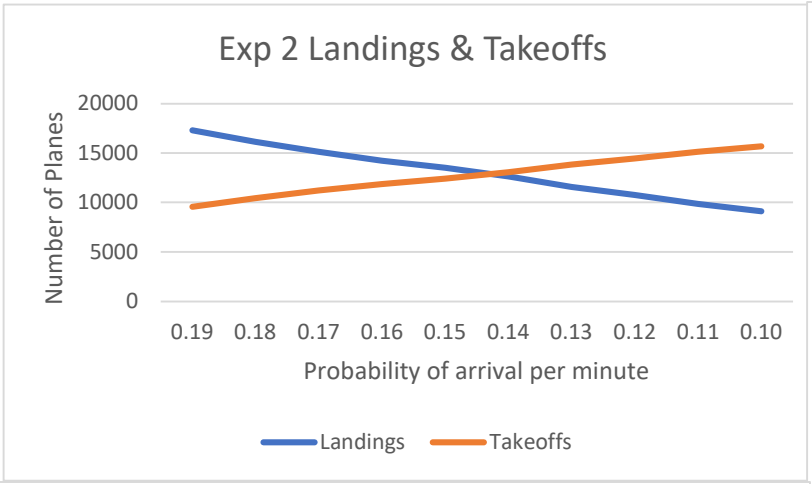
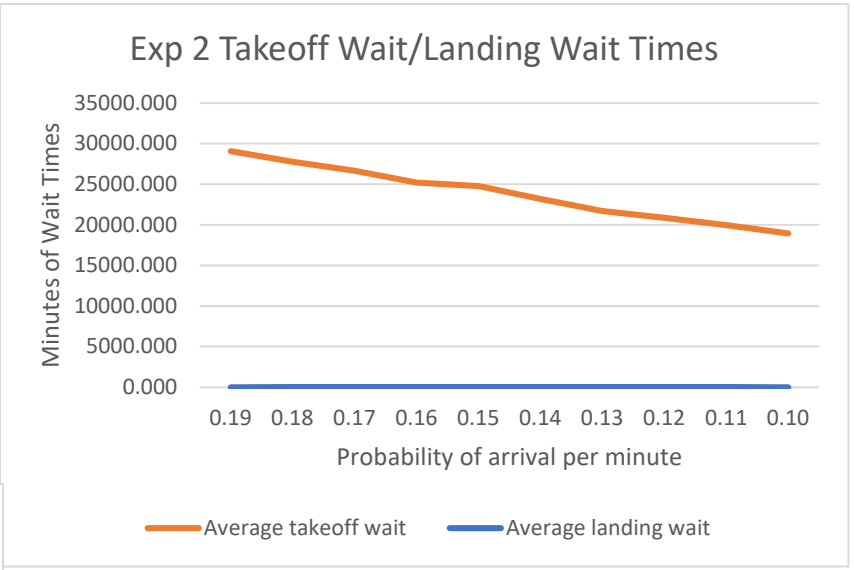
EXPERIMENT 1	
1a.	
Landed	44873
Took off	0
Crashed	538
Average time waiting to land	3.165
Average time waiting to take off	0

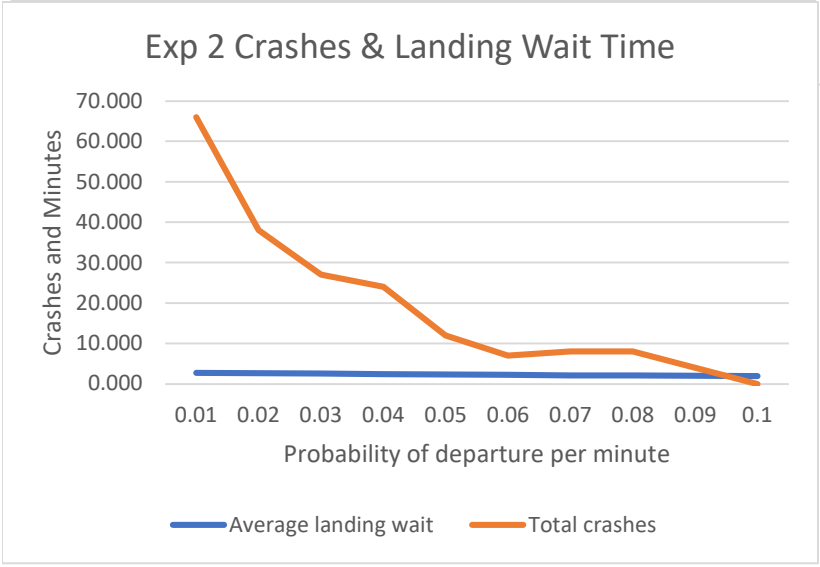
1b.	
Landed	2
Took off	19787
Crashed	0
Average time waiting to land	0
Average time waiting to take off	1.438

EXPERIMENT 2										
2a. & 2b.	SIM 1	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6	SIM 7	SIM 8	SIM 9	SIM 10
Planes landed	17293	16121	15110	14202	13498	12627	11573	10763	9855	9103
Average landing wait	2.765	2.608	2.522	2.374	2.325	2.210	2.121	2.050	1.998	1.948
Planes took off	9580	10436	11188	11866	12386	13035	13824	14434	15112	15671
Average takeoff wait	29062.155	27743.704	26644.794	25209.646	24769.370	23177.983	21672.759	20853.932	19954.607	18942.060
Total crashes	66	38	27	24	12	7	8	8	4	0
Time to land	3	3	3	3	3	3	3	3	3	3
Time to take off	4	4	4	4	4	4	4	4	4	4
Probability of arrival per minute	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10
Probability of departure per minute	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Total simulation minutes	90000	90000	90000	90000	90000	90000	90000	90000	90000	90000

EXPERIMENT 2 (cont'd.)







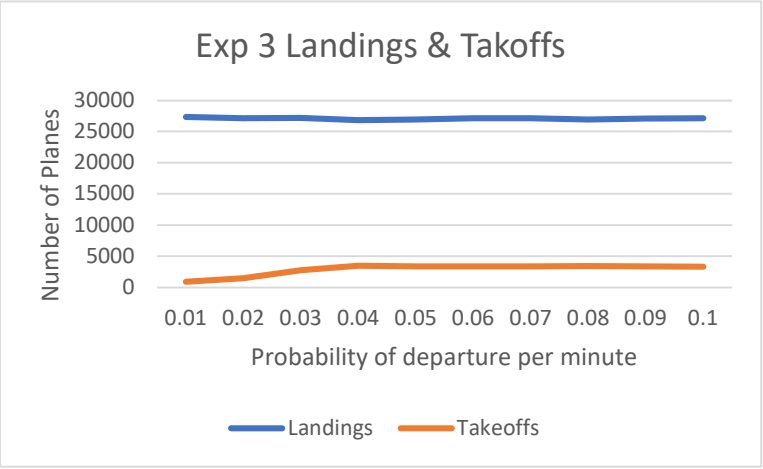
Conclusions:

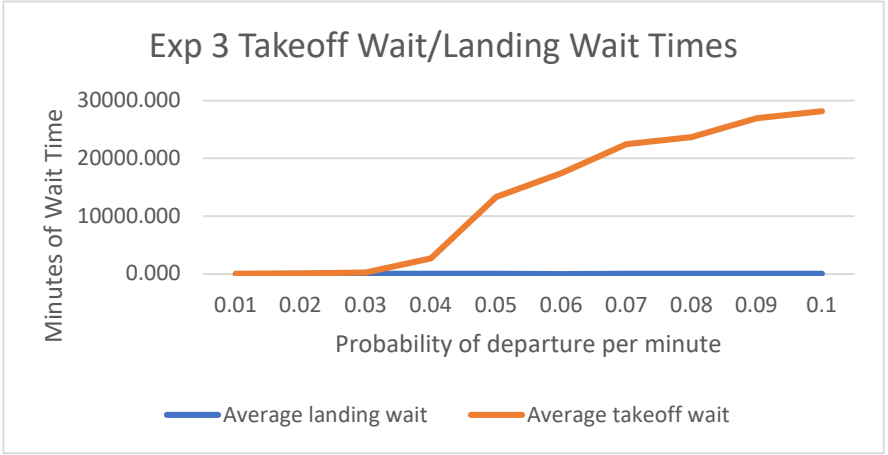
As the probability of arrival decreases, the rate of landings decrease and the rate of takeoffs increase.

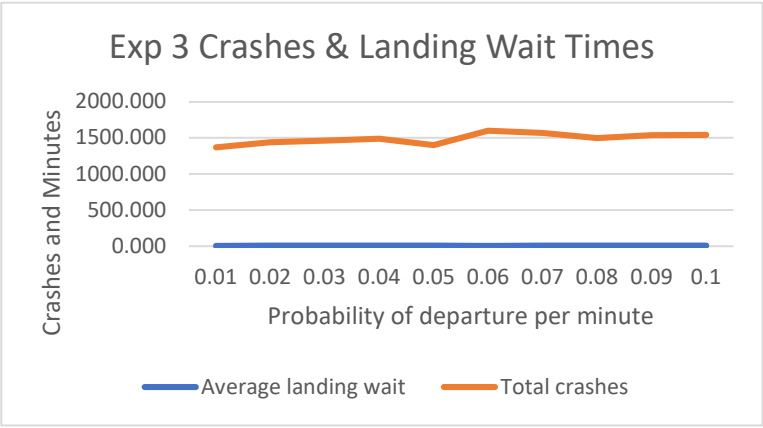
As the wait time to take off decreases, the rate of landings stays relatively flat.

Finally, as the average wait time to land decreases slightly, the rate of crashes decreases exponentially.

EXPERIMENT 3										
3a. & 3b.	SIM 1	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6	SIM 7	SIM 8	SIM 9	SIM 10
Planes landed	27338	27144	27193	26822	26939	27145	27113	26938	27071	27153
Average landing wait	4.506	4.710	4.982	5.061	5.077	5.183	5.162	5.084	5.116	5.162
Planes took off	892	1463	2723	3462	3341	3339	3338	3413	3347	3286
Average takeoff wait	43.111	72.911	243.329	2665.720	13281.752	17416.950	22437.954	23638.201	26891.182	28122.935
Total crashes	1368	1438	1460	1485	1399	1597	1565	1493	1535	1538
Time to land	3	3	3	3	3	3	3	3	3	3
Time to take off	4	4	4	4	4	4	4	4	4	4
Probability of arrival per minute	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Probability of departure per minute	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
Total simulation minutes	90000	90000	90000	90000	90000	90000	90000	90000	90000	90000







Conclusions:

As the probability of departure increases, the rate of landings decreases slightly and the rate of takeoffs increase.

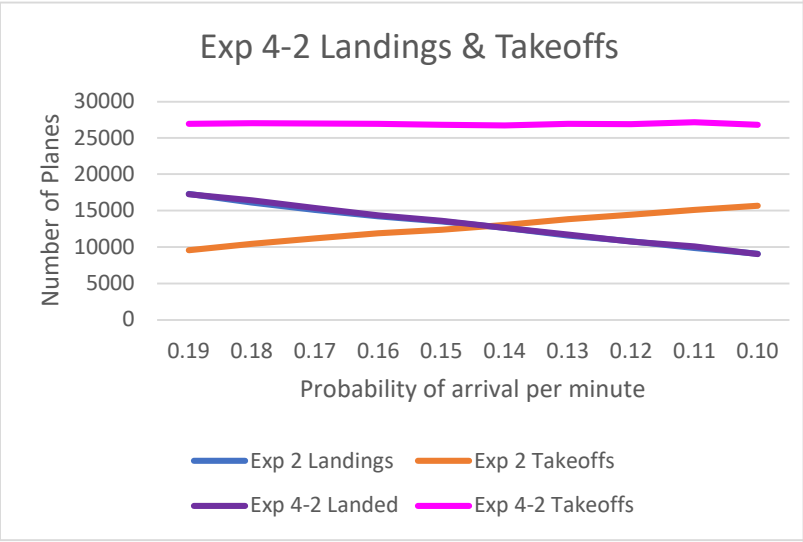
As the departure rate increases, the average takeoff wait time increases and the average landing wait time stays relatively flat.

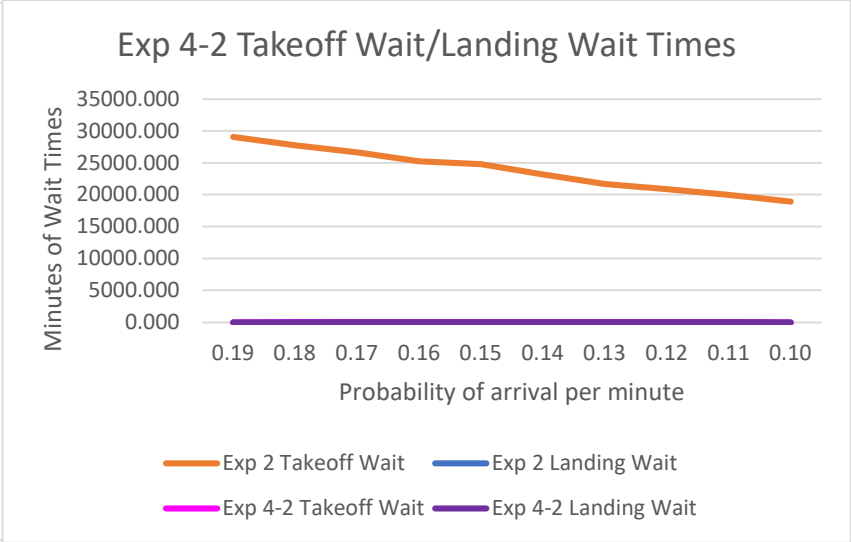
Finally, the number of crashes increases slightly as the departure rate increases, and the landing wait time remained relatively flat.

EXPERIMENT 4

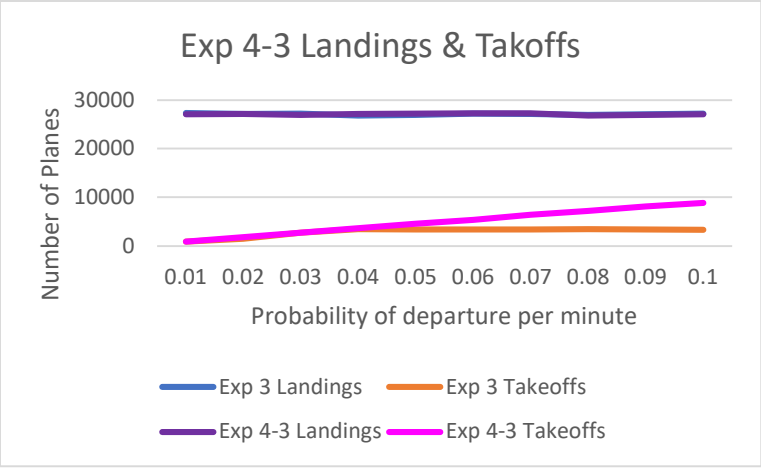
4 (2a. & 2b.)	SIM 1	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6	SIM 7	SIM 8	SIM 9	SIM 10
Planes landed	17279	16393	15346	14336	13591	12641	11702	10752	10088	9062
Average landing wait	0.662	0.648	0.620	0.575	0.569	0.518	0.501	0.505	0.476	0.443
Planes took off	26941	27034	26949	26940	26808	26708	26947	26885	27161	26789
Average takeoff wait	6.593	5.897	4.441	3.917	3.348	2.992	2.569	2.240	2.120	1.768
Total crashes	0	0	0	0	0	0	0	0	0	0
Time to land	3	3	3	3	3	3	3	3	3	3
Time to take off	4	4	4	4	4	4	4	4	4	4
Probability of arrival per minute	0.19	0.18	0.17	0.16	0.15	0.14	0.13	0.12	0.11	0.10
Probability of departure per minute	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Total simulation minutes	90000	90000	90000	90000	90000	90000	90000	90000	90000	90000

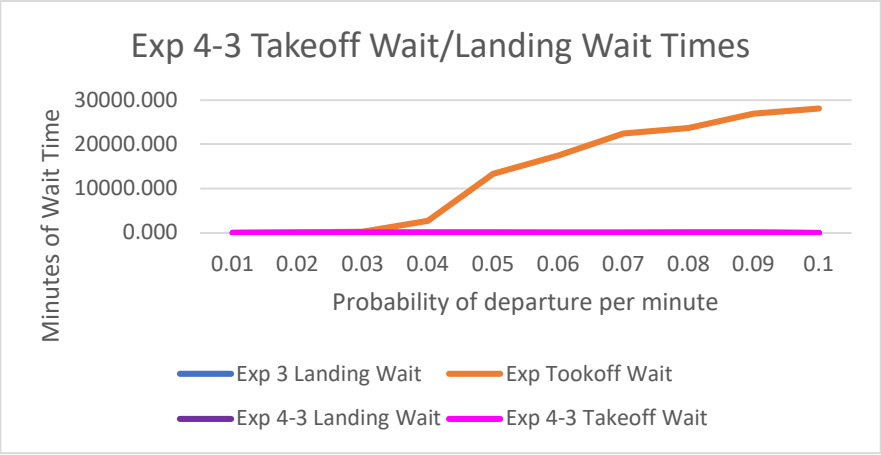
4 (3a. & 3b.)	SIM 1	SIM 2	SIM 3	SIM 4	SIM 5	SIM 6	SIM 7	SIM 8	SIM 9	SIM 10
Planes landed	27073	27107	26932	27110	27160	27221	27283	26800	26897	27067
Average landing wait	0.141	0.159	0.192	0.214	0.239	0.255	0.296	0.307	0.340	0.364
Planes took off	872	1820	2742	3609	4538	5313	6382	7212	8094	8867
Average takeoff wait	0.617	0.762	0.884	1.006	1.064	1.141	1.363	1.438	1.567	1.754
Total crashes	0	0	0	0	0	0	0	0	0	0
Time to land	3	3	3	3	3	3	3	3	3	3
Time to take off	4	4	4	4	4	4	4	4	4	4
Probability of arrival per minute	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30	0.30
Probability of departure per minute	0.01	0.02	0.03	0.04	0.05	0.06	0.07	0.08	0.09	0.1
Total simulation minutes	90000	90000	90000	90000	90000	90000	90000	90000	90000	90000





EXPERIMENT 4 (cont'd.)





Summary of Findings:

Experiment 4's landings and landing wait times had virtually no change no from Experiments 2 or 3.

Takeoffs significantly increased for Experiment 4 over Experiments 2 and 3, while takeoff wait times significantly decreased.

Adding a second runway eliminated crashes for the numbers compared. (A graph for crashes was not requested in Experiment 4.)

Within these three experiments, the optimal arrival rate is 0.19 per minute with time to land of 3 minutes.

The optimal departure rate is 0.30 per minute with a time to take off of 4 minutes.

The optimal rates changed minimally from one runway to two runways. However, adding a second runway eliminated crashes, increased takeoffs, and reduced wait times overall.

These conclusions are derived by comparing results of Experiments 2 and 3 with one runway to Experiment 4 with two runways. Experiment 4 used the same arrival rate, departure rate, time to land, time to takeoff, minutes of fuel remaining, and simulation time to run each simulation from Experiments 2 and 3.