



# How can the West 4<sup>th</sup> NYU Starbucks manage to improve its customer service

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Decision Models

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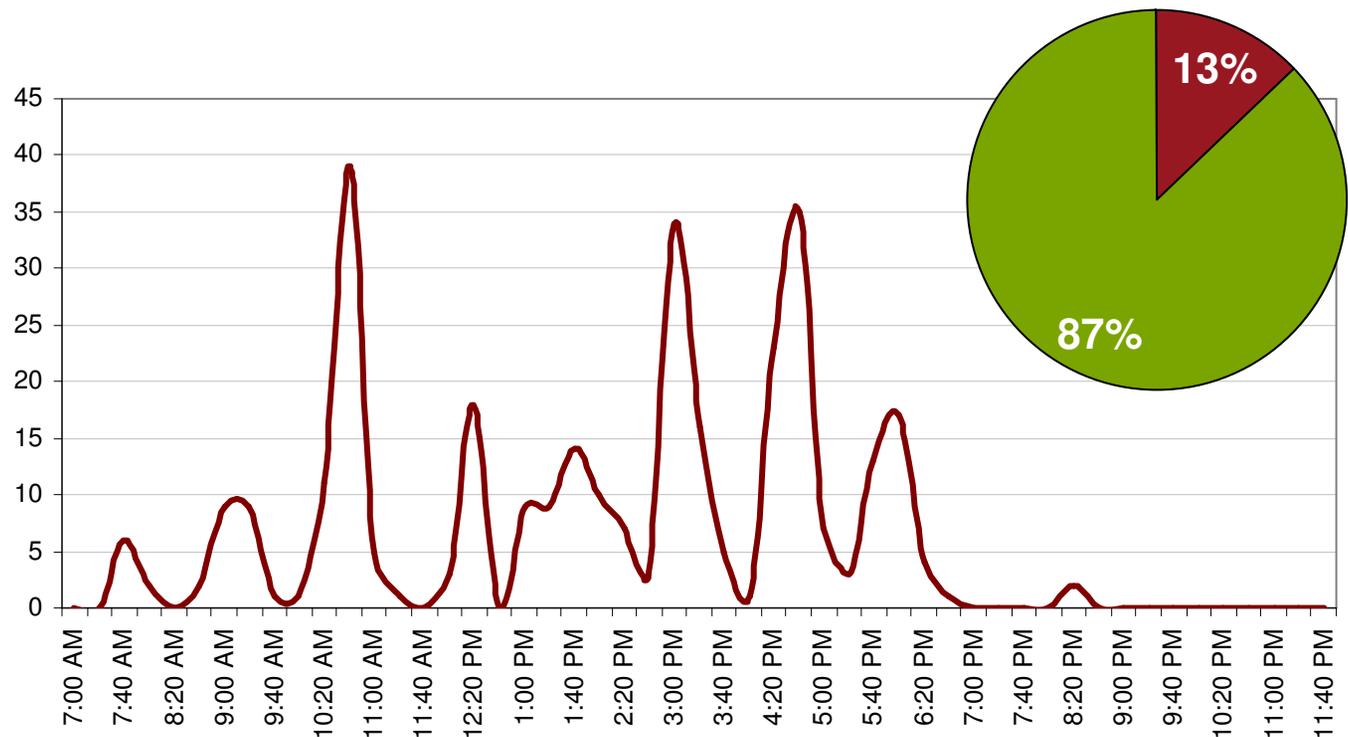
# On a normal day, service level at Starbucks is resulting in a loss of up to 320 clients



Long waiting times is driving a high churn rate with potential indirect consequences in customer satisfaction:

Approximately 320 or 13% out of a total of 2,500 customers either give up at the door or after waiting a couple minutes in the line

### # customers giving up (on every 20 minute slot)



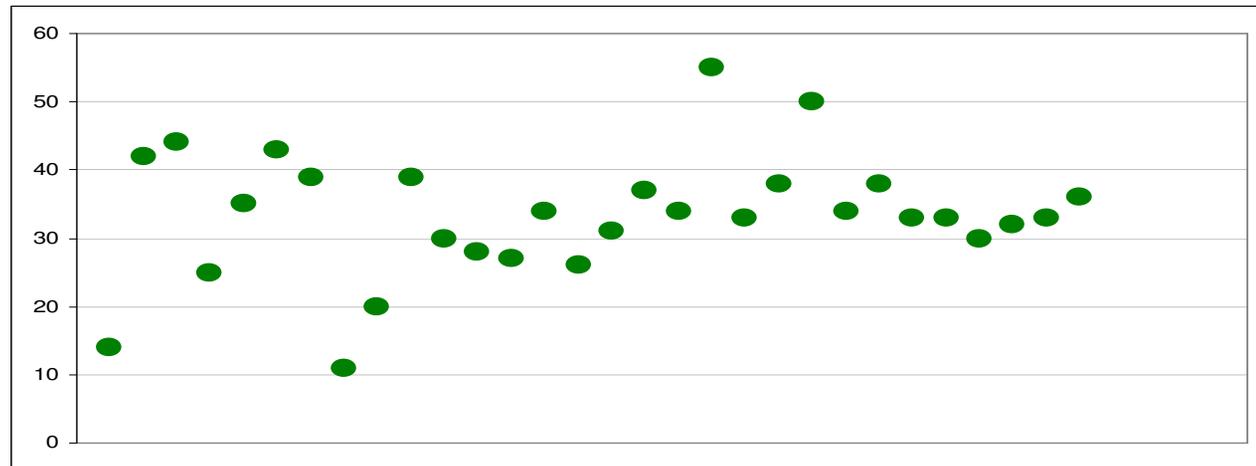
Source: Field measures (number of total customers versus customers giving up across a full day of work, 7 AM to 12 AM)

# High volatility across work station's capacity rates decreases overall service level

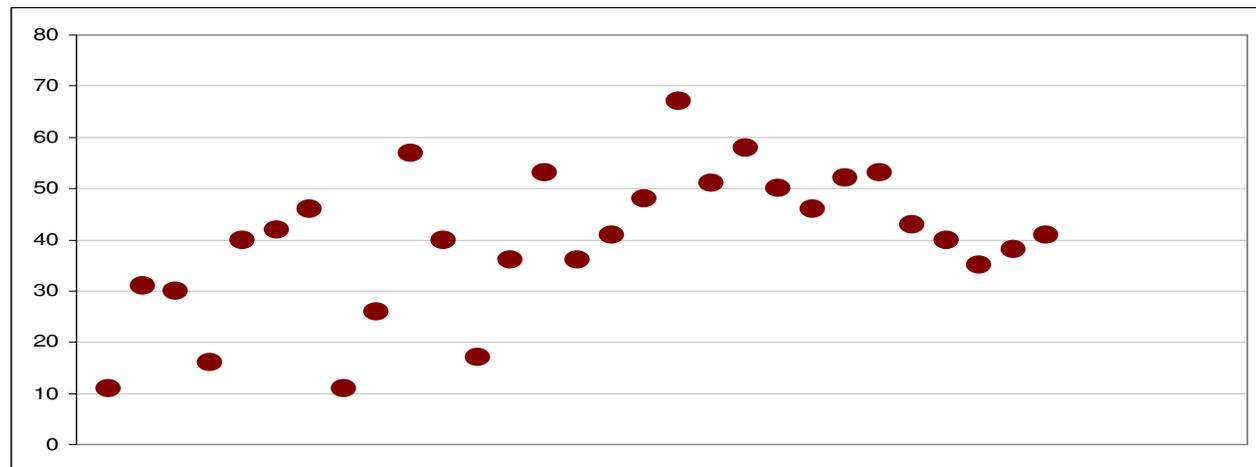


# of clients/beverages served\* (on a 20 minute slot)

At the cashiers



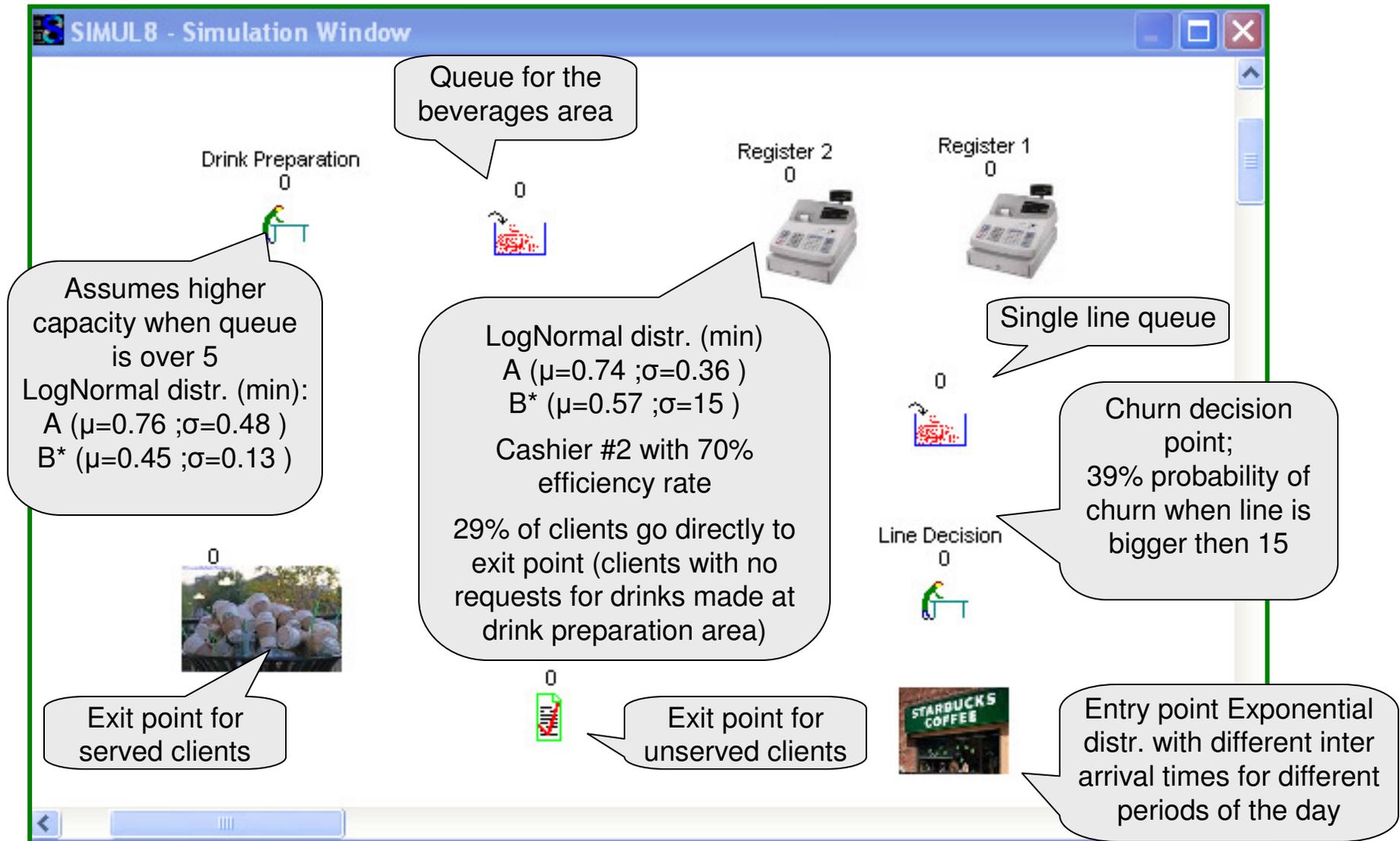
At the coffee machines



\* Field measures (27 observations of 20 minute slots between 7 AM to 12 AM, Mon-Thu) during peak times (always people queuing)



# The system was simulated using Simul8



\* Peak capacity for registers = queue for registers is > 15; Peak for drink preparation = queue for drinks >5

# New initiatives would significantly increase service level and potentially eliminate churn



	Description	Key performance measures		
		Churn	Queuing time (min)	Total time in system (min)
<b>Base case</b>	System <i>as is</i>	13 %	5.76	8.74
<b>10-drink cards</b>	Pre purchased card with 10 equal drinks that can be used to order directly from the beverages area	8 % (-5 pp)	5.65 (-1.9%)	8.74 (-0%)
<b>Priority register</b>	Dedicate 1 cashier to customers paying with Starbucks card or Campus Cash (assumes increase in number of customers using this payment method)	6 % (-7 pp)	4.51 (-21.7%)	7.90 (-9.6%)
<b>Drink Comm.</b>	Intercom in the beverages area printing all orders coming from registers	9 % (-4 pp)	4.63 (-19.6%)	7.87 (-9.9%)
<b>Automated register</b>	Automatic machine for clients who want to order drinks from the beverages area. Assumes previous measure is in place	3 % (-10 pp)	3.81 (-33.9%)	7.41 (-15.2%)

Source: Team analysis



# The four initiatives were built into the model according to their specifications

• [BACKUP](#)

## Changes in model

### 10-drink cards

- Model assumes 10% of customers will go directly to the drink area independently of the size of the line for the registers

### Priority register

- Assumes 50% of clients would adhere to either Starbucks Card or Campus Cash.
- Second cashier's time per client is set to 0.5 min (fixed).

### Drink Comm.

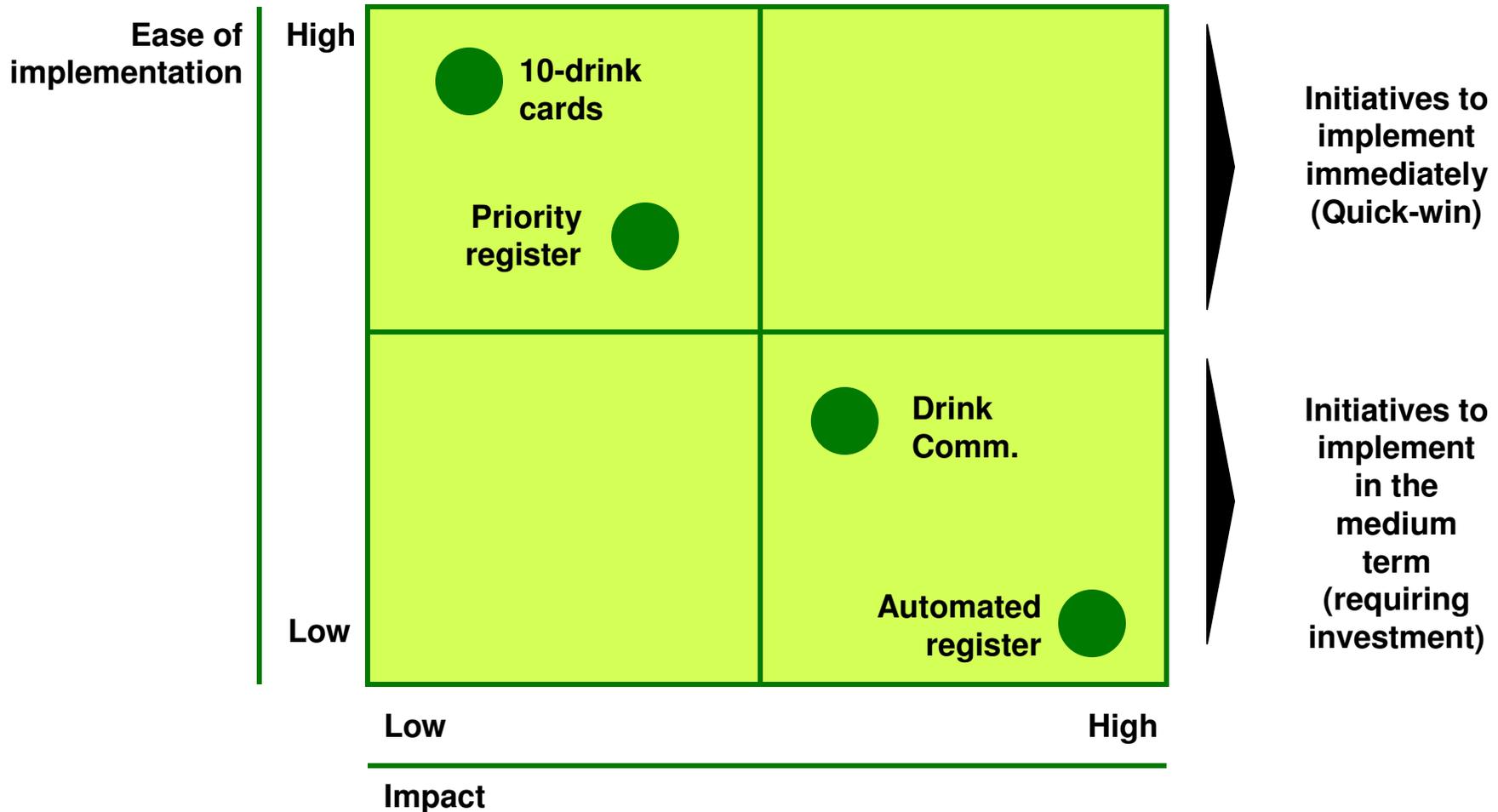
- Assumes a 10% efficiency increase across working stations

### Automated register

- Assumes 10% efficiency increase across working stations
- New register (automatic) with same capacity as current registers (conservative approach)
- Assumes 30% of clients only go for drinks and 50% of these would use the automatic vendor machine

**All assumptions would need further field analysis for verification**

# Starbucks should phase-in the 4 initiatives accordingly to their ease of implementation





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# BACKUP

# Field measures



## Demand. # of clients coming in. Mon-Thu

	# of People		Total Demand
	Getting Into Line	# of People giving up	
7:00:00 - 7:20:00	15	0	15
7:20:00 - 7:40:00	22	0	22
7:40:00 - 8:00:00	48	6	54
8:00:00 - 8:20:00	14	2	16
8:20:00 - 8:40:00	35	0	35
8:40:00 - 9:00:00	51	2	53
9:00:00 - 9:20:00	97	9	106
9:20:00 - 9:40:00	47	9	56
9:40:00 - 10:00:00	33	1	34
10:00:00 - 10:20:00	33	1	34
10:20:00 - 10:40:00	68	11	79
10:40:00 - 11:00:00	75	39	114
11:00:00 - 11:20:00	37	5	42
11:20:00 - 11:40:00	31	1	32
11:40:00 - 12:00:00	52	0	52
12:00:00 - 12:20:00	63	3	66
12:20:00 - 12:40:00	60	18	78
12:40:00 - 13:00:00	45	0	45
13:00:00 - 13:20:00	54	9	63
13:20:00 - 13:40:00	86	9	95
13:40:00 - 14:00:00	78	14	92
14:00:00 - 14:20:00	37	10	47
14:20:00 - 14:40:00	47	7	54
14:40:00 - 15:00:00	32	3	35
15:00:00 - 15:20:00	87	34	121
15:20:00 - 15:40:00	55	16	71

	# of People		Total Demand
	Getting Into Line	# of People giving up	
15:40:00 - 16:00:00	60	5	65
16:00:00 - 16:20:00	62	1	63
16:20:00 - 16:40:00	64	23	87
16:40:00 - 17:00:00	65	35	100
17:00:00 - 17:20:00	57	7	64
17:20:00 - 17:40:00	54	3	57
17:40:00 - 18:00:00	59	13	72
18:00:00 - 18:20:00	62	17	79
18:20:00 - 18:40:00	50	4	54
18:40:00 - 19:00:00	38	1	39
19:00:00 - 19:20:00	50	0	50
19:20:00 - 19:40:00	39	0	39
19:40:00 - 20:00:00	48	0	48
20:00:00 - 20:20:00	58	0	58
20:20:00 - 20:40:00	39	2	41
20:40:00 - 21:00:00	34	0	34
21:00:00 - 21:20:00	41	0	41
21:20:00 - 21:40:00	38 *	0	38
21:40:00 - 22:00:00	38 *	0	38
22:00:00 - 22:20:00	38 *	0	38
22:20:00 - 22:40:00	38 *	0	38
22:40:00 - 23:00:00	38 *	0	38
23:00:00 - 23:20:00	38 *	0	38
23:20:00 - 23:40:00	38 *	0	38
23:40:00 - 0:00:00	38 *	0	38

\* Assumes continuous demand after 9:20 pm

# Field measures



## Capacity. Mon-Thu

	# of Transactions for ONE cashier	Number of Beverages Served
7:00:00 - 7:20:00	11	8
7:20:00 - 7:40:00	14	11
7:40:00 - 8:00:00	42	31
8:00:00 - 8:20:00	44	30
8:20:00 - 8:40:00	25	16
8:40:00 - 9:00:00	35	40
9:00:00 - 9:20:00	43	42
9:20:00 - 9:40:00	39	46
9:40:00 - 10:00:00	*	*
10:00:00 - 10:20:00	11	11
10:20:00 - 10:40:00	20	26
10:40:00 - 11:00:00	39	57
11:00:00 - 11:20:00	30	40
11:20:00 - 11:40:00	28	17
11:40:00 - 12:00:00	*	*
12:00:00 - 12:20:00	27	36
12:20:00 - 12:40:00	34	53
12:40:00 - 13:00:00	26	36
13:00:00 - 13:20:00	31	41
13:20:00 - 13:40:00	37	48
13:40:00 - 14:00:00	34	67
14:00:00 - 14:20:00	*	*
14:20:00 - 14:40:00	*	*
14:40:00 - 15:00:00	*	*
15:00:00 - 15:20:00	55	51
15:20:00 - 15:40:00	33	58

	# of Transactions for ONE cashier	Number of Beverages Served
15:40:00 - 16:00:00	38	50
16:00:00 - 16:20:00	50	46
16:20:00 - 16:40:00	34	52
16:40:00 - 17:00:00	38	53
17:00:00 - 17:20:00	33	43
17:20:00 - 17:40:00	33	40
17:40:00 - 18:00:00	30	35
18:00:00 - 18:20:00	32	38
18:20:00 - 18:40:00	33	41
18:40:00 - 19:00:00	*	*
19:00:00 - 19:20:00	*	*
19:20:00 - 19:40:00	*	*
19:40:00 - 20:00:00	*	*
20:00:00 - 20:20:00	*	*
20:20:00 - 20:40:00	*	*
20:40:00 - 21:00:00	*	*
21:00:00 - 21:20:00	*	*
21:20:00 - 21:40:00	*	*
21:40:00 - 22:00:00	*	*
22:00:00 - 22:20:00	*	*
22:20:00 - 22:40:00	*	*
22:40:00 - 23:00:00	*	*
23:00:00 - 23:20:00	*	*
23:20:00 - 23:40:00	*	*
23:40:00 - 0:00:00	*	*

\* Not relevant since employees were not working at full capacity



# Model Inputs (probability distributions)

		Register (1 and 2)		Drinks	
		Mean	Standard Dev.	Mean	Standard Dev.
Base case	Normal	0.74	0.36	0.76	0.48
	Peak *	0.57	0.15	0.45	0.13

		Register (1 and 2)	
		Mean	Standard Dev.
10 drinks cards	Normal	0.74	0.36
	Peak *	0.57	0.15

		Register (1)		Register (2)	
		Mean	Standard Dev.	Mean	Standard Dev.
Priority cashier	Normal	0.74	0.36	0.50	0.00
	Peak *	0.57	0.15	0.50	0.00

		Register (1 and 2)		Drinks	
		Mean	Standard Dev.	Mean	Standard Dev.
Drink communic.	Normal	0.66	0.32	0.68	0.43
	Peak *	0.52	0.13	0.41	0.12

		Register (3)	
		Mean	Standard Dev.
Automated register	Normal	0.74	0.36
	Peak *	0.57	0.15

\* Peak capacity for registers = queue for registers is > 15; Peak for drink preparation = queue for drinks >5