# PARKING SET® SHOW CASE FOR AUTOMATIC PARKING SOLUTIONS

## ❖ Parking Set background

Parking Set technology was designed and implemented in the market first in 2005. A number of projects were completed and validated in Israel based on this technology. In a course of time the technology has been purchased by a local manufacturer for re-design and upgrade. In the period of 2005-2020 a total of 15 parking facilities have been constructed and operated successfully. Parking Set Automatic Parking Solution Group is an exclusive distributor of the product and is unwinding up a local manufacturing in Europe to meet the demands of the European market for parking needs.

## ❖ Priorities

***Parking Set Automatic Parking Solutions Group*** is an international professional team specialized not only in the area of development, design, installation, operation and management of automatic parking and storage complexes, but also is experienced in the field of real estate development and city transport infrastructure management, investment and finance, and local regulations.

***We are focused*** on providing high class services for parking and self-storage facilities to our clients and building up our own parking and self-storage network in the international market.

***Our priorities*** are comfortable cooperation with customers and partners at any stage of the project, safety in the operation and usage of our product, high quality of the services provided, partnership with the industry leaders and implementation of the advanced innovative products.

***Parking Set*** is an innovative stunning solution created to change the world of automatic parking and self-storage solutions, meant for vehicles and/or belongings in a self-storage mode in densely populated areas, historical centers, megacities, in redevelopment, reconstruction or new construction projects.

## ❖ Integrated approach benefits

- Multi-purpose high-speed Automatic parking complexes (APC) with high efficiency rate for urban central spots and metro station areas.
- Renovation of the existing facility and multistoried garage and parking pool into a high-speed Automatic parking complexe (APC) with high storage capacity.
- Set up of the compact (10-40 lots) semi-automatic parking facilities (usually underground) designed for "closed end-user groups" in urban buildings, such as tenants of the house, office employees, etc.
- Set up pf the parking and self-storage area on water: local rivers and lakes or/and in the coastal city areas.
- Complex parking solutions to promote and support to remove street parking, thereby increasing traffic capacity on the streets.
- Green approach, eco-friendly technology.
- High technological competitiveness level in efficient land use and problem solution in the premises with complex geometry.

## ❖ High level comparison

| Standard parking solutions | Parking Set solutions |
|---|---|
| Current parking lot efficiency — not more than 50%.<br>Standard lots only.<br>Low capacity (max 60%). | Parking lot efficiency — 80%, capable to increase to 94%.<br>Almost for any property.<br>High capacity (94%). |
| Step by step operation. As a result,<br>long waiting time for both cars check-in and return.<br>Parking operator is limited by the level and box size.<br>Slow and sequential. | Parallel operation on all operational stages.<br>Waiting time is comparatively less.<br>No limits on level size and garage height.<br>Very Fast due to parallel configuration. |
| Malfunction sensitive.<br>Some of the equipment items<br>if malfunctioned or broke, cause entire parking facility for a standstill.<br>High vulnerability – parking<br>jamming in case of malfunction. | Any malfunction or breaking does not prevent the system from normal operation.<br>All processes are doubled for security purposes.<br>System failure as a result of a breakdown is absolutely impossible.<br>It continues operating perfectly even in case of malfunction or breaking of parts. |
| Limitation on use.<br>The combined objects can not be<br>maintained properly.<br>If non-standard lots required:<br>customized option to be very expensive. | The system is fully universal and can maintain combined objects on high level.<br>Automated parking area and automated warehouse are can be combined all in one.<br>Standard elements applied only, inexpensive mass production. |
| Minimal area required 40×60 m | Minimal area required is not limited. |

## ❖ Description of the product

**PARKING SET** – proprietary (*) modular system with 4 types of commercial basic modules building up almost any parking area. Equipment itself as well as automatic software operating it almost not bound to a specific project.

**Specific control program** providing and supporting several ongoing operations and high speed and reliability as a result.

**Special patented algorithm** (**) providing and supporting high check-in and return service speed for each vehicle (30-40 per hour for each check-in box) retaining high efficiency of the storage density (86-96%) in comparison with 50-65% of the alternative automatic parking systems.


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* Modular Multi-Dimensional Parking System

** Method/system for enabling automated receiving and retrieving of cargo for Storing Purposes

- **Synopsis for the projects that were under Parking Set consideration and/or Parking Set technology implementation**

This technology, that was once designed in Israel and successfully implemented in a number of projects already, is somewhat an excellent example of modern day's approach to a parking construction. Below you will have a synopsis for three cases showing a real project, implemented and successfully operating since 2017 up today, a project as a case study to show strength and efficiency of the product, and a potential project which is in work as of today. They all have different "entry point" and showing variety of scenarios that our technology can cope with.

## 1. New Construction Project in a downtown area (completed in 2017)

**Objective:** accommodate 16 parking lots in a building of 16 private apartments in Tel Aviv downtown.

**Location:**

Central urban area of TEL AVIV, on high demand, very expensive piece of land. A private building of 16 apartments.

**Requirements of the owner:**

Requirements are to organize a parking structure in a land spot of limited capacity with a building on it having a small adjacent area. Small parking area is to serve the private purpose of the tenants of the building, and the aim is to use every inch to accommodate parking lots for every tenant of the building.

**Problem solving:**

Arrange a technological underground parking area of 16 parking lots allowing to efficiently use a small territory of the private building.

**Analysis of the area:**

This is a central urban area which is densely populated and a piece of land under our consideration is used for a tenants building of 16 apartments. It is surrounded by similar buildings with private apartments that are located very close to each other and have no capacity for parking on the adjacent territory. The only option to park is along the street which is available at a high hourly rate only. Standard parking solutions do not allow enough parking lots to cover needs of every tenant of the building.




**Solution:**

Implement underground robotic parking area which will allow using the available space assigned for the building efficiently and accommodating 16 parking lots for tenants. Parking lots will be located on several underground floors with a single point of ingress/egress. Standard parking solutions do not allow building up enough parking lots to cover needs of every tenant of the building. Parking area was designed and constructed along with the constructions of the entire building.

Having analyzed the project area and the requirements of the multiple tenancy building, with a high demand for parking, with no standard parking availabilities within the perimeter of the adjacent area and outside, a solution was designed to accommodate 16 parking lots using innovative technology that will allow best outcome for this area:

- fully automated parking area of 16 parking lots for vehicles with weight of 3 tons and length of 5.5 m.
- 2 story underground parking area hosted in the basement of the building.
- single point of ingress/egress located outside of building, in the adjacent open area to the building.
- upon arrival at the check-in point the driver calls for the platform to rise from the underground area, moves the vehicle onto the platform, leaves the vehicle on the platform and leaves the platform/elevator.
- the platform/elevator moves the vehicle down to the storage lot.
- storage floor height is 2.4 m.
- to call a vehicle from the parking lot the driver an pad with an interface, elevator/platform returns the vehicle to the check-in point and at this point the driver gets into the vehicle and leaves the check-in point.
- anticipation period upon call back of the vehicle can make 1.5-2 min






## 2. Project of Fit-In into an urban space

**Objective:** create parking area of 10+ parking lots

**Location:**

Potential parking spot is found in an internal yard of an operating business center. It is located in Moscow central area with high traffic and high density level of population.

**Requirements of the owner:**

Increase parking capacity in the internal yard of the business center using innovative technology with the highest efficiency rate of the land use. Use every inch to create more parking lots to get the maximum possible number of the parking lots.

**Problem solving:**

Arrange parking area of 10-16 parking lots in a limited area of the internal yard of 7.5m * 16m with height of 8.5m with a complicated access way in a very populated area where a lot of small and big businesses operate. There is a huge demand for parking in the central area and almost no space to locate it. Standard non automatic parking solutions provide low efficiency on parking.

**Analysis of the area:**

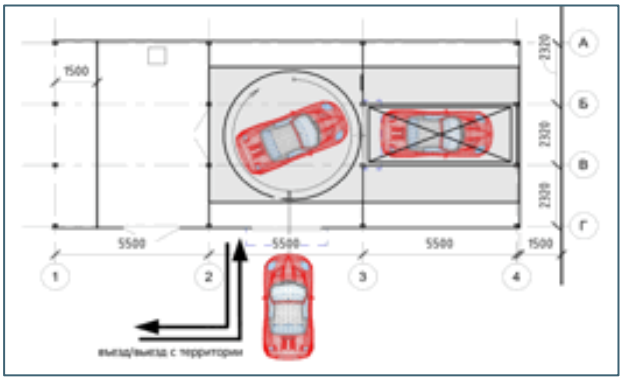
A small internal yard of the business center accommodates few parking lots for 5 vehicles. The area of the yard is not equipped for parking in any special way and is only marked and arranged as a standard non-automatic parking solution. The only access to the yard is the ingress and egress of the yard. Business center is located in a very central point of Moscow (in a historical building) where there is an extreme shortage of parking spaces and high demand for parking, and high street traffic.

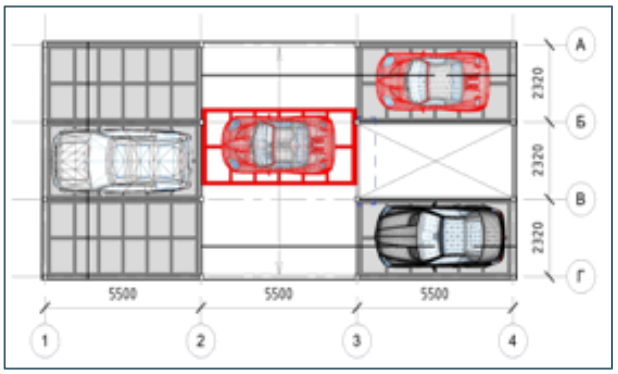

**Solution:**

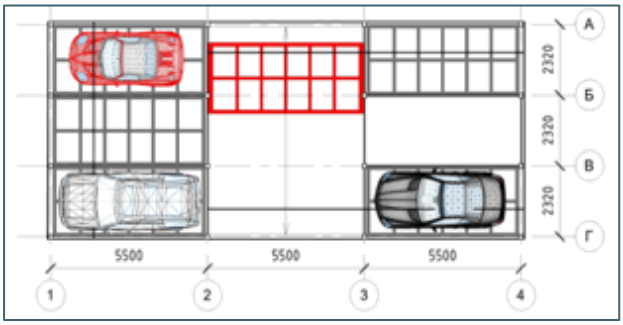
Having analyzed the area and the requirements of the owner of the property, we can summarize and conclude that this is a premium class business center, class A, located in a historical building, it is a prestigious old construction of a cultural meaning, with a high demand for parking. Parking Set designed a solution based on an innovative technology that will provide best outcome for this area. The layouts were taken into work, analyzed, calculations were made and a visualization project presented to the client for consideration:

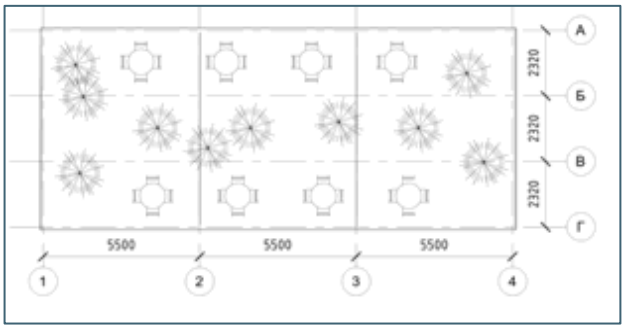
- Fully automated parking area of 10-16 parking lots for regular and premium vehicles with weight of 3 tons and length of 5.5 m.
- 4 story parking building to include small entrance hall on the ground floor incorporating check-in box, elevator, payment machine and a client interface pad, 2 floors for vehicles storage, and an upper roof floor to accommodate a recreation area.
- upon arrival at the check-in box the driver leaves the vehicle in the check-in box, sets up parking option on the client interface pad and leaves the check-in chamber.
- detectors in the check-in box scan the space, and once the check-in box is confirmed to be free of people, the ring platform (rotating platform) turns the vehicle with its front side facing the exit way and the vehicle is taken by the elevator platform to the storage lot.
- maintenance floor height is 2.7 m.
- storage floor can accommodate 5-7 vehicles (8 vehicles can be accommodated at a full occupancy).
- storage floor height is 2.4 m.
- every next storage floor can accommodate 5-7 vehicles.
- to call a vehicle from the parking lot the driver picks up corresponding options on the interface pad or via sms or any other system implemented, gets the payment completed via payment machine or telephone application or any other system implemented, elevator platform returns the vehicle to the check-in box and at this point the driver gets into the vehicle and leaves the check-in box.

- mobile application allows the end-user/driver to see their vehicle online all the way.
- anticipation period  upon call back of the vehicle can make 1.5-2 min
- service speed can be adjusted in the system in accordance to the requirements of the customer.




## 3. Automatic Parking System renovation

**Objective:**

Renovation of an underground parking area to increase parking capacity by 30-50%, reduce waiting time on a call.

**Location:**

Existing parking area is a part of the cultural building (a theater) located in the center of one of the European capital cities. Existing underground parking was designed and constructed for 93 parking lots.

**Requirements of the owner:**

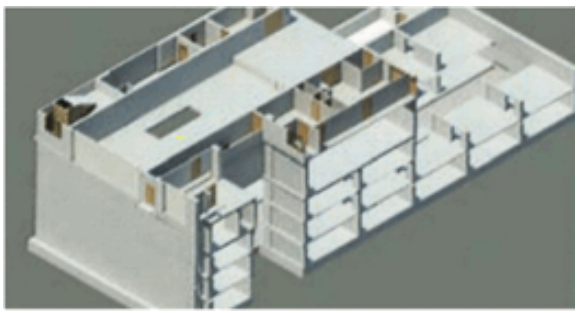
Increase parking capacity in the existing parking area of the theater using innovative technology with the highest efficiency rate of the land use.

**Problem solving:**

Re-arrange the existing internal underground parking infrastructure to maximize parking capacity; implement innovative parking technology to provide full time operation of the parking area and to minimize failures and malfunctions of the parking system; increase the service speed and decrease waiting time and avoid delay on a call.

**Analysis of the area:**

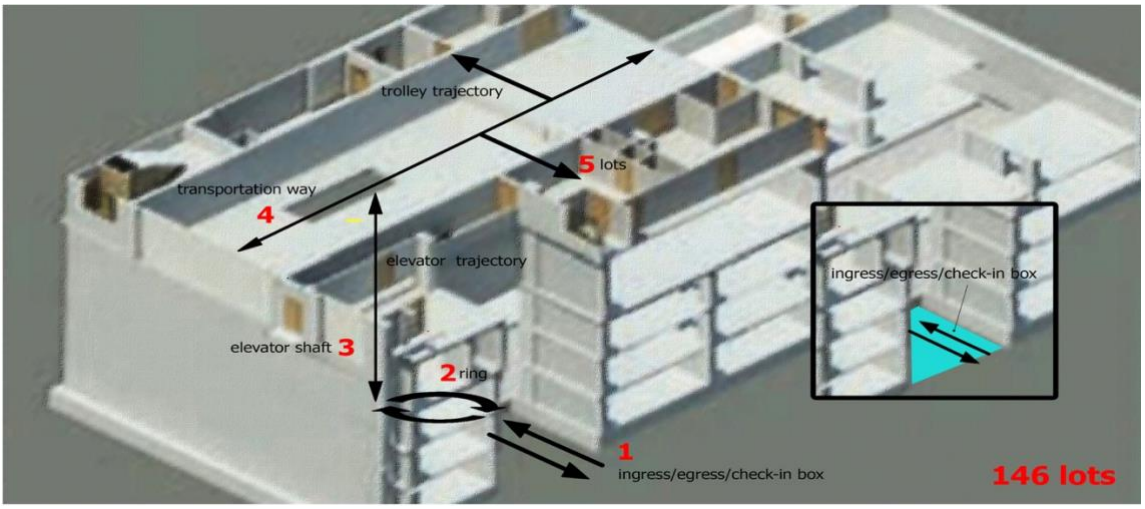
- Existing parking area is an underground concrete and metal construction inside the building of a theater having several floors. It includes 93 parking lots that are aligned to the transportation corridor/way on both sides. Lower levels of the parking are located below zero point.
- Existing parking arrangement operates via central trolley/transfer gear of a corridor type, which is placed between the 2 rows of several concrete floors .
- The parking arrangement has a horizontal transferring mechanism that occupies all of the central part of parkin area in all of the height of the parking area.

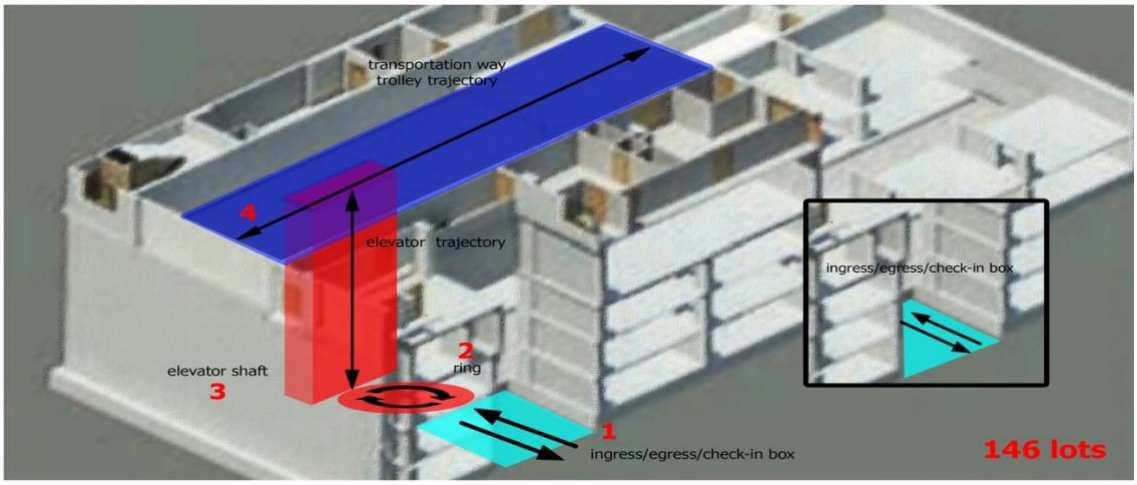


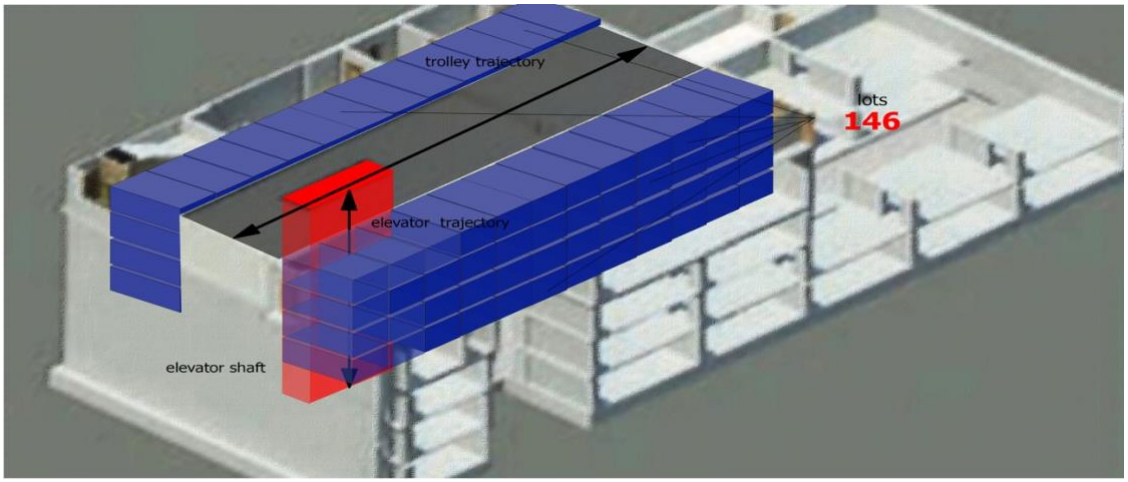
**Solution:**

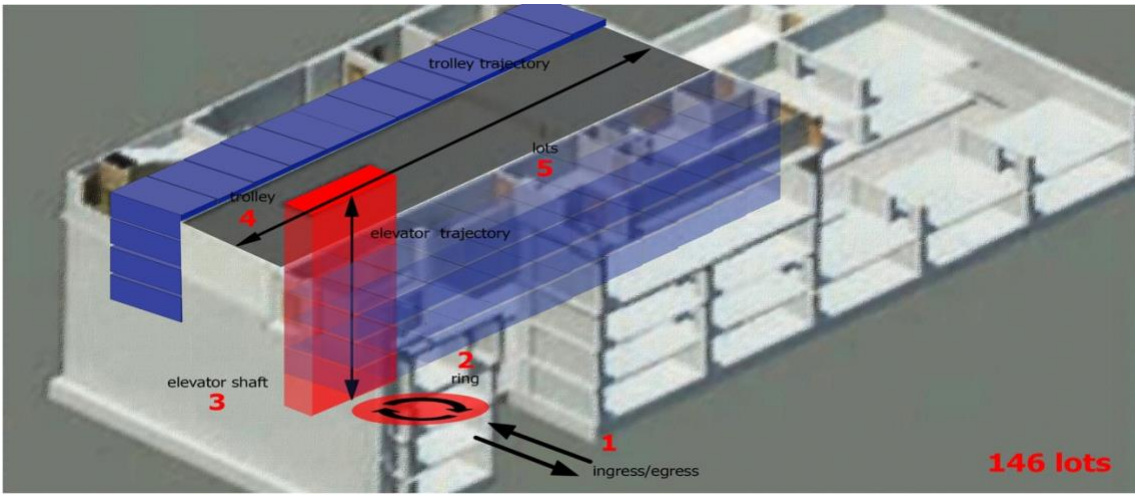
- Retain all of the parking lots on concrete floors along the transportation corridor/way.

- Install Parking Set technology on existing concrete floors.
- Fill up the space making it more compact.
- Remove central transportation trolley/carriage that will release another 30%+ of the internal parking space.
- Fill up the released space with modules of the Parking Set equipment: first - installation of the solid support basis – metal support columns that will carry metal railing or concrete flooring extension on each floor that will carry metal railing, second – installation of the modules of the parking equipment on the extended solid basis in the central parking area where the space was released after the transportation trolley/carriage removal.
- Elements of the Parking Set system to ensure high resilience, increase service speed, reduce waiting period, minimize risks of failures and malfunctions, keep up the system operation full time.
- Increase parking capacity by 30%+.






For any inquiries please do not hesitate to contact Parking Set representatives to get more technological and descriptive details.

Sincerely yours,
Parking Set team