

Capacity analysis

For Takeout wall grocery

www.pickdelso.com

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Assumptions (2 of 9)

- Capacity calculation of Takeout wall includes nine assumptions (by changing assumptions the capacity of Takeout wall can be affected)
- Assumption 1: picking of grocery products is performed in a dark store
- Assumption 2: a delivery point and Takeout wall at there are located in proximity of the dark store
- Delivery point may be constantly manned
- Alternatively, a customer can call at the delivery point a customer servant by pressing a call button (the customer servant is, for example, a picker picking products in the dark store)

Cart capacity

- Maximum capacity of the cart is 500 litres
- **Assumption 3:** shopping bag includes at most 20 litres products, thus the cart capacity is at most 25 bags ($500/20 = 25$)
- **Assumption 4:** also frozen food is stored in Takeout wall
- Frozen food of each customer is placed with a gel ice pack into a cool bag (The cool bag fits into a repository of Takeout wall.)
- Because of the frozen food the cart probably contains unused space because a repository may include only one frozen food product
- **Assumption 5:** capacity of the cart is 20 bags of products i.e. 400 litres products ($20 \times 20 = 400$)

Number of bags in day

- **Assumption 6:** dark store corresponds a conventional grocery whose turnover is 2.5 million €
(A conventional grocery is such where customers pick their shopping)
- **Assumption 7:** a bag of shopping cost on average 22€
- 2.5 million € turnover means that grocery products are sold 113636 bags within one year (2500000/22 = 113636)
- **Assumption 8:** Takeout wall is usable 24 hours/day each day in year
- Grocery products are sold daily on average 311 bags
(113636/365 = 311)

Time periods and windows

- **Assumption 9:** day (24 hours) is divided into three periods and **eight time windows in the following manner**
- Time periods and their lengths:
 - From morning to afternoon, 07 – 15, eight hours
 - Rush hours, 15 – 19, four hours
 - From evening to morning, 19 – 15, twelve hours
- Time window table:

From morning to afternoon	Rush hours	From evening to morning
07 – 11	15 – 16	19 – 23
11 – 15	16 – 17	23 – 07
	17 – 18	
	18 – 19	

Result

- Turnover per day is on average **311 bags** (this amount of products corresponds with the product amount sold per year in a grocery whose turnover is 2.5 million €)
- Capacity of cart is 20 bags, **thus the amount of 16 carts of products is sold per day** ($311/20 = 16$)
- Delivery of 311 bags requires that 16 carts are positioned in Takeout wall per day
- Because there are *eight* time windows per day, it is enough that simultaneously *two* carts are positioned in Takeout wall ($8 \times 2 = 16$)
- **Day capacity of Takeout wall** is $8 \times 2 \times 20 = \underline{320}$ bags, thus *Takeout wall with two parking places has sufficient capacity* (in such Takeout wall grocery whose turnover is 2.5 million €)