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RESOLUTION OF PARKING SPACE DEADLOCKS

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Technical task:
In a driverless transport system, the vehicles have to drive to parking lots when there is no current order. If they do not do so, it can happen that other orders are blocked by the vehicle stopping at its current position, which a following vehicle wants to reach. Ideally, there are at least as many parking spaces as there are vehicles, so that each vehicle can reach a parking space. However, this requires a lot of space, so that the number of parking spaces is usually less than the number of vehicles. Therefore m parking spaces are available and n vehicles with n > m. In such a constellation, it can happen that all m parking spaces are already occupied by m vehicles and that an m+1 tes vehicle must also park. Since all parking spaces are occupied, it cannot drive to the parking area and has to wait at its current position until the next parking space becomes available. In this situation it could happen that the vehicle that could leave a parking place next is supposed to drive to the current position of the m+1st vehicle and therefore cannot leave because this position is still occupied. This creates a deadlock situation which can cause a chain reaction of unsolvable conflicts.

Solution:
The new idea is to recognize such situations and resolve them automatically. For this purpose, in the case that all parking spaces are occupied, it must first be checked whether one of the m parked vehicles should move to the current position of the m+1 vehicle and therefore still park because this position is occupied. If this is the case, the rule that it is not allowed to drive off yet is temporarily cancelled. The parked vehicle drives off, immediately afterwards the m+1 vehicle can drive to the parking position and the deadlock is released again.

Advantage:
A deadlock of this type is automatically resolved. Otherwise, the system might stop.