

Report to the Arizona Independent Redistricting Commission on Recommended Competitiveness Baseline for State Legislative Districts

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I have been retained by National Demographics Corporation (NDC) to consult in the construction of competitive districts and competitiveness evaluation of redistricting state legislative plans for the Arizona Independent Redistricting Commission (IRC). I was directed by NDC to assist Douglas Johnson on February 5-6 to construct competitive districts for consideration by the IRC.

I define a competitive district as one in which it cannot be determined with a reasonable degree of statistical certainty which of the candidates of the two political parties will win an election within the district. As described in previous reports, I apply a statistical procedure known as “JudgeIt” to predict the expected Democratic vote as a percentage of the two major political parties within a given district. This estimate has a degree of error of plus or minus 3.5 percentage points – a value determined by the statistical procedure. If the expected Democratic vote as a percentage of the two major political parties falls within the range 46.5 to 53.5%, then I cannot determine with a reasonable degree of statistical certainty which of the two political parties is expected to win the district, and I therefore label the district competitive. The JudgeIt analysis presented here is based on 1996-2002 state legislative elections.

NDC prepared two maps as starting points for my consultation with Mr. Johnson. It is my understanding that these maps are based on the state legislative grid map. In addition to describing my consultation with Mr. Johnson, this report contains competitiveness analyses of the legislative grid map, the two maps prepared by NDC, and the two maps that resulted from my consultation with Mr. Johnson. A JudgeIt analysis of the legislative grid map indicates 6 competitive districts.

Mr. Johnson, under my direction, explored increasing the competitiveness of these two maps, called Competitive A-1 and Competitive B-1. I was instructed by NDC to assist Mr. Johnson in improving the competitiveness of two tests maps, regardless of any criteria other than equal population and contiguity.

The first map that Mr. Johnson and I examined on February 5 and 6 is called Competitive B-1, which I understand to be an NDC prepared map that identified districts with an Arizona Quick and Dirty value equal to 50.0%. (This map and intermediate test maps were originally labeled as Competitive 1-6 though Competitive 1-11.). JudgeIt analysis indicated Competitive B-1 had 16 competitive districts. In the descriptions that follow, JudgeIt values are given in parentheses. The following changes were made to Competitive B-1:

- Democrats and Republicans in Districts L (47.9%) and M (57.2%) were balanced to form new Districts L (52.1%) and M (52.1%), resulting in an additional competitive district, District M.
- Population among Districts A (45.0%), CC (62.6%), and DD (50.9%), was exchanged to form new Districts A (52.2%), CC (52.5%), and DD (53.3%), resulting in two additional competitive districts, Districts A and CC. Population was additionally exchanged between A and B (44.4%) to form a new District B (47.0%), resulting in an additional competitive district.
- Population was later exchanged between A, CC, and DD without substantively affecting the competitiveness of these districts, in order to provide for additional possibilities of exchanges with other districts.
- Population was exchanged between C (46.1%), D (55.7%), and DD to form new Districts C (46.9%), D (49.6%) and DD, resulting in two additional competitive districts.
- Population was exchanged among Districts S (52.0%), T (45.9%), and Z (48.2%), to form new Districts S (50.5%), T (47.5%), and Z (47.4%), resulting in two additional competitive districts, Districts A and CC.
- Population was exchanged between Districts B (44.4%) and D, to form new Districts B (47.0%) and D, resulting in an additional competitive district, District B.

A JudgeIt analysis of the resulting map, B-2, was found to have 23 districts within a range of 46.5-53.5%.

The second map that Mr. Johnson and myself examined on February 6, is called Competitive A-1, which I understand to be an NDC prepared map that identified 23 districts within an Arizona Quick and Dirty range of 45.5 to 54.5%. (This map and intermediate test maps were originally labeled as Competitive A-2 though Competitive A-5.). JudgeIt analysis indicated Competitive A-1 had 21 competitive districts. I noted two Democratic districts that were close to falling within the JudgeIt competitive range – Districts DD and J – and these were explored to increase the number of districts that fell within the JudgeIt competitive range.

- Population was exchanged between DD (54.3%) and CC (41.8%), but the exchange failed to make DD competitive.
- Population was exchanged between J (55.2%) and N (50%) to form two new districts, District J (53.2%) and (51.7%), resulting in an additional competitive district.
- Further population was exchanged between DD and G (49.9%), forming two new districts, District DD (51.8%) and G (51.2%), resulting in an additional competitive district.
- CC (41.8%) was further unsuccessfully explored to bring it within the competitive range though radical population exchanges with DD.

A JudgeIt analysis of the resulting map, A-2, was found to have 23 districts within a range of 46.5-53.5%.

In constructing maps Competitive A-2 and Competitive B-2 from maps Competitive A-1 and Competitive B-2, respectively, I noted that the political geography of Arizona constrains the drawing of competitive districts beyond the Republican leaning nature of the state noted in my previous reports to the IRC. In particular, the concentration of Democrats in the Tucson area limits the drawing of competitive districts in the southeast corner of the state, and forces the drawing of an uncompetitive Democratic district unless an extraordinary effort is made to connect Tucson to Republican areas of the state with census block-wide connectors stretching across the center of the state. The concentrated east-west band of Republicans to the north of Phoenix forces the construction of uncompetitive Republican districts in that region without similar extraordinary effort. The unsuccessful tests District CC in Competitive B-1 were aimed towards this goal, and the failure of the effort demonstrates the difficulty in creating further competitive districts.

I find both Competitive A-2 and B-2 to have 23 competitive districts. It is unknown whether other plans exist with more competitive districts than Competitive A-2 and Competitive B-2. However, I am confident that 23 competitive districts is close to, if not, the upper limit of the number of competitive state legislative districts that can be drawn in Arizona. Twenty-three competitive districts can therefore reasonably serve as a baseline for the most number of competitive districts that the commission can draw, disregarding any criteria except equal population and contiguity.

District	Competitiveness State Leg – Legislative Grid Map		
	%Dem	%Rep	Competitiveness
A	41.7	58.3	Republican
AA	40.4	59.6	Republican
B	44.6	55.4	Republican
BB	41.6	58.4	Republican
C	44.7	55.3	Republican
CC	61.4	38.6	Democratic
D	55.8	44.2	Democratic
DD	54.4	45.6	Democratic
E	47.7	52.3	Competitive/Republican
F	44.4	55.6	Republican
G	39.9	60.1	Republican
H	52.2	47.8	Competitive/Democratic
I	46.4	53.6	Republican
J	61.1	38.9	Democratic
K	53.3	46.7	Competitive/Democratic
L	46.9	53.1	Competitive/Republican
M	57.4	42.6	Democratic
N	50.9	49.1	Competitive/Democratic
O	57.9	42.1	Democratic
P	56.4	43.6	Democratic
Q	50.9	49.1	Competitive/Democratic
R	55.7	44.3	Democratic
S	58.9	41.1	Democratic
T	43.2	56.8	Republican
U	42.7	57.3	Republican
V	40.7	59.3	Republican
W	43.8	56.2	Republican
X	45.6	54.4	Republican
Y	39.1	60.9	Republican
Z	42.7	57.3	Republican
			15 Republican
			2 Competitive/Republican
			4 Competitive/Democratic
			9 Democratic

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District	Competitiveness State Leg – Competitive A-1		
	%Dem	%Rep	Competitiveness
A	48.8	51.2	Competitive/Republican
AA	52.7	47.3	Competitive/Democratic
B	49.5	50.5	Competitive/Republican
BB	47.2	52.8	Competitive/Republican
C	47.8	52.2	Competitive/Republican
CC	41.8	58.2	Republican
D	48.1	51.9	Competitive/Republican
DD	54.3	45.7	Democratic
E	41.2	58.8	Republican
F	39.5	60.5	Republican
G	49.9	50.1	Competitive/Republican
H	41.6	58.4	Republican
I	49.9	50.1	Competitive/Republican
J	55.2	44.8	Democratic
K	51.2	48.8	Competitive/Democratic
L	51.3	48.7	Competitive/Democratic
M	50.2	49.8	Competitive/Democratic
N	50.0	50.0	Competitive/Republican
O	48.1	51.9	Competitive/Republican
P	49.5	50.5	Competitive/Republican
Q	40.1	9.9	Republican
R	38.4	61.6	Republican
S	51.1	48.9	Competitive/Democratic
T	65.9	34.1	Democratic
U	48.1	51.9	Competitive/Republican
V	47.6	52.4	Competitive/Republican
W	47.2	52.8	Competitive/Republican
X	48.6	51.4	Competitive/Republican
Y	51.0	49.0	Competitive/Democratic
Z	52.9	47.1	Competitive/Democratic
		6	Republican
		14	Competitive/Republican
		7	Competitive/Democratic
		3	Democratic

Compiled: 2-6-04

District	Competitiveness State Leg – Competitive A-2		
	%Dem	%Rep	Competitiveness
A	48.8	51.2	Competitive/Republican
AA	52.7	47.3	Competitive/Democratic
B	49.5	50.5	Competitive/Republican
BB	47.2	52.8	Competitive/Republican
C	47.8	52.2	Competitive/Republican
CC	41.8	58.2	Republican
D	48.1	51.9	Competitive/Republican
DD	51.8	48.2	Competitive/Democratic
E	41.2	58.8	Republican
F	39.5	60.5	Republican
G	51.2	48.8	Competitive/Democratic
H	41.6	58.4	Republican
I	49.9	50.1	Competitive/Republican
J	53.2	46.8	Competitive/Democratic
K	51.2	48.8	Competitive/Democratic
L	51.3	48.7	Competitive/Democratic
M	50.2	49.8	Competitive/Democratic
N	51.7	48.3	Competitive/Democratic
O	48.1	51.9	Competitive/Republican
P	49.5	50.5	Competitive/Republican
Q	40.1	59.9	Republican
R	38.4	61.6	Republican
S	51.1	48.9	Competitive/Democratic
T	65.9	34.1	Democratic
U	48.1	51.9	Competitive/Republican
V	47.6	52.4	Competitive/Republican
W	47.2	52.8	Competitive/Republican
X	48.6	51.4	Competitive/Republican
Y	51.0	49.0	Competitive/Democratic
Z	52.9	47.1	Competitive/Democratic
		6	Republican
		12	Competitive/Republican
		11	Competitive/Democratic
		1	Democratic

Compiled: 2-6-04

District	Competitiveness State Leg – Competitive B-1		
	%Dem	%Rep	Competitiveness
A	45.0	55.0	Republican
AA	38.1	61.9	Republican
B	44.4	55.6	Republican
BB	40.2	59.8	Republican
C	46.1	53.9	Republican
CC	62.6	37.4	Democratic
D	55.7	44.3	Democratic
DD	50.9	49.1	Competitive/Democratic
E	47.6	52.4	Competitive/Republican
F	47.1	52.9	Competitive/Republican
G	40.4	59.6	Republican
H	50.1	49.9	Competitive/Democratic
I	48.3	51.7	Competitive/Republican
J	62.2	37.8	Democratic
K	51.4	48.6	Competitive/Democratic
L	47.9	52.1	Competitive/Republican
M	57.2	42.8	Democratic
N	49.5	50.5	Competitive/Republican
O	51.2	48.8	Competitive/Democratic
P	50.7	49.3	Competitive/Democratic
Q	50.2	49.8	Competitive/Democratic
R	51.4	48.6	Competitive/Democratic
S	52.0	48.0	Competitive/Democratic
T	45.9	54.1	Republican
U	43.2	56.8	Republican
V	39.8	60.2	Republican
W	47.2	52.8	Competitive/Republican
X	49.4	50.6	Competitive/Republican
Y	39.6	60.4	Republican
Z	48.2	51.8	Competitive/Republican
			10 Republican
			8 Competitive/Republican
			8 Competitive/Democratic
			4 Democratic

Compiled: 2-6-04

District	Competitiveness State Leg – Competitive B-2		
	%Dem	%Rep	Competitiveness
A	52.2	47.8	Competitive/Democratic
AA	38.1	61.9	Republican
B	47.0	53.0	Competitive/Republican
BB	40.2	59.8	Republican
C	46.9	53.1	Competitive/Republican
CC	52.5	47.5	Competitive/Democratic
D	49.6	50.4	Competitive/Republican
DD	53.3	46.7	Competitive/Democratic
E	47.6	52.4	Competitive/Republican
F	47.1	52.9	Competitive/Republican
G	40.4	59.6	Republican
H	50.1	49.9	Competitive/Democratic
I	48.3	51.7	Competitive/Republican
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L	52.1	47.9	Competitive/Democratic
M	52.1	47.9	Competitive/Democratic
N	49.5	50.5	Competitive/Republican
O	51.2	48.8	Competitive/Democratic
P	50.7	49.3	Competitive/Democratic
Q	50.2	49.8	Competitive/Democratic
R	51.4	48.6	Competitive/Democratic
S	50.5	49.5	Competitive/Democratic
T	47.5	52.5	Competitive/Republican
U	43.2	56.8	Republican
V	39.8	60.2	Republican
W	47.2	52.8	Competitive/Republican
X	49.4	50.6	Competitive/Republican
Y	40.4	59.6	Republican
Z	47.4	52.6	Competitive/Republican
			6 Republican
			11 Competitive/Republican
			12 Competitive/Democratic
			1 Democratic

Compiled: 2-6-04