TRAFFIC ANALYSIS REPORT FOR

Lodga GROUP WEST



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Created by: Ajeetkumar Shreenath Rai

1. SUMMARY

People flow in Lodga GROUP WEST is analyzed. The building has 36 floors and the travel height is 111.4 meters. The assumed population is 690 persons.
BUILDING TYPE: **Residential**

1.1. ELEVATOR ANALYSIS

DESIGN CRITERIA		
	UP-PEAK	TWO-WAY
Target design criteria	Satisfactory	Satisfactory
Average waiting time	60 s	60 s
Average time to destination	150 s	150 s
Interval	100 s	100 s
Nominal travel time	50 s	50 s
Peak passenger demand	5 % / 5 min	5 % / 5 min

SIMULATION RESULTS

ELEVATOR GROUP : 3 lift , 2.5 mps GROUP CONTROL: FULL COLLECTIVE CONTROL

No of Elevators 3 | Floors/Stops 1 - 35 / 36 | Load(person) 10 | Speed (m/s) 2.5 | NTT (s) 44.6 | Population 690 | Car Load Factor(CLF) 80%

TRAFFIC TYPE	DEMAND (% / 5 min)	DEMAND (persons / 5 min)	CLF (% of rated load)	AWT (s)	% of long waits	ATTD (s)	% of long journeys	MEETS THE CRITERIA
Up-peak	5	34	51	29	4	97	6	Yes
Two-way	5	34	35	28	3	79	2	Yes

ELEVATOR GROUP : 3 lift , 3 mps GROUP CONTROL: FULL COLLECTIVE CONTROL

No of Elevators 3 | Floors/Stops 1 - 35 / 36 | Load(person) 10 | Speed (m/s) 3 | NTT (s) 37.1 | Population 690 | Car Load Factor(CLF) 80%

TRAFFIC TYPE	DEMAND (% / 5 min)	DEMAND (persons / 5 min)	CLF (% of rated load)	AWT (s)	% of long waits	ATTD (s)	% of long journeys	MEETS THE CRITERIA
Up-peak	5	34	45	23	4	84	4	Yes
Two-way	5	34	32	25	2	72	1	Yes

DISCLAIMER

The results of the report are valid exploring theoretical vertical-traffic planning scenarios which involve KONE products, services, and people flow planning tools. The results of the report are sensitive to the parameter values used and data which is used as input, and are applicable only with the input values shown in the report. Therefore, results should not be interpreted as any kind of representation or warranty of the performance of any actual elevator installation. KONE shall in no event be liable for any damage caused by or incurred in connection with the use of the results. The user shall have no right to make copies of, or reproduce, disassemble, decompile, reverse engineer or modify the results of the report or disclose it to any third party.

2. BUILDING DATA

Assumed population is 690 persons

Floor	Comment	Height (m)	Travel (m)	Population	Entry %
35	35		111.4	19	0
34	34	3.05	108.35	19	0
33	33	3.05	105.3	19	0
32	32	3.05	102.25	19	0
31	31	3.05	99.2	19	0
30	30	3.05	96.15	19	0
29	29	3.05	93.1	19	0
28	28	3.05	90.05	19	0
27	27	3.05	87	19	0
26	26	3.05	83.95	19	0
25	25	3.05	80.9	20	0
24	24	3.05	77.85	20	0
23	23	3.05	74.8	20	0
22	22	3.05	71.75	20	0
21	21	3.05	68.7	20	0
20	20	3.05	65.65	20	0
19	19	3.05	62.6	20	0
18	18	5.95	56.65	20	0
17	17	3.05	53.6	20	0
16	16	3.05	50.55	20	0
15	15	3.05	47.5	20	0
14	14	3.05	44.45	20	0
13	13	3.05	41.4	20	0
12	12	3.05	38.35	20	0
11	11	3.05	35.3	20	0
10	10	3.05	32.25	20	0
9	9	3.05	29.2	20	0
8	8	3.05	26.15	20	0
7	7	3.05	23.1	20	0
6	6	3.05	20.05	20	0
5	5	3.05	17	20	0
4	4	3.05	13.95	20	0
3	3	3.05	10.9	20	0
2	2	3.05	7.85	20	0
1	1	3.05	4.8	20	0
0	Gr	4.8	0	0	100

3. ELEVATORS

3.1. ELEVATOR PARAMETERS

ELEVATOR GROUP PARAMETERS		
Elevator group name	**3 lift , 2.5 mps**	**3 lift , 3 mps**
Number of elevators in group	3	3
Rated speed	2.5 m/s	3 m/s
Acceleration	0.8 m/s^2	0.8 m/s^2
Jerk	1.2 m/s^3	1.2 m/s^3
Rated passenger capacity	10 persons	10 persons

DOOR PARAMETERS		
Elevator group name	**3 lift , 2.5 mps**	**3 lift , 3 mps**
Type	High duty	High duty
Opening	Center	Center
Width	900 mm	900 mm
Closing time	2.7 s	2.7 s
Opening time	1.4 s	1.4 s
Two-way transfer times per passenger	2.6 s	2.6 s
Photocell delay	1.2 s	1.2 s
Start delay	0.7 s	0.7 s

ADVANCE DOOR OPENING		
Elevator group name	**3 lift , 2.5 mps**	**3 lift , 3 mps**
Distance	0.15 m	0.15 m
Speed	0.3 m/s	0.3 m/s

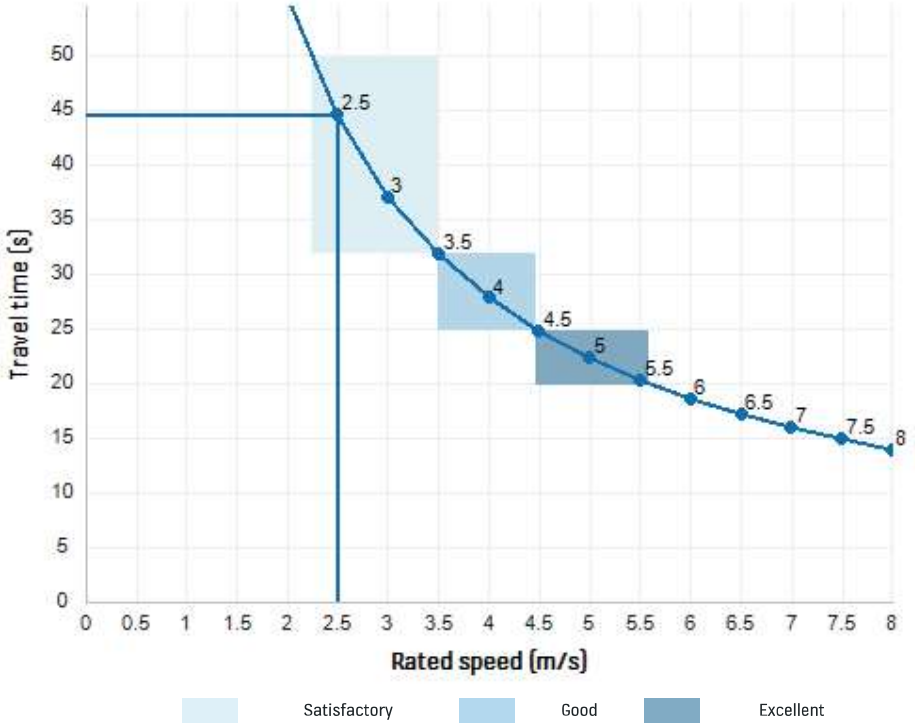
3.2. SPEED SELECTION

RECOMMENDED SPEEDS		
	3 lift , 2.5 mps	**3 lift , 3 mps**
Satisfactory	2.2 - 3.5 m/s	2.2 - 3.5 m/s
Good	3.5 - 4.5 m/s	3.5 - 4.5 m/s
Excellent	4.5 - 5.6 m/s	4.5 - 5.6 m/s

RATED SPEED CLASSIFICATION		
Elevator group name	**3 lift , 2.5 mps**	**3 lift , 3 mps**
Rated speed	2.5 m/s	3 m/s
Travel height	111.4 m	111.4 m
Populated floors	1 - 35	1 - 35
Nominal travel time	44.6 s Satisfactory	37.1 s Satisfactory
Minimum flight distance where full speed is reached	9.48 m	13.25 m

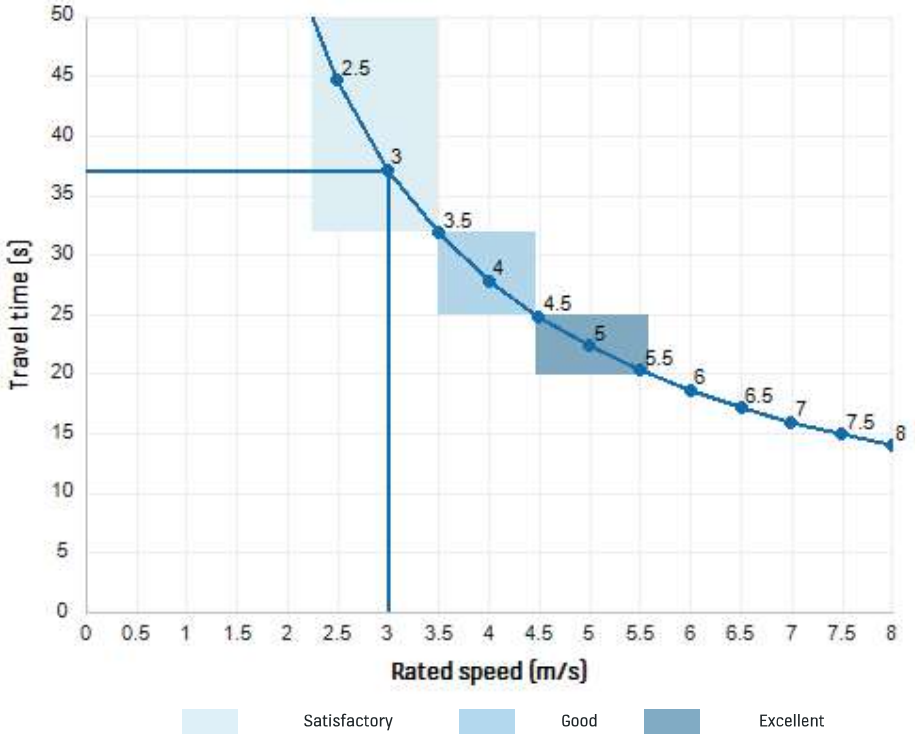
Nominal travel time graph for 3 lift , 2.5 mps

NTT = 44.6 s | Flight time = 48.35 s | v = 2.5 m/s | a = 0.8 m/s^2 | j = 1.2 m/s^3 | Total travel = 111.4 m



Nominal travel time graph for 3 lift , 3 mps

NTT = 37.1 s | Flight time = 41.55 s | v = 3 m/s | a = 0.8 m/s^2 | j = 1.2 m/s^3 | Total travel = 111.4 m



3.3. ELEVATOR CALCULATION RESULTS

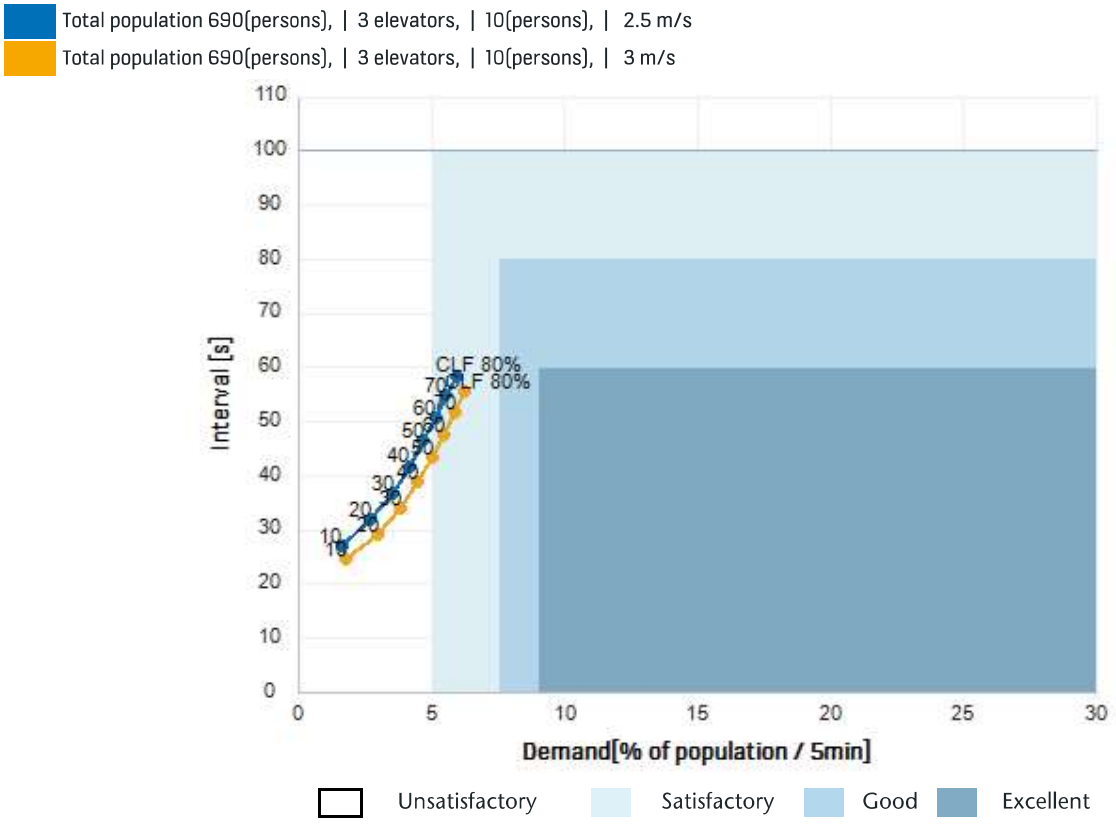
OVERALL CLASSIFICATION		
Target design criteria	KONE - Satisfactory	
Overall performance	3 lift , 2.5 mps Satisfactory	3 lift , 3 mps Satisfactory

UP-PEAK RESULTS		
Elevator group name	**3 lift , 2.5 mps**	**3 lift , 3 mps**
Car Load Factor (CLF)	80% (8 persons)	80% (8 persons)
Handling Capacity (HC5)	41.1 persons / 5 min	43.4 persons / 5 min
Relative Handling Capacity (%HC5)	6 % / 5 min Satisfactory	6.3 % / 5 min Satisfactory
Average Round Trip Time	175.2 s	166 s
Average Interval	58.4 s- Excellent	55.3 s- Excellent

Note: Handling capacity, interval and round trip time are only for Full collective control.

PERFORMANCE GRAPH - FULL COLLECTIVE CONTROL

Performance Graph



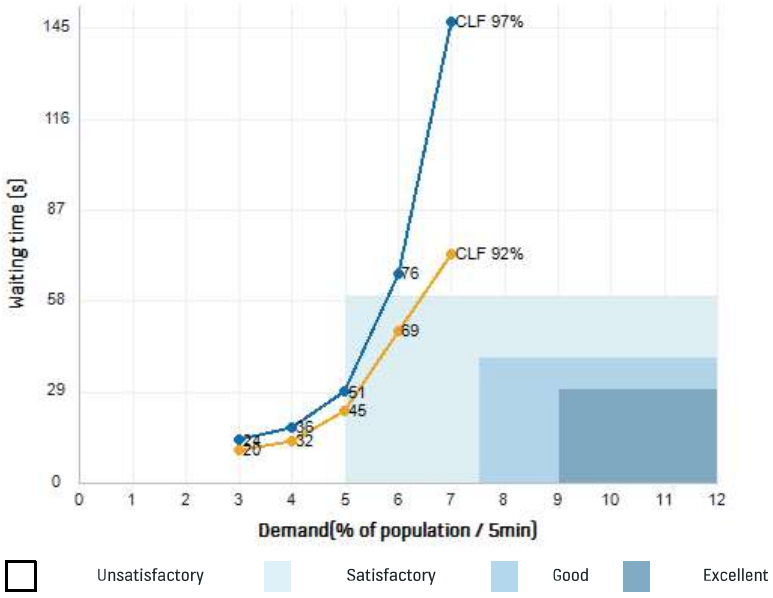
3.4. SIMULATION RESULTS

Simulation settings		
NAME	UP-PEAK	TWO-WAY
Simulation time (h)	2	2
Traffic components (incoming – outgoing - interfloor)	100-0-0	50-50-0
Peak passenger demand (% of pop./ 5 min)	5	5

UP-PEAK WAITING TIMES

3 lift , 2.5 mps

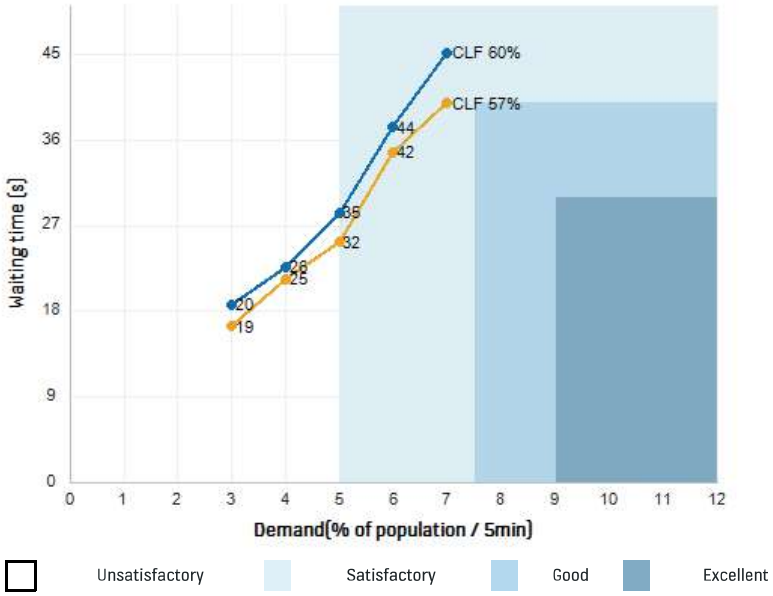
3 lift , 3 mps



TWO-WAY TRAFFIC WAITING TIME

3 lift , 2.5 mps

3 lift , 3 mps



Average waiting times:Up-peak

DEMAND	3 lift , 2.5 mps		3 lift , 3 mps	
[% / 5 min]	DEMAND persons/5 min	UP-PEAK AWT(s)	DEMAND persons/5 min	UP-PEAK AWT(s)
3	21	13.45	21	10.43

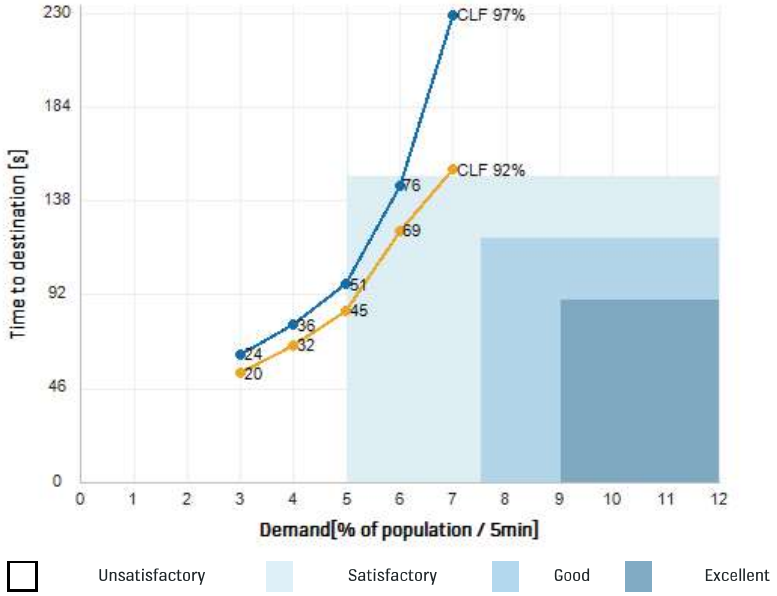
4	28	17.54	28	13.37
5	34	29.03	34	22.97
6	41	66.74	41	48.37
7	48	147.11	48	72.89

Average waiting times: Two-way

DEMAND	3 lift , 2.5 mps		3 lift , 3 mps	
	DEMAND	Two-way	DEMAND	Two-way
[% / 5 min]	persons/5 min	AWT(s)	persons/5 min	AWT(s)
3	21	18.67	21	16.36
4	28	22.61	28	21.37
5	34	28.35	34	25.19
6	41	37.25	41	34.69
7	48	45.12	48	39.79

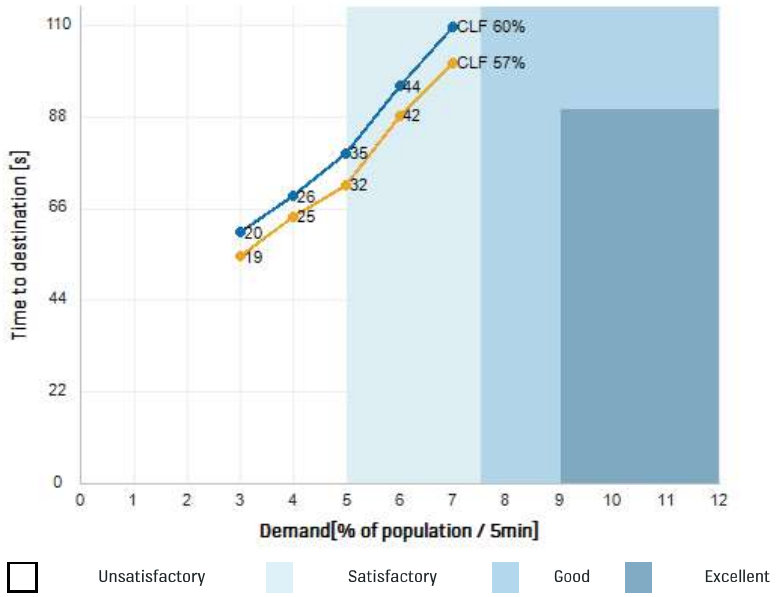
UP-PEAK TIME TO DESTINATION

3 lift , 2.5 mps
3 lift , 3 mps



TWO-WAY TRAFFIC TIME TO DESTINATION

3 lift , 2.5 mps
3 lift , 3 mps



Average time to destination: UP-PEAK

DEMAND	3 lift , 2.5 mps		3 lift , 3 mps	
	DEMAND	UP-PEAK	DEMAND	UP-PEAK

[% / 5 min]	persons/5 min	ATTD(s)	persons/5 min	ATTD(s)
3	21	62.49	21	53.51
4	28	76.93	28	67.07
5	34	96.99	34	84.14
6	41	145.26	41	123.04
7	48	228.81	48	153.24

Average time to destination: Two-way

DEMAND	3 lift , 2.5 mps		3 lift , 3 mps	
	DEMAND	TWO-WAY	DEMAND	TWO-WAY
[% / 5 min]	persons/5 min	ATTD(s)	persons/5 min	ATTD(s)
3	21	60.2	21	54.27
4	28	68.75	28	63.98
5	34	79.2	34	71.58
6	41	95.27	41	88.23
7	48	109.45	48	100.79

4. TERMS

Handling Capacity (HC) is 80% of the theoretical Transportation Capacity considering randomness in passenger arrivals and saturation in queuing.

Transportation Capacity (TC) is the theoretical number of persons per hour the system can transport.

Car Load Factor (CLF) is the maximum load in percent of nominal load reached during elevator round trip.

Utilization Factor (UF) is the actual demand in percent of transportation capacity.

Level of Service (LOS) shows the pedestrian space around, classified to A-F. Level A is spacious, level F is very tight.

Interval shows how often elevators leave the lobby during up-peak.

Nominal travel time (NTT) is obtained by dividing the travel height by the elevator rated speed.

Average waiting time (AWT) is the time from when a passenger either registers a landing call, or joins a queue, until the responding elevator begins to open its doors at the boarding floor.

Average time to destination (ATTD) is the time from when a passenger either registers a landing call or joins a queue until the passenger alights at the destination floor.

Percentage of long waits is the proportion of passengers whose waiting time exceeds 60 seconds.

Percentage of long journeys is the proportion of passengers whose Time to destination exceeds 120 seconds.

Average queue length (AQL) shows the line of people with constant traffic.

Full Collective (FC) control with up and down call buttons at landings and elevator serves the landing calls according to the running direction.

Destination Control System (DCS) with Destination Operation Panels at the landings and people with the same destination calls are allocated in the same cars.

Destination Operation Panel (DOP) is a keypad at a landing where passenger can directly give the destination floor call to the elevator group.

Brake to brake time begins when the elevator car starts to move and ends when the elevator car has stopped after the run.

Door closed to brake closed begins when the door is closed and ends when the elevator car has stopped after the run.

Door closed to beginning of door opening begins when the door is closed and ends when the door starts to open near the end of the run before the car has stopped.

Door to door performance time begins when the door starts to close and ends when the door is 800 mm open after the run.