

Comparison Matrix : Mechanical Parking Systems vs Automatic Parking

		Stackers	Puzzles	Rotary Parking System	Robotic Parking
		Mechanical Parking Systems			Fully Automated Parking
1	System view				
2	Heights	up to 4 parking spaces per stacker	up to 6 levels high and one UG: --> 16 spaces max / system	up to 10 levels	Max 15 levels
3	footprint needed	~ 8 ft x 19 ft / 2.5 x 5.5 meters	19 ft x 25 ft / 5.5 x 7.5 meters	uses 3 conventional parking spaces /	min Length 30 meters x 12 meters width
4	how many spaces	up to 4 / stacker/ multiple nr of stackers in a row	5 per system w 2 levels / multiple nr of systems in a row	Maximum of 20 cars per carousel	from 100-1000 + cars per system
5	Storage cycle	Car enters at grade level - system lifts car up	Car enters at grade level - system operates mechanically	Car enters at grade level - system rotates mechanically	Car can enter/exit on the Terminals that can be installed in any level.
6	Retrieval cycle	Average retrieval time of less than a minute	Average retrieval time of less than a minute	Close to 2 minutes average per retrieval	Average retrieval time of 177 seconds per single retrieval
7	Peak Traffic Capacity	for top car, all others below need be driven out	retrieval only one after the other - sequential ops only	one after the other - sequential	depending on size, from 40 to 1,000+ cars / hour, or up to 20 cars/ minute
8	Access	Push Button controls	RFID card and keypad controls	Push Button controls	Mobileapp,touchless RFID card, FOB's
9	installation time	1-2 weeks per stacker system	2-4 weeks per system	4-6 weeks per system	48-60 weeks for a 750 space garage
10	Service needs	Maintenance of Hydraulic Systems	Periodic maintenance needed	Periodic maintenance needed	Very minimal, Inbuilt diagnostics-Predictive/preventive maintenance
11	Cost / space	8-12 K USD per space	13-16 K USD Per space	15 - 20 K USD per space	25-35K per space turnkey (including building, system and infrastructure)
12	Application good for:	unlimited additions of systems in rows	unlimited additions of systems in rows	unlimited additions of systems in rows	Capacity from 100-1000+ cars
13	sprinklers needed	yes	yes	yes	yes
14	Operator	Not necessary	Not necessary	Not necessary	Minimum 1 operator needed
15	Ventillation	if in enclosed space: 8 ACH per hour	if in enclosed space: 8 ACH per hour	if in enclosed space: 8 ACH per hour	2 ACH per hour
16	Redundancy	Not Available	Not Available	Not Available	Highly redundant
17	Hardware	Minimal	Minimal	Minimal	Need Hardware servers for handling patron data & system management
18	Safety	not 100% safe , Damage to cars/Patrons possible	not 100% safe , Damage to cars/Patrons possible	not 100% safe , Damage to cars/Patrons possible	Highly safe facility
19	Insurance/Liability	Moderate/High Liability	Moderate/High Liability	Moderate/High Liability	Very low liability
20	Digital Twin	Not available	Not available	Not available	Yes 100%
21	EV charging	Not Possible	Yes-Very limited	Not possible	Yes- Highly efficient fully Automated EV charging
22	Self Driving Cars	Costly Infrastructure setup needed	Costly Infrastructure setup needed	Costly Infrastructure setup needed	Infrastructure is built-in to accept self driving cars
23	Fleet management	Not possible due to capacity limitations	Not possible due to capacity limitations	Not possible due to capacity limitations	Yes 100% compatible with automated fleet management & services
24	Valet needs	Yes human valet	Yes human valet	Yes human valet	Machines does the valet parking

