

Source: Peter Nigst, Wien

Automatic parking. Quite simple.

Automatic parking. With a proven technology that uses space intelligently.

Automatic parking systems made by Stolzer are based on technical standards which have been proven all over the world. The systems were first applied to industrial settings as fully automatic storage systems for heavy loads.



Technology proven all over the world. Horizontal and vertical movement of a vehicle to a safe parking place, leaving the driver and passengers free to move on to other activities.

The technological principle of automatic parking has been proven thousands of times in industrial automation. Storage and retrieval units handle tons of cargo within a minimum of space. For instance, stacks of sheet metal are fed into machines from exact positions within seconds.

This technology was developed by Paul Stolzer in the eighties and was established as a reliable standard for storage systems. In recent years, the technology has been adapted for automated parking systems.

Vehicles are driven on to a pallet that can move the car vertically or horizontally. The vehicle is then automatically moved by a storage and retrieval unit to an empty spot in the rack structure.

Regular customers (that is, employees and/or building residents) get a transponder, public users get a ticket. The system can identify and retrieve a vehicle in less than two minutes. The Stolzer technology for automatic parking can be installed in existing buildings as well as in new construction. Automatic parking pays for itself when used for long-term customers as well as for public usage.

Parking System auto- LP

For narrow spaces, for parking up to 60 vehicles with one storage and retrieval unit in a maximum headroom of up to 16 m in an underground, above ground or mixed structure.

Parking system auto- UP

Universal parking system for parking up to 100 vehicles with one Storage and retrieval unit in a maximum headroom of up to 20 m in an underground, above ground or mixed structure.

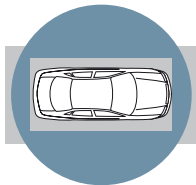


The basic functionality of automatic parking is based on the use of four components.



Transfer room

Drivers pull straight on to a pallet in the garage floor. The car is checked for proper position. The car is then moved to an empty shelf of the rack structure. The system also turns the car so it can be driven right out of the garage without backing up. The driver doesn't enter the parking system area. A transponder or a ticket guarantees fast and safe parking in and out.



Turntable

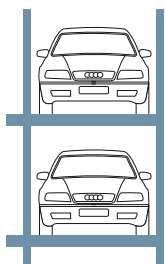
Once the parking position is approved and the passengers have left the vehicle, a turntable turns the vehicle into the exit direction. The use of the turntable means that the pallet in the transfer room can be positioned at any angle.



Storage and retrieval unit

Stolzer automatic parking systems let you park twice as many vehicles in a given space compared to a conventional garage. This is due to short distances within a parking system and due to the linear movement of the storage and retrieval unit. The system is based on a horizontal X- and a vertical Z-movement as well as horizontal Y-direction for servicing the shelves within the rack structure. Using precision roller chains (or friction wheels with servo drives) our storage and retrieval units can service up to 100 m of system length and up to 50 m of height. Driving speeds up to 2 m / second allow for a high output capacity.

The storage and retrieval unit uses a computerized system for easy operation, monitoring and documentation of the parking process.



Rack structure

A free-standing, steel rack structure holds the vehicles. The rack can be concealed behind a facade or integrated into a building. The vehicles are parked on pallets. As an alternative, a concrete structure may be used. In this case the pallet rails are doweled to the concrete slabs.

Parking system auto- TP

For small surface areas, for parking up to 100 vehicles with one storage and retrieval unit in a max. headroom of up to 50 m in an underground, above ground or mixed structure.

Parking system auto- SP

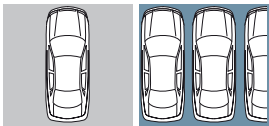
Universal parking system for high throughput capacity and a high number of parking places in an underground, above ground or mixed structure.

Parking system auto- LP

For narrow spaces, parking up to 60 vehicles with one storage and retrieval unit in a maximum headroom up to 16 m in an underground, above ground or mixed structure.



Especially in areas that are architecturally sensitive, traffic presents a challenge for planners and builders. The advantages of the parking system auto- LP are visible at first glance.



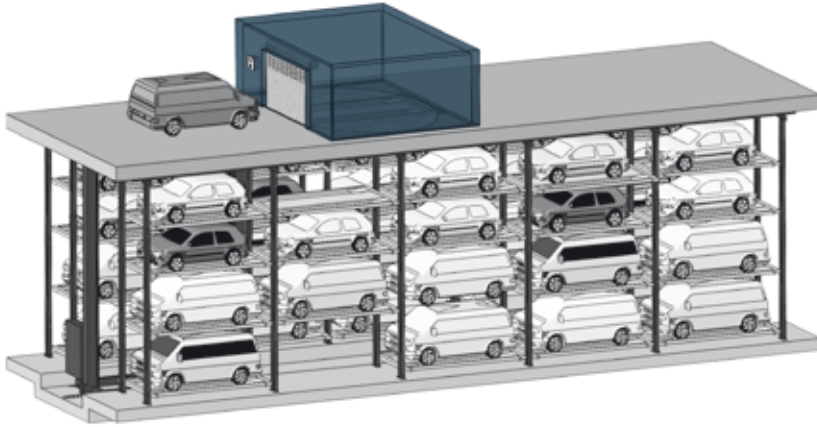
Using the parking system auto- LP, you can park twice as many vehicles compared to conventional parking.

The parking system auto- LP was designed for narrow buildings. It may be used to park more vehicles in an existing garage. Or for redevelopment projects or for new construction with very limited space. It allows for parking of up to 60 vehicles including SUVs within a max. headroom of 16 m or 8 parking levels and a max. length of 100 m, under ground, above ground or in a mixed structure.

For parking this number of vehicles on the street or in a conventional garage, floor space of 750 m² would be required.

The parking system auto- LP offers two modular versions, depending on the location of the transfer room. There is an auto- LPM version with the transfer room being located in the center of the parking system between the rack areas and a auto- LPS version with the transfer room being located above the rack area. For planners and architects this means maximum flexibility to define the location and size of the space as well as to organize the traffic pattern.

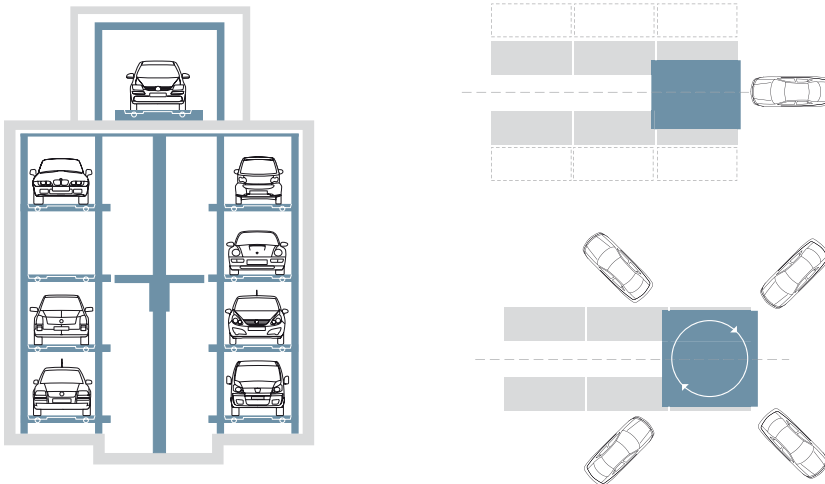
As a further version the parking system auto- LP may be built as a tower solution. This option allows for starting from 50 m² ground floor area and build up to a height of 30 m. In this solution, the storage and retrieval unit that usually moves along rails will be replaced by a stationary elevator solution.



40 parking places shown in an underground arrangement of an auto- LPM, with the transfer room centered between the rack areas. The underground volume includes 1880 m³ (30 m length x 7 m width x 9 m high).

(auto- LPM) System Version I

The transfer room is located **centered** above the storage and retrieval unit. This solution allows for a double row arrangement or a mixed single and double row arrangement of the parking places. This solution is just one example of a wide variety of architectural solutions.



Without turntable

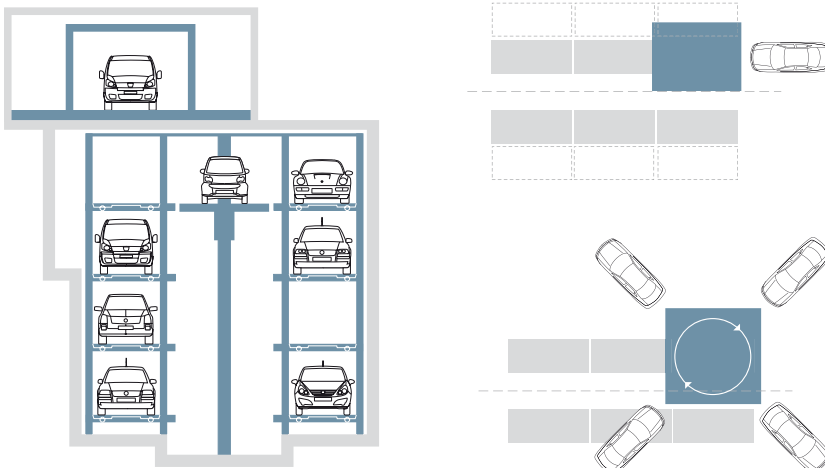
The transfer room is centered between the rack areas and can be entered from the front or from the back. Double-row parking is also an option.

With turntable

The transfer room is centered between the rack areas and can be entered at different angles. So, it can be adjusted according to the traffic direction.

(auto- LPS) System version II

The transfer room is located **to the left or right** of the storage and retrieval unit. This solution allows for a double row arrangement or a mixed single and double row arrangement of the parking places. This solution is just one of a wide variety of architectural solutions.



Without turntable

The transfer room is located laterally above the rack area. It can be entered from the front or from the back. Double row parking is also an option.

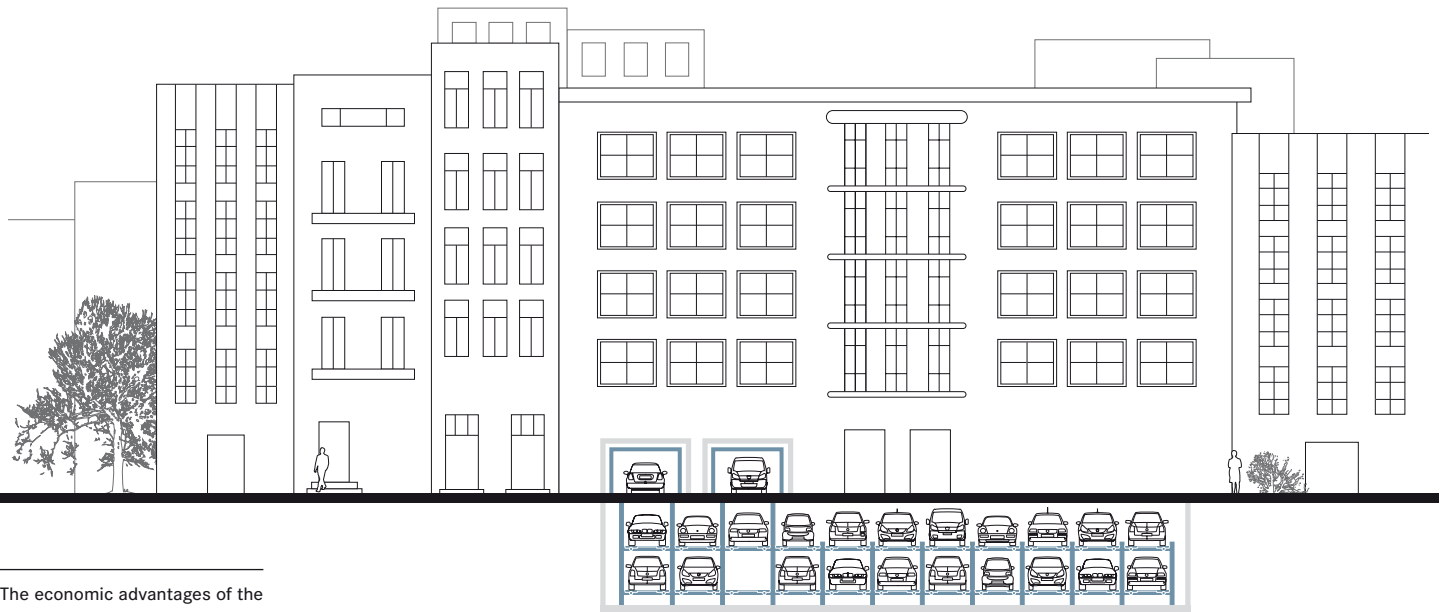
With turntable

The transfer room is located laterally above the rack area and can be entered at different angles. So, it can be adjusted according to the traffic direction.

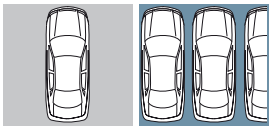


Parking system auto- UP

Universal parking system that allows for parking up to 100 vehicles with one storage and retrieval unit in a maximum headroom of up to 20 m, as an underground, above ground or mixed structure.

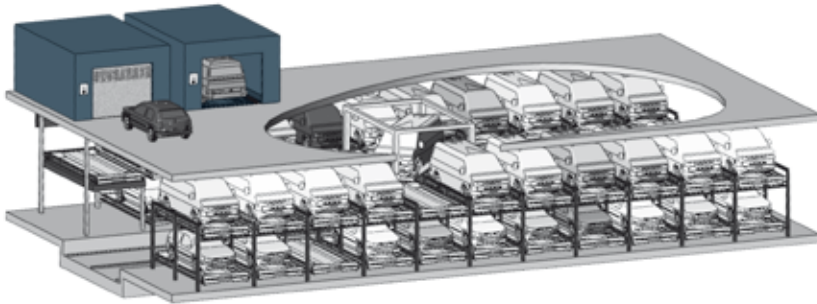


The economic advantages of the parking system auto- UP can be demonstrated for example in office or industrial parks.



You can park twice as many vehicles in an automated parking garage compared to a conventional one.

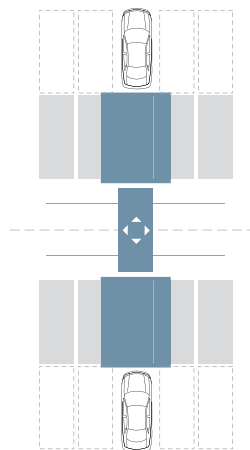
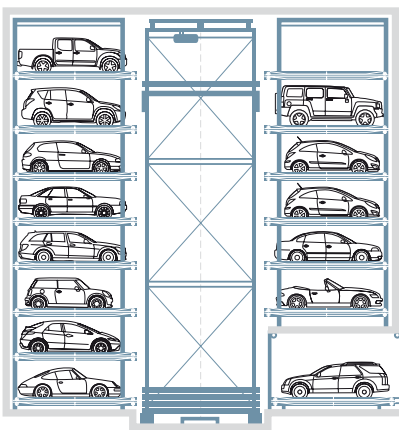
The parking system auto- UP is the universal parking system that enables you to provide more parking spaces more economically in office buildings, hotels, residential buildings or public parking systems. About 100 parking places for various vehicle heights are handled by one storage and retrieval unit in a maximum headroom of up to 20 m. The rack structure can be built above ground, underground or in a mixed solution. The parking places can be located either in a free-standing steel rack structure or in a concrete structure with intermediate slabs. When a car enters the transfer room, the turntable will turn the vehicle into exit position. Next, the storage and retrieval unit will park it in the closest shelf. A pallet quick-change solution enables short cycle times, even in a double row arrangement that is two vehicles deep. With the pallet quick-change feature, this parking system is suitable even for garages with high vehicle turnover.



This sample shows a parking system auto- UP in an underground version that holds 40 parking places on two levels. To increase the throughput capacity, two transfer rooms are located on grade level. The underground volume is 2300 m³.

Parking places in a free-standing steel rack structure (above ground)

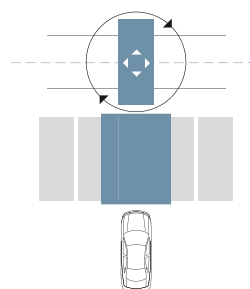
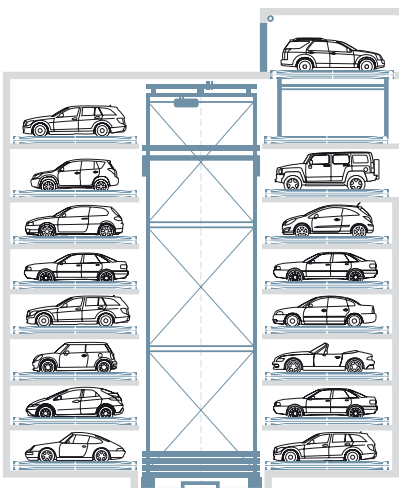
This example shows an above-ground parking system with a transfer room at grade level. The transfer room can be located on any parking level and all four sides of the parking system.



The entrance and exit is organized via separated rooms, which are connected by the storage and retrieval unit. This solution doesn't need a turntable. Double-row parking is possible as an added option.

Parking places on intermediate slabs in a concrete structure (underground)

In this solution the pallet's rails will be doweled to the concrete slabs (the Stolzer pallet quick-change system is based on a loaded pallet plus an empty one). As the loaded pallet leaves, an empty one arrives simultaneously. So, there is no need to restore a pallet. With the option of a lateral car lift, the transfer room can be located above the auto- UP parking system.

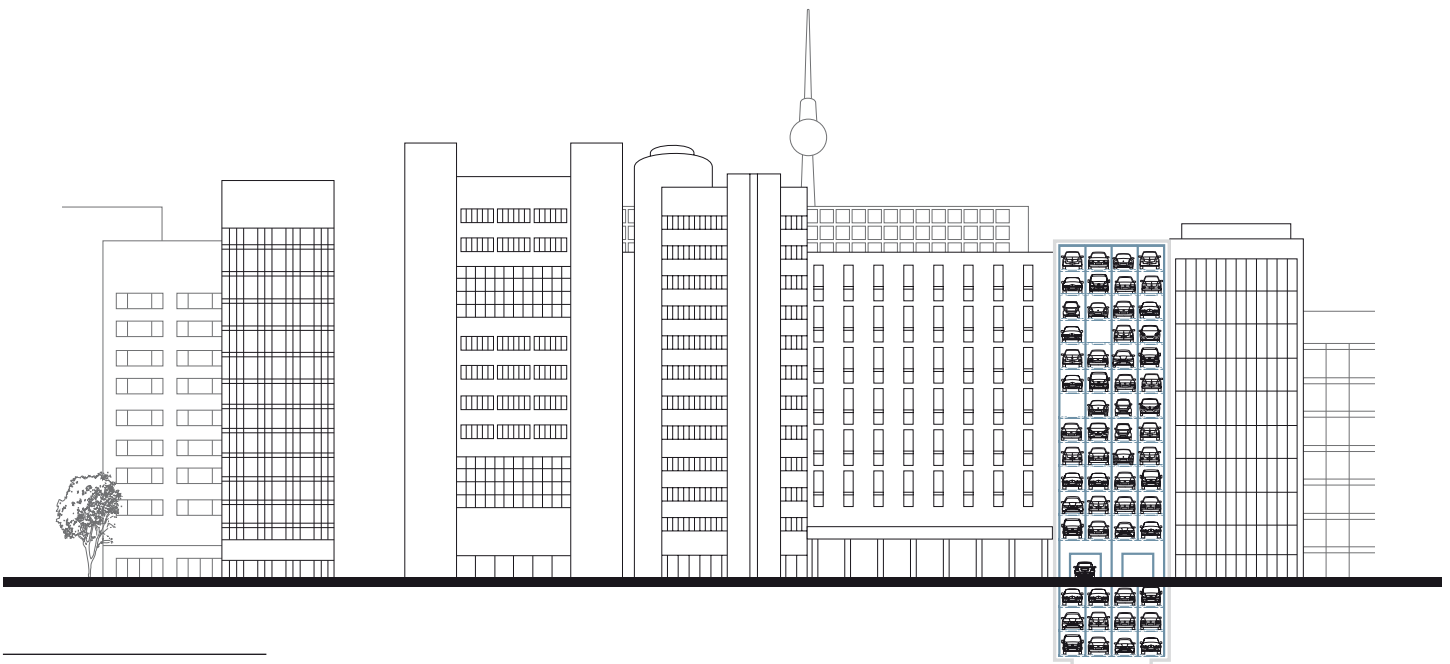


The drop-off and pick-up process uses the same transfer room. The vehicles are turned on a turntable in the storage and retrieval unit.

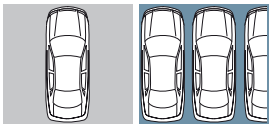


Parking system auto- TP

For small surface areas, for parking up to 100 vehicles with one storage and retrieval unit in a headroom of up to 50 m above ground, underground or in a mixed structure.



Parking on the 10th floor? The parking system auto- TP allows for parking places to be built in more compact spaces.

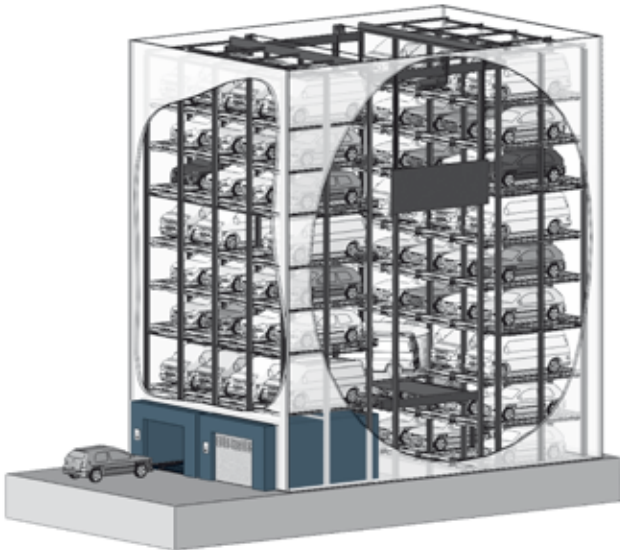


You can park twice as many vehicles in an automated parking garage compared to a conventional one.

A total of 12 parking levels. One transfer level, eight parking levels for sedans, and four parking levels for SUVs. Several transfer rooms increase capacity? Eighteen parking levels and two transfer levels? Two transfer rooms with car lifts?

The parking system auto- TP can adapted to a wide variety of ideas and local situations. Due to its modular design it may be built to a headroom of up to 50 m. Transfer rooms can be located on any parking level. By using a car lift, the transfer rooms also can be located above the parking system.

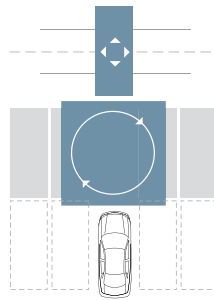
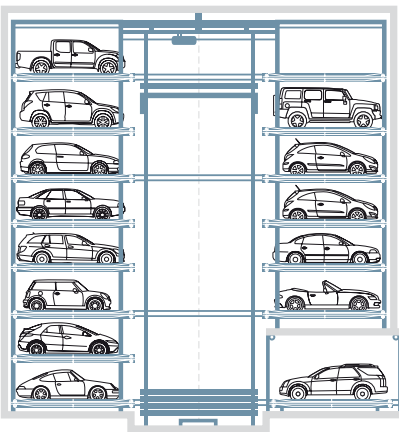
The Stolzer pallet quick-change solution allows for fast transfer and short access times. A turntable in the storage and retrieval unit allows for parking – as well as exiting – without putting the car in “Reverse.” To increase capacity, two transfer rooms can be used per parking system.



This sample shows a parking system auto- TP with two transfer rooms below the shelves (here you see a suggested facade in aluminium or other materials). This module can be integrated into an existing facade or built as a standalone structure.

Parking places in a free-standing steel rack structure (above ground)

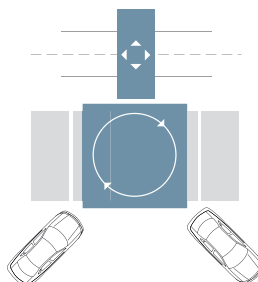
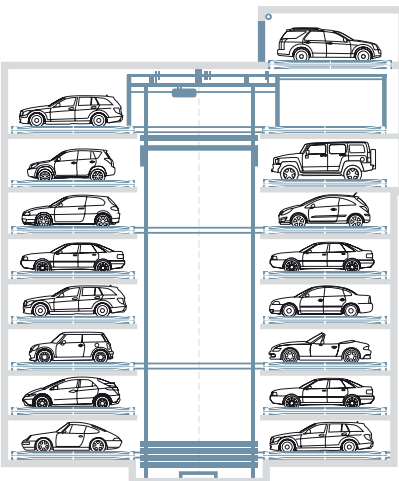
This sample shows a parking system above ground with a transfer room on grade level. The transfer room can be located on any parking level and all four sides of the parking system.



The drop-off and pick-up uses the same transfer room. The turntable inside the transfer room lets drivers enter and exit the garage without putting the car into "Reverse."

Parking places on intermediate slabs in a concrete structure (underground)

In this solution the pallets rails are doweled to the concrete slabs (the Stolzer pallet quick-change system is based on a loaded pallet plus an empty one). When a loaded pallet leaves, an empty one arrives simultaneously. So, there is no need to restore a pallet. With the option of a lateral car lift, the transfer room can be located above the auto- TP parking system.

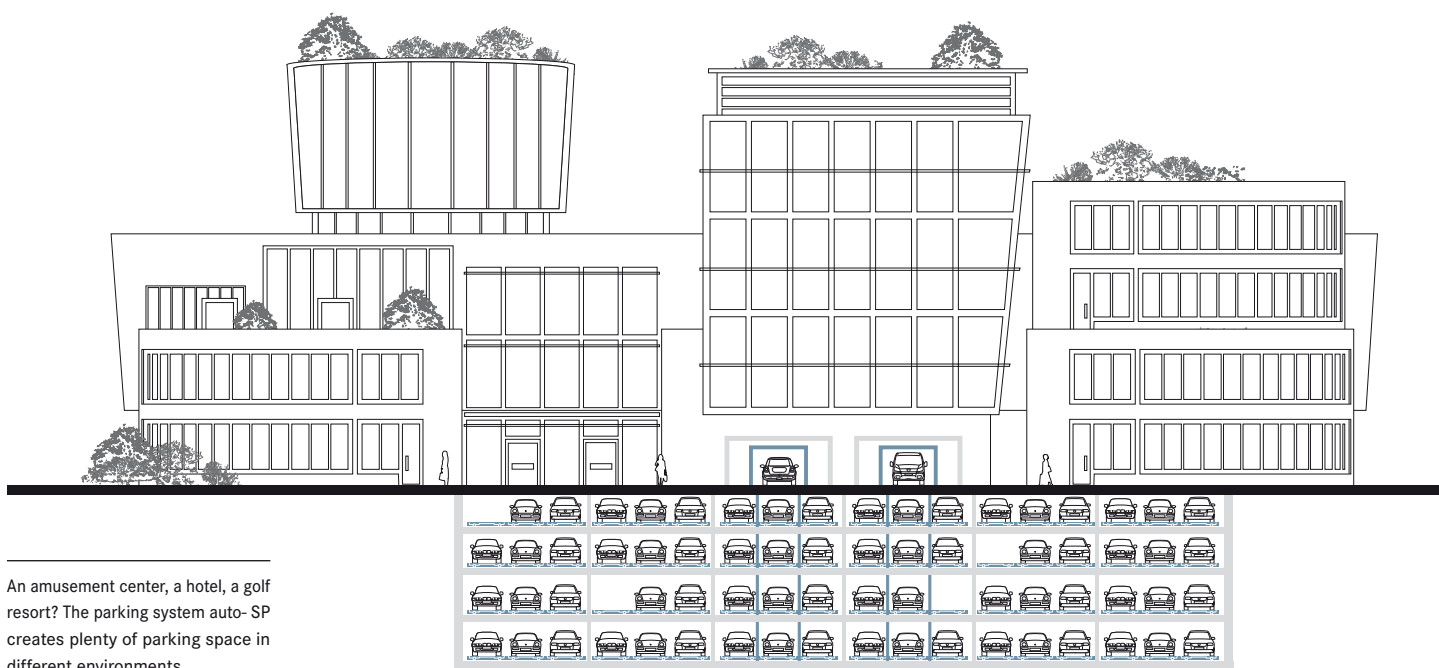


The transfer room with a turntable can be entered in different angles. Narrow entrance situations are rarely a problem. A turntable inside the transfer room with a width of 6,2 m allows for a flexible driving angle.

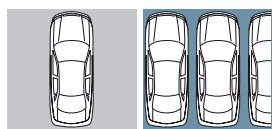


Parking system auto- SP

Universal parking system for high throughput capacity and a high number of parking places in an underground, above ground or mixed solution.



An amusement center, a hotel, a golf resort? The parking system auto- SP creates plenty of parking space in different environments.

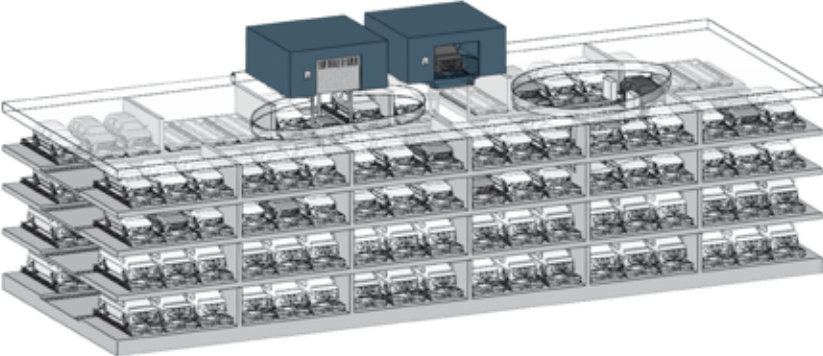


You can park twice as many vehicles in an automated parking garage compared to a conventional one.

This parking system auto- SP was designed for a high number of parking places and a high throughput capacity. Due to its modular design it can be adapted to a wide variety of building requirements. The combination of vertical car lifts and horizontal shuttles serving every parking level allows for various flexible designs.

Hundreds of parking places can be handled. This parking system model can be built above ground, underground or in a structure that spans both. The transfer rooms may be located above or below the parking system as well as on any of the parking levels. Various vehicle heights can be accommodated, so the system is suitable for public usage.

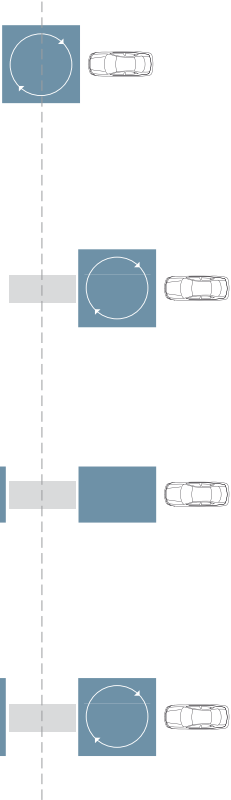
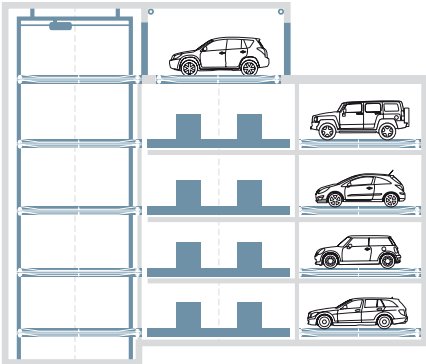
The pallet quick-change system allows for short cycle times. Depending on the arrangement of the transfer rooms or on the usage of turntables, vehicles can enter and exit so the driver is always driving forward. Due to its throughput capacity the parking system auto- SP is suitable for public usage even if there are peak hours with high traffic volume.



This sample shows an underground solution of a parking system auto- SP with two transfer rooms on grade level above the parking system structure.

Parking places on intermediate slabs in a concrete structure (underground)

In this solution, the pallet’s rails will be doweled to the concrete slabs (the Stolzer pallet quick-change system is based on a loaded pallet plus an empty one). As a loaded pallet leaves, an empty one arrives simultaneously. So, there is no need to restore a pallet. Due to the combination of vertical car lifts and horizontal shuttles serving every parking level, this parking system ends up with a high throughput capacity.



Transfer room located on the car lift. Vehicle drop-off and pick-up happens in the same transfer room. The turntable in the transfer room allows the driver to always move forward.

Independent transfer room with turntable. Vehicle drop-off and pick-up happens in the same transfer room. The turntable in the transfer room allows for entering and exiting with the car in „Drive.“

Two independent transfer rooms, one for drop-off, one for pick-up. This arrangement doesn` t need any turntable within the parking system.

Two independent transfer rooms, each holding a turntable. With this arrangement, the usage of the transfer rooms can be organized on demand. Entrance and exit can be directed to either side.

Independent transfer rooms, as shown in the sketches above, allow for processing the following request, even if the transfer rooms are still occupied.



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