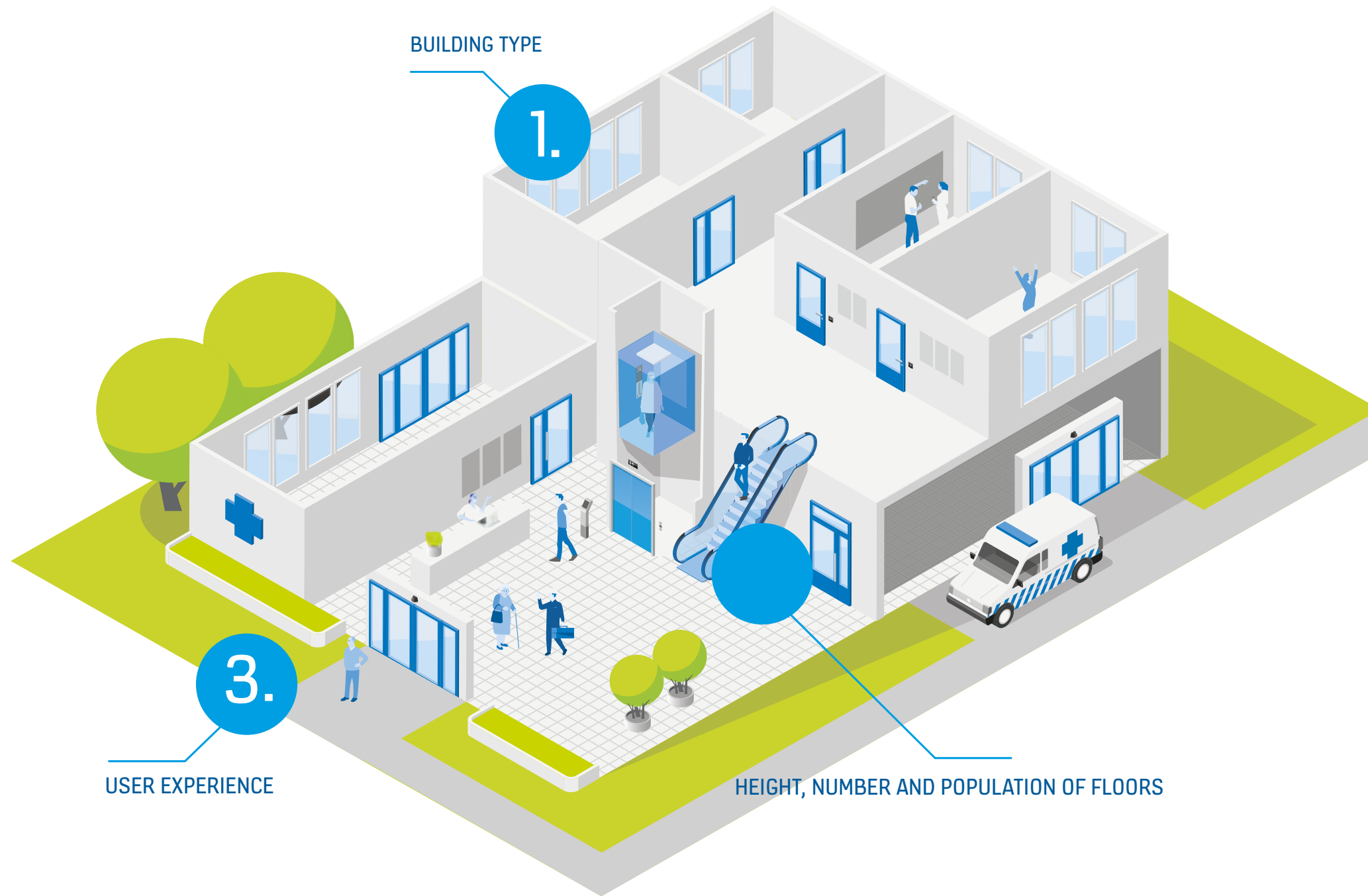
# PEOPLE FLOW

FACTORS AFFECTING PEOPLE FLOW INCLUDE:

- BUILDING TYPE (RESIDENTIAL, HOTEL, OFFICE, ETC.)
- NUMBER OF FLOORS
- POPULATION PER FLOOR
- FLOOR HEIGHTS

HOVER YOUR CURSOR OVER THE NUMBERED DOTS TO READ MORE.

1. HOW BUILDING TYPE AFFECTS TRAFFIC FLOW
2. HOW THE NUMBER, HEIGHT AND POPULATION OF FLOORS AFFECT TRAFFIC FLOW
3. USER EXPERIENCE



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# ELEVATOR SPECIFICATIONS

## CREATING ELEVATOR SPECIFICATIONS FOR YOUR PROJECT

Creating elevator specifications is easy. But creating specs that result in cost predictability and space savings takes careful thought. There's no need to start from scratch though. Take advantage of an editable master spec template and simply customize it to meet your needs.

You can start by making sure you have all of the basic information included like capacity, speed and number of landings, for example. Next, you can refine your specification, taking into account factors like access control provisions, car height and car interior design options.

You'll want to make sure your specification is thorough but one that is too limiting may cause some unanticipated consequences:

- You may limit the number of manufacturers that can bid on the project
- You may be requiring non-standard features that lead to an expensive, custom-engineered solution

Today, the standard offerings from most major manufacturers' should be initially considered as they can often meet the performance and design requirements of most buildings.

## SOME IMPORTANT TO-DOS

- Pick an elevator manufacturer early so the hoistway can be designed for the specific dimensions of their equipment
- No shaft will be built exactly plumb, so add some extra space to the hoistway width and depth just to be sure
- Make sure you know the overhead structure required
- Ask your local sales rep to help you ensure that the elevators comply with all the relevant codes



## HELP IS AT HAND

Elevator manufacturers often offer free tools that speed up planning. You can input your building and elevator parameters and quickly generate project-specific documents like specifications and CAD drawings.

KONE experts will be happy to help you with your next project.

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# SAVING SPACE & KEEPING COSTS DOWN

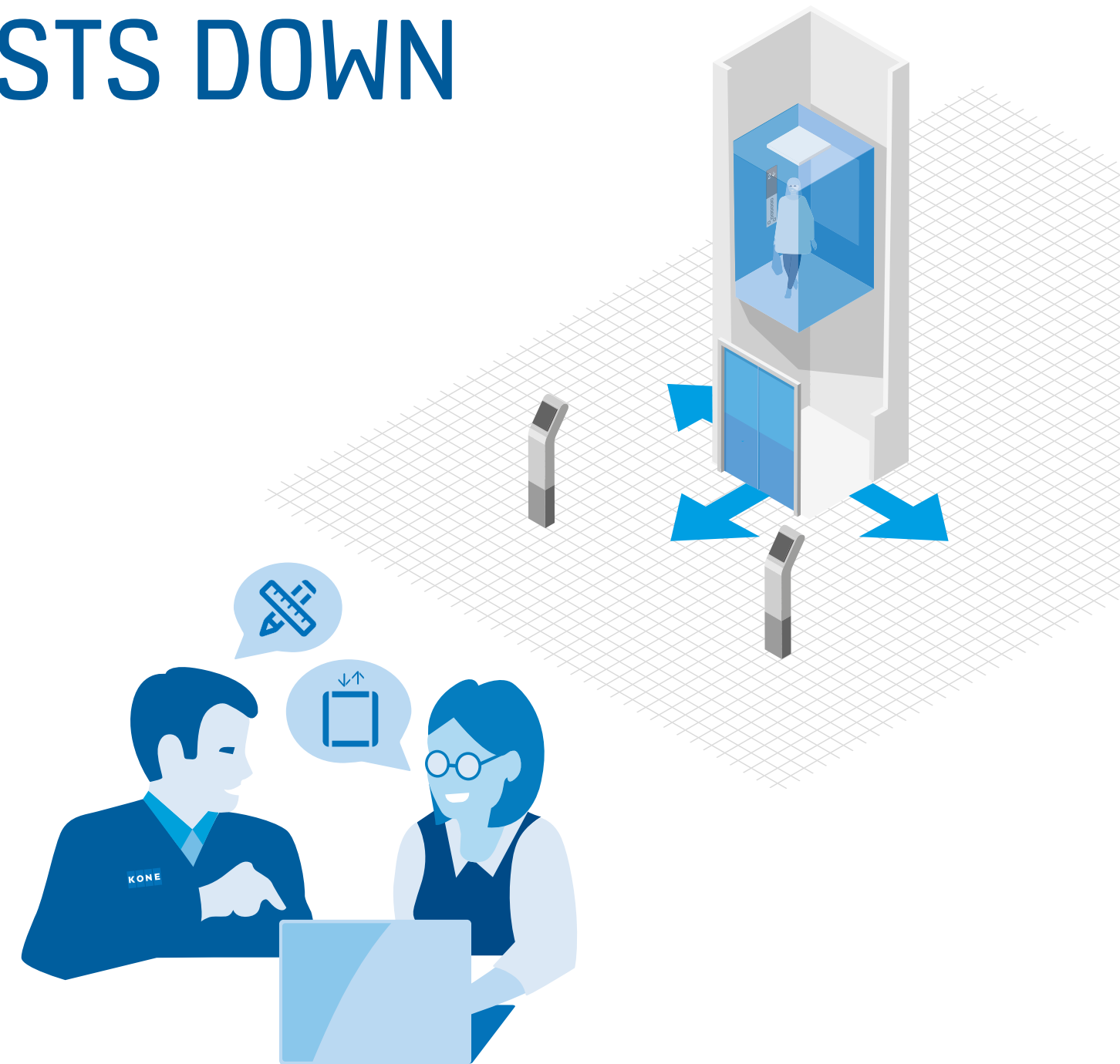
## GO MACHINE ROOM-LESS

Traditional hydraulic and overhead traction elevators require machine rooms, located either above the hoistway or adjacent to it on the first floor. Not only do machine rooms take up some of the most valuable floor space in the building, but they also add costs in terms of design, construction, temperature-control and maintenance.

Machine room-less elevators are not only the most space-efficient option, they also consume less power than traditional geared traction elevators. Installing an eco-efficient KONE elevator solution can also help in achieving green building accreditations such as LEED or BREEAM certification.

## INCREASE CAPACITY WITH A DESTINATION CONTROL SYSTEM

When machine room-less elevators are not an option (in very tall buildings, for example), you can still save space by closely matching elevator specifications with the needs of the building. Destination control systems help to keep waiting times manageable, even during the busiest periods. Since vertical transportation is provisioned to handle peak demand, such systems can potentially reduce both the size and the number of elevators needed in a building.



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# REIMAGINING EFFICIENCY

## DESTINATION CONTROL SYSTEMS

Throughout the 20th century, the speed, safety and carrying capacity of elevators has increased while the space they occupy has decreased. Then came the next big challenge: how to transport passengers with greater efficiency.

Destination control systems (DCS) help address this challenge by using artificial intelligence to learn and forecast building traffic flows. When the traffic intensity changes, the system measures the changes in traffic patterns and adjusts its optimization routines accordingly.

With a DCS, passengers can select their desired destination floor before they even enter the elevator. The floor can also be automatically chosen for them using information carried on their access card or mobile device. A DCS also guides passengers to the correct elevator. In this way, each car makes fewer stops and the total journey time is reduced.



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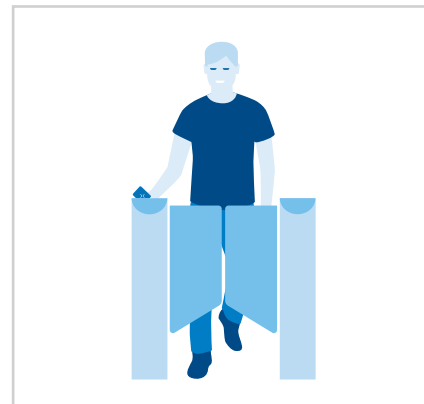
## A HOST OF INNOVATIONS

Elevator technology has progressed in other areas as well as destination control systems. The overall result is reduced energy usage, better efficiency of use and the ability for elevators to travel higher and faster than ever before.



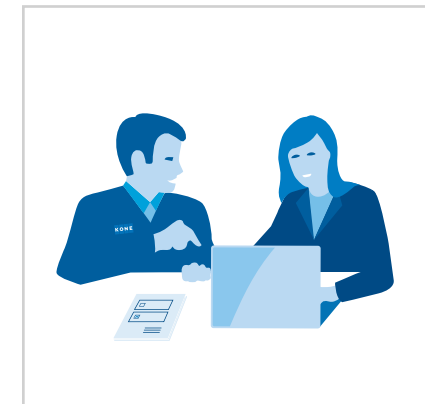
### REGENERATIVE DRIVE

Offsets power consumption by converting braking energy into electricity that can be used elsewhere in the building.



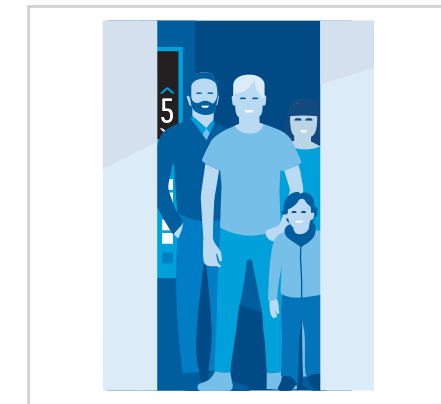
### ACCESS CONTROL SYSTEMS

Control access to building entrances, turnstiles, stairwells and elevator landings.



### MONITORING SOLUTIONS

Centralize elevator and escalator monitoring for a real-time overview of equipment status, demand, traffic performance and availability.



### CARBON FIBER CABLES

Provide unrivalled elevator eco-efficiency, reliability and durability, while also improving elevator performance.

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# THE ULTIMATE PLANNING CHECKLIST

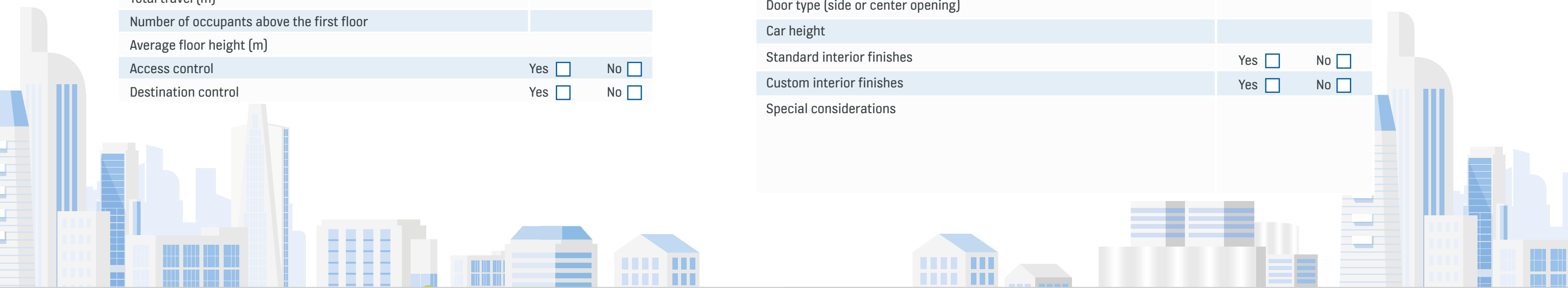
Use this interactive checklist to make sure you account for key details in the early stages of your elevator planning. This information can be useful in discussions with manufacturers or when utilizing online planning tools.

## BUILDING INFORMATION

Building type		
<input type="checkbox"/> Office	<input type="checkbox"/> Retail	
<input type="checkbox"/> Residential	<input type="checkbox"/> Medical facility	
<input type="checkbox"/> Hotel	<input type="checkbox"/> Public transportation and airports	
<input type="checkbox"/> Special buildings	<input type="checkbox"/> Other	
Number of landings		
Total travel (m)		
Number of occupants above the first floor		
Average floor height (m)		
Access control	Yes <input type="checkbox"/>	No <input type="checkbox"/>
Destination control	Yes <input type="checkbox"/>	No <input type="checkbox"/>

## ELEVATOR INFORMATION

Quantity (number of elevators in the group)	
Load (e.g. persons / kg)	
Speed (e.g. m / s)	
Car type (e.g. single entrance or through type car)	
Control location (physical location of the elevator control system)	
Door width	
Door height	
Door type (side or center opening)	
Car height	
Standard interior finishes	Yes <input type="checkbox"/> No <input type="checkbox"/>
Custom interior finishes	Yes <input type="checkbox"/> No <input type="checkbox"/>
Special considerations	



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# ADDING VALUE

Congratulations! You're well on your way to becoming an elevator planning expert. If you would like to take your planning to the next level, our KONE experts are happy to help you in your upcoming project.

[CONTACT US TO BOOK AN APPOINTMENT TODAY »](#)



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# Discover our planning tools for architects on your local KONE website



## [KONE Quick Traffic »](#)

Find the right number of elevators for your building. KONE Quick Traffic gives you a rough estimate of the required number of elevators for different building types.



## [KONE Elevator Toolbox »](#)

Create a configuration that matches your needs and generate detailed specs, CAD drawings and BIM files..



## [KONE Car designer »](#)

Choose an interior from the current KONE Design Collection or mix and match materials, lighting and accessories for a custom look.

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