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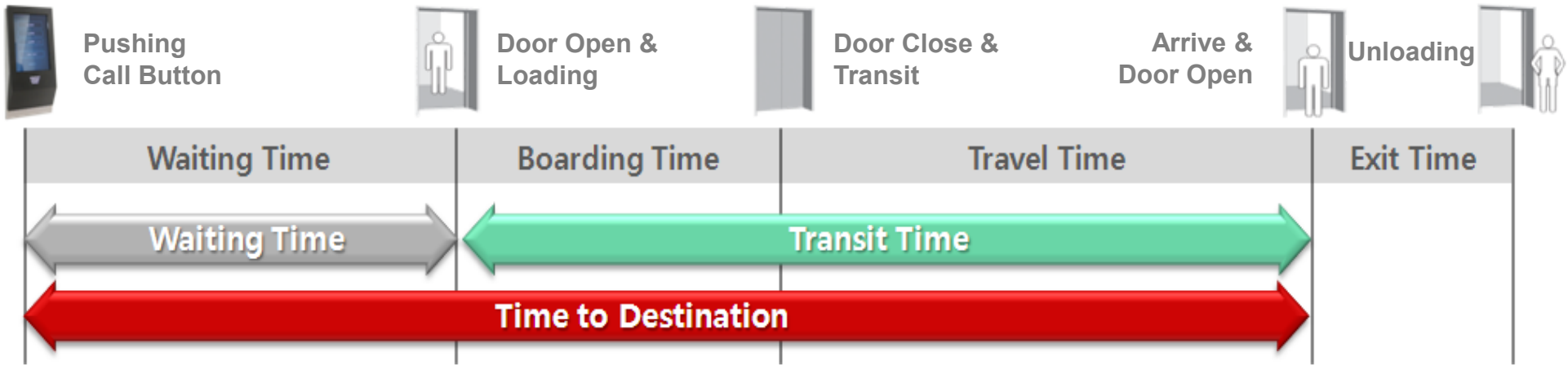
LODHA Thane Project

Traffic Analysis

13th May, 2021

HYUNDAI
ELEVATOR CO., LTD.

Traffic Simulation



Average waiting time	+	Average transit time	=	Average time to destination
Button Push to Door Opening Time		Car Start to Door Opening at Destination		Button Push to Arrival at Destination

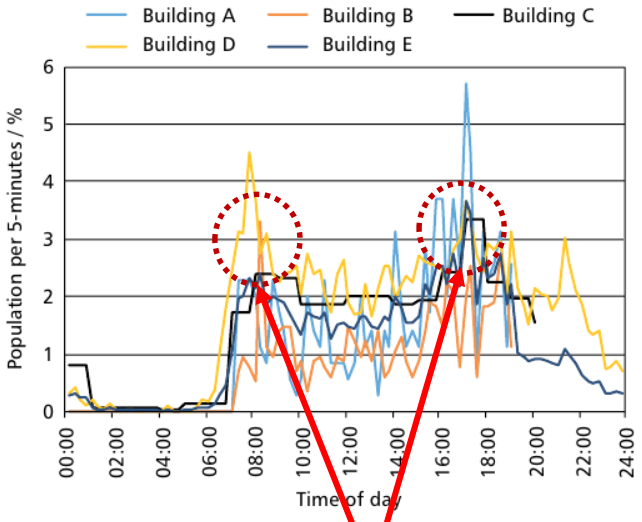
Average Waiting Time + Average Transit Time = Average time to destination

AWT + ATT = ATD

Lift Traffic Pattern and Five Minute Handling capacity

○ **Daily Lift Pattern in a Residential Building**

According to Siikonen (2013) studies on the passenger demand of the residential buildings, <u>two-way peak in the evening</u> is the busiest time for the lift system.



Siikonen(2013), CIBSE Guide D 2020

○ **Five Minute Handling Capacity (5HC)**

Percentage of the total population that lifts can handle within five minutes of the highest peak time

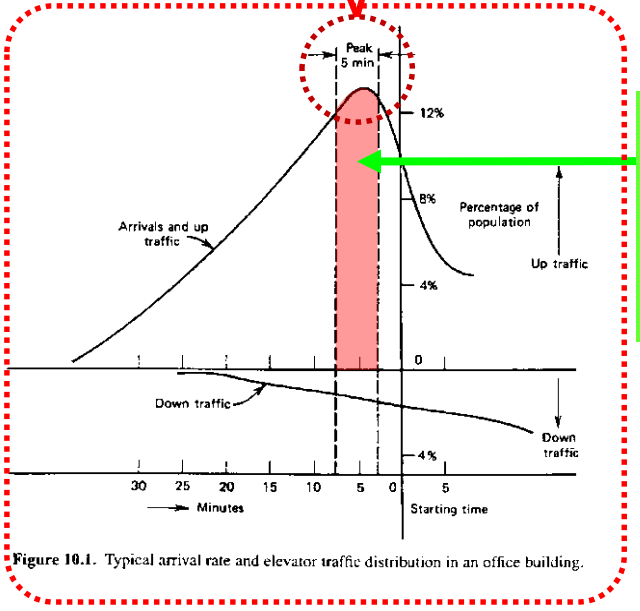


Figure 10.1. Typical arrival rate and elevator traffic distribution in an office building.

Five Minute Handling Capacity (5HC, %)

• Traffic Analysis Criteria

Method	Population	Five Minute Handling Capacity (%)	AWT (sec) *	ATT (sec)	ATD (sec)
Simulation	Different for each Tower	Residential : 5%	40 ~ 60 sec	60 ~ 75 sec	100 ~ 135 sec
Remark	○ Evening peak income & outgoing ratio: 60% incoming, 40% outgoing ○ Following methods and variables were used for the simulation ▷ Group Collective Operation ▷ Car loading factor by area: 80% ▷ Absenteeism: 0% ▷ 68KG/P as per the Indian standard				

Population Data

Usage	Floor	Height(m)	Population	O:Stop, X:Non-stop
36	40	3.15	13	O
35	39	3.15	13	O
34	38	3.15	13	O
33	37	3.15	13	O
32	36	3.15	13	O
31	35	3.15	13	O
30	34	3.15	13	O
29	33	3.15	13	O
28	32	3.15	10	O
27	31	3.15	13	O
26	30	3.15	13	O
25	29	3.15	13	O
24	28	3.15	13	O
23	27	3.15	13	O
22	26	3.15	13	O
21	25	3.15	10	O
20	24	3.15	13	O
19	23	3.15	13	O
18	22	3.15	13	O
17	21	3.15	13	O
16	20	3.15	13	O
15	19	3.15	13	O
14	18	3.15	10	O
13	17	3.15	13	O
12	16	3.15	13	O
11	15	3.15	13	O
10	14	3.15	13	O
9	13	3.15	13	O
8	12	3.15	13	O
7	11	3.15	10	O
6	10	3.15	13	O
5	9	3.15	13	O
4	8	3.15	13	O
3	7	3.15	13	O
2	6	3.15	13	O
1	5	3.15	13	O
3rd Podium	4	3.20	0	O
2nd Podium	3	3.20	0	O
1st Podium	2	3.50	0	O
Basement Floor	1	3.00	0	O

Elevator Specification		
	Use	Passenger
	Capacity	700
	Speed	1.75
BOI1	lift No	L0104
	Q'ty	4
	Group	4 Car Group

Usage	Floor	Height(m)	Population	O:Stop, X:Non-stop
36	40	3.15	13	O
35	39	3.15	13	O
34	38	3.15	13	O
33	37	3.15	13	O
32	36	3.15	13	O
31	35	3.15	13	O
30	34	3.15	13	O
29	33	3.15	13	O
28	32	3.15	10	O
27	31	3.15	13	O
26	30	3.15	13	O
25	29	3.15	13	O
24	28	3.15	13	O
23	27	3.15	13	O
22	26	3.15	13	O
21	25	3.15	10	O
20	24	3.15	13	O
19	23	3.15	13	O
18	22	3.15	13	O
17	21	3.15	13	O
16	20	3.15	13	O
15	19	3.15	13	O
14	18	3.15	10	O
13	17	3.15	13	O
12	16	3.15	13	O
11	15	3.15	13	O
10	14	3.15	13	O
9	13	3.15	13	O
8	12	3.15	13	O
7	11	3.15	10	O
6	10	3.15	13	O
5	9	3.15	13	O
4	8	3.15	13	O
3	7	3.15	13	O
2	6	3.15	13	O
1	5	3.15	13	O
3rd Podium	4	3.20	0	O
2nd Podium	3	3.20	0	O
1st Podium	2	3.50	0	O
Basement Floor	1	3.00	0	O

Elevator Specification		
	Use	Passenger
	Capacity	700
	Speed	2.5
BOI2	lift No	L0103
	Q'ty	3
	Group	3 Car Group

Usage	Floor	Height(m)	Population	O:Stop, X:Non-stop
36	40	3.15	13	O
35	39	3.15	13	O
34	38	3.15	13	O
33	37	3.15	13	O
32	36	3.15	13	O
31	35	3.15	13	O
30	34	3.15	13	O
29	33	3.15	13	O
28	32	3.15	10	O
27	31	3.15	13	O
26	30	3.15	13	O
25	29	3.15	13	O
24	28	3.15	13	O
23	27	3.15	13	O
22	26	3.15	13	O
21	25	3.15	10	O
20	24	3.15	13	O
19	23	3.15	13	O
18	22	3.15	13	O
17	21	3.15	13	O
16	20	3.15	13	O
15	19	3.15	13	O
14	18	3.15	10	O
13	17	3.15	13	O
12	16	3.15	13	O
11	15	3.15	13	O
10	14	3.15	13	O
9	13	3.15	13	O
8	12	3.15	13	O
7	11	3.15	10	O
6	10	3.15	13	O
5	9	3.15	13	O
4	8	3.15	13	O
3	7	3.15	13	O
2	6	3.15	13	O
1	5	3.15	13	O
3rd Podium	4	3.20	0	O
2nd Podium	3	3.20	0	O
1st Podium	2	3.50	0	O
Basement Floor	1	3.00	0	O

Elevator Specification		
	Use	Passenger
	Capacity	700
	Speed	3
BOI3	lift No	L0103
	Q'ty	3
	Group	3 Car Group

Population Data

Usage	Floor	Height(m)	Population	O:Stop, X:Non-stop
36	40	3.15	21	O
35	39	3.15	21	O
34	38	3.15	21	O
33	37	3.15	21	O
32	36	3.15	21	O
31	35	3.15	21	O
30	34	3.15	21	O
29	33	3.15	21	O
28	32	3.15	18	O
27	31	3.15	21	O
26	30	3.15	21	O
25	29	3.15	21	O
24	28	3.15	21	O
23	27	3.15	21	O
22	26	3.15	21	O
21	25	3.15	18	O
20	24	3.15	21	O
19	23	3.15	21	O
18	22	3.15	21	O
17	21	3.15	21	O
16	20	3.15	21	O
15	19	3.15	21	O
14	18	3.15	18	O
13	17	3.15	21	O
12	16	3.15	21	O
11	15	3.15	21	O
10	14	3.15	21	O
9	13	3.15	21	O
8	12	3.15	21	O
7	11	3.15	18	O
6	10	3.15	21	O
5	9	3.15	21	O
4	8	3.15	21	O
3	7	3.15	21	O
2	6	3.15	21	O
1	5	3.15	21	O
3rd Podium	4	3.20	0	O
2nd Podium	3	3.20	0	O
1st Podium	2	3.50	0	O
Basement Floor	1	3.00	0	O
Elevator Specification			Use	Passenger
			Capacity	700
			Speed	2.5
BOII1			lift No	L0104
			Q'ty	4
			Group	4 Car Group

Usage	Floor	Height(m)	Population	O:Stop, X:Non-stop
36	40	3.15	21	O
35	39	3.15	21	O
34	38	3.15	21	O
33	37	3.15	21	O
32	36	3.15	21	O
31	35	3.15	21	O
30	34	3.15	21	O
29	33	3.15	21	O
28	32	3.15	18	O
27	31	3.15	21	O
26	30	3.15	21	O
25	29	3.15	21	O
24	28	3.15	21	O
23	27	3.15	21	O
22	26	3.15	21	O
21	25	3.15	18	O
20	24	3.15	21	O
19	23	3.15	21	O
18	22	3.15	21	O
17	21	3.15	21	O
16	20	3.15	21	O
15	19	3.15	21	O
14	18	3.15	18	O
13	17	3.15	21	O
12	16	3.15	21	O
11	15	3.15	21	O
10	14	3.15	21	O
9	13	3.15	21	O
8	12	3.15	21	O
7	11	3.15	18	O
6	10	3.15	21	O
5	9	3.15	21	O
4	8	3.15	21	O
3	7	3.15	21	O
2	6	3.15	21	O
1	5	3.15	21	O
3rd Podium	4	3.20	0	O
2nd Podium	3	3.20	0	O
1st Podium	2	3.50	0	O
Basement Floor	1	3.00	0	O
Elevator Specification			Use	Passenger
			Capacity	700
			Speed	3
BOII2			lift No	L0103
			Q'ty	3
			Group	3 Car Group

Traffic Analysis Results

BOI1

Service Floor	Population	Load (kg)	Units	Speed (m/s)	AWT (sec) (40~60 sec)	ATT (sec) (~75 sec)	ATD (sec) (100~135 sec)	Result
40 Stops	456	700	4	1.75	23.5	60.0	83.5	Excellent

BOI2

Service Floor	Population	Load (kg)	Units	Speed (m/s)	AWT (sec) (40~60 sec)	ATT (sec) (~75 sec)	ATD (sec) (100~135 sec)	Result
40 Stops	456	700	3	2.5	26.4	51.8	78.3	Excellent

BOI3

Service Floor	Population	Load (kg)	Units	Speed (m/s)	AWT (sec) (40~60 sec)	ATT (sec) (~75 sec)	ATD (sec) (100~135 sec)	Result
40 Stops	456	700	3	3	21.0	46.8	67.8	Excellent

Comment

All three options shows an excellent results.

Traffic Analysis Results

BOII 1

Service Floor	Population	Load (kg)	Units	Speed (m/s)	AWT (sec) (40~60 sec)	ATT (sec) (~75 sec)	ATD (sec) (100~135 sec)	Result
40 Stops	744	700	4	2.5	23.5	58.2	81.8	Excellent

BOII 2

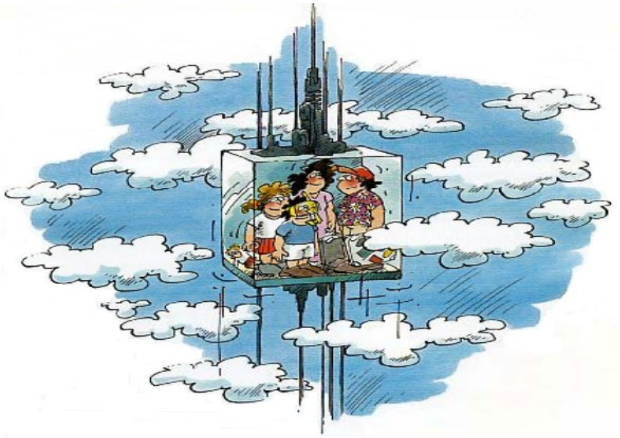
Service Floor	Population	Load (kg)	Units	Speed (m/s)	AWT (sec) (40~60 sec)	ATT (sec) (~75 sec)	ATD (sec) (100~135 sec)	Result
40 Stops	744	700	3	3	41.7	62.6	104.3	Satisfactory

Comment

All two options shows very good results.

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Thank You



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