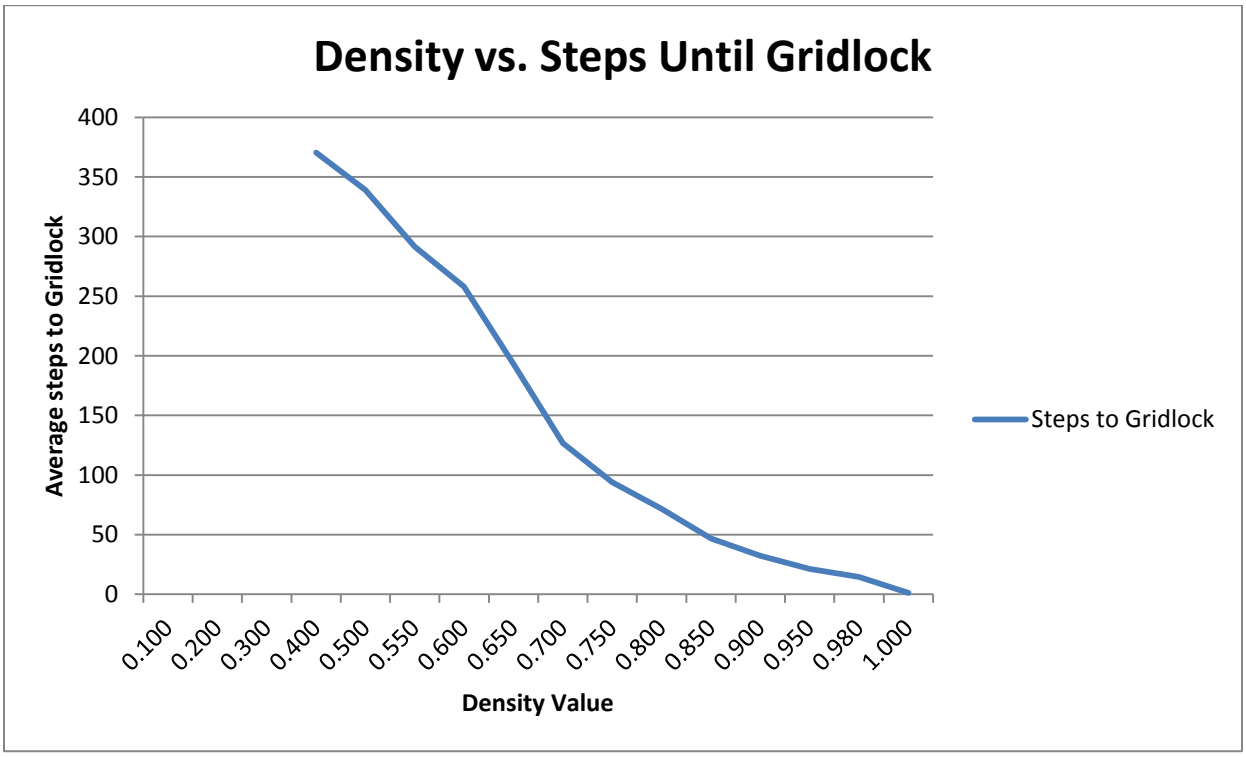
In my BML simulation, in order to test where the density most affects chances of gridlock, I ran simulations of a 100 by 100 grid with 500 steps and 20 simulations for each density value. So I have 20 results for each density value with these tests.



The most dramatic differences occur when the density changes between 0.6 to 0.7. This is when the average steps until gridlock drops the most, as the step number starts to tail off as the density continues to get closer to 1.00. The most significant changes in terms of what percentage of simulations ran into gridlock occurred between 0.4 and 0.5 however. When the density is only 0.4, just 2 out of 20 simulations ran into gridlock. When the density is 0.5, 15 out of 20 simulations ran into gridlock.

Area	Steps to Gridlock	Area	Steps to Gridlock	0.8 Density
10x10	16.45	20x10	21.30	
15x15	24.80	10x30	23.85	
20x20	28.75	10x20	24.60	
30x30	45.95	10x50	27.95	
40x40	45.40	30x10	28.25	
50x50	45.30	40x10	30.25	
60x60	55.00	10x90	32.55	
70x70	54.20	20x30	34.00	
80x80	61.10	30x20	35.65	
90x90	58.50	10x40	35.80	
100x100	71.70	90x10	36.65	

Using a density of 0.8, we can see that as the area of the grid increases, the higher the average number of steps required for gridlock. However, the size has diminishing returns, as the higher areas start to level out. As for shape, there seems to be no trend. The 20x20 grid has the same area as the 40x10 and the 10x40, but the two rectangular grids take on average longer to reach gridlock. However, the square 30x30 grid takes a longer time to reach gridlock than the rectangular 90x10 and 10x90, even though all these grids have identical areas.