



**S**ITUATIONAL

**U**NDERLYING

**V**ALUE



## The “SUV” Statistic for Baseball, Football and Basketball – Situational Underlying Value

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**Abstract:** Situational Underlying Value (SUV) arose from an attempt to develop an all-encompassing statistic for measuring “clutchiness” for individual baseball players. It was to be based on the “run expectancy” concept, whereby each base with a certain number of outs is “worth” some fraction of a run. Hitters/runners reaching these bases would acquire the “worth” of that base, with the “worth” being earned by the hitter if he reached a base or advanced a runner, or the runner himself if he advanced “on his own” (e.g., stolen base, wild pitch). After several iterations, the version for SUV Baseball presented herein evolved, and it is demonstrated via two games. Subsequently, the concept was extended to professional football and NCAA Men’s Basketball, both with two example games highlighting selected individual players. As with Major League Baseball, these are team games where individual performance may be hard to gauge with a single statistic. This is the goal of SUV, which can be used as a measure both for the team and individual players.

**Keywords:** Baseball, Football, Basketball, Statistics, Expected Value

# 1. SUV BASEBALL

SUV – Situational Underlying Value – for professional baseball (MLB) is a concept based on the more traditional one of “run expectancy.” This is a statistical estimate of the number of runs expected to result from a base runner or multiple runners given his/their presence at a particular base, or bases, and the number of outs in an inning. Numerous baseball websites discuss this concept, e.g., References [1-4]. One can find dozens more with a simple internet search on “run expectancy.” For my development of the SUV statistic, I employ the first of the listed websites, since this provides the raw data from which the run expectancies were calculated:

## Expected Runs/Chance of Scoring Table

The following table was produced from play-by-play data from every Major League baseball game played between 1984 and 1994. Shortened innings and extra innings are not included. The table gives the expected number of runs (column headed "Expected") that will score given a particular state in the inning, given by the number of outs ("Outs") and the runners on base ("Runners"). Numbers under the "Runners" column tell which bases are occupied. The column headed "Prob > 0" gives the probability that a team will score at least one run in that inning. Raw data used to produce the expected values are given in the final three columns. (Data from Project Scoresheet/Baseball Workshop, courtesy David Nichols)

Outs	Runners	Expected	Prob > 0	Count	Total Runs	Shutout
0	---	0.49	0.275	377390	186702	273565
0	1--	0.88	0.435	97684	85966	55235
0	-2-	1.13	0.633	29342	33131	10768
0	12-	1.50	0.636	21978	32895	7994
0	--3	1.37	0.837	5360	7333	871
0	1-3	1.75	0.870	9845	17210	1284
0	-23	1.98	0.860	5571	11011	781
0	123	2.37	0.882	5233	12419	617
1	---	0.26	0.159	270279	70996	227329
1	1--	0.52	0.276	112521	58731	81420
1	-2-	0.69	0.414	52502	36227	30789
1	12-	0.92	0.425	39375	36031	22649
1	--3	0.96	0.667	18798	18020	6257
1	1-3	1.17	0.653	19988	23348	6942
1	-23	1.40	0.686	14152	19800	4443
1	123	1.57	0.678	13474	21175	4339
2	---	0.10	0.067	215735	21306	201378
2	1--	0.23	0.128	113013	25469	98497
2	-2-	0.33	0.224	64639	21275	50176
2	12-	0.44	0.231	50463	22358	38792
2	--3	0.38	0.275	27006	10272	19583
2	1-3	0.50	0.286	25826	13007	18447
2	-23	0.61	0.277	15357	9304	11100
2	123	0.76	0.321	16281	12332	11060

The first three columns are the ones of interest, and I display them in a matrix format as follows, but to four significant figures given the raw data from the “count” and “total runs” columns:

base→ outs↓	3	2	1	0
0	1.3681	1.1291	0.8800	-0.4947
1	0.9586	0.6900	0.5220	-0.2627
2	0.3804	0.3291	0.2254	-0.0988

<b>bases→ outs↓</b>	<b>123</b>	<b>23</b>	<b>13</b>	<b>12</b>
<b>0</b>	2.3732	1.9765	1.7481	1.4967
<b>1</b>	1.5715	1.3991	1.1681	0.9151
<b>2</b>	0.7574	0.6058	0.5036	0.4431

The first table lists the run expectancies for bases empty cases per number of outs. This implies that each inning is theoretically worth 0.4947 run (the [0, 0] entry in the first table), from which the incremental run expectancy, which we subsequently term the SUV, for each bases empty case becomes -0.2320, -0.1639 and -0.0988, respectively. For the remaining SUVs, I scale each to the run expectancy for its corresponding bases empty case to yield the following SUVs (e.g., for the runner on 1<sup>st</sup> with no out, the SUV = 0.08800-0.4947 = 0.3953):

<b>base→ outs↓</b>	<b>3</b>	<b>2</b>	<b>1</b>	<b>0</b>
<b>0</b>	0.8734	0.6344	0.3853	-0.2320
<b>1</b>	0.6959	0.4273	0.2593	-0.1639
<b>2</b>	0.2816	0.2304	0.1266	-0.0988

<b>bases→ outs↓</b>	<b>123</b>	<b>23</b>	<b>13</b>	<b>12</b>
<b>0</b>	1.8785	1.4818	1.2534	1.0020
<b>1</b>	1.3089	1.1364	0.9054	0.6524
<b>2</b>	0.6587	0.5071	0.4049	0.3443

This implies, e.g., that a leadoff single is worth 0.3853 run, while making the first out always deducts 0.2320 run (and maybe more if there are base runners). Ideally, the SUVs for individual bases would sum to their multi-base counterparts, e.g., with no outs and runners on 1<sup>st</sup> and 2<sup>nd</sup>, 0.3853 + 0.6344 = 1.0197 would equal 1.0020. In reality, this is not exactly the case, as shown in the following (based on sums of individual SUVs):

<b>bases→ outs↓</b>	<b>123</b>	<b>23</b>	<b>13</b>	<b>12</b>
<b>0</b>	1.8931	1.5078	1.2587	1.0197
<b>1</b>	1.3826	1.1233	0.9552	0.6866
<b>2</b>	0.6386	0.5120	0.4082	0.3570

However, the differences are uniformly small (none greater than ~6%, as shown below):

<b>bases→ outs↓</b>	<b>123</b>	<b>23</b>	<b>13</b>	<b>12</b>
<b>0</b>	0.78%	1.76%	0.42%	1.77%
<b>1</b>	5.63%	-1.16%	5.50%	5.24%
<b>2</b>	-3.05%	0.96%	0.82%	3.68%

From here on, restrict all SUVs to just two significant figures, which reduces the two SUV matrices to the following:

base→ outs↓	3	2	1	0
0	0.87	0.63	0.39	-0.23
1	0.70	0.43	0.26	-0.16
2	0.28	0.23	0.13	-0.10

bases→ outs↓	123	23	13	12
0	1.88	1.48	1.25	1.00
1	1.31	1.14	0.91	0.65
2	0.66	0.51	0.40	0.34

By adjusting the SUVs for the individual bases slightly as follows:

base→ outs↓	3	2	1	0
0	<b>0.87</b>	<b>0.63</b>	<b>0.39</b>	<b>-0.23</b>
1	<b>0.68</b>	<b>0.44</b>	<b>0.22</b>	<b>-0.16</b>
2	<b>0.29</b>	<b>0.23</b>	<b>0.12</b>	<b>-0.10</b>

The differences with the multi-base SUVs becomes even smaller, no greater than ~3%.

bases→ outs↓	123	23	13	12
0	1.89	1.50	1.26	1.02
1	1.34	1.12	0.90	0.66
2	0.64	0.52	0.41	0.35

bases→ outs↓	123	23	13	12
0	0.53%	1.35%	0.80%	2.00%
1	2.29%	-1.75%	-1.10%	1.54%
2	-3.03%	1.96%	2.50%	2.94%

For example, the sum of the SUVs for 1<sup>st</sup> and 2<sup>nd</sup> separately with no outs = 0.39 + 0.63 = 1.02, which is only  $(1.02 - 1.00)/1.00 = 0.02$  or 2.00% higher. On average, the difference (absolute values) is only 1.36%. Thus, the SUVs as slightly adjusted above are considered final.

The following are two examples of how the SUV works.

<u>Example 1</u>	<u>Earned</u>	<u>Unearned</u>	<u>Batter SUV</u>
Out	-0.23		-0.23
1B	0.22		0.22
Sac	-0.15		-0.15
1B/RBI	0.89		0.89
Out	-0.22		-0.22
Sum	0.51	0	0.51
<b>Total</b>	<b>0.51</b>		

<u>Example 2</u>	<u>Earned</u>	<u>Unearned</u>	<u>Batter SUV</u>
E/Runner to 2B	0	0.63	0.00
Out	-0.42		-0.42
BB	0.22		0.22
GO/Runner to 3B	-0.41		-0.41
2B/2 RBI	1.82		1.82
WP/Runner to 3B	0.06		
HBP	0.12		0.12
SB	0.11		
E/1 Run/Runner to 3B	0	0.89	0.00
Out	-0.51		-0.51
Sum	0.99	1.52	0.99
<b>Total</b>	<b>2.51</b>		

GO = Ground out  
SB = Stolen base

In terms of the formulas:

<u>Example 1</u>	<u>Earned</u>	<u>Unearned</u>	<u>Batter SUV</u>
Out	-0.23		-0.23
1B	0.22		0.22
Sac	=0.23-0.22-0.16		-0.15
1B/RBI	=1.00-0.23+0.12		0.89
Out	=-0.12-0.10		-0.22
Sum	=SUM(above)	=SUM(above)	=SUM(above)
<b>Total</b>	<b>=Earned+Unearned</b>		

<u>Example 2</u>	<u>Earned</u>	<u>Unearned</u>	<u>Batter SUV</u>
E/Runner to 2B	0	=0.63	0.00
Out	=0.44-0.63-0.23		-0.42
BB	=0.22		0.22
<b>GO/Runner to 3B</b>	<b>=0.29+0.12-0.44-0.22-0.16</b>		<b>-0.41</b>
<b>2B/2 RBI</b>	<b>=0.23+2.00-0.29-0.12</b>		<b>1.82</b>
WP/Runner to 3B	=0.29-0.23		
HBP	=0.12		0.12
SB	=0.23-0.12		
E/1 Run/Runner to 3B	0	=1.00-0.29+0.29-0.23+0.12	0.00
Out	=-0.29-0.12-0.10		-0.51
Sum	=SUM(above)	=SUM(above)	=SUM(above)
<b>Total</b>	<b>=Earned+Unearned</b>		

For example, in Example 2, the *fourth batter* hit into a ground out with runners on 1<sup>st</sup> and 2<sup>nd</sup> with one out, forcing the runner going into 2<sup>nd</sup> for the second out. From the SUV matrix, runners at 1<sup>st</sup> and 3<sup>rd</sup> with two outs are worth 0.29 and 0.12, respectively. Eliminating a runner at 2<sup>nd</sup> with one out deducts 0.44 (thus, a net decrease in moving him from 2<sup>nd</sup> to 3<sup>rd</sup> at the expense of an out = 0.44 – 0.29 = 0.15). Eliminating a runner at 1<sup>st</sup> with one out deducts 0.22 (and, since he disappears entirely due to the force, this is the net decrease). Finally, adding the second out deducts 0.16. The net results of all of this is -0.41, as shown. The *fifth batter* doubled, driving in both runners, for 2.00 runs and an SUV for being on 2<sup>nd</sup> with two outs of 0.23. Eliminating the runners at 1<sup>st</sup> and 3<sup>rd</sup> with two outs deducted 0.29 and 0.12, respectively. Thus, this batter's total SUV became 1.82. Finally, in the first example, one run was scored, so

the net SUV =  $1.00 - 0.49 = 0.51$ . In the second, three runs scored for a net of  $3.00 - 0.49 = 2.51$ , of which 1.52 was unearned. A run scored is always worth 1.00.

The following expanded box scores from two different games illustrates full use of the SUV statistic, including pitching. The first game was a Washington national 3-0 victory over the Chicago Cubs at Wrigley Field on May 27, 2015. The second was Game 7 of the 2016 World Series where the Cubs ended their 108-year drought with an 8-7 victory over the Cleveland Indians in 10 innings. For batters, the more positive the SUV, the better. For pitchers, the more negative, the better.

Team	Hitter	1		2		3		4		5		6		7		8		9		Total	
		AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB-R-H-RBI	SUV
Washington	Span	out(K)	-0.23			1b	0.12			dp	-0.78			1b	0.22			reach 1st on error (Castro)	0	5-0-2-0	-0.67
	Desmond	1b	0.22			out	-0.22			2b	0.23			out(K)	-0.26			1b	0.44	5-0-3-0	0.41
	Escobar	out(K)	-0.26					1b	0.39	out	-0.33			out	-0.22			on after force out at 2nd	-0.41	5-1-1-0	-0.83
	Harper	out(K)	-0.22					bb	0.63			hr	1	Russell pitching →	bb	0.39	out(K)	-0.51	3-1-2-1	1.29	
	Zimmerman			out(K)	-0.23			fielder's choice (force out at 2nd) + reach on throwing error (Russell, A) which allows run to score	-0.35			out(K)	-0.23		Motte pitching →	out	-0.4			4-0-0-0	-1.21
	Ramos			out	-0.16			bb	0.44			out(K)	-0.16			out(K)	-0.26			3-0-0-0	-0.14
	Uggla			out	-0.1			out(K)	-0.47			reach 1st on error (Castro)	0			out	-0.22			4-0-0-0	-0.79
	Grace (8)																				
	Janssen (8)																				
	Moore					out	-0.23	out(K)	-0.45			out	-0.22							3-0-0-0	-0.90
	Taylor (8)														Wood pitching →	out(K)	-0.23			1-0-0-0	-0.23
	Scherzer					out(K)	-0.16			1b	0.39			out	-0.23					3-0-1-0	0.00
	Espinosa (8)																hr	1		1-1-1-1	1.00
	R-H-E & SUV	0-1-0	-0.49	0-0-0	-0.49	0-1-0	-0.49	1-1-2	0.19	0-2-0	-0.49	1-1-1	0.39	0-1-0	-0.49	0-0-0	-0.49	1-2-1	0.29	37-3-9-2	-2.07
							unearned	0.32			unearned	0.12					unearned	0.22	unearned	0.66	
							total	0.51			total	0.51					total	0.51	total	-1.41	
Chicago	Coghlan	out(K)	-0.23			out(K)	-0.4			out(K)	-0.16									3-0-0-0	-0.79
	Soler (8)													Grace pitching →	2b	0.63				1-0-1-0	0.63
	Rizzo	out(K)	-0.16			1b	0.44			out	-0.1					hbp	0.39			3-0-1-0	0.57
	Bryant	bb	0.12			out	-0.47					out(K)	-0.23	Janssen pitching →	out	-0.59				3-0-0-0	-1.17
	Fowler	out(K)	-0.22			out(K)	-0.45					out(K)	-0.16			sac	-0.3			3-0-0-0	-1.13
	Castro			1b	0.39			out(K)	-0.23			1b	0.12			out	-0.62			4-0-2-0	-0.34
	Lake			out	-0.4			2b + SB (2 out)	0.5			out(K)	-0.22			Storen pitching →	out	-0.26		4-0-1-0	-0.38
	Ross			out	-0.26			out(K)	-0.37					out	-0.23					3-0-0-0	-0.86
	Montero (7)																	out(K)	-0.22	1-0-0-0	-0.22
	Lester			out	-0.22			out(K)	-0.39											2-0-0-0	-0.61
	Baxter (PH-7)													out(K)	-0.16					1-0-0-0	-0.16
	Russell, J (8)																				
	Motte (8+)																				
	Wood (9)																				
Herrera (PH-9)																	1b	0.39	1-0-1-0	0.39	
Russell, A					1b	0.39				out(K)	-0.23			out(K)	-0.1			out	-0.4	4-0-1-0	-0.34
R-H-E & SUV	0-0-0	-0.49	0-1-0	-0.49	0-2-0	-0.49	0-1-0	-0.49	0-0-0	-0.49	0-1-0	-0.49	0-0-0	-0.49	0-1-0	-0.49	0-1-0	-0.49	33-0-7-0	-4.41	
Team	Pitcher	IP	H	R	ER	BB	SO	SUV													
Washington	Scherzer (W)	7	6	0	0	1	13	-3.43													
	Grace	0	1	0	0	0	0	1.02													
	Janssen (H)	1	0	0	0	0	0	-1.51													
	Storen (S)	1	1	0	0	0	1	-0.49													
	Total	9	8	0	0	1	14	-4.41													
Chicago	Lester (L)	7	7	2	1	2	10	-1.87													
	Russell, J	0	0	0	0	1	0	0.39													
	Motte	1	0	0	0	0	1	-0.88													
	Wood	1	2	1	1	0	2	0.29													
	Unearned							0.66													
Total	9	9	3	2	3	13	-1.41														

See <http://espn.go.com/mlb/playbyplay?gameId=350527116> for complete play by play.

Team	Hitter	1		2		3		4		5		6		7		8		9		10		Total			
		AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB+H+BB	SUV		
Chicago Cubs	Fowler	hr	1.00			out	-0.16	Miller pitching →		1b	0.39			1b	0.39			out	-0.39			5-1-3-1	1.23		
	Schwarber	1b (steals 2b w/2 outs)	0.50			1b (out @ 2b)	-0.10			dp	-0.78			out	-0.40					1b	0.39	5-0-3-0	-0.39		
	Almora (PR-10)																					0-1-0-0	0.00		
	Bryant	out	-0.40						1b	0.39	bb	0.12			dp (K + caught stealing)	-0.48	← Allen pitching			out (runner to 2b)	-0.18	4-2-1-0	-0.55		
	Rizzo	out	-0.26						hbp	0.63	1b (runner scores + reach 2b)	1.11					out(K)	-0.23			bb	0.22	3-1-1-1	1.47	
	Zobrist	out	-0.33						out (force @ 2b)	-0.35	out	-0.33								out	-0.16	2b (runner @ 1b to 3b)	1.46	5-1-1-1	0.29
	Russell			out	-0.23				sac fly (runner to 2b)	0.17				out	-0.23			out	-0.1			bb	0.22	3-0-0-1	-0.17
	Contreras			out	-0.16				2b	1.00														2-0-1-1	0.84
	Ross (5)												hr	1.00					bb	0.39				1-1-1-1	1.39
	Coghlan (PR-9)																							0-0-0-0	0.00
	Montero (9)																					1b (all runners + 1b)	1.00	1-0-1-1	1.00
	Hayward			out	-0.10				out	-0.33			out	-0.16					out (force @ 2b; steals 2b on Shaw; to 3b on)	-0.18	Bauer pitching →	out(K)	-0.86	5-0-0-0	-1.63
	Baez					out	-0.23				hr	1.00	out(K)	-0.10			Shaw pitching →		out(K)	-0.55	out	-0.74	5-1-1-1	-0.62	
R-H-E & SUV	1-2-0	0.51	0-0-0	-0.49	0-1-0	-0.49	2-2-0	1.51	2-3-0	1.51	1-1-0	0.51	0-1-0	-0.49	0-0-0	-0.49	0-0-1	-0.73	2-3-0	1.51	38-8-13-8	2.86			
																		unearned	0.24			unearned	0.24		
																		total	-0.49			total	3.10		
Cleveland Indians	Santana	out	-0.23			1b	0.54			bb (scores from 3b on wp w/2 outs)	0.83			out (runner to 2b)	-0.15			out	-0.23			4-1-1-1	0.76		
	Kipnis	out(K)	-0.16			E/1b + runner to 2b)	0.00	Lester pitching →		1b (reach 2b on E; runner to 3rd; scores)	1.00			out(K)	-0.33			out(K)	-0.16			5-1-1-0	0.35		
	Lindor	E/1b	0.00			out	-0.47			out (K)	-0.10					out	-0.23	out	-0.10			5-0-0-0	-0.90		
	Napoli	out (force 2b)	-0.22			out	-0.45					out(K)	-0.23			out(K)	-0.16	Edwards pitching →		out(K)	-0.23	5-0-0-0	-1.29		
	Ramirez			1b (picked off w/0 out)	-0.23			out	-0.23				out	-0.16			1b	0.12			out	-0.16	5-1-2-0	-0.66	
	Chisenhall			1b	0.22			out	-0.16												bb (to 2nd on indifference w/2 outs)	0.23	2-0-1-0	0.06	
	Guyer (6)											1b	0.12	Chapman pitching →		2b	1.11					2-2-2-1	1.46		
	Davis			dp	-0.48			out	-0.10				out	-0.22			hr	1.77			1b	0.89	5-1-2-3	1.86	
	Crisp					2b	0.63				out	-0.23			out	-0.23	1b	0.12					4-1-2-0	0.29	
	Martinez (9)																		Montgomery pitching →		out	-0.22	1-0-0-0	-0.22	
	Perez					sac	-0.18				out(K)	-0.16			bb	0.22							1-0-0-0	-0.12	
	Naquin (PR- 7)																						0-0-0-0	0.00	
	Gomes (8)																		out(K)	-0.22			1-0-0-0	-0.22	
R-H-E & SUV	0-0-1	-0.61	0-1-0	-0.49	1-2-1	0.07	0-0-0	-0.49	2-1-1	1.34	0-1-0	-0.49	0-0-0	-0.49	3-4-0	2.51	0-1-0	-0.49	1-1-0	0.51	40-7-11-5	1.37			
	unearned	0.12			unearned	0.44			unearned	0.17												unearned	0.73		
	total	-0.49			total	0.51			total	1.51												total	2.10		
Team	Pitcher	IP	H	R	ER	BB	SO	SUV																	
Chicago Cubs	Hendricks	4.67	4	2	1	1	2	-1.08																	
	Lester	3.00	3	2	1	1	4	-0.35																	
	Chapman (W)	1.33	3	2	2	0	2	2.29																	
	Edwards	0.67	1	1	1	1	1	0.73																	
	Montgomery (S)	0.33	0	0	0	0	0	-0.22																	
	Unearned							0.73																	
	TOTAL	10.00	11	7	5	3	9	2.10																	
Cleveland Indians	Kluber	4.00	6	4	4	0	0	2.04																	
	Miller	2.33	4	2	2	1	1	1.01																	
	Allen	2.00	0	0	0	1	2	-0.76																	
	Shaw (L)	1.00	3	2	2	2	1	2.17																	
	Bauer	0.67	0	0	0	0	1	-1.60																	
	Unearned							0.24																	
	Total	10.00	13	8	8	4	5	3.10																	

See <http://www.baseball-reference.com/boxes/CLE/CLE201611020.shtml> for complete play by play.

An interesting wrinkle is to assign SUVs by league, considering that the National still refuses to use the Designated Hitter. The following article (“MLB — Run Distribution per Game & per Inning — Negative Binomial”) by Sean Dolinar notes that “Using data from 2011-2013, the American League [AL] had an expected value of 0.4830 runs/inning ..., while the National League [NL] had 0.4468 runs/innings ...” [5] Thus, the NL scored  $0.4468/0.4830 = 0.9251$  or ~7.5% less runs than the AL. Assuming both leagues played an equal (or essentially equal) number of innings over the three seasons, the MLB average runs/inning is the average of those for each league, i.e.,  $MLB = (AL + NL)/2$ . Since  $NL = 0.9251 AL$ ,  $AL = \frac{2}{1+0.9251} \times MLB = 0.5091$ , for the MLB average of 0.49. The corresponding value for the NL is 0.4709. Rounding these to two significant figures (0.51 and 0.47), we see that the adjustment to the MLB average is ~4%, an increase for the AL and a decrease for the NL.<sup>a</sup> Again working with just two significant figures, the SUVs for the two leagues become the following:

MLB SUVs	base→ outs↓	3	2	1	0
	0	0.87	0.63	0.39	-0.23
1	0.68	0.44	0.22	-0.16	
2	0.29	0.23	0.12	-0.10	

AL SUVs	base→ outs↓	3	2	1	0
	0	0.91	0.66	0.41	-0.24
1	0.71	0.46	0.23	-0.17	
2	0.30	0.24	0.12	-0.10	

NL SUVs	base→ outs↓	3	2	1	0
	0	0.83	0.60	0.37	-0.22
1	0.65	0.42	0.21	-0.15	
2	0.28	0.22	0.12	-0.10	

With these, it is possible to revise the two games to be specific to their league (treating the World Series game as an AL game since Cleveland was the home team and both teams use the DH).

<sup>a</sup>  $AL Adjustment = 0.51/0.49 \approx 1.04$ ;  $NL Adjustment = 0.47/0.49 \approx 0.96$ .

Team	Hitter	1		2		3		4		5		6		7		8		9		Total		
		AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB-R-H-RBI	SUV	
Washington	Span	out(K)	-0.22			1b	0.12			dp	-0.74			1b	-0.21			reach 1st on error (Castro)	0	5-0-2-0	-0.63	
	Desmond	1b	0.21			out	-0.22			2b	0.22			out(K)	-0.24			1b	0.42	5-0-3-0	0.39	
	Escobar	out(K)	-0.24					1b	0.37	out	-0.32			out	-0.22			on after force out at 2nd	-0.38	5-1-1-0	-0.79	
	Harper	out(K)	-0.22					bb	0.6			hr	1	Russell pitching →	bb	0.37	out(K)	-0.5	3-1-2-1	1.25		
	Zimmerman			out(K)	-0.22			fielder's choice (force out at 2nd) + reach on throwing error (Russell, A) which allows run to score	-0.33			out(K)	-0.22		Motte pitching →	out	-0.38			4-0-0-0	-1.15	
	Ramos			out	-0.15			bb	0.42			out(K)	-0.15				out(K)	-0.24		3-0-0-0	-0.12	
	Ugla			out	-0.1			out(K)	-0.44			reach 1st on error (Castro)	0				out	-0.22		4-0-0-0	-0.76	
	Grace (8)																					
	Janssen (8)																					
	Moore					out	-0.22	out(K)	-0.44			out	-0.22							3-0-0-0	-0.88	
	Taylor (8)															Wood pitching →	out(K)	-0.22		1-0-0-0	-0.22	
	Scherzer					out(K)	-0.15				1b	0.37			out	-0.22				3-0-1-0	0.00	
	Espinosa (8)																	hr	1	1-1-1-1	1.00	
R-H-E & SUV	0-1-0	-0.47	0-0-0	-0.47	0-1-0	-0.47	1-1-2	0.18	0-2-0	-0.47	1-1-1	0.41	0-1-0	-0.47	0-0-0	-0.47	1-2-1	0.32	37-3-9-2	-1.91		
							unearned	0.35			unearned	0.12					unearned	0.21	unearned	0.68		
							total	0.53			total	0.53					total	0.53	total	-1.23		
Chicago	Coghlan	out(K)	-0.22			out(K)	-0.38			out(K)	-0.15									3-0-0-0	-0.75	
	Soler (8)													Grace pitching →	2b	0.6				1-0-1-0	0.60	
	Rizzo	out(K)	-0.15			1b	0.42			out	-0.1					hbp	0.37			3-0-1-0	0.54	
	Bryant	bb	0.12			out	-0.44					out(K)	-0.22	Janssen pitching →	out	-0.56				3-0-0-0	-1.10	
	Fowler	out(K)	-0.22			out(K)	-0.44					out(K)	-0.15			sac	-0.28			3-0-0-0	-1.09	
	Castro			1b	0.37			out(K)	-0.22			1b	0.12			out	-0.6			4-0-2-0	-0.33	
	Lake			out	-0.38			2b + SB (2 out)	0.48			out(K)	-0.22			Storen pitching →	out	-0.24		4-0-1-0	-0.36	
	Ross			out	-0.24			out(K)	-0.35					out	-0.22					3-0-0-0	-0.81	
	Montero (7)																	out(K)	-0.22	1-0-0-0	-0.22	
	Lester			out	-0.22			out(K)	-0.38											2-0-0-0	-0.60	
Baxter (PH-7)														out(K)	-0.15				1-0-0-0	-0.15		
Russell, J (8)																						
Motte (8+)																						
Wood (9)																						
Herrera (PH-9)																	1b	0.37	1-0-1-0	0.37		
Russell, A					1b	0.37				out(K)	-0.22			out(K)	-0.1		out	-0.38	4-0-1-0	-0.33		
R-H-E & SUV	0-0-0	-0.47	0-1-0	-0.47	0-2-0	-0.47	0-1-0	-0.47	0-0-0	-0.47	0-1-0	-0.47	0-0-0	-0.47	0-1-0	-0.47	0-1-0	-0.47	33-0-7-0	-4.23		
Team	Pitcher	IP	H	R	ER	BB	SO	SUV														
Washington	Scherzer (W)	7	6	0	0	1	13	-3.29														
	Grace	0	1	0	0	0	0	0.97														
	Janssen (H)	1	0	0	0	0	0	-1.44														
	Storen (S)	1	1	0	0	0	1	-0.47														
	Total	9	8	0	0	1	14	-4.23														
Chicago	Lester (L)	7	7	2	1	2	10	-1.76														
	Russell, J	0	0	0	0	1	0	0.37														
	Motte	1	0	0	0	0	1	-0.84														
	Wood	1	2	1	1	0	2	0.32														
	Unearned							0.68														
Total	9	9	3	2	3	13	-1.23															

See <http://espn.go.com/mlb/playbyplay?gameId=350527116> for complete play by play.

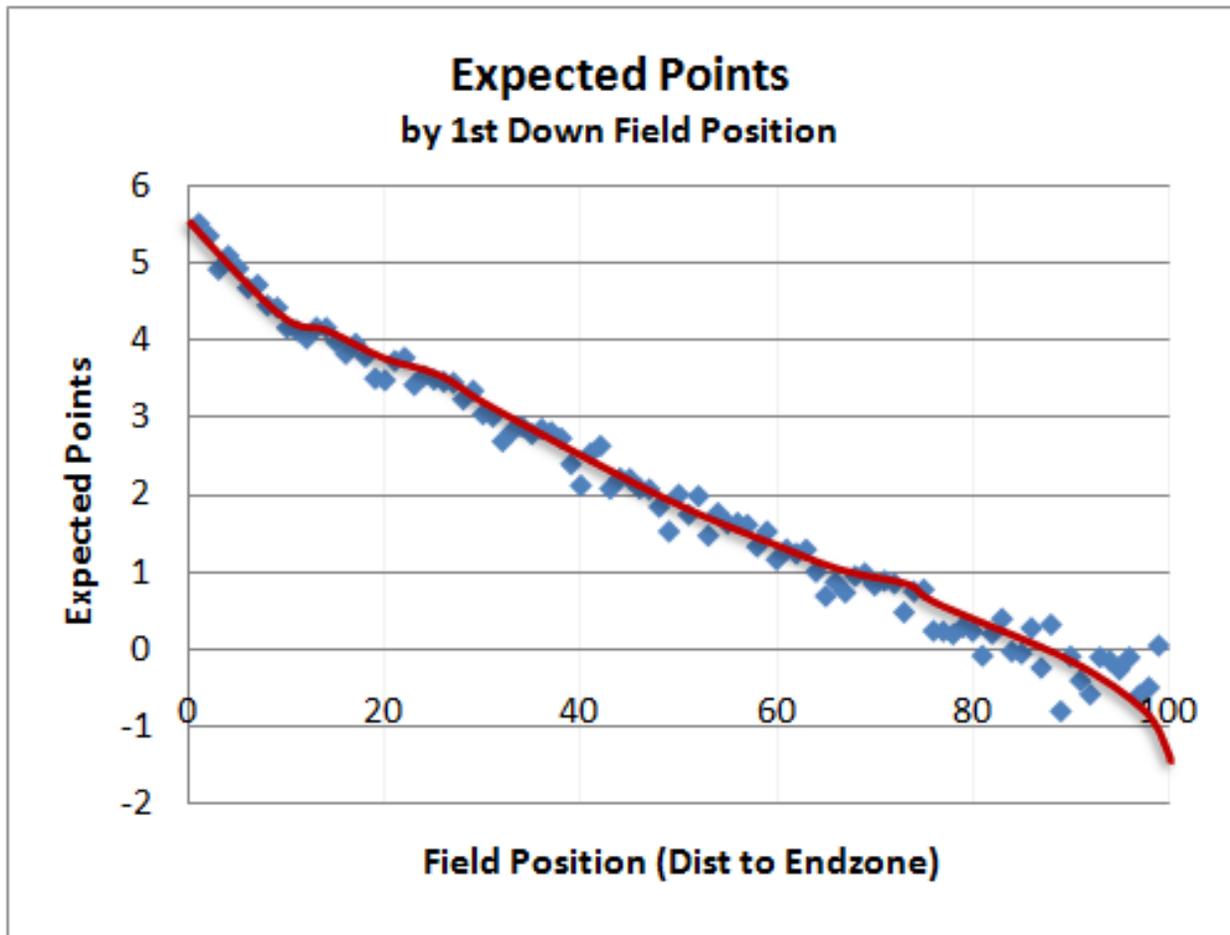
Team	Hitter	1		2		3		4		5		6		7		8		9		10		Total		
		AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB	SUV	AB+H+BB	SUV	
Chicago Cubs	Fowler	hr	1.00			out	-0.17	Miller pitching →		1b	0.41			1b	0.41			out	-0.40			5-1-3-1	1.25	
	Schwarber	1b (steals 2b w/2 outs)	0.53			1b (out @ 2b)	-0.10			dp	-0.82			out	-0.42					1b	0.41	5-0-3-0	-0.40	
	Almora (PR-10)																					0-1-0-0	0.00	
	Bryant	out	-0.42					1b	0.41	bb	0.12			dp (K + caught stealing)	-0.50	← Allen pitching				out (runner to 2b)	-0.19	4-2-1-0	-0.58	
	Rizzo	out	-0.28					hbp	0.66	1b (runner scores + reach 2b)	1.12					out(K)	-0.24			bb	0.23	3-1-1-1	1.49	
	Zobrist	out	-0.34					out (force @ 2b)	-0.37	out	-0.34						out	-0.17			2b (runner @ 1b to 3b)	1.48	5-1-1-1	0.26
	Russell			out	-0.24			sac fly (runner to 2b)	0.13				out	-0.24			out	-0.1			bb	0.23	3-0-0-1	-0.22
	Contreras			out	-0.17			2b	1.00					hr	1.00				bb	0.41			2-0-1-1	0.83
	Ross (5)																						1-1-1-1	1.41
	Coghlan (PR-9)																						0-0-0-0	0.00
	Montero (9)																				1b (all runners + 1b)	1.00	1-0-1-1	1.00
	Hayward			out	-0.10			out	-0.34				out	-0.17					out (force @ 2b; steals 2b on Shaw; to 3b on)	-0.19	Bauer pitching → out(K)	-0.91	5-0-0-0	-1.71
	Baez					out	-0.24			hr	1.00	out(K)	-0.10			Shaw pitching →			out(K)	-0.58	out	-0.76	5-1-1-1	-0.68
R-H-E & SUV	1-2-0	0.49	0-0-0	-0.51	0-1-0	-0.51	2-2-0	1.49	2-3-0	1.49	1-1-0	0.49	0-1-0	-0.51	0-0-0	-0.51	0-0-1	-0.76	2-3-0	1.49	38-8-13-8	2.65		
																		unearned	0.25			unearned	0.25	
																		total	-0.51			total	2.90	
Cleveland Indians	Santana	out	-0.24			1b	0.52			bb (scores from 3b on wp w/2 outs)	0.82			out (runner to 2b)	-0.16			out	-0.24			4-1-1-1	0.70	
	Kipnis	out(K)	-0.17			E/1b + runner to 2b)	0.00	Lester pitching →		1b (reach 2b on E; runner to 3rd; scores)	1.00			out(K)	-0.34			out(K)	-0.17			5-1-1-0	0.32	
	Lindor	E/1b	0.00			out	-0.50			out (K)	-0.10					out	-0.24	out	-0.10			5-0-0-0	-0.94	
	Napoli	out (force 2b)	-0.22			out	-0.46					out(K)	-0.24			out(K)	-0.17	Edwards pitching →		out(K)	-0.24	5-0-0-0	-1.33	
	Ramirez			1b (picked off w/0 out)	-0.24			out	-0.24				out	-0.17			1b	0.12			out	-0.17	5-1-2-0	-0.70
	Chisenhall			1b	0.23			out	-0.17														2-0-1-0	0.06
	Guyer (6)											1b	0.12	Chapman pitching →		2b	1.12			bb (to 2nd on indifference w/2 outs)	0.24	2-2-2-1	1.48	
	Davis			dp	-0.50			out	-0.10				out	-0.22			hr	1.76			1b	0.88	5-1-2-3	1.82
	Crisp					2b	0.66			out	-0.24				out	-0.24	1b	0.12					4-1-2-0	0.30
	Martinez (9)																		Montgomery pitching →		out	-0.22	1-0-0-0	-0.22
	Perez					sac	-0.19			out(K)	-0.17				bb	0.23							1-0-0-0	-0.13
	Naquin (PR- 7)																						0-0-0-0	0.00
	Gomes (8)																out(K)	-0.22					1-0-0-0	-0.22
R-H-E & SUV	0-0-1	-0.63	0-1-0	-0.51	1-2-1	0.03	0-0-0	-0.51	2-1-1	1.31	0-1-0	-0.51	0-0-0	-0.51	3-4-0	2.49	0-1-0	-0.51	1-1-0	0.49	40-7-11-5	1.14		
		unearned	0.12			unearned	0.46			unearned	0.18											unearned	0.76	
		total	-0.51			total	0.49			total	1.49											total	1.90	
Team	Pitcher	IP	H	R	ER	BB	SO	SUV																
Chicago Cubs	Hendricks	4.67	4	2	1	1	2	-1.21																
	Lester	3.00	3	2	1	1	4	-0.41																
	Chapman (W)	1.33	3	2	2	0	2	2.27																
	Edwards	0.67	1	1	1	1	1	0.71																
	Montgomery (S)	0.33	0	0	0	0	0	-0.22																
	Unearned							0.76																
	TOTAL	10.00	11	7	5	3	9	1.90																
Cleveland Indians	Kluber	4.00	6	4	4	0	0	1.96																
	Miller	2.33	4	2	2	1	1	0.97																
	Allen	2.00	0	0	0	1	2	-0.79																
	Shaw (L)	1.00	3	2	2	2	1	2.18																
	Bauer	0.67	0	0	0	0	1	-1.67																
	Unearned							0.25																
	Total	10.00	13	8	8	4	5	2.90																

See <http://www.baseball-reference.com/boxes/CLE/CLE201611020.shtml> for complete play by play.

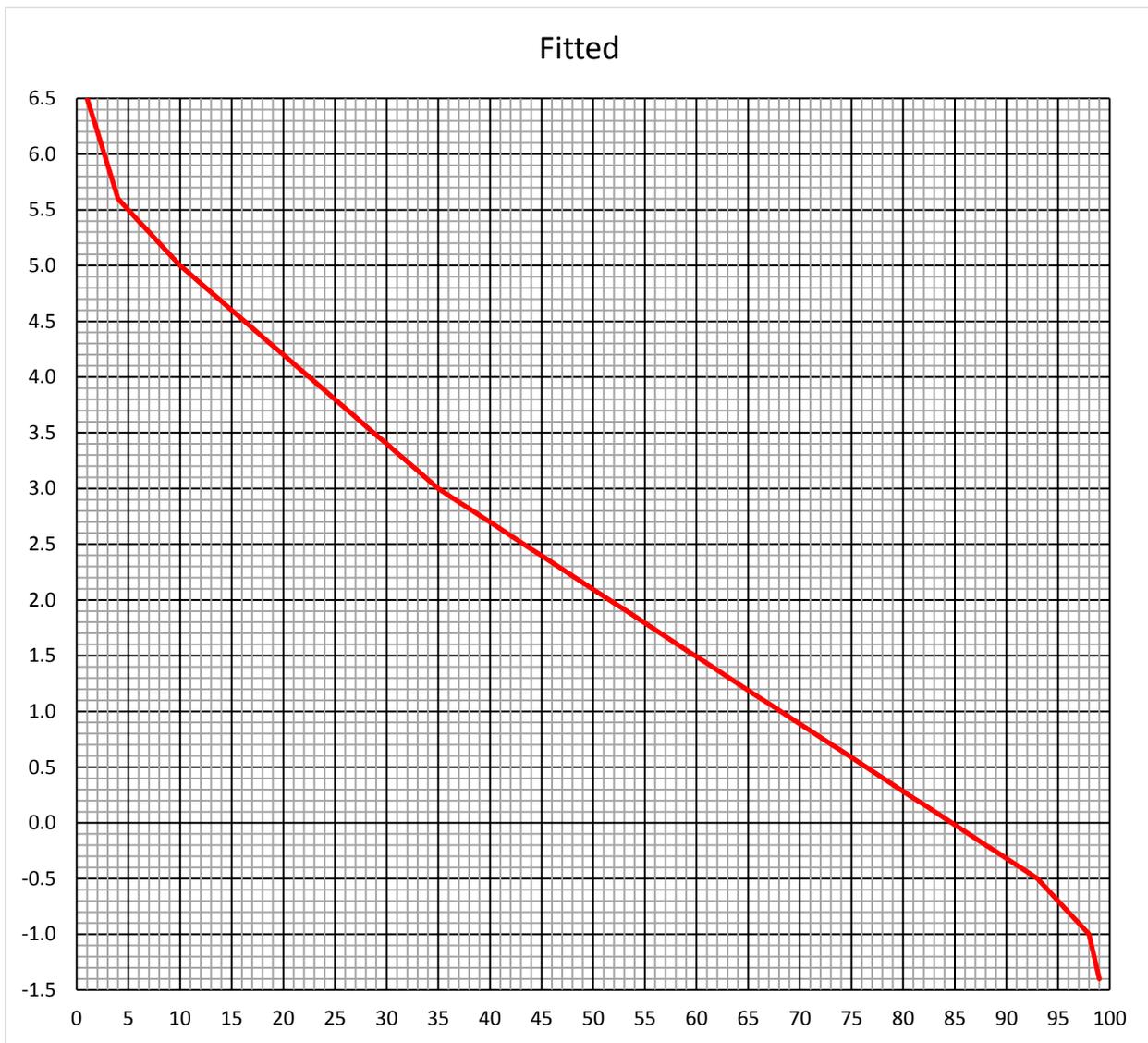
## 2. SUV FOOTBALL

SUV for professional football (NFL) is not as readily conceived as that for baseball, although the concept of each position on the field with down and yards to go has been examined for the possibility of assigning point values (from here on referred to as SUVs). Quantification of this concept is taken from the following, "Expected Points and Expected Points Added Explained," by Brian Burke: [6]

*Every spot on the field has an abstract value in terms of points. We can begin assigning values at the end zones, where having the ball has a clear and concrete value. Possessing the ball at the opponent's end zone is worth (nearly always) 7 points. And having the ball at your own end zone is worth -2 points. Every other yard line has a point value too. We can measure it by averaging how many points will be scored next ... The concept of point expectancy originated with the work of Virgil Carter, a former NFL quarterback who studied operations research in the early 1970s (while an active player). Carroll, Palmer, and Thorn adapted the concept in their 1987 book *The Hidden Game of Football* ... The graph below plots the expected points for a 1st down at each yard line. For simplicity, I've named each yard line in terms of its distance from an opponent's end zone. Having the ball at one's own 20 is "the 80 yard line" for example.*



This was readily linearized into segments based on the following values assumed for field position and expected points from the chart: (1, 6.5), (4, 5.6), (10, 5), (35, 3), (93, -0.5), (98, -1) and (99, -1.4). When plotted, this piecewise linear function appears as follows:



To adjust for 2<sup>nd</sup> and 3<sup>rd</sup> downs, Burke recommends the following:

*Things become more complicated when we consider other down and distance situations. Suppose at any given yard line, a pass falls incomplete on 1<sup>st</sup> and 10. Second down and 10 represents a drop off of about 0.5 points expected. Second and 9 represents a slightly smaller drop off, until at about 2<sup>nd</sup> and 5 when the expected points are approximately equal to those for 1<sup>st</sup> and 10. This is consistent with the 1<sup>st</sup> down probability method I described in my previous posts. Third down and 10 represents a further drop off of about 0.5 points.*

Based on the fitted curve and Burke's recommended adjustments for 2<sup>nd</sup> and 3<sup>rd</sup> down, I compiled the following SUVs for all field positions for 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> down with 10 or less yards to go. Note that, after decreasing the SUV for 1<sup>st</sup> and 10 by Burke's recommended 0.5, I increased each SUV by 0.1 as the yards to go decreased from 10 to five. For five or less, I assumed a constant equal to 1<sup>st</sup> and 10. I did likewise for 3<sup>rd</sup> downs, with 3<sup>rd</sup> and 10 0.5 less than 2<sup>nd</sup> and 10 down to 3<sup>rd</sup> and five (or less) being the same as 2<sup>nd</sup> and 10. The results are shown below. They are immediately followed by results for more than 10 yards to go. For these, I assumed a 0.1 decrease by yard up to 20 yards, which I then treated as constant for anything higher. These are shown below:

yd	pt (1/10-)	pt (2/10)	pt (2/9)	pt (2/8)	pt (2/7)	pt (2/6)	pt (2/5-)	pt (3/10)	pt (3/9)	pt (3/8)	pt (3/7)	pt (3/6)	pt (3/5-)
1	6.50	6.00	6.10	6.20	6.30	6.40	6.50	5.50	5.60	5.70	5.80	5.90	6.00
2	6.20	5.70	5.80	5.90	6.00	6.10	6.20	5.20	5.30	5.40	5.50	5.60	5.70
3	5.90	5.40	5.50	5.60	5.70	5.80	5.90	4.90	5.00	5.10	5.20	5.30	5.40
4	5.60	5.10	5.20	5.30	5.40	5.50	5.60	4.60	4.70	4.80	4.90	5.00	5.10
5	5.50	5.00	5.10	5.20	5.30	5.40	5.50	4.50	4.60	4.70	4.80	4.90	5.00
6	5.40	4.90	5.00	5.10	5.20	5.30	5.40	4.40	4.50	4.60	4.70	4.80	4.90
7	5.30	4.80	4.90	5.00	5.10	5.20	5.30	4.30	4.40	4.50	4.60	4.70	4.80
8	5.20	4.70	4.80	4.90	5.00	5.10	5.20	4.20	4.30	4.40	4.50	4.60	4.70
9	5.10	4.60	4.70	4.80	4.90	5.00	5.10	4.10	4.20	4.30	4.40	4.50	4.60
10	5.00	4.50	4.60	4.70	4.80	4.90	5.00	4.00	4.10	4.20	4.30	4.40	4.50
11	4.92	4.42	4.52	4.62	4.72	4.82	4.92	3.92	4.02	4.12	4.22	4.32	4.42
12	4.84	4.34	4.44	4.54	4.64	4.74	4.84	3.84	3.94	4.04	4.14	4.24	4.34
13	4.76	4.26	4.36	4.46	4.56	4.66	4.76	3.76	3.86	3.96	4.06	4.16	4.26
14	4.68	4.18	4.28	4.38	4.48	4.58	4.68	3.68	3.78	3.88	3.98	4.08	4.18
15	4.60	4.10	4.20	4.30	4.40	4.50	4.60	3.60	3.70	3.80	3.90	4.00	4.10
16	4.52	4.02	4.12	4.22	4.32	4.42	4.52	3.52	3.62	3.72	3.82	3.92	4.02
17	4.44	3.94	4.04	4.14	4.24	4.34	4.44	3.44	3.54	3.64	3.74	3.84	3.94
18	4.36	3.86	3.96	4.06	4.16	4.26	4.36	3.36	3.46	3.56	3.66	3.76	3.86
19	4.28	3.78	3.88	3.98	4.08	4.18	4.28	3.28	3.38	3.48	3.58	3.68	3.78
20	4.20	3.70	3.80	3.90	4.00	4.10	4.20	3.20	3.30	3.40	3.50	3.60	3.70
21	4.12	3.62	3.72	3.82	3.92	4.02	4.12	3.12	3.22	3.32	3.42	3.52	3.62
22	4.04	3.54	3.64	3.74	3.84	3.94	4.04	3.04	3.14	3.24	3.34	3.44	3.54
23	3.96	3.46	3.56	3.66	3.76	3.86	3.96	2.96	3.06	3.16	3.26	3.36	3.46
24	3.88	3.38	3.48	3.58	3.68	3.78	3.88	2.88	2.98	3.08	3.18	3.28	3.38
25	3.80	3.30	3.40	3.50	3.60	3.70	3.80	2.80	2.90	3.00	3.10	3.20	3.30
26	3.72	3.22	3.32	3.42	3.52	3.62	3.72	2.72	2.82	2.92	3.02	3.12	3.22
27	3.64	3.14	3.24	3.34	3.44	3.54	3.64	2.64	2.74	2.84	2.94	3.04	3.14
28	3.56	3.06	3.16	3.26	3.36	3.46	3.56	2.56	2.66	2.76	2.86	2.96	3.06
29	3.48	2.98	3.08	3.18	3.28	3.38	3.48	2.48	2.58	2.68	2.78	2.88	2.98
30	3.40	2.90	3.00	3.10	3.20	3.30	3.40	2.40	2.50	2.60	2.70	2.80	2.90
31	3.32	2.82	2.92	3.02	3.12	3.22	3.32	2.32	2.42	2.52	2.62	2.72	2.82
32	3.24	2.74	2.84	2.94	3.04	3.14	3.24	2.24	2.34	2.44	2.54	2.64	2.74
33	3.16	2.66	2.76	2.86	2.96	3.06	3.16	2.16	2.26	2.36	2.46	2.56	2.66

yd	pt (1/10-)	pt (2/10)	pt (2/9)	pt (2/8)	pt (2/7)	pt (2/6)	pt (2/5-)	pt (3/10)	pt (3/9)	pt (3/8)	pt (3/7)	pt (3/6)	pt (3/5-)
34	3.08	2.58	2.68	2.78	2.88	2.98	3.08	2.08	2.18	2.28	2.38	2.48	2.58
35	3.00	2.50	2.60	2.70	2.80	2.90	3.00	2.00	2.10	2.20	2.30	2.40	2.50
36	2.94	2.44	2.54	2.64	2.74	2.84	2.94	1.94	2.04	2.14	2.24	2.34	2.44
37	2.88	2.38	2.48	2.58	2.68	2.78	2.88	1.88	1.98	2.08	2.18	2.28	2.38
38	2.82	2.32	2.42	2.52	2.62	2.72	2.82	1.82	1.92	2.02	2.12	2.22	2.32
39	2.76	2.26	2.36	2.46	2.56	2.66	2.76	1.76	1.86	1.96	2.06	2.16	2.26
40	2.70	2.20	2.30	2.40	2.50	2.60	2.70	1.70	1.80	1.90	2.00	2.10	2.20
41	2.64	2.14	2.24	2.34	2.44	2.54	2.64	1.64	1.74	1.84	1.94	2.04	2.14
42	2.58	2.08	2.18	2.28	2.38	2.48	2.58	1.58	1.68	1.78	1.88	1.98	2.08
43	2.52	2.02	2.12	2.22	2.32	2.42	2.52	1.52	1.62	1.72	1.82	1.92	2.02
44	2.46	1.96	2.06	2.16	2.26	2.36	2.46	1.46	1.56	1.66	1.76	1.86	1.96
45	2.40	1.90	2.00	2.10	2.20	2.30	2.40	1.40	1.50	1.60	1.70	1.80	1.90
46	2.34	1.84	1.94	2.04	2.14	2.24	2.34	1.34	1.44	1.54	1.64	1.74	1.84
47	2.28	1.78	1.88	1.98	2.08	2.18	2.28	1.28	1.38	1.48	1.58	1.68	1.78
48	2.22	1.72	1.82	1.92	2.02	2.12	2.22	1.22	1.32	1.42	1.52	1.62	1.72
49	2.16	1.66	1.76	1.86	1.96	2.06	2.16	1.16	1.26	1.36	1.46	1.56	1.66
50	2.09	1.59	1.69	1.79	1.89	1.99	2.09	1.09	1.19	1.29	1.39	1.49	1.59
51	2.03	1.53	1.63	1.73	1.83	1.93	2.03	1.03	1.13	1.23	1.33	1.43	1.53
52	1.97	1.47	1.57	1.67	1.77	1.87	1.97	0.97	1.07	1.17	1.27	1.37	1.47
53	1.91	1.41	1.51	1.61	1.71	1.81	1.91	0.91	1.01	1.11	1.21	1.31	1.41
54	1.85	1.35	1.45	1.55	1.65	1.75	1.85	0.85	0.95	1.05	1.15	1.25	1.35
55	1.79	1.29	1.39	1.49	1.59	1.69	1.79	0.79	0.89	0.99	1.09	1.19	1.29
56	1.73	1.23	1.33	1.43	1.53	1.63	1.73	0.73	0.83	0.93	1.03	1.13	1.23
57	1.67	1.17	1.27	1.37	1.47	1.57	1.67	0.67	0.77	0.87	0.97	1.07	1.17
58	1.61	1.11	1.21	1.31	1.41	1.51	1.61	0.61	0.71	0.81	0.91	1.01	1.11
59	1.55	1.05	1.15	1.25	1.35	1.45	1.55	0.55	0.65	0.75	0.85	0.95	1.05
60	1.49	0.99	1.09	1.19	1.29	1.39	1.49	0.49	0.59	0.69	0.79	0.89	0.99
61	1.43	0.93	1.03	1.13	1.23	1.33	1.43	0.43	0.53	0.63	0.73	0.83	0.93
62	1.37	0.87	0.97	1.07	1.17	1.27	1.37	0.37	0.47	0.57	0.67	0.77	0.87
63	1.31	0.81	0.91	1.01	1.11	1.21	1.31	0.31	0.41	0.51	0.61	0.71	0.81
64	1.25	0.75	0.85	0.95	1.05	1.15	1.25	0.25	0.35	0.45	0.55	0.65	0.75
65	1.19	0.69	0.79	0.89	0.99	1.09	1.19	0.19	0.29	0.39	0.49	0.59	0.69
66	1.13	0.63	0.73	0.83	0.93	1.03	1.13	0.13	0.23	0.33	0.43	0.53	0.63

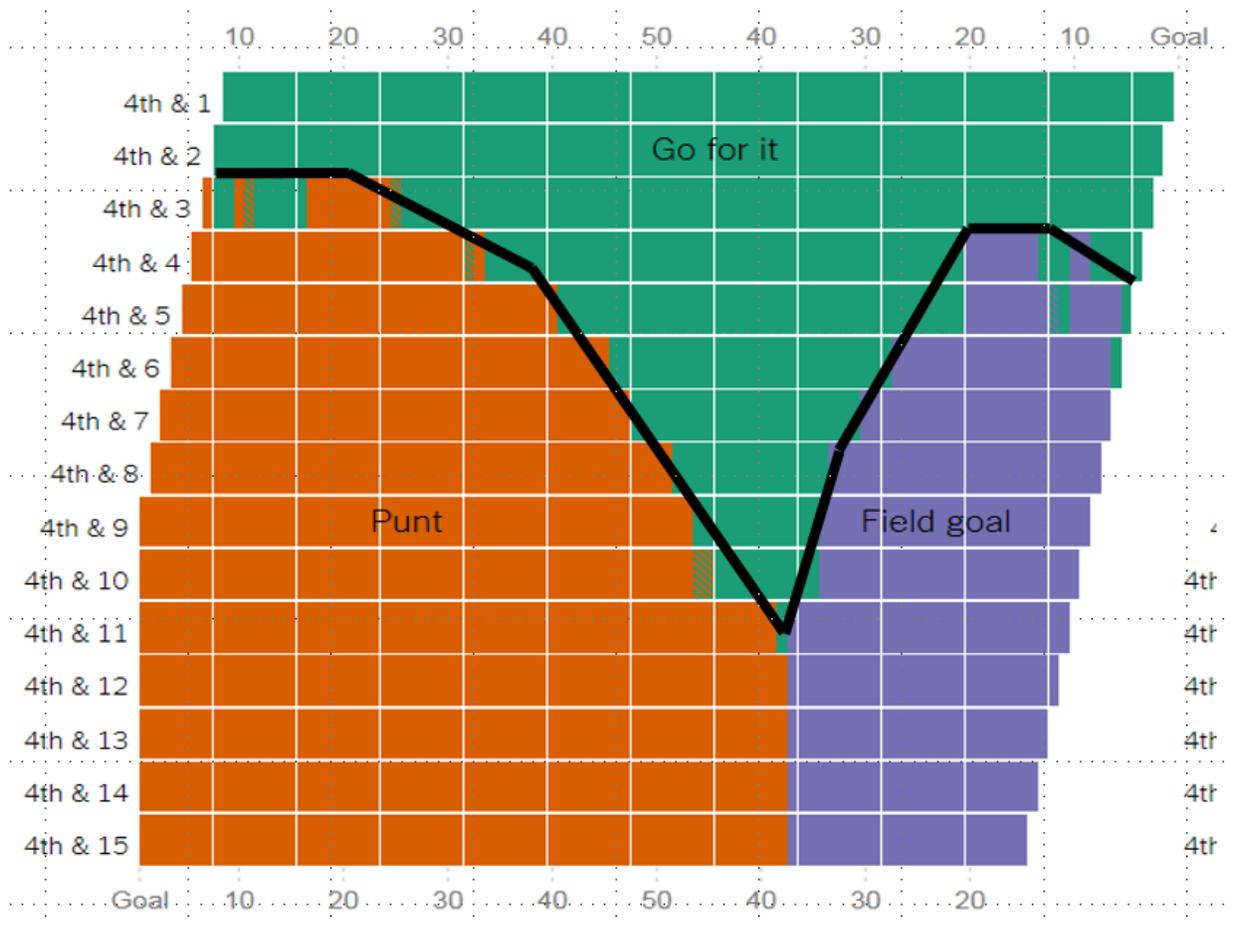
yd	pt (1/10-)	pt (2/10)	pt (2/9)	pt (2/8)	pt (2/7)	pt (2/6)	pt (2/5-)	pt (3/10)	pt (3/9)	pt (3/8)	pt (3/7)	pt (3/6)	pt (3/5-)
67	1.07	0.57	0.67	0.77	0.87	0.97	1.07	0.07	0.17	0.27	0.37	0.47	0.57
68	1.01	0.51	0.61	0.71	0.81	0.91	1.01	0.01	0.11	0.21	0.31	0.41	0.51
69	0.95	0.45	0.55	0.65	0.75	0.85	0.95	-0.05	0.05	0.15	0.25	0.35	0.45
70	0.89	0.39	0.49	0.59	0.69	0.79	0.89	-0.11	-0.01	0.09	0.19	0.29	0.39
71	0.83	0.33	0.43	0.53	0.63	0.73	0.83	-0.17	-0.07	0.03	0.13	0.23	0.33
72	0.77	0.27	0.37	0.47	0.57	0.67	0.77	-0.23	-0.13	-0.03	0.07	0.17	0.27
73	0.71	0.21	0.31	0.41	0.51	0.61	0.71	-0.29	-0.19	-0.09	0.01	0.11	0.21
74	0.65	0.15	0.25	0.35	0.45	0.55	0.65	-0.35	-0.25	-0.15	-0.05	0.05	0.15
75	0.59	0.09	0.19	0.29	0.39	0.49	0.59	-0.41	-0.31	-0.21	-0.11	-0.01	0.09
76	0.53	0.03	0.13	0.23	0.33	0.43	0.53	-0.47	-0.37	-0.27	-0.17	-0.07	0.03
77	0.47	-0.03	0.07	0.17	0.27	0.37	0.47	-0.53	-0.43	-0.33	-0.23	-0.13	-0.03
78	0.41	-0.09	0.01	0.11	0.21	0.31	0.41	-0.59	-0.49	-0.39	-0.29	-0.19	-0.09
79	0.34	-0.16	-0.06	0.04	0.14	0.24	0.34	-0.66	-0.56	-0.46	-0.36	-0.26	-0.16
80	0.28	-0.22	-0.12	-0.02	0.08	0.18	0.28	-0.72	-0.62	-0.52	-0.42	-0.32	-0.22
81	0.22	-0.28	-0.18	-0.08	0.02	0.12	0.22	-0.78	-0.68	-0.58	-0.48	-0.38	-0.28
82	0.16	-0.34	-0.24	-0.14	-0.04	0.06	0.16	-0.84	-0.74	-0.64	-0.54	-0.44	-0.34
83	0.10	-0.40	-0.30	-0.20	-0.10	0.00	0.10	-0.90	-0.80	-0.70	-0.60	-0.50	-0.40
84	0.04	-0.46	-0.36	-0.26	-0.16	-0.06	0.04	-0.96	-0.86	-0.76	-0.66	-0.56	-0.46
85	-0.02	-0.52	-0.42	-0.32	-0.22	-0.12	-0.02	-1.02	-0.92	-0.82	-0.72	-0.62	-0.52
86	-0.08	-0.58	-0.48	-0.38	-0.28	-0.18	-0.08	-1.08	-0.98	-0.88	-0.78	-0.68	-0.58
87	-0.14	-0.64	-0.54	-0.44	-0.34	-0.24	-0.14	-1.14	-1.04	-0.94	-0.84	-0.74	-0.64
88	-0.20	-0.70	-0.60	-0.50	-0.40	-0.30	-0.20	-1.20	-1.10	-1.00	-0.90	-0.80	-0.70
89	-0.26	-0.76	-0.66	-0.56	-0.46	-0.36	-0.26	-1.26	-1.16	-1.06	-0.96	-0.86	-0.76
90	-0.32	-0.82	-0.72	-0.62	-0.52	-0.42	-0.32	-1.32	-1.22	-1.12	-1.02	-0.92	-0.82
91	-0.38	-0.88	-0.78	-0.68	-0.58	-0.48	-0.38	-1.38	-1.28	-1.18	-1.08	-0.98	-0.88
92	-0.44	-0.94	-0.84	-0.74	-0.64	-0.54	-0.44	-1.44	-1.34	-1.24	-1.14	-1.04	-0.94
93	-0.50	-1.00	-0.90	-0.80	-0.70	-0.60	-0.50	-1.50	-1.40	-1.30	-1.20	-1.10	-1.00
94	-0.60	-1.10	-1.00	-0.90	-0.80	-0.70	-0.60	-1.60	-1.50	-1.40	-1.30	-1.20	-1.10
95	-0.70	-1.20	-1.10	-1.00	-0.90	-0.80	-0.70	-1.70	-1.60	-1.50	-1.40	-1.30	-1.20
96	-0.80	-1.30	-1.20	-1.10	-1.00	-0.90	-0.80	-1.80	-1.70	-1.60	-1.50	-1.40	-1.30
97	-0.90	-1.40	-1.30	-1.20	-1.10	-1.00	-0.90	-1.90	-1.80	-1.70	-1.60	-1.50	-1.40
98	-1.00	-1.50	-1.40	-1.30	-1.20	-1.10	-1.00	-2.00	-1.90	-1.80	-1.70	-1.60	-1.50
99	-1.40	-1.90	-1.80	-1.70	-1.60	-1.50	-1.40	-2.40	-2.30	-2.20	-2.10	-2.00	-1.90

yd	pt (1/10-)	pt (1/11)	pt (1/12)	pt (1/13)	pt (1/14)	pt (1/15)	pt (1/16)	pt (1/17)	pt (1/18)	pt (1/19)	pt (1/20+)
1	6.50	6.40	6.30	6.20	6.10	6.00	5.90	5.80	5.70	5.60	5.50
2	6.20	6.10	6.00	5.90	5.80	5.70	5.60	5.50	5.40	5.30	5.20
3	5.90	5.80	5.70	5.60	5.50	5.40	5.30	5.20	5.10	5.00	4.90
4	5.60	5.50	5.40	5.30	5.20	5.10	5.00	4.90	4.80	4.70	4.60
5	5.50	5.40	5.30	5.20	5.10	5.00	4.90	4.80	4.70	4.60	4.50
6	5.40	5.30	5.20	5.10	5.00	4.90	4.80	4.70	4.60	4.50	4.40
7	5.30	5.20	5.10	5.00	4.90	4.80	4.70	4.60	4.50	4.40	4.30
8	5.20	5.10	5.00	4.90	4.80	4.70	4.60	4.50	4.40	4.30	4.20
9	5.10	5.00	4.90	4.80	4.70	4.60	4.50	4.40	4.30	4.20	4.10
10	5.00	4.90	4.80	4.70	4.60	4.50	4.40	4.30	4.20	4.10	4.00
11	4.92	4.82	4.72	4.62	4.52	4.42	4.32	4.22	4.12	4.02	3.92
12	4.84	4.74	4.64	4.54	4.44	4.34	4.24	4.14	4.04	3.94	3.84
13	4.76	4.66	4.56	4.46	4.36	4.26	4.16	4.06	3.96	3.86	3.76
14	4.68	4.58	4.48	4.38	4.28	4.18	4.08	3.98	3.88	3.78	3.68
15	4.60	4.50	4.40	4.30	4.20	4.10	4.00	3.90	3.80	3.70	3.60
16	4.52	4.42	4.32	4.22	4.12	4.02	3.92	3.82	3.72	3.62	3.52
17	4.44	4.34	4.24	4.14	4.04	3.94	3.84	3.74	3.64	3.54	3.44
18	4.36	4.26	4.16	4.06	3.96	3.86	3.76	3.66	3.56	3.46	3.36
19	4.28	4.18	4.08	3.98	3.88	3.78	3.68	3.58	3.48	3.38	3.28
20	4.20	4.10	4.00	3.90	3.80	3.70	3.60	3.50	3.40	3.30	3.20
21	4.12	4.02	3.92	3.82	3.72	3.62	3.52	3.42	3.32	3.22	3.12
22	4.04	3.94	3.84	3.74	3.64	3.54	3.44	3.34	3.24	3.14	3.04
23	3.96	3.86	3.76	3.66	3.56	3.46	3.36	3.26	3.16	3.06	2.96
24	3.88	3.78	3.68	3.58	3.48	3.38	3.28	3.18	3.08	2.98	2.88
25	3.80	3.70	3.60	3.50	3.40	3.30	3.20	3.10	3.00	2.90	2.80
26	3.72	3.62	3.52	3.42	3.32	3.22	3.12	3.02	2.92	2.82	2.72
27	3.64	3.54	3.44	3.34	3.24	3.14	3.04	2.94	2.84	2.74	2.64
28	3.56	3.46	3.36	3.26	3.16	3.06	2.96	2.86	2.76	2.66	2.56
29	3.48	3.38	3.28	3.18	3.08	2.98	2.88	2.78	2.68	2.58	2.48
30	3.40	3.30	3.20	3.10	3.00	2.90	2.80	2.70	2.60	2.50	2.40
31	3.32	3.22	3.12	3.02	2.92	2.82	2.72	2.62	2.52	2.42	2.32
32	3.24	3.14	3.04	2.94	2.84	2.74	2.64	2.54	2.44	2.34	2.24
33	3.16	3.06	2.96	2.86	2.76	2.66	2.56	2.46	2.36	2.26	2.16

yd	pt (1/10-)	pt (1/11)	pt (1/12)	pt (1/13)	pt (1/14)	pt (1/15)	pt (1/16)	pt (1/17)	pt (1/18)	pt (1/19)	pt (1/20+)
34	3.08	2.98	2.88	2.78	2.68	2.58	2.48	2.38	2.28	2.18	2.08
35	3.00	2.90	2.80	2.70	2.60	2.50	2.40	2.30	2.20	2.10	2.00
36	2.94	2.84	2.74	2.64	2.54	2.44	2.34	2.24	2.14	2.04	1.94
37	2.88	2.78	2.68	2.58	2.48	2.38	2.28	2.18	2.08	1.98	1.88
38	2.82	2.72	2.62	2.52	2.42	2.32	2.22	2.12	2.02	1.92	1.82
39	2.76	2.66	2.56	2.46	2.36	2.26	2.16	2.06	1.96	1.86	1.76
40	2.70	2.60	2.50	2.40	2.30	2.20	2.10	2.00	1.90	1.80	1.70
41	2.64	2.54	2.44	2.34	2.24	2.14	2.04	1.94	1.84	1.74	1.64
42	2.58	2.48	2.38	2.28	2.18	2.08	1.98	1.88	1.78	1.68	1.58
43	2.52	2.42	2.32	2.22	2.12	2.02	1.92	1.82	1.72	1.62	1.52
44	2.46	2.36	2.26	2.16	2.06	1.96	1.86	1.76	1.66	1.56	1.46
45	2.40	2.30	2.20	2.10	2.00	1.90	1.80	1.70	1.60	1.50	1.40
46	2.34	2.24	2.14	2.04	1.94	1.84	1.74	1.64	1.54	1.44	1.34
47	2.28	2.18	2.08	1.98	1.88	1.78	1.68	1.58	1.48	1.38	1.28
48	2.22	2.12	2.02	1.92	1.82	1.72	1.62	1.52	1.42	1.32	1.22
49	2.16	2.06	1.96	1.86	1.76	1.66	1.56	1.46	1.36	1.26	1.16
50	2.09	1.99	1.89	1.79	1.69	1.59	1.49	1.39	1.29	1.19	1.09
51	2.03	1.93	1.83	1.73	1.63	1.53	1.43	1.33	1.23	1.13	1.03
52	1.97	1.87	1.77	1.67	1.57	1.47	1.37	1.27	1.17	1.07	0.97
53	1.91	1.81	1.71	1.61	1.51	1.41	1.31	1.21	1.11	1.01	0.91
54	1.85	1.75	1.65	1.55	1.45	1.35	1.25	1.15	1.05	0.95	0.85
55	1.79	1.69	1.59	1.49	1.39	1.29	1.19	1.09	0.99	0.89	0.79
56	1.73	1.63	1.53	1.43	1.33	1.23	1.13	1.03	0.93	0.83	0.73
57	1.67	1.57	1.47	1.37	1.27	1.17	1.07	0.97	0.87	0.77	0.67
58	1.61	1.51	1.41	1.31	1.21	1.11	1.01	0.91	0.81	0.71	0.61
59	1.55	1.45	1.35	1.25	1.15	1.05	0.95	0.85	0.75	0.65	0.55
60	1.49	1.39	1.29	1.19	1.09	0.99	0.89	0.79	0.69	0.59	0.49
61	1.43	1.33	1.23	1.13	1.03	0.93	0.83	0.73	0.63	0.53	0.43
62	1.37	1.27	1.17	1.07	0.97	0.87	0.77	0.67	0.57	0.47	0.37
63	1.31	1.21	1.11	1.01	0.91	0.81	0.71	0.61	0.51	0.41	0.31
64	1.25	1.15	1.05	0.95	0.85	0.75	0.65	0.55	0.45	0.35	0.25
65	1.19	1.09	0.99	0.89	0.79	0.69	0.59	0.49	0.39	0.29	0.19
66	1.13	1.03	0.93	0.83	0.73	0.63	0.53	0.43	0.33	0.23	0.13

yd	pt (1/10-)	pt (1/11)	pt (1/12)	pt (1/13)	pt (1/14)	pt (1/15)	pt (1/16)	pt (1/17)	pt (1/18)	pt (1/19)	pt (1/20+)
67	1.07	0.97	0.87	0.77	0.67	0.57	0.47	0.37	0.27	0.17	0.07
68	1.01	0.91	0.81	0.71	0.61	0.51	0.41	0.31	0.21	0.11	0.01
69	0.95	0.85	0.75	0.65	0.55	0.45	0.35	0.25	0.15	0.05	-0.05
70	0.89	0.79	0.69	0.59	0.49	0.39	0.29	0.19	0.09	-0.01	-0.11
71	0.83	0.73	0.63	0.53	0.43	0.33	0.23	0.13	0.03	-0.07	-0.17
72	0.77	0.67	0.57	0.47	0.37	0.27	0.17	0.07	-0.03	-0.13	-0.23
73	0.71	0.61	0.51	0.41	0.31	0.21	0.11	0.01	-0.09	-0.19	-0.29
74	0.65	0.55	0.45	0.35	0.25	0.15	0.05	-0.05	-0.15	-0.25	-0.35
75	0.59	0.49	0.39	0.29	0.19	0.09	-0.01	-0.11	-0.21	-0.31	-0.41
76	0.53	0.43	0.33	0.23	0.13	0.03	-0.07	-0.17	-0.27	-0.37	-0.47
77	0.47	0.37	0.27	0.17	0.07	-0.03	-0.13	-0.23	-0.33	-0.43	-0.53
78	0.41	0.31	0.21	0.11	0.01	-0.09	-0.19	-0.29	-0.39	-0.49	-0.59
79	0.34	0.24	0.14	0.04	-0.06	-0.16	-0.26	-0.36	-0.46	-0.56	-0.66
80	0.28	0.18	0.08	-0.02	-0.12	-0.22	-0.32	-0.42	-0.52	-0.62	-0.72
81	0.22	0.12	0.02	-0.08	-0.18	-0.28	-0.38	-0.48	-0.58	-0.68	-0.78
82	0.16	0.06	-0.04	-0.14	-0.24	-0.34	-0.44	-0.54	-0.64	-0.74	-0.84
83	0.10	0.00	-0.10	-0.20	-0.30	-0.40	-0.50	-0.60	-0.70	-0.80	-0.90
84	0.04	-0.06	-0.16	-0.26	-0.36	-0.46	-0.56	-0.66	-0.76	-0.86	-0.96
85	-0.02	-0.12	-0.22	-0.32	-0.42	-0.52	-0.62	-0.72	-0.82	-0.92	-1.02
86	-0.08	-0.18	-0.28	-0.38	-0.48	-0.58	-0.68	-0.78	-0.88	-0.98	-1.08
87	-0.14	-0.24	-0.34	-0.44	-0.54	-0.64	-0.74	-0.84	-0.94	-1.04	-1.14
88	-0.20	-0.30	-0.40	-0.50	-0.60	-0.70	-0.80	-0.90	-1.00	-1.10	-1.20
89	-0.26	-0.36	-0.46	-0.56	-0.66	-0.76	-0.86	-0.96	-1.06	-1.16	-1.26
90	-0.32	-0.42	-0.52	-0.62	-0.72	-0.82	-0.92	-1.02	-1.12	-1.22	-1.32
91	-0.38	-0.48	-0.58	-0.68	-0.78	-0.88	-0.98	-1.08	-1.18	-1.28	-1.38
92	-0.44	-0.54	-0.64	-0.74	-0.84	-0.94	-1.04	-1.14	-1.24	-1.34	-1.44
93	-0.50	-0.60	-0.70	-0.80	-0.90	-1.00	-1.10	-1.20	-1.30	-1.40	-1.50
94	-0.60	-0.70	-0.80	-0.90	-1.00	-1.10	-1.20	-1.30	-1.40	-1.50	-1.60
95	-0.70	-0.80	-0.90	-1.00	-1.10	-1.20	-1.30	-1.40	-1.50	-1.60	-1.70
96	-0.80	-0.90	-1.00	-1.10	-1.20	-1.30	-1.40	-1.50	-1.60	-1.70	-1.80
97	-0.90	-1.00	-1.10	-1.20	-1.30	-1.40	-1.50	-1.60	-1.70	-1.80	-1.90
98	-1.00	-1.10	-1.20	-1.30	-1.40	-1.50	-1.60	-1.70	-1.80	-1.90	-2.00
99	-1.40	-1.50	-1.60	-1.70	-1.80	-1.90	-2.00	-2.10	-2.20	-2.30	-2.40

Guidance for 4<sup>th</sup> down was more difficult to find and develop into an SUV. For this, the following two articles provided information: “How Coaches and the NYT 4th Down Bot Compare,” by Brian Burke and Kevin Quealy, and “4th and Go for It?,” by Mike Tanier. [7-8] The first article provided the chart below, recommending what to choose on 4<sup>th</sup> down, on which I superimposed line segments representing the boundaries between going for it vs. other. The line segments connected at the following values for field position and yards to go: (99, 2), (76, 2), (61, 4), (38, 10.5), (32, 7), (21, 3), (12, 3), (4, 4):



The second article provided the following information:

*Going for it on 4<sup>th</sup>-and-short has had a 62.7% success rate over the last three years [2010-2012] ... There is a noticeable dip in the 2011 data: 2010 and 2012 look alike and suggest an over 66% (2 out of 3) conversion rate ... The year-to-year data sets are small enough to allow for this kind of fluctuation. It is best to assume that the "real" success rate lies between the low of 2011 and the high of the other two years, though we will see later that there are compelling reasons to lean toward the higher rate ... The raw data tells us that 4<sup>th</sup>-and-short conversion attempts are not a high-risk gamble. A 63% success rate represents good odds. ... That stability is the most interesting finding of this study. The 62.7% success rate we started with is much closer to 66.7%, or two-thirds, if a few more dire circumstance attempts are teased out ... [I]f a team goes for it on 4<sup>th</sup>-and-short three times in a game, they are statistically likely to gain two 1<sup>st</sup> downs and turn the ball over on downs once. If the team makes those three attempts at, say, the opponent's 40-yard line, that means they will get the ball in scoring position twice but give the opponent good field position once.*

Based on this discussion, I assumed that the probability of success in “going for it” on 4<sup>th</sup> and short would be 2/3. However, the “go for it” region in the chart extends beyond two yards over much of its range. While the probability of success for 4<sup>th</sup> and longer than two yards is surely less than 2/3, in terms of SUV, I assumed that the full “go for it” region could be characterized by an SUV as follows. Starting with the equivalent yardage (and field position) on 4<sup>th</sup>

down, adjust the corresponding SUV for 3<sup>rd</sup> down by multiplying by 2/3 and then subtracting 1/3 of the SUV for 1<sup>st</sup> and 10 from that same field position, representing the SUV of the other team should it take over after 4<sup>th</sup> down. If the 4<sup>th</sup> down yardage exceeded the “break even” threshold (BET) for the “go for it” region, as indicated by the solid black line superimposed on the chart, then the SUV would be reduced further using the following equation (note that “|” represents absolute value):

$$\frac{2}{3}x 0.9^{(yds\ needed - BET\ from\ above)}x(SUV\ for\ 3rd\ down\ equivalent\ yardage) - [(1 - \frac{2}{3}x 0.9^{(yds\ needed - BET\ from\ above)})x|SUV\ if\ defense\ takes\ over\ 1st\ and\ 10|]$$

The assumption here is that the SUV is reduced by 10% for each yard beyond the BET.

Here are two examples. Say a team has 4<sup>th</sup> and 3 or less from its own 30, where the BET = 3. From the chart, this lies within the “go for it” region, so the SUV would be as follows:

$$\frac{2}{3}x 0.39 - \left(1 - \frac{2}{3}\right)x 3.40 = -0.87$$

where 0.39 = SUV for 3<sup>rd</sup> and 3 (i.e., 5 or less) from 70 yards away and 3.40 is the SUV for 1<sup>st</sup> and 10 from 30 yards away. Now, if at the same field position it was 4<sup>th</sup> and 6, the SUV would be reduced using the following:

$$\frac{2}{3}x 0.9^{(6-3)}x 0.29 - \left[1 - \frac{2}{3}x 0.9^{(6-3)}\right]x 3.40 = -1.61$$

but now using the SUV for 3<sup>rd</sup> and 6 from 70 yards away (0.29).

Based on the above, here are the SUVs for 4<sup>th</sup> down (anything above 20 yards to go was treated as constant, consistent with 1<sup>st</sup>, 2<sup>nd</sup> and 3<sup>rd</sup> downs).

yd	pt (4/1)	pt (4/2)	pt (4/3)	pt (4/4)	pt (4/5)	pt (4/6)	pt (4/7)	pt (4/8)	pt (4/9)	pt (4/10)
1	3.53	3.53	3.53	3.53	3.04	2.54	2.10	1.71	1.36	1.04
2	3.47	3.47	3.47	3.47	3.02	2.56	2.16	1.80	1.48	1.20
3	3.30	3.30	3.30	3.30	2.88	2.45	2.06	1.72	1.42	1.15
4	3.13	3.13	3.13	3.13	2.74	2.33	1.97	1.65	1.37	1.11
5	3.10	3.10	3.10	3.10	2.72	2.32	1.97	1.66	1.39	1.14
6	3.07	3.07	3.07	3.07	2.70	2.32	1.98	1.67	1.41	1.17
7	3.03	3.03	3.03	3.03	2.68	2.31	1.98	1.69	1.43	1.20
8	2.99	2.99	2.99	2.99	2.64	2.28	1.96	1.68	1.43	1.20
9	2.94	2.94	2.94	2.61	2.31	1.99	1.71	1.46	1.24	1.05
10	2.89	2.89	2.89	2.57	2.28	1.97	1.70	1.46	1.25	1.06
11	2.86	2.86	2.86	2.55	2.27	1.97	1.70	1.47	1.26	1.07
12	2.83	2.83	2.83	2.52	2.25	1.96	1.70	1.47	1.27	1.09
13	2.79	2.79	2.79	2.50	2.24	1.95	1.70	1.48	1.28	1.10
14	2.76	2.76	2.76	2.48	2.22	1.94	1.70	1.48	1.29	1.12
15	2.73	2.73	2.73	2.45	2.21	1.94	1.70	1.49	1.30	1.14
16	2.67	2.67	2.67	2.39	2.15	1.88	1.65	1.44	1.25	1.09
17	2.59	2.59	2.59	2.32	2.08	1.81	1.58	1.37	1.19	1.03
18	2.52	2.52	2.52	2.25	2.01	1.74	1.51	1.30	1.12	0.96
19	2.45	2.45	2.45	2.18	1.94	1.67	1.44	1.23	1.05	0.89
20	2.37	2.37	2.37	2.11	1.87	1.60	1.37	1.17	0.99	0.83
21	2.30	2.30	2.30	2.03	1.80	1.53	1.30	1.10	0.92	0.76
22	2.22	2.22	2.22	1.96	1.73	1.46	1.23	1.03	0.85	0.69
23	2.15	2.15	2.15	2.15	1.89	1.60	1.35	1.12	0.92	0.75
24	2.08	2.08	2.08	2.08	1.82	1.53	1.28	1.05	0.85	0.68
25	2.00	2.00	2.00	2.00	1.75	1.46	1.21	0.98	0.79	0.61
26	1.93	1.93	1.93	1.93	1.93	1.61	1.33	1.09	0.87	0.68
27	1.86	1.86	1.86	1.86	1.86	1.54	1.26	1.02	0.80	0.61
28	1.78	1.78	1.78	1.78	1.78	1.72	1.41	1.14	0.90	0.69
29	1.71	1.71	1.71	1.71	1.71	1.64	1.34	1.07	0.83	0.62
30	1.64	1.64	1.64	1.64	1.64	1.57	1.26	1.00	0.76	0.55
31	1.56	1.56	1.56	1.56	1.56	1.50	1.43	1.13	0.87	0.64
32	1.49	1.49	1.49	1.49	1.49	1.42	1.36	1.06	0.80	0.57
33	1.42	1.42	1.42	1.42	1.42	1.35	1.28	1.22	0.93	0.67
34	1.34	1.34	1.34	1.34	1.34	1.28	1.21	1.14	0.86	0.60
35	1.27	1.27	1.27	1.27	1.27	1.20	1.14	1.07	1.00	0.72
36	1.21	1.21	1.21	1.21	1.21	1.14	1.08	1.01	0.94	0.66
37	1.15	1.15	1.15	1.15	1.15	1.08	1.02	0.95	0.88	0.82
38	1.09	1.09	1.09	1.09	1.09	1.02	0.96	0.89	0.82	0.76
39	1.03	1.03	1.03	1.03	1.03	0.96	0.90	0.83	0.76	0.70
40	0.97	0.97	0.97	0.97	0.97	0.90	0.84	0.77	0.70	0.64
41	0.91	0.91	0.91	0.91	0.91	0.84	0.77	0.71	0.64	0.57
42	0.85	0.85	0.85	0.85	0.85	0.78	0.71	0.65	0.58	0.30

yd	pt (4/1)	pt (4/2)	pt (4/3)	pt (4/4)	pt (4/5)	pt (4/6)	pt (4/7)	pt (4/8)	pt (4/9)	pt (4/10)
43	0.79	0.79	0.79	0.79	0.79	0.72	0.65	0.59	0.52	0.24
44	0.73	0.73	0.73	0.73	0.73	0.66	0.59	0.53	0.46	0.18
45	0.67	0.67	0.67	0.67	0.67	0.60	0.53	0.47	0.40	0.12
46	0.61	0.61	0.61	0.61	0.61	0.54	0.47	0.41	0.12	-0.13
47	0.55	0.55	0.55	0.55	0.55	0.48	0.41	0.35	0.06	-0.19
48	0.49	0.49	0.49	0.49	0.49	0.42	0.35	0.29	0.00	-0.25
49	0.43	0.43	0.43	0.43	0.43	0.36	0.29	0.00	-0.26	-0.48
50	0.36	0.36	0.36	0.36	0.36	0.30	0.23	-0.06	-0.32	-0.54
51	0.30	0.30	0.30	0.30	0.30	0.24	0.17	-0.12	-0.38	-0.61
52	0.24	0.24	0.24	0.24	0.24	0.18	0.11	-0.18	-0.44	-0.67
53	0.18	0.18	0.18	0.18	0.18	0.12	-0.18	-0.45	-0.68	-0.88
54	0.12	0.12	0.12	0.12	0.12	0.06	-0.24	-0.51	-0.74	-0.94
55	0.06	0.06	0.06	0.06	0.06	0.00	-0.30	-0.57	-0.80	-1.00
56	0.00	0.00	0.00	0.00	0.00	-0.30	-0.57	-0.81	-1.02	-1.20
57	-0.06	-0.06	-0.06	-0.06	-0.06	-0.36	-0.63	-0.87	-1.08	-1.26
58	-0.12	-0.12	-0.12	-0.12	-0.12	-0.42	-0.69	-0.93	-1.14	-1.32
59	-0.18	-0.18	-0.18	-0.18	-0.18	-0.48	-0.75	-0.99	-1.20	-1.38
60	-0.24	-0.24	-0.24	-0.24	-0.48	-0.76	-1.00	-1.22	-1.40	-1.57
61	-0.30	-0.30	-0.30	-0.30	-0.54	-0.82	-1.06	-1.28	-1.46	-1.63
62	-0.36	-0.36	-0.36	-0.36	-0.61	-0.88	-1.12	-1.34	-1.52	-1.69
63	-0.42	-0.42	-0.42	-0.42	-0.67	-0.94	-1.18	-1.40	-1.58	-1.75
64	-0.48	-0.48	-0.48	-0.48	-0.73	-1.00	-1.24	-1.46	-1.64	-1.81
65	-0.54	-0.54	-0.54	-0.79	-1.01	-1.26	-1.47	-1.67	-1.83	-1.98
66	-0.61	-0.61	-0.61	-0.85	-1.08	-1.33	-1.55	-1.74	-1.91	-2.06
67	-0.67	-0.67	-0.67	-0.92	-1.15	-1.40	-1.62	-1.81	-1.98	-2.13
68	-0.74	-0.74	-0.74	-0.99	-1.22	-1.47	-1.69	-1.88	-2.05	-2.20
69	-0.81	-0.81	-0.81	-1.06	-1.29	-1.54	-1.76	-1.95	-2.13	-2.28
70	-0.87	-0.87	-0.87	-1.13	-1.35	-1.61	-1.83	-2.03	-2.20	-2.35
71	-0.94	-0.94	-0.94	-1.20	-1.42	-1.68	-1.90	-2.10	-2.27	-2.43
72	-1.01	-1.01	-1.01	-1.26	-1.49	-1.75	-1.97	-2.17	-2.35	-2.50
73	-1.08	-1.08	-1.33	-1.56	-1.77	-2.00	-2.20	-2.38	-2.54	-2.68
74	-1.14	-1.14	-1.40	-1.63	-1.84	-2.07	-2.28	-2.46	-2.61	-2.75
75	-1.21	-1.21	-1.47	-1.70	-1.91	-2.14	-2.35	-2.53	-2.69	-2.83
76	-1.28	-1.28	-1.54	-1.77	-1.98	-2.22	-2.42	-2.60	-2.76	-2.90
77	-1.34	-1.34	-1.60	-1.84	-2.05	-2.29	-2.49	-2.68	-2.84	-2.98
78	-1.41	-1.41	-1.67	-1.91	-2.12	-2.36	-2.57	-2.75	-2.91	-3.05
79	-1.48	-1.48	-1.74	-1.98	-2.19	-2.43	-2.64	-2.82	-2.98	-3.13
80	-1.54	-1.54	-1.81	-2.05	-2.26	-2.50	-2.71	-2.89	-3.06	-3.20
81	-1.61	-1.61	-1.88	-2.12	-2.33	-2.57	-2.78	-2.97	-3.13	-3.27
82	-1.68	-1.68	-1.95	-2.19	-2.40	-2.64	-2.85	-3.04	-3.20	-3.35
83	-1.74	-1.74	-2.01	-2.26	-2.47	-2.72	-2.93	-3.11	-3.28	-3.42
84	-1.81	-1.81	-2.08	-2.33	-2.55	-2.79	-3.00	-3.19	-3.35	-3.50

yd	pt (4/1)	pt (4/2)	pt (4/3)	pt (4/4)	pt (4/5)	pt (4/6)	pt (4/7)	pt (4/8)	pt (4/9)	pt (4/10)
85	-1.88	-1.88	-2.15	-2.40	-2.62	-2.86	-3.07	-3.26	-3.43	-3.57
86	-1.95	-1.95	-2.22	-2.46	-2.69	-2.93	-3.14	-3.33	-3.50	-3.65
87	-2.01	-2.01	-2.29	-2.53	-2.76	-3.00	-3.22	-3.41	-3.57	-3.72
88	-2.08	-2.08	-2.35	-2.60	-2.83	-3.07	-3.29	-3.48	-3.65	-3.79
89	-2.15	-2.15	-2.42	-2.67	-2.90	-3.14	-3.36	-3.55	-3.72	-3.87
90	-2.21	-2.21	-2.49	-2.74	-2.97	-3.21	-3.43	-3.62	-3.79	-3.94
91	-2.29	-2.29	-2.57	-2.82	-3.05	-3.30	-3.52	-3.71	-3.88	-4.03
92	-2.36	-2.36	-2.64	-2.90	-3.13	-3.38	-3.60	-3.80	-3.97	-4.12
93	-2.43	-2.43	-2.72	-2.98	-3.21	-3.46	-3.69	-3.88	-4.06	-4.21
94	-2.53	-2.53	-2.82	-3.08	-3.31	-3.56	-3.79	-3.98	-4.16	-4.31
95	-2.63	-2.63	-2.92	-3.18	-3.41	-3.66	-3.89	-4.08	-4.26	-4.41
96	-2.73	-2.73	-3.02	-3.28	-3.51	-3.76	-3.99	-4.18	-4.36	-4.51
97	-2.90	-2.90	-3.20	-3.47	-3.71	-3.98	-4.21	-4.41	-4.59	-4.75
98	-3.07	-3.07	-3.38	-3.66	-3.92	-4.19	-4.43	-4.64	-4.83	-4.99
99	-3.43	-3.43	-3.74	-4.02	-4.26	-4.53	-4.77	-4.98	-5.16	-5.32

yd	pt (4/11)	pt (4/12)	pt (4/13)	pt (4/14)	pt (4/15)	pt (4/16)	pt (4/17)	pt (4/18)	pt (4/19)	pt (4/20+)
1	0.77	0.52	0.30	0.11	-0.06	-0.21	-0.35	-0.47	-0.58	-0.67
2	0.95	0.72	0.52	0.35	0.19	0.05	-0.07	-0.18	-0.27	-0.36
3	0.92	0.71	0.52	0.36	0.21	0.08	-0.04	-0.14	-0.23	-0.31
4	0.89	0.69	0.52	0.36	0.23	0.10	0.00	-0.10	-0.18	-0.26
5	0.93	0.73	0.57	0.42	0.28	0.17	0.06	-0.03	-0.11	-0.18
6	0.96	0.78	0.61	0.47	0.34	0.23	0.13	0.04	-0.04	-0.11
7	1.00	0.82	0.66	0.52	0.40	0.29	0.19	0.11	0.04	-0.03
8	1.01	0.83	0.68	0.55	0.43	0.32	0.23	0.15	0.07	0.01
9	0.88	0.73	0.59	0.47	0.37	0.28	0.20	0.13	0.06	0.01
10	0.89	0.74	0.62	0.50	0.40	0.31	0.23	0.16	0.10	0.05
11	0.91	0.77	0.64	0.53	0.43	0.35	0.27	0.21	0.15	0.09
12	0.93	0.79	0.67	0.56	0.47	0.38	0.31	0.25	0.19	0.14
13	0.95	0.82	0.70	0.59	0.50	0.42	0.35	0.29	0.23	0.18
14	0.97	0.84	0.73	0.62	0.54	0.46	0.39	0.33	0.28	0.23
15	0.99	0.87	0.75	0.66	0.57	0.49	0.43	0.37	0.32	0.27
16	0.95	0.83	0.72	0.62	0.53	0.46	0.39	0.34	0.29	0.24
17	0.88	0.76	0.65	0.55	0.47	0.40	0.33	0.27	0.22	0.18
18	0.82	0.69	0.59	0.49	0.41	0.33	0.27	0.21	0.16	0.12
19	0.75	0.63	0.52	0.43	0.34	0.27	0.20	0.15	0.10	0.05
20	0.69	0.56	0.46	0.36	0.28	0.20	0.14	0.08	0.03	-0.01
21	0.62	0.50	0.39	0.30	0.21	0.14	0.08	0.02	-0.03	-0.07
22	0.55	0.43	0.33	0.23	0.15	0.08	0.01	-0.04	-0.09	-0.13
23	0.59	0.46	0.34	0.24	0.15	0.07	0.00	-0.07	-0.12	-0.17
24	0.53	0.39	0.28	0.17	0.08	0.00	-0.07	-0.13	-0.18	-0.23

yd	pt (4/11)	pt (4/12)	pt (4/13)	pt (4/14)	pt (4/15)	pt (4/16)	pt (4/17)	pt (4/18)	pt (4/19)	pt (4/20+)
25	0.46	0.33	0.21	0.11	0.02	-0.06	-0.13	-0.19	-0.24	-0.29
26	0.51	0.36	0.23	0.12	0.02	-0.07	-0.14	-0.21	-0.27	-0.32
27	0.44	0.30	0.17	0.05	-0.05	-0.13	-0.21	-0.28	-0.33	-0.38
28	0.50	0.34	0.20	0.07	-0.04	-0.13	-0.22	-0.29	-0.36	-0.41
29	0.44	0.27	0.13	0.01	-0.10	-0.20	-0.28	-0.36	-0.42	-0.48
30	0.37	0.21	0.06	-0.06	-0.17	-0.26	-0.35	-0.42	-0.48	-0.54
31	0.44	0.26	0.10	-0.03	-0.15	-0.26	-0.35	-0.43	-0.50	-0.56
32	0.37	0.19	0.04	-0.10	-0.22	-0.32	-0.42	-0.50	-0.57	-0.63
33	0.45	0.26	0.08	-0.07	-0.20	-0.31	-0.42	-0.50	-0.58	-0.65
34	0.38	0.19	0.02	-0.13	-0.27	-0.38	-0.48	-0.57	-0.65	-0.71
35	0.48	0.26	0.07	-0.09	-0.24	-0.36	-0.48	-0.57	-0.66	-0.73
36	0.42	0.20	0.01	-0.15	-0.30	-0.42	-0.54	-0.63	-0.72	-0.79
37	0.54	0.30	0.09	-0.09	-0.25	-0.39	-0.52	-0.62	-0.72	-0.80
38	0.69	0.42	0.19	-0.01	-0.19	-0.35	-0.49	-0.61	-0.71	-0.81
39	0.42	0.18	-0.03	-0.21	-0.37	-0.51	-0.64	-0.75	-0.84	-0.92
40	0.36	0.12	-0.09	-0.27	-0.43	-0.57	-0.70	-0.81	-0.90	-0.98
41	0.30	0.06	-0.15	-0.33	-0.49	-0.63	-0.76	-0.87	-0.96	-1.04
42	0.06	-0.16	-0.35	-0.51	-0.66	-0.79	-0.90	-0.99	-1.08	-1.15
43	0.00	-0.22	-0.41	-0.57	-0.72	-0.85	-0.96	-1.06	-1.14	-1.21
44	-0.06	-0.28	-0.47	-0.63	-0.78	-0.91	-1.02	-1.12	-1.20	-1.27
45	-0.12	-0.34	-0.53	-0.69	-0.84	-0.97	-1.08	-1.18	-1.26	-1.34
46	-0.35	-0.55	-0.72	-0.87	-1.00	-1.11	-1.21	-1.30	-1.37	-1.44
47	-0.41	-0.61	-0.78	-0.93	-1.06	-1.17	-1.27	-1.36	-1.43	-1.50
48	-0.47	-0.67	-0.84	-0.99	-1.12	-1.23	-1.33	-1.42	-1.50	-1.56
49	-0.68	-0.86	-1.01	-1.14	-1.26	-1.37	-1.46	-1.53	-1.60	-1.66
50	-0.74	-0.92	-1.07	-1.21	-1.32	-1.43	-1.52	-1.59	-1.66	-1.72
51	-0.80	-0.98	-1.13	-1.27	-1.38	-1.49	-1.58	-1.66	-1.72	-1.78
52	-0.86	-1.04	-1.19	-1.33	-1.44	-1.55	-1.64	-1.72	-1.78	-1.84
53	-1.06	-1.22	-1.35	-1.48	-1.58	-1.67	-1.76	-1.83	-1.89	-1.94
54	-1.12	-1.28	-1.41	-1.54	-1.64	-1.73	-1.82	-1.89	-1.95	-2.00
55	-1.18	-1.34	-1.48	-1.60	-1.70	-1.79	-1.88	-1.95	-2.01	-2.06
56	-1.36	-1.50	-1.63	-1.74	-1.83	-1.92	-1.99	-2.05	-2.11	-2.16
57	-1.42	-1.56	-1.69	-1.80	-1.89	-1.98	-2.05	-2.11	-2.17	-2.22
58	-1.48	-1.62	-1.75	-1.86	-1.95	-2.04	-2.11	-2.17	-2.23	-2.28
59	-1.54	-1.68	-1.81	-1.92	-2.01	-2.10	-2.17	-2.23	-2.29	-2.34
60	-1.71	-1.84	-1.95	-2.05	-2.14	-2.21	-2.28	-2.33	-2.38	-2.43
61	-1.77	-1.90	-2.01	-2.11	-2.20	-2.27	-2.34	-2.39	-2.44	-2.49
62	-1.83	-1.96	-2.07	-2.17	-2.26	-2.33	-2.40	-2.45	-2.50	-2.55
63	-1.89	-2.02	-2.13	-2.23	-2.32	-2.39	-2.46	-2.51	-2.57	-2.61
64	-1.95	-2.08	-2.19	-2.29	-2.38	-2.45	-2.52	-2.58	-2.63	-2.67
65	-2.11	-2.23	-2.33	-2.42	-2.49	-2.56	-2.62	-2.67	-2.72	-2.76
66	-2.19	-2.30	-2.40	-2.49	-2.57	-2.64	-2.70	-2.75	-2.79	-2.83

yd	pt (4/11)	pt (4/12)	pt (4/13)	pt (4/14)	pt (4/15)	pt (4/16)	pt (4/17)	pt (4/18)	pt (4/19)	pt (4/20+)
67	-2.26	-2.38	-2.48	-2.57	-2.65	-2.71	-2.77	-2.83	-2.87	-2.91
68	-2.34	-2.45	-2.55	-2.64	-2.72	-2.79	-2.85	-2.90	-2.95	-2.99
69	-2.41	-2.53	-2.63	-2.72	-2.80	-2.87	-2.93	-2.98	-3.03	-3.07
70	-2.49	-2.60	-2.71	-2.80	-2.88	-2.94	-3.01	-3.06	-3.11	-3.15
71	-2.56	-2.68	-2.78	-2.87	-2.95	-3.02	-3.08	-3.14	-3.18	-3.22
72	-2.63	-2.75	-2.86	-2.95	-3.03	-3.10	-3.16	-3.21	-3.26	-3.30
73	-2.80	-2.91	-3.00	-3.09	-3.16	-3.22	-3.28	-3.33	-3.37	-3.41
74	-2.88	-2.98	-3.08	-3.16	-3.23	-3.30	-3.35	-3.40	-3.45	-3.48
75	-2.95	-3.06	-3.15	-3.24	-3.31	-3.38	-3.43	-3.48	-3.52	-3.56
76	-3.03	-3.13	-3.23	-3.31	-3.39	-3.45	-3.51	-3.56	-3.60	-3.64
77	-3.10	-3.21	-3.31	-3.39	-3.46	-3.53	-3.59	-3.64	-3.68	-3.72
78	-3.18	-3.29	-3.38	-3.47	-3.54	-3.61	-3.66	-3.71	-3.76	-3.80
79	-3.25	-3.36	-3.46	-3.54	-3.62	-3.68	-3.74	-3.79	-3.83	-3.87
80	-3.33	-3.44	-3.53	-3.62	-3.69	-3.76	-3.82	-3.87	-3.91	-3.95
81	-3.40	-3.51	-3.61	-3.70	-3.77	-3.84	-3.90	-3.95	-3.99	-4.03
82	-3.48	-3.59	-3.69	-3.77	-3.85	-3.91	-3.97	-4.02	-4.07	-4.11
83	-3.55	-3.66	-3.76	-3.85	-3.92	-3.99	-4.05	-4.10	-4.15	-4.19
84	-3.63	-3.74	-3.84	-3.92	-4.00	-4.07	-4.13	-4.18	-4.22	-4.26
85	-3.70	-3.81	-3.91	-4.00	-4.08	-4.15	-4.20	-4.26	-4.30	-4.34
86	-3.78	-3.89	-3.99	-4.08	-4.15	-4.22	-4.28	-4.33	-4.38	-4.42
87	-3.85	-3.96	-4.06	-4.15	-4.23	-4.30	-4.36	-4.41	-4.46	-4.50
88	-3.93	-4.04	-4.14	-4.23	-4.31	-4.38	-4.44	-4.49	-4.54	-4.58
89	-4.00	-4.12	-4.22	-4.31	-4.38	-4.45	-4.51	-4.57	-4.61	-4.65
90	-4.08	-4.19	-4.29	-4.38	-4.46	-4.53	-4.59	-4.64	-4.69	-4.73
91	-4.16	-4.28	-4.38	-4.47	-4.55	-4.62	-4.69	-4.74	-4.79	-4.83
92	-4.25	-4.37	-4.48	-4.57	-4.65	-4.72	-4.78	-4.83	-4.88	-4.92
93	-4.34	-4.46	-4.57	-4.66	-4.74	-4.81	-4.87	-4.93	-4.98	-5.02
94	-4.44	-4.56	-4.67	-4.76	-4.84	-4.91	-4.97	-5.03	-5.08	-5.12
95	-4.54	-4.66	-4.77	-4.86	-4.94	-5.01	-5.07	-5.13	-5.18	-5.22
96	-4.64	-4.76	-4.87	-4.96	-5.04	-5.11	-5.17	-5.23	-5.28	-5.32
97	-4.89	-5.02	-5.13	-5.22	-5.31	-5.38	-5.45	-5.50	-5.56	-5.60
98	-5.14	-5.27	-5.38	-5.48	-5.57	-5.65	-5.72	-5.78	-5.83	-5.88
99	-5.47	-5.59	-5.71	-5.80	-5.89	-5.97	-6.03	-6.09	-6.14	-6.19

The next step was to apply this to an actual game. The recent AFC playoff between Pittsburgh and Kansas City (January 15, 2017) was chosen, which Pittsburgh won 18-16. [9] The results follow.

<b>DRIVE pit-01</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(15:00 - 1st) C.Santos kicks 63 yards from KC 35 to PIT 2. J.Gilbert to PIT 30 for 28 yards (A.Sherman).	-1.00	0.89	1.89
1st and 10 at PIT 30			
(14:54 - 1st) (Shotgun) B.Roethlisberger pass incomplete short middle to L.Bell (D.Poe).	0.89	0.39	-0.50
2nd and 10 at PIT 30			
(14:50 - 1st) (Shotgun) B.Roethlisberger pass short right to A.Brown to PIT 37 for 7 yards (R.Parker).	0.39	0.81	0.42
3rd and 3 at PIT 37			
(14:14 - 1st) (No Huddle, Shotgun) B.Roethlisberger pass short left to E.Rogers to PIT 41 for 4 yards (E.Berry).	0.81	1.55	0.74
1st and 10 at PIT 41			
(13:38 - 1st) (No Huddle, Shotgun) B.Roethlisberger pass short right to J.James to KC 46 for 13 yards (R.Parker; D.Sorensen).	1.55	2.34	0.79
1st and 10 at KC 46			
(12:58 - 1st) (No Huddle, Shotgun) B.Roethlisberger pass short middle to J.James to KC 30 for 16 yards (M.Peters; E.Berry).	2.34	3.40	1.06
1st and 10 at KC 30			
(12:16 - 1st) (No Huddle, Shotgun) L.Bell right guard to KC 24 for 6 yards (J.Jenkins).	3.40	3.88	0.48
2nd and 4 at KC 24			
(11:38 - 1st) L.Bell right guard to KC 13 for 11 yards (J.Houston).	3.88	4.76	0.88
1st and 10 at KC 13			
(11:01 - 1st) (Shotgun) L.Bell up the middle to KC 5 for 8 yards (R.Wilson).	4.76	5.50	0.74
2nd and 2 at KC 5			
(10:18 - 1st) (No Huddle, Shotgun) B.Roethlisberger pass incomplete short right to L.Bell.	5.50	5.00	-0.50
3rd and 2 at KC 5			
(10:11 - 1st) (No Huddle, Shotgun) B.Roethlisberger pass short left to E.Rogers to KC 4 for 1 yard (R.Parker).	5.00	3.13	-1.87
4th and 1 at KC 4			
(9:38 - 1st) Chris Boswell 22 Yd Field Goal	3.13	3.00	-0.13
	<b>RESULT</b>		
	-1.00	3.00	<b>4.00</b>

<b>DRIVE KCI-01</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(9:38 - 1st) C.Boswell kicks 45 yards from PIT 35 to KC 20. D.Harris to KC 45 for 25 yards (D.Heyward-Bey).	0.28	1.79	1.51
1st and 10 at KC 45			
(9:31 - 1st) (Shotgun) S.Ware right guard to PIT 48 for 7 yards (J.Harrison).	1.79	2.22	0.43
2nd and 3 at PIT 48			
(9:01 - 1st) (No Huddle) T.Hill right end to PIT 41 for 7 yards (R.Shazier).	2.22	2.64	0.42
1st and 10 at PIT 41			
(8:11 - 1st) (Shotgun) A.Smith pass short right to T.Kelce to PIT 20 for 21 yards (S.Davis).	2.64	4.20	1.56
1st and 10 at PIT 20			
(7:24 - 1st) (Shotgun) A.Smith pass short middle to T.Hill to PIT 13 for 7 yards (B.Dupree).	4.20	4.84	0.64
2nd and 3 at PIT 13			
(6:48 - 1st) A.Smith pass short left to J.Maclin to PIT 5 for 8 yards (A.Burns).	4.84	5.50	0.66
1st and Goal at PIT 5			
(6:09 - 1st) Albert Wilson Pass From Alex Smith for 5 Yrds C.Santos extra point is Good	5.50	7.00	1.50
	<b>RESULT</b>		
	0.28	7.00	<b>6.72</b>

Let's analyze Kansas City's scoring drive. Kansas City receives the punt at their own 20 (potential 1<sup>st</sup> and 10 from 80 yards away gives starting SUV = 0.28) and returns it 25 yards to the 45 (finishing SUV for 1<sup>st</sup> and 10 from 55 yards away = 1.79), an increase in SUV of  $1.79 - 0.28 = 1.51$ . Next is a 7-yard gain to Pittsburgh's 48, making it 2<sup>nd</sup> and 7, which has an SUV = 2.22 for an increase of  $2.22 - 1.79 = 0.43$ . Another run for 7 yards yields a 1<sup>st</sup> and 10 at Pittsburgh's 41, an SUV = 2.64 and another increase of  $2.64 - 2.22 = 0.42$ . A 20-yard completion to the Pittsburgh 20 yields another 1<sup>st</sup> and 10, with an SUV = 4.20 for another gain of  $4.20 - 2.64 = 1.56$ . Next is a 7-yard completion to the 13, where the SUV for 2<sup>nd</sup> and 3 is 4.84 – an increase of  $4.84 - 4.20 = 0.64$ . Another completion to the 5 yields 1<sup>st</sup> and goal with an SUV = 5.50 (for 1<sup>st</sup> and 10 or less), an increase of  $5.50 - 4.84 = 0.66$ . Finally a touchdown pass, with a successful extra point yields 7.00 points and a final SUV gain of  $7.00 - 5.50 = 1.50$ . Summing all the SUV changes yields 6.72, which happens to be the difference between the final SUV (7.00) and the starting SUV (0.28), as expected.

Continuing with the game ...

<b>DRIVE pit-02</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(6:09 - 1st) C.Santos kicks 65 yards from KC 35 to end zone, Touchback.	0.59	0.59	0.00
1st and 10 at PIT 25			
(6:09 - 1st) L.Bell left guard to PIT 25 for no gain (R.Wilson).	0.59	0.09	-0.50
2nd and 10 at PIT 25			
(5:33 - 1st) (Shotgun) B.Roethlisberger pass incomplete short right to A.Brown.	0.09	-0.41	-0.50
3rd and 10 at PIT 25			
(5:28 - 1st) (Shotgun) B.Roethlisberger pass deep left to A.Brown to KC 23 for 52 yards (J.Houston).	-0.41	3.96	4.37
1st and 10 at KC 23			
(4:44 - 1st) (No Huddle, Shotgun) B.Roethlisberger pass incomplete short right to J.James.	3.96	3.46	-0.50
2nd and 10 at KC 23			
(4:41 - 1st) (Shotgun) B.Roethlisberger pass short right to E.Rogers pushed ob at KC 20 for 3 yards (S.Nelson).	3.46	3.50	0.04
3rd and 7 at KC 20			
(4:02 - 1st) (Shotgun) B.Roethlisberger pass incomplete short left to A.Brown.	3.50	1.37	-2.13
4th and 7 at KC 20			
(3:51 - 1st) Chris Boswell 38 Yd Field Goal	1.37	3.00	1.63
	<b>RESULT</b>		
	0.59	3.00	<b>2.41</b>

<b>DRIVE KCI-02</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(3:51 - 1st) C.Boswell kicks 65 yards from PIT 35 to KC 0. T.Hill to KC 12 for 12 yards (V.Williams).	0.59	-0.20	-0.79
1st and 10 at KC 12			
(3:46 - 1st) A.Smith pass incomplete deep right to S.Ware.	-0.20	-0.70	-0.50
2nd and 10 at KC 12			
(3:39 - 1st) (Shotgun) A.Smith pass short middle to T.Kelce to KC 25 for 13 yards (M.Mitchell).	-0.70	0.59	1.29
1st and 10 at KC 25			
(2:56 - 1st) (Shotgun) A.Smith pass short right to S.Ware pushed ob at KC 29 for 4 yards (R.Cockrell).	0.59	0.73	0.14
2nd and 6 at KC 29			
(2:15 - 1st) (Shotgun) C.West right guard to KC 29 for no gain (R.Shazier). PENALTY on KC-M.Morse, Offensive Holding, 10 yards, enforced at KC 29 - No Play.	0.73	-0.88	-1.61
2nd and 16 at KC 19			
(1:44 - 1st) (Shotgun) A.Smith pass incomplete short right to D.Harris [J.Harrison]. Penalty on KC-L.Duvernay-Tardif, Ineligible Downfield Pass, declined.	-0.88	-1.38	-0.50
3rd and 16 at KC 19			
(1:35 - 1st) (Shotgun) A.Smith pass short left to T.Hill to KC 28 for 9 yards (A.Burns).	-1.38	-1.97	-0.59
4th and 7 at KC 28			
(0:56 - 1st) D.Colquitt punts 43 yards to PIT 29, Center-J.Winchester, fair catch by A.Brown.	-1.97	-0.83	1.14
	<b>RESULT</b>		
	0.59	-0.83	<b>-1.42</b>

Also, let's analyze this drive, which resulted in a punt and included a penalty. The kickoff was taken in the end zone, which potentially is a 1<sup>st</sup> and 10 and the 25, giving a starting SUV from 75 yards away = 0.59. The kick was returned only 12 yards for a finishing SUV for 1<sup>st</sup> and 10 and 88 yards away = -0.20, a negative SUV change of  $-0.20 - 0.559 = -0.79$ . An incomplete pass makes it 2<sup>nd</sup> and 10, an SUV = -0.70 for a loss of 0.50 (negative SUV). Next is a 13-yard completion to the 25, where the SUV for 1<sup>st</sup> and 10 is 0.59, a gain of 1.29. Another completion for 4 yards yields 2<sup>nd</sup> and 6, with an SUV = 0.73 for another gain of 0.14. The next play is nullified by offensive holding, so it becomes 2<sup>nd</sup> and 16 from 71 yards away, with an SUV = -0.88, resulting in a decrease of 1.61. An incompletion makes it 3<sup>rd</sup> and 16, reducing the SUV to -0.88, another drop of 0.50. A completion of 9 yards still leaves 4<sup>th</sup> and 7 from 72 yards away, an SUV = -1.97, representing yet another decrease of 0.59. Kansas City punts to the Pittsburgh 29, where there is a fair catch and a starting SUV for the Steelers of 0.83, which is evaluated as a negative for Kansas City, i.e., -0.83. However, this play results in a gain of 1.14 from -1.97 to -0.83. Overall, this drive has a negative SUV of -1.42, again the difference between the finishing SUV of -0.38 and the starting SUV of 0.59.

Continuing now through the rest of the game ...

<b>DRIVE pit-03</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
1st and 10 at PIT 29			
(0:48 - 1st) (Shotgun) B.Roethlisberger right guard to PIT 33 for 4 yards (T.Smith).	0.83	0.97	0.14
2nd and 6 at PIT 33			
(0:14 - 1st) (Shotgun) L.Bell up the middle to PIT 38 for 5 yards (R.Wilson; T.Hali).	0.97	0.87	-0.10
3rd and 1 at PIT 38			
(15:00 - 2nd) L.Bell up the middle to PIT 40 for 2 yards (J.Houston).	0.87	1.49	0.62
1st and 10 at PIT 40			
(14:29 - 2nd) (No Huddle, Shotgun) L.Bell right tackle to PIT 49 for 9 yards (R.Parker).	1.49	2.16	0.67
2nd and 1 at PIT 49			
(13:58 - 2nd) (No Huddle) L.Bell up the middle to KC 45 for 6 yards (D.Poe; C.Jones).	2.16	2.40	0.24
1st and 10 at KC 45			
(13:20 - 2nd) (No Huddle) L.Bell right tackle to KC 38 for 7 yards (J.Houston).	2.40	2.82	0.42
2nd and 3 at KC 38			
(12:47 - 2nd) (No Huddle, Shotgun) B.Roethlisberger pass short right to A.Brown to KC 29 for 9 yards (M.Peters).	2.82	3.48	0.66
1st and 10 at KC 29			
(12:09 - 2nd) (No Huddle, Shotgun) B.Roethlisberger pass short left to J.James to KC 24 for 5 yards (S.Nelson; R.Wilson).	3.48	3.88	0.40
2nd and 5 at KC 24			
(11:24 - 2nd) (No Huddle, Shotgun) B.Roethlisberger pass short right to C.Hamilton to KC 20 for 4 yards (M.Peters).	3.88	3.70	-0.18
3rd and 1 at KC 20			
(10:57 - 2nd) (No Huddle) L.Bell up the middle to KC 17 for 3 yards (T.Smith; J.Houston).	3.70	4.44	0.74
1st and 10 at KC 17			
(10:18 - 2nd) (No Huddle, Shotgun) B.Roethlisberger pass incomplete deep middle to A.Brown (M.Peters).	4.44	3.94	-0.50
2nd and 10 at KC 17			
(10:12 - 2nd) (No Huddle, Shotgun) L.Bell left guard to KC 18 for -1 yards (E.Berry).	3.94	3.26	-0.68
3rd and 11 at KC 18			
(9:29 - 2nd) (No Huddle, Shotgun) B.Roethlisberger pass incomplete short left to L.Bell.	3.26	0.82	-2.44
4th and 11 at KC 18			
(9:18 - 2nd) Chris Boswell 36 Yd Field Goal	0.82	3.00	2.18
	<b>RESULT</b>		
	0.83	3.00	<b>2.17</b>

<b>DRIVE KCI-03</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(9:18 - 2nd) C.Boswell kicks 65 yards from PIT 35 to end zone, Touchback.	0.59	0.59	0.00
1st and 10 at KC 25			
(9:18 - 2nd) (Shotgun) S.Ware up the middle to KC 28 for 3 yards (J.Hargrave).	0.59	0.57	-0.02
2nd and 7 at KC 28			
(8:36 - 2nd) (Shotgun) A.Smith pass short left to T.Hill pushed ob at KC 35 for 7 yards (J.Harrison).	0.57	1.19	0.62
1st and 10 at KC 35			
(8:08 - 2nd) A.Smith pass short middle INTERCEPTED by R.Shazier [B.Dupree] at KC 45. R.Shazier to KC 44 for 1 yard (J.Reid).	1.19	-2.46	-3.65
	<b>RESULT</b>		
	0.59	-2.46	<b>-3.05</b>

<b>DRIVE pit-04</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
1st and 10 at KC 44			
(7:58 - 2nd) (Shotgun) L.Bell right tackle to KC 35 for 9 yards (M.Peters).	2.46	3.00	0.54
2nd and 1 at KC 35			
(7:28 - 2nd) L.Bell up the middle to KC 31 for 4 yards (R.Wilson).	3.00	3.32	0.32
1st and 10 at KC 31			
(6:48 - 2nd) (No Huddle, Shotgun) B.Roethlisberger pass short left to J.James to KC 5 for 26 yards (E.Berry).	3.32	5.50	2.18
1st and Goal at KC 5			
(6:12 - 2nd) (No Huddle) B.Roethlisberger pass short left intended for A.Brown INTERCEPTED by E.Berry (F.Zombo) - Touchback.	5.50	-0.28	-5.78
	<b>RESULT</b>		
	2.46	-0.28	<b>-2.74</b>

A brief discussion about the interception. Starting at the Kansas City 5 with 1<sup>st</sup> and goal, Pittsburgh's SUV = 5.50. The play ended with Kansas City taking over at their own 20 via the interception and touchback, for a starting Kansas City SUV = 0.28. This gave Pittsburgh a finishing SUV of -0.28 for the play and an overall decrease of 5.78 on that play.

<b>DRIVE KCI-04</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
1st and 10 at KC 20			
(6:04 - 2nd) S.Ware left guard to KC 23 for 3 yards (R.Shazier).	0.28	0.27	-0.01
2nd and 7 at KC 23			
(5:26 - 2nd) (Shotgun) A.Smith pass incomplete short right to T.Hill (B.Dupree).	0.27	-0.23	-0.50
3rd and 7 at KC 23			
(5:23 - 2nd) (Shotgun) A.Smith pass incomplete short left to S.Ware.	-0.23	-2.49	-2.26
4th and 7 at KC 23			
(5:16 - 2nd) D.Colquitt punts 38 yards to PIT 39, Center-J.Winchester. A.Brown pushed ob at PIT 45 for 6 yards (J.O'Shaughnessy).	-2.49	-1.79	0.70
	<b>RESULT</b>		
	0.28	-1.79	<b>-2.07</b>

<b>DRIVE pit-05</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
1st and 10 at PIT 45			
(5:03 - 2nd) L.Bell up the middle to PIT 47 for 2 yards (M.Peters; D.Poe).	1.79	1.61	-0.18
2nd and 8 at PIT 47			
(4:19 - 2nd) (No Huddle, Shotgun) B.Roethlisberger pass short left to A.Brown pushed ob at KC 49 for 4 yards (S.Nelson).	1.61	1.66	0.05
3rd and 4 at KC 49			
(3:38 - 2nd) (No Huddle, Shotgun) PENALTY on PIT-B.Roethlisberger, Delay of Game, 5 yards, enforced at KC 49 - No Play.	1.66	0.95	-0.71
3rd and 9 at PIT 46			
(3:15 - 2nd) (No Huddle, Shotgun) L.Bell right end pushed ob at KC 37 for 17 yards (E.Berry).	0.95	2.88	1.93
1st and 10 at KC 37			
(2:49 - 2nd) (No Huddle) L.Bell left guard to KC 31 for 6 yards (R.Nunez-Roches; R.Wilson).	2.88	3.32	0.44
2nd and 4 at KC 31			
(2:10 - 2nd) (No Huddle) L.Bell right guard to KC 25 for 6 yards (J.Jenkins).	3.32	3.80	0.48
1st and 10 at KC 25			
(2:00 - 2nd) (Shotgun) L.Bell right end to KC 24 for 1 yard (D.Ford).	3.80	3.48	-0.32
2nd and 9 at KC 24			
(1:14 - 2nd) (Shotgun) B.Roethlisberger pass short left to L.Bell to KC 27 for -3 yards (R.Wilson).	3.48	2.44	-1.04
3rd and 12 at KC 27			
(1:06 - 2nd) (Shotgun) B.Roethlisberger pass incomplete deep middle to E.Rogers (C.Jones).	2.44	0.30	-2.14
4th and 12 at KC 27			
(0:55 - 2nd) Chris Boswell 45 Yd Field Goal	0.30	3.00	2.70
	<b>RESULT</b>		
	1.79	3.00	<b>1.21</b>

<b>DRIVE KCI-05</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
0:55 - 2nd) C.Boswell kicks 70 yards from PIT 35 to KC -5. T.Hill to KC 16 for 21 yards (J.Jones; J.Dangerfield).	0.59	0.04	-0.55
1st and 10 at KC 16			
(0:50 - 2nd) (Shotgun) A.Smith pass short right to T.Hill to KC 20 for 4 yards (B.Dupree).	0.04	0.18	0.14
2nd and 6 at KC 20			
(0:26 - 2nd) (No Huddle, Shotgun) PENALTY on PIT-R.Shazier, Roughing the Passer, 15 yards, enforced at KC 20 - No Play.	0.18	1.19	1.01
1st and 10 at KC 35			
(0:20 - 2nd) (Shotgun) PENALTY on KC-Z.Fulton, False Start, 5 yards, enforced at KC 35 - No Play.	1.19	0.39	-0.80
1st and 15 at KC 30			
(0:20 - 2nd) (Shotgun) A.Smith pass incomplete short left to J.Maclin.	0.39	-0.11	-0.50
2nd and 15 at KC 30			
(0:13 - 2nd) A.Smith pass short middle to C.West to KC 38 for 8 yards. FUMBLES, RECOVERED by PIT-A.Burns at KC 40.	-0.11	-2.70	-2.59
	<b>RESULT</b>		
	0.59	-2.70	<b>-3.29</b>

<b>DRIVE pit-half</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
1st and 10 at KC 40			
(0:03 - 2nd) B.Roethlisberger pass short left to A.Brown to KC 11 for 29 yards (R.Wilson; T.Mitchell).	2.70	4.92	2.22
	<b>RESULT</b>		
	2.70	4.92	<b>2.22</b>

<b>DRIVE KCI-06</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(15:00 - 3rd) C.Boswell kicks 60 yards from PIT 35 to KC 5. T.Hill to KC 24 for 19 yards (T.Matakevich).	-0.70	0.53	1.23
1st and 10 at KC 24			
(14:55 - 3rd) (Shotgun) A.Smith pass incomplete short right to C.Conley [S.Tuitt].	0.53	-0.03	-0.56
2nd and 10 at KC 24			
(14:50 - 3rd) (Shotgun) S.Ware up the middle to KC 23 for -1 yards (J.Harrison).	-0.03	-0.69	-0.66
3rd and 11 at KC 23			
(14:08 - 3rd) (Shotgun) A.Smith pass incomplete deep middle to T.Kelce.	-0.69	-3.10	-2.41
4th and 11 at KC 23			
(14:00 - 3rd) D.Colquitt punts 54 yards to PIT 23, Center-J.Winchester. A.Brown to PIT 26 for 3 yards (A.Wilson).	-3.10	-0.65	2.45
	<b>RESULT</b>		
	-0.70	-0.65	<b>0.05</b>

<b>DRIVE pit-06</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
1st and 10 at PIT 26			
(13:48 - 3rd) (Shotgun) L.Bell up the middle to KC 36 for 38 yards (R.Wilson).	0.65	2.94	2.29
1st and 10 at KC 36			
(13:04 - 3rd) (Shotgun) L.Bell left end to KC 30 for 6 yards (R.Wilson).	2.94	3.40	0.46
2nd and 4 at KC 30			
(12:23 - 3rd) (Shotgun) L.Bell left end to KC 25 for 5 yards (E.Berry; D.Ford).	3.40	3.80	0.40
1st and 10 at KC 25			
(11:34 - 3rd) (Shotgun) B.Roethlisberger pass incomplete short left to A.Brown (C.Jones).	3.80	3.30	-0.50
2nd and 10 at KC 25			
(11:31 - 3rd) (Shotgun) L.Bell up the middle to KC 24 for 1 yard (R.Wilson; E.Berry).	3.30	2.98	-0.32
3rd and 9 at KC 24			
(10:48 - 3rd) (Shotgun) B.Roethlisberger pass short left to L.Bell to KC 25 for -1 yards (D.Poe; R.Wilson).	2.98	0.61	-2.37
4th and 10 at KC 25			
(10:06 - 3rd) Chris Boswell 43 Yd Field Goal	0.61	3.00	2.39
	<b>RESULT</b>		
	0.65	3.00	<b>2.35</b>

<b>DRIVE KCI-07</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(10:06 - 3rd) C.Boswell kicks 64 yards from PIT 35 to KC 1. T.Hill to KC 21 for 20 yards (V.Williams).	-1.40	0.34	1.74
1st and 10 at KC 21			
(9:59 - 3rd) A.Smith pass short right to S.Ware to KC 18 for -3 yards (J.Harrison) [S.Tuitt].	0.34	-0.64	-0.98
2nd and 13 at KC 18			
(9:19 - 3rd) Pass incomplete. PENALTY on PIT-R.Cockrell, Defensive Pass Interference, 20 yards, enforced at KC 18 - No Play.	-0.64	1.37	2.01
1st and 10 at KC 38			
(9:11 - 3rd) (Shotgun) S.Ware up the middle to KC 41 for 3 yards (B.Dupree).	1.37	1.35	-0.02
2nd and 7 at KC 41			
(8:33 - 3rd) A.Smith scrambles up the middle to KC 45 for 4 yards (S.Tuitt).	1.35	1.29	-0.06
3rd and 3 at KC 45			
(8:33 - 3rd) (Shotgun) Direct snap to S.Ware. S.Ware up the middle to PIT 47 for 8 yards (M.Mitchell).	1.29	2.28	0.99
1st and 10 at PIT 47			
(7:12 - 3rd) (Shotgun) A.Smith pass incomplete short middle to T.Hill.	2.28	1.78	-0.50
2nd and 10 at PIT 47			
(7:07 - 3rd) (Shotgun) T.Hill left end pushed ob at PIT 39 for 8 yards (R.Shazier).	1.78	2.26	0.48
3rd and 2 at PIT 39			
(6:27 - 3rd) (Shotgun) PENALTY on KC-A.Smith, Delay of Game, 5 yards, enforced at PIT 39 - No Play.	2.26	1.76	-0.50
3rd and 7 at PIT 44			
(6:01 - 3rd) (Shotgun) A.Smith sacked at 50 for -6 yards (J.Harrison).	1.76	-1.07	-2.83
4th and 13 at 50			
(5:22 - 3rd) D.Colquitt punts 48 yards to PIT 2, Center-J.Winchester, out of bounds.	-1.07	1.00	2.07
	<b>RESULT</b>		
	-1.40	1.00	<b>2.40</b>

<b>DRIVE pit-07</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
1st and 10 at PIT 2			
(5:12 - 3rd) L.Bell up the middle to PIT 2 for no gain (R.Wilson).	-1.00	-1.50	-0.50
2nd and 10 at PIT 2			
(4:26 - 3rd) L.Bell up the middle to PIT 11 for 9 yards (M.Peters).	-1.50	-0.76	0.74
3rd and 1 at PIT 11			
(3:49 - 3rd) L.Bell up the middle to PIT 11 for no gain (F.Zombo; D.Poe).	-0.76	-2.15	-1.39
4th and 1 at PIT 11			
(3:08 - 3rd) J.Berry punts 35 yards to PIT 46, Center-G.Warren, out of bounds.	-2.15	-2.34	-0.19
	<b>RESULT</b>		
	-1.00	-2.34	<b>-1.34</b>

<b>DRIVE KCI-08</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
1st and 10 at PIT 46			
(3:00 - 3rd) (Shotgun) A.Smith pass incomplete deep middle to T.Kelce.	2.34	1.84	-0.50
2nd and 10 at PIT 46			
(2:52 - 3rd) A.Smith scrambles to PIT 41 for 5 yards (B.Dupree). PENALTY on KC-T.Kelce, Unnecessary Roughness, 15 yards.	1.84	0.46	-1.38
3rd and 20 at KC 44			
(2:09 - 3rd) (Shotgun) A.Smith pass deep right to J.Maclin to PIT 36 for 20 yards (R.Cockrell).	0.46	2.94	2.48
1st and 10 at PIT 36			
(1:39 - 3rd) C.West left end to PIT 37 for -1 yards (J.Hargrave).	2.94	2.28	-0.66
2nd and 11 at PIT 37			
(0:58 - 3rd) (Shotgun) A.Smith pass short right to C.Conley pushed ob at PIT 30 for 7 yards (R.Cockrell).	2.28	2.90	0.62
3rd and 4 at PIT 30			
(0:19 - 3rd) (Shotgun) A.Smith pass incomplete short middle to A.Wilson.	2.90	1.64	-1.26
4th and 4 at PIT 30			
(0:10 - 3rd) Cairo Santos 48 Yd Field Goal	1.64	3.00	1.36
	<b>RESULT</b>		
	2.34	3.00	<b>0.66</b>

<b>DRIVE pit-08</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(0:10 - 3rd) C.Santos kicks 59 yards from KC 35 to PIT 6. S.Coates to PIT 30 for 24 yards (D.Thomas).	-0.60	0.89	1.49
1st and 10 at PIT 30			
(0:02 - 3rd) L.Bell up the middle to PIT 31 for 1 yard (K.Reyes).	0.89	0.55	-0.34
2nd and 9 at PIT 31			
(15:00 - 4th) (Shotgun) B.Roethlisberger pass short middle to E.Rogers to PIT 45 for 14 yards (R.Parker).	0.55	1.79	1.24
1st and 10 at PIT 45			
(14:20 - 4th) (Shotgun) L.Bell up the middle to PIT 48 for 3 yards (J.Houston).	1.79	1.77	-0.02
2nd and 7 at PIT 48			
(13:39 - 4th) (Shotgun) B.Roethlisberger pass short right to D.Ayers to KC 46 for 6 yards (R.Wilson).	1.77	2.34	0.57
3rd and 1 at KC 46			
(13:00 - 4th) (No Huddle) L.Bell up the middle to KC 44 for 2 yards (D.Sorensen).	2.34	2.16	-0.18
1st and 10 at KC 44			
(12:17 - 4th) (No Huddle, Shotgun) B.Roethlisberger pass deep middle to J.James to KC 21 for 23 yards (S.Nelson).	2.16	4.12	1.96
1st and 10 at KC 21			
(11:27 - 4th) (Shotgun) L.Bell left end to KC 19 for 2 yards (K.Reyes; R.Wilson).	4.12	3.88	-0.24
2nd and 8 at KC 19			
(10:43 - 4th) (Shotgun) B.Roethlisberger pass incomplete deep middle to E.Rogers.	3.88	3.48	-0.40
3rd and 8 at KC 19			
(10:38 - 4th) (Shotgun) B.Roethlisberger sacked at KC 25 for -6 yards (sack split by J.Jenkins and D.Ford).	3.48	0.11	-3.37
4th and 14 at KC 25			
(9:49 - 4th) Chris Boswell 43 Yd Field Goal	0.11	3.00	2.89
	<b>RESULT</b>		
	-0.60	3.00	<b>3.60</b>

<b>DRIVE KCI-09</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(9:49 - 4th) C.Boswell kicks 65 yards from PIT 35 to end zone, Touchback.	0.59	0.59	0.00
1st and 10 at KC 25			
(9:49 - 4th) (Shotgun) A.Smith pass short middle to T.Kelce to KC 49 for 24 yards (L.Timmons; J.Harrison).	0.59	2.03	1.44
1st and 10 at KC 49			
(9:03 - 4th) S.Ware up the middle to PIT 40 for 11 yards (M.Mitchell).	2.03	2.70	0.67
1st and 10 at PIT 40			
(8:21 - 4th) (Shotgun) A.Smith pass incomplete deep left to J.Maclin.	2.70	2.20	-0.50
2nd and 10 at PIT 40			
(8:15 - 4th) A.Smith pass incomplete. PENALTY on KC-S.Ware, Face Mask (15 Yards), 15 yards, enforced at PIT 40 - No Play.	2.20	1.20	-1.00
2nd and 25 at KC 45			
(8:08 - 4th) (Shotgun) A.Smith pass deep right to T.Kelce to PIT 38 for 17 yards (R.Cockrell).	1.20	2.02	0.82
3rd and 8 at PIT 38			
(7:21 - 4th) (Shotgun) A.Smith pass incomplete. A.Smith intentionally threw away the pass. No intended receiver.	2.02	0.89	-1.13
4th and 8 at PIT 38			
(7:11 - 4th) (Shotgun) A.Smith pass short right to C.Conley to PIT 26 for 12 yards (R.Shazier).	0.89	3.72	2.83
1st and 10 at PIT 26			
(6:25 - 4th) T.Hill up the middle to PIT 23 for 3 yards (R.Shazier).	3.72	3.76	0.04
2nd and 7 at PIT 23			
(5:43 - 4th) (Shotgun) A.Smith pass short right to A.Wilson to PIT 25 for -2 yards (R.Cockrell).	3.76	2.90	-0.86
3rd and 9 at PIT 25			
(4:53 - 4th) A.Smith pass incomplete. PENALTY on PIT-S.Davis, Unnecessary Roughness, 13 yards, enforced at PIT 25 - No Play.	2.90	4.84	1.94
1st and 10 at PIT 12			
(4:47 - 4th) (Shotgun) A.Smith pass short left to C.West to PIT 6 for 6 yards (M.Mitchell; S.Davis).	4.84	5.40	0.56
2nd and 4 at PIT 6			
(4:14 - 4th) (Shotgun) A.Smith pass short middle to T.Kelce to PIT 4 for 2 yards (W.Gay).	5.40	5.10	-0.30
3rd and 2 at PIT 4			
(3:34 - 4th) (Shotgun) A.Smith pass incomplete short right to D.Harris.	5.10	3.13	-1.97
4th and 2 at PIT 4			
(3:29 - 4th) A.Smith pass short right to A.Sherman to PIT 1 for 3 yards (S.Davis; R.Cockrell).	3.13	6.50	3.37
1st and Goal at PIT 1			
(2:43 - 4th) Spencer Ware 1 Yard Rush TWO-POINT CONVERSION ATTEMPT. A.Smith pass to J.Maclin is incomplete. ATTEMPT FAILS.	6.50	6.00	-0.50
	<b>RESULT</b>		
	0.59	6.00	<b>5.41</b>

<b>DRIVE pit-end</b>	<b>SUV: start</b>	<b>finish</b>	<b>delta</b>
(2:43 - 4th) C.Santos kicks 58 yards from KC 35 to PIT 7. J.Gilbert to PIT 5 for -2 yards (E.Murray).	-0.50	-0.70	-0.20
1st and 10 at PIT 5			
(2:38 - 4th) L.Bell up the middle to PIT 7 for 2 yards (C.Jones).	-0.70	-0.80	-0.10
2nd and 8 at PIT 7			
(2:32 - 4th) B.Roethlisberger pass short left to E.Rogers to PIT 12 for 5 yards (S.Nelson).	-0.80	-0.70	0.10
3rd and 3 at PIT 12			
(2:00 - 4th) (Shotgun) B.Roethlisberger pass short right to A.Brown ran ob at PIT 19 for 7 yards.	-0.70	0.22	0.92
1st and 10 at PIT 19			
(1:51 - 4th) B.Roethlisberger kneels to PIT 18 for -1 yards.	0.22	-0.44	-0.66
2nd and 11 at PIT 18			
(1:12 - 4th) B.Roethlisberger kneels to PIT 17 for -1 yards.	-0.44	-1.10	-0.66
3rd and 12 at PIT 17			
(0:32 - 4th) B.Roethlisberger kneels to PIT 16 for -1 yards.	-1.10	-3.84	-2.74
	<b>RESULT (with kneel)</b>		
	-0.50	-3.84	<b>-3.34</b>
	<b>RESULT (without kneel)</b>		
	-0.50	0.22	<b>0.72</b>

Note that the green highlighted entries represent kneel-downs, so results are shown both with and without their SUVs.

The following summarize all the drives and give the total SUVs for the game, broken down by type of play and for three individual players (one quarterback, one running back and one wide receiver) for each team. The green entries for Pittsburgh remove the SUVs from the kneel-downs. Incomplete passes are attributed fully to the quarterback, except if there is a clear indication that the receiver dropped the ball, in which case he receives full negative credit. Pass completions are halved between the quarterback and receiver. Individual players also get (or lose) credit for kick returns and penalties. Quarterback runs are attributed solely to the quarterback (so a sack is treated as a run, not a pass). Quarterbacks get full negative credit for interceptions, unless there is clear indication that the receiver bobbled the ball causing the interception. Other “judgmental” assignments can be made as needed based on particulars of a play.

### PITTSBURGH

DRIVE	Ben	Bell	Brown	kick	run	pass	pen.	kneel	punt	FG	SUM	CUMU
01	-0.430	2.100	0.210	1.89	2.10	0.14	0.00	0.00	0.00	-0.13	4.00	4.00
02	-0.925	-0.500	2.185	0.00	-0.50	1.28	0.00	0.00	0.00	1.63	2.41	6.41
03	-2.360	1.910	0.330	0.00	2.05	-2.06	0.00	0.00	0.00	2.18	2.17	8.58
04	-4.690	0.860	0.000	0.00	0.86	-3.60	0.00	0.00	0.00	0.00	-2.74	5.84
05	-3.345	1.830	0.385	0.00	2.35	-3.13	-0.71	0.00	0.00	2.70	1.21	7.05
half	1.110	0.000	1.110	0.00	0.00	2.22	0.00	0.00	0.00	0.00	2.22	9.27
06	-1.685	1.645	0.180	0.00	2.83	-2.87	0.00	0.00	0.00	2.39	2.35	11.62
07	0.000	-1.150	0.000	0.00	-1.15	0.00	0.00	0.00	-0.19	0.00	-1.34	10.28
08	-1.885	-0.780	0.000	1.49	-4.15	3.37	0.00	0.00	0.00	2.89	3.60	13.88
end	-3.550	-0.100	0.460	-0.20	-0.10	1.02	0.00	-4.06	0.00	0.00	-3.34	10.54
T	-17.760	5.815	4.860	3.18	4.29	-3.63	-0.71	-4.06	-0.19	11.66	10.54	10.54
end	0.510	-0.100	0.460	-0.20	-0.10	1.02	0.00	0.00	0.00	0.00	0.72	14.60
T	-13.700	5.815	4.860	3.18	4.29	-3.63	-0.71	0.00	-0.19	11.66	14.60	14.60

Brown SUVs include two punt returns in KCI-04 (in pit-05, 6 yards from Pit 39 for +0.36) and KCI-06 (in pit-06, 3 yards from Pit 23 for +0.18).

### KANSAS CITY

DRIVE	Smith	Hill	Kelce	kick	run	pass	pen.	kneel	punt	FG	SUM	CUMU
01	2.180	0.740	0.780	1.51	0.85	4.36	0.00	0.00	0.00	0.00	6.72	6.72
02	-1.645	-1.085	0.645	-0.79	0.00	-0.16	-1.61	0.00	1.14	0.00	-1.42	5.30
03	-3.340	0.310	0.000	0.00	-0.02	-3.03	0.00	0.00	0.00	0.00	-3.05	2.25
04	-2.760	0.000	0.000	0.00	-0.01	-2.76	0.00	0.00	0.70	0.00	-2.07	0.18
05	-0.190	0.070	0.000	-0.55	0.00	-2.95	0.21	0.00	0.00	0.00	-3.29	-3.11
06	-2.970	1.230	0.000	1.23	-0.66	-2.97	0.00	0.00	2.45	0.00	0.05	-3.06
07	-4.380	2.220	0.000	1.74	-1.44	-1.48	1.51	0.00	2.07	0.00	2.40	-0.66
08	-0.210	0.000	-1.380	0.00	-0.66	1.34	-1.38	0.00	0.00	1.36	0.66	0.00
09	0.330	0.040	0.980	0.00	0.21	4.26	0.94	0.00	0.00	0.00	5.41	5.41
T	-12.985	3.525	1.025	3.14	-1.73	-3.39	-0.33	0.00	6.36	1.36	5.41	5.41

Smith SUVs includes completed pass fumbled by receiver in KCI-05 (8 yards from KCI 30 for +0.48/2 = +0.24).

The results suggest that, while the game was very close (an 18-16 Pittsburgh victory via a missed two-point conversion by Kansas City at the end), Pittsburgh dominated the play (SUV = 14.60 vs. 5.41), given they drove for six field goals and nearly a touchdown (end zone interception).

Following this exercise, it was clear that some expediting could be done, in particular assigning the SUV for each play to the particular type of play (kick, run, pass, etc.), as this would streamline the summation effort at the end. This was done for the next game, the Giants’ 20-19 Super Bowl XXV win over Buffalo, when Norwood missed the field goal “wide right” at the end. This game also had a safety, which will be discussed.

DRIVE Buf-01											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
		Bahr kick to B 14, D. Smith 20 return (Bahr).	-0.08	1.13							1.21
B 34	1-10	Kelly pressured, pass to Reed right overthrown, incomplete.	1.13			0.63					-0.50
B 34	2-10	Kelly 4 pass to Reed middle (G. Jackson).	0.63			0.77					0.14
B 38	3-6	Kelly 5 pass to Reed middle (G. Jackson, Howard).	0.77			-0.06					-0.83
B 43	4-1	Tuten 46 punt, Meggett 20 return (Tuten).	-0.06						-0.95		-0.89
<b>Total</b>			2.39	1.21	0.00	-1.19	0.00	0.00	-0.89	0.00	<b>-0.87</b>

DRIVE Nyg-01											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
N 31	1-10	Anderson run left, no gain (Wright). Play nullified and Buffalo penalized 5 for offsides (Talley).	0.95				1.25				0.30
N 36	1-5	Meggett 4 run off right tackle (B. Smith).	1.25		1.49						0.24
N 40	2-1	Carthon 3 run middle (Bennett, Bentley).	1.49		1.67						0.18
N 43	1-10	Hostetler rollout right, 13 pass to Cross (L. Smith). Holding against Buffalo (Odomes) declined.	1.67			2.46					0.79
B 44	1-10	Meggett fell down in backfield, then 10 run left (L. Smith, Kelso).	2.46		3.08						0.62
B 34	1-10	Hostetler deep pass to wide-open Bavaro middle overthrown, incomplete.	3.08			2.58					-0.50
B 34	2-10	Meggett 3 draw left (Conlan).	2.58		2.62						0.04
B 31	3-7	Hostetler 16 pass to Ingram crossing middle (caught at B 26) (Talley).	2.62			4.60					1.98
B 15	1-10	Anderson 3 run right (Conlan).	4.60		4.64						0.04
B 12	2-7	Hostetler rollout right, 1 run (Seals).	4.64		4.32						-0.32
B 11	3-6	Hostetler pass to Ingram left end zone broken up (Hicks), incomplete.	4.32			1.97					-2.35
B 11	4-6	Bahr, 28-yard field goal (7:14).	1.97							3.00	1.03
<b>Total</b>			31.63	0.00	-3.52	4.24	0.30	0.00	0.00	1.03	<b>2.05</b>

DRIVE Buf-02											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
		Bahr kick to B 5, D. Smith 24 return (Rouson).	-0.70	0.83							1.53
B 29	1-10	Thomas 2 Shotgun draw middle (Thompson).	0.83		0.65						-0.18
B 31	2-8	Kelly 61 pass to Lofton deep left (caught at NY 20) off deflection by P. Williams (Walls).	0.65			5.20					4.55
N 8	1-go	Kelly pass to McKeller middle incomplete.	5.20			4.90					-0.30
N 8	2-go	Thomas 3 Shotgun draw middle (Howard).	4.90		5.00						0.10
N 5	3-go	Kelly pass to Thomas left goal line broken up (Walls), incomplete.	5.00			2.72					-2.28
N 5	4-go	Norwood, 23-yard field goal (5:51).	2.72							3.00	0.28
<b>Total</b>			<b>18.60</b>	<b>1.53</b>	<b>-0.08</b>	<b>1.97</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>0.28</b>	<b>3.70</b>

DRIVE Nyg-02											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
		Norwood kick into end zone, touchback.	0.28	0.28							0.00
N 20	1-10	Anderson 5 run left (B. Smith).	0.28		0.53						0.25
N 25	2-5	Hostetler 5 scramble left (Bennett).	0.53		0.89						0.36
N 30	1-10	Meggett 3 sweep right (Talley, Wright).	0.89		0.87						-0.02
N 33	2-7	Hostetler 17 pass to Baker left off deflection by Cross (Odomes, Kelso).	0.87			2.09					1.22
50	1-10	Anderson 4 run middle (Seals).	2.09		2.24						0.15
B 46	2-6	Hostetler pressured, pass to Baker right sideline overthrown, incomplete.	2.24			1.74					-0.50
B 46	3-6	Hostetler pressured, pass to Meggett crossing middle dropped, incomplete.	1.74			0.66					-1.08
B 46	4-6	Landeta 46 punt, touchback.	0.66						-0.28		-0.94
<b>Total</b>			<b>9.58</b>	<b>0.00</b>	<b>0.74</b>	<b>-0.36</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.94</b>	<b>0.00</b>	<b>-0.56</b>

DRIVE Buf-03											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
B 20	1-10	Thomas 3 run middle (Howard).	0.28		0.27						-0.01
B 23	2-7	Kelly 11 pass to Reed right (Thompson, Collins).	0.27			1.13					0.86
B 34	1-10	Kelly 4 pass to Reed left (Thompson, Banks).	1.13			1.27					0.14
B 38	2-6	Buffalo penalized 5 for false start (Ritcher).	1.27				0.47				-0.80
B 33	2-11	Kelly 20 pass to Reed middle (Collins, Walls).	0.47			2.28					1.81
N 47	1-10	Thomas 6 Shotgun draw left (Reasons).	2.28		2.64						0.36
N 41	2-4	Kelly 13 pass to Thomas short right (Banks).	2.64		3.56						0.92
N 28	1-10	K. Davis 3 run right (Howard).	3.56		3.60						0.04
N 25	2-7	Kelly 9 pass to Reed crossing right (Collins).	3.60			4.52					0.92
N 16	1-10	Thomas 3 run right (Johnson).	4.52		4.56						0.04
N 13	2-7	Kelly 5 pass to McKeller left (Guyton).	4.56			4.70					0.14
N 8	3-2	New York penalized 4 (half the distance) for roughing the passer (Marshall). New York—first time out (13:14).	4.70				5.60				0.90
N 4	1-go	Mueller 3 run middle (Taylor).	5.60		6.50						0.90
N 1	2-go	D. Smith 1 run right, touchdown (12:30). Norwood kicked extra point.	6.50		7.00						0.50
<b>Total</b>			41.38	0.00	2.75	3.87	0.10	0.00	0.00	0.00	<b>6.72</b>

DRIVE Nyg-03											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
		Norwood kick to NY 10, Duerson 22 return (Tasker).	-0.32	1.01							1.33
N 32	1-10	Hostetler 2 scramble left (out of bounds).	1.01		0.83						-0.18
N 34	2-8	Anderson 2 run middle (Wright).	0.83		0.65						-0.18
N 36	3-6	Hostetler hit as he threw (Seals), pass to Kyles incomplete.	0.65			-1.00					-1.65
N 36	4-6	Landeta 37 punt, Edwards fair catch.	-1.00						-0.71		0.29
<b>Total</b>			1.17	1.33	-0.36	-1.65	0.00	0.00	0.29	0.00	<b>-0.39</b>

DRIVE Buf-04											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
B 27	1-10	Thomas 14 run left (Walls, P. Williams).	0.71		1.55						0.84
B 41	1-10	Thomas 4 run left (Johnson).	1.55		1.69						0.14
B 45	2-6	Kelly pass to Reed right broken up (Guyton), incomplete.	1.69			1.19					-0.50
B 45	3-6	New York penalized 5 for offsides (Howard).	1.19				1.59				0.40
50	3-1	Kelly pass to Reed middle dropped, incomplete.	1.59			0.36					-1.23
50	4-1	Tuten 43 punt, Meggett fair catch.	0.36						0.50		0.14
<b>Total</b>			7.09	0.00	-0.71	-0.04	0.40	0.00	0.14	0.00	<b>-0.21</b>

DRIVE Nyg-04											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
N 7	1-10	Hostetler 7 pass to Anderson middle (K. Jackson).	-0.50			-0.08					0.42
N 14	2-3	Anderson 3 run middle (Bentley). Play nullified and New York penalized 7 (half the distance) for holding (Oates).	-0.08				-1.00				-0.92
N 7	2-10	Hostetler tripped over Anderson, regained footing, then sacked, loss of 7 (B. Smith), SAFETY (8:27). Buffalo penalized 5 for excessive celebration (B. Smith), assessed on free kick. Landeta free kick from NY 25 to B 15. Treated as if kick went to B 25 (if no penalty).	-1.00		-2.59						-1.59
Buffalo penalized 5 for excessive celebration (B. Smith), assessed on free kick. Landeta free kick from NY 25 to B 15. Treated as if kick went to B 25, with 10-yd penalty taking it back to 15.			-0.59				0.02				0.61
<b>Total</b>			-2.17	0.00	-1.59	0.42	-0.31	0.00	0.00	0.00	<b>-1.48</b>

The safety and post-safety excessive celebration penalty were treated separately. For the safety, the Giants started 2<sup>nd</sup> and 10 from their own 7, an SUV = -1.00 at 93 yards away. The safety resulted in a loss of 2.00 points and a free kick, which was treated as giving the ball to Buffalo at their 25 (SUV = 0.59), where they would have been without the 10-yard penalty. Thus, the finishing SUV was the negative sum of the safety (-2.00) and Buffalo's assumed starting position (-0.59), or -2.59, resulting in an SUV decrease for the play of -1.59. The penalty was treated as Buffalo getting the ball at their 25 and losing 10 yards, a change in SUV from 0.59 to -0.02 for them, or from -0.59 to +0.02 for the Giants, an increase of 0.61.

DRIVE Buf-05											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
Landeta free kick from NY 25 to B 15, Edwards 15 return (Rouson).			-0.02	0.89							0.91
B 30	1-10	Kelly pass to Reed deep right broken up (Guyton), incomplete.	0.89			0.39					-0.50
B 30	2-10	Kelly pass to McKeller middle incomplete.	0.39			-0.11					-0.50
B 30	3-10	Kelly pressured, pass to McKeller left overthrown, incomplete.	-0.11			-2.35					-2.24
B 30	4-10	Tuten 47 punt, Meggett fair catch.	-2.35						-0.47		1.88
<b>Total</b>			-1.20	0.91	0.00	-3.24	0.00	0.00	1.88	0.00	<b>-0.45</b>

DRIVE Nyg-05											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
N 23	1-10	Anderson 3 run left (Wright).	0.47		0.45						-0.02
N 26	2-7	Anderson 4 run left (Baldinger, Conlan).	0.45		0.39						-0.06
N 30	3-3	Hostetler pass batted down at line (Seals), incomplete.	0.39			-0.87					-1.26
N 30	4-3	Landeta 54 punt, Edwards fair catch.	-0.87						-0.04		0.83
<b>Total</b>			0.44	0.00	-0.08	-1.26	0.00	0.00	0.83	0.00	<b>-0.51</b>

DRIVE Buf-06											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
B 16	1-10	Thomas 18 run right (Guyton).	0.04		1.13						1.09
B 34	1-10	Thomas 4 run middle (Howard, Banks).	1.13		1.27						0.14
B 38	2-6	Kelly 10 screen pass to Thomas right (Collins).	1.27			2.22					0.95
B 48	1-10	Kelly 8 pass to Thomas right (G. Jackson).	2.22			2.46					0.24
N 44	2-2	Kelly pass to Lofton left goal line incomplete.	2.46			1.96					-0.50
N 44	3-2	Buffalo penalized 5 for false start (Wolford).	1.96				1.46				-0.50
N 49	3-7	Kelly 5 pass to Reed crossing right (Banks).	1.46			0.73					-0.73
N 44	4-2	Tuten 31 punt, Meggett fair catch.	0.73						0.14		-0.59
<b>Total</b>			11.27	0.00	1.23	-0.04	-0.50	0.00	-0.59	0.00	<b>0.10</b>

DRIVE Nyg-06											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
N 13	1-10	Hostetler rollout right, 6 pass to Bavaro (Conlan).	-0.14			0.22					0.36
N 19	2-4	Anderson 18 run right middle (Kelso).	0.22		1.31						1.09
N 37	1-10	Hostetler 22 pass to Ingram right sideline (out of bounds).	1.31			2.64					1.33
B 41	1-10	Meggett 17 run around left end (L. Smith, Kelso). Two-Minute Warning at 1:55.	2.64		3.88						1.24
B 24	1-10	Hostetler pass to Carthon left overthrown, incomplete.	3.88		3.38						-0.50
B 24	2-10	Hostetler 3 dump-off pass to Carthon left (Conlan). New York-second time out (1:13).	3.38			3.42					0.04
B 21	3-7	Hostetler 7 pass to Cross left (crawled 1 for first down) (Bennett).	3.42			4.68					1.26
B 14	1-10	Hostetler rollout right, pass batted down (Bennett), incomplete.	4.68			4.18					-0.50
B 14	2-10	Hostetler pass to Baker middle end zone underthrown, incomplete.	4.18			3.68					-0.50
B 14	3-10	Hostetler 14 pass to Baker left front corner of end zone, touchdown (:25). Bahr kicked extra point.	3.68			7.00					3.32
<b>Total</b>			27.25	0.00	1.83	5.31	0.00	0.00	0.00	0.00	<b>7.14</b>

DRIVE Buf-half											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
Bahr kick to B 4, D. Smith recovered own fumble, 9 return.			-0.80	-0.14							0.66
B 13	1-10	Kelly knelt down, loss of 1.	-0.14					-0.80			-0.66
<b>Total</b>			-0.94	0.66	0.00	0.00	0.00	-0.66	0.00	0.00	<b>0.00</b>

DRIVE Nyg-07											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
		Norwood kick to NY 9, Meggett 16 return (Gardner).	-0.38	0.59							0.97
N 25	1-10	Hostetler rollout right, pressured, pass to Cross incomplete.	0.59			0.49					-0.10
N 25	2-10	New York penalized 5 for false start (Kratch).	0.49				-0.72				-1.21
N 20	2-15	Hostetler 7 screen pass to Meggett left (Odomes).	-0.72			-0.09					0.63
N 27	3-8	Hostetler 11 pass to Meggett middle (caught at NY 30) (Odomes).	-0.09			1.37					1.46
N 38	1-10	Meggett 4 sweep left (Bentley).	1.37		1.51						0.14
N 42	2-6	Anderson 5 run middle (Seals, Bentley).	1.51		1.41						-0.10
N 47	3-1	Anderson 24 run around left end (Kelso, Bennett).	1.41		3.48						2.07
B 29	1-10	Carthon 5 run left (Wright).	3.48		3.88						0.40
B 24	2-5	Meggett 15 run right (Kelso). Play nullified and New York penalized 10 for holding (Bavaro).	3.88				2.08				-1.80
B 34	2-15	Hostetler 2 scramble middle (Wright, Pike).	2.08		1.94						-0.14
B 32	3-13	Hostetler 14 pass to Ingram middle (caught at B 26, then broke two tackles) (J. Williams).	1.94			4.36					2.42
B 18	1-10	Anderson 5 run middle (Lodish).	4.36		4.76						0.40
B 13	2-5	Meggett 1 run right (Bennett, K. Jackson).	4.76		4.34						-0.42
B 12	3-4	Hostetler rollout left, 9 pass to Cross (L. Smith).	4.34			5.90					1.56
B 3	1-go	Anderson 2 run middle (L. Smith).	5.90		6.50						0.60
B 1	2-go	Anderson 1 run off left end, touchdown (5:31) Bahr kicked extra point.	6.50		7.00						0.50
<b>Total</b>			41.42	0.97	3.45	5.97	-3.01	0.00	0.00	0.00	<b>7.38</b>

DRIVE Buf-07											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
		Bahr kick to B 7, Edwards 33 return (Bahr, Abrams).	-0.50	1.49							1.99
B 40	1-10	Thomas 8 run middle (Walls, G. Jackson).	1.49		1.97						0.48
B 48	2-2	Kelly 5 scramble middle (G. Jackson).	1.97		2.28						0.31
N 47	1-10	Thomas 2 run middle (Reasons).	2.28		2.10						-0.18
N 45	2-8	Kelly pass to Reed incomplete. Play nullified and Buffalo penalized 10 for offensive pass interference (McKeller).	2.10				0.49				-1.61
B 45	2-18	Kelly pass to Edwards left sideline overthrown, incomplete. Holding against Buffalo (J. Davis) declined.	0.49		0.60						0.11
B 45	3-18	Kelly sacked, loss of 7 (Marshall).	0.60		-2.55						-3.15
B 38	4-25	Tuten 20 punt, out of bounds.	-2.55						-1.61		0.94
<b>Total</b>			5.88	1.99	-2.54	0.11	-1.61	0.00	0.94	0.00	<b>-1.11</b>

DRIVE Nyg-08											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
N 42	1-10	Hostetler rollout left, 10 pass to Cross (Odomes).	1.61			2.22					0.61
B 48	1-10	Hostetler pass to Baker left sideline incomplete. Play nullified and Buffalo penalized 5 for holding (Odomes). Automatic first down.	2.22				2.52				0.30
B 43	1-10	Anderson run right, no gain (Conlan, Bennett).	2.52			2.02					-0.50
B 43	2-10	Hostetler rollout left, sacked, loss of 1 (forced out by Wright).	2.02		1.36						-0.66
B 44	3-11	Hostetler 9 pass to Ingram left (L. Smith).	1.36			0.67					-0.69
B 35	4-2	Anderson run left, loss of 2 (B. Smith).	0.67		-2.88						-3.55
<b>Total</b>			10.40	0.00	-5.57	0.78	0.30	0.00	0.00	0.00	<b>-4.49</b>

DRIVE Buf-08											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
B 37	1-10	Kelly 9 pass to Thomas left (Howard).	2.88			1.85					-1.03
B 46	2-1	Kelly 4 screen pass to K. Davis left (Reasons, Walls).	1.85			2.09					0.24
50	1-10	Kelly 19 pass to K. Davis left (Reasons, P. Williams).	2.09			3.32					1.23
N 31	1-10	Thomas 31 shotgun draw middle, broke 2 tackles, then bounced out right and down sideline, touchdown (14:52). Norwood kicked extra point.	3.32		7.00						3.68
<b>Total</b>			10.14	0.00	3.68	0.44	0.00	0.00	0.00	0.00	<b>4.12</b>

DRIVE Nyg-09											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
		Norwood kick to NY 13, Meggett 10 return (Mueller).	-0.14	0.47							0.61
N 23	1-10	Anderson 3 run middle (Seals).	0.47		0.45						-0.02
N 26	2-7	Hostetler pressured, deep pass to Ingram overthrown, incomplete.	0.45			-0.05					-0.50
N 26	3-7	Hostetler 17 pass to Bavaro right (Conlan).	-0.05			1.67					1.72
N 43	1-10	Anderson 7 run right (K. Jackson).	1.67		2.09						0.42
50	2-3	Carthon 4 run middle (Baldinger).	2.09		2.34						0.25
B 46	1-10	Hostetler 19 pass to Bavaro middle (L. Smith).	2.34			3.64					1.30
B 27	1-10	Hostetler 13 pass to Ingram right (L. Smith).	3.64			4.68					1.04
B 14	1-10	Anderson 4 run left (Drane, Talley).	4.68		4.90						0.22
B 10	2-6	Hostetler 1 pass to Bavaro right (Conlan, L. Smith). New York--first time out (10:57).	4.90			4.60					-0.30
B 9	3-5	Meggett 6 run around right end (Bentley).	4.60		5.90						1.30
B 3	1-go	Anderson run left, loss of 4 (Wright).	5.90		5.10						-0.80
B 7	2-go	Anderson 4 run middle (Bailey, Conlan).	5.10		5.40						0.30
B 3	3-go	Hostetler pass batted down (Bennett), incomplete.	5.40			3.30					-2.10
B 3	4-go	Bahr, 21-yard field goal (7:20).	3.30							3.00	-0.30
<b>Total</b>			<b>44.35</b>	<b>0.61</b>	<b>1.67</b>	<b>1.16</b>	<b>0.00</b>	<b>0.00</b>	<b>0.00</b>	<b>-0.30</b>	<b>3.14</b>

DRIVE Buf-09											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
		Bahr kick to B 7, D. Smith 13 return (Brown).	-0.50	0.28							0.78
B 20	1-10	Thomas 4 run right end (Collins, Banks).	0.28		0.43						0.15
B 24	2-6	Kelly 15 pass to Thomas right sideline (Collins).	0.43			1.43					1.00
B 39	1-10	Kelly 1 scramble right (Johnson).	1.43		1.09						-0.34
B 40	2-9	K. Davis 1 Shotgun draw left (Marshall).	1.09		0.75						-0.34
B 41	3-8	Kelly pass to Edwards broken up (P. Williams), incomplete.	0.75			-0.99					-1.74
B 41	4-8	Tuten 46 punt, Meggett 17 return (Tasker).	-0.99						0.89		1.88
<b>Total</b>			<b>2.49</b>	<b>0.78</b>	<b>-0.53</b>	<b>-0.74</b>	<b>0.00</b>	<b>0.00</b>	<b>1.88</b>	<b>0.00</b>	<b>1.39</b>

DRIVE Nyg-10											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
N 30	1-10	Anderson 5 run left (Bailey, Talley).	-0.89		1.19						2.08
N 35	2-5	Anderson 9 run middle (Conlan, Bailey).	1.19		1.73						0.54
N 44	1-10	Meggett run right, no gain (Lodish). Buffalo-first time out (3:33).	1.73		1.23						-0.50
N 44	2-10	Hostetler 7 pass to Bavaro right (Kelso). New York-second time out (2:41).	1.23			1.66					0.43
B 49	3-3	Hostetler 1 Shotgun draw middle (Seals). Buffalo-second time out (2:22).	1.66		0.49						-1.17
B 48	4-2	Landeta 38 punt, Edwards fair catch.	0.49						0.32		-0.17
<b>Total</b>			5.41	0.00	0.95	0.43	0.00	0.00	-0.17	0.00	<b>1.21</b>

DRIVE Buf-10											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
B 10	1-10	Kelly 8 scramble middle (Johnson). Two-Minute Warning.	-0.32		0.16						0.48
B 18	2-2	Kelly 1 scramble middle (Howard).	0.16		-0.28						-0.44
B 19	3-1	Thomas 22 Shotgun draw middle, then left (Walls).	-0.28		1.55						1.83
B 41	1-10	Kelly 4 pass to Reed middle (Banks).	1.55			1.69					0.14
B 45	2-6	Kelly 9 scramble middle (Banks). Buffalo-third time out (:48).	1.69		2.34						0.65
N 46	1-10	Kelly 6 pass to McKeller right (shoestring catch) (Thompson). Official time out with :29 remaining for replay review.	2.34			2.70					0.36
N 40	2-4	Thomas 11 Shotgun draw right (Collins).	2.70		3.48						0.78
N 29	1-10	Kelly spiked ball to stop clock. (:08). New York-third time out.	3.48			2.98					-0.50
N 29	2-10	Norwood's 47-yard field-goal attempt was wide right.	2.98							-0.83	-3.81
<b>Total</b>			14.30	0.00	3.30	0.00	0.00	0.00	0.00	-3.81	<b>-0.51</b>

DRIVE Nyg-end											
Yard	Down	Play	Start	Kick	Run	Pass	Pen.	Knee	Punt	FG	Delta
N 29	1-10	Hostetler knelt down, loss of 1.	0.83					0.29			-0.54
<b>Total</b>			0.83	0.00	0.00	0.00	0.00	-0.54	0.00	0.00	<b>-0.54</b>

Nyg Summary												
DRIVE	Hoss	Meggett	Bavaro	kick	run	pass	pen.	kneel	punt	FG	SUM	CUMU
01	2.535	2.110	0.000	0.00	-3.52	4.24	0.30	0.00	0.00	1.03	2.05	2.05
02	0.470	-1.100	0.000	0.00	0.74	-0.36	0.00	0.00	-0.94	0.00	-0.56	1.49
03	-1.830	0.000	0.000	1.33	-0.36	-1.65	0.00	0.00	0.29	0.00	-0.39	1.10
04	-2.380	0.000	0.000	0.00	-1.59	0.42	-0.31	0.00	0.00	0.00	-1.48	-0.38
05	-1.260	0.000	0.000	0.00	-0.08	-1.26	0.00	0.00	0.83	0.00	-0.51	-0.89
06	2.155	1.240	0.180	0.00	1.83	5.31	0.00	0.00	0.00	0.00	7.14	6.25
07	2.795	1.735	-1.800	0.97	3.45	5.97	-3.01	0.00	0.00	0.00	7.38	13.63
08	0.160	0.000	0.000	0.00	-5.57	0.78	0.30	0.00	0.00	0.00	-4.49	9.14
09	-0.720	1.910	1.360	0.61	1.67	1.16	0.00	0.00	0.00	-0.30	3.14	12.28
10	-0.955	-0.500	0.215	0.00	0.95	0.43	0.00	0.00	-0.17	0.00	1.21	13.49
end	-0.540	1.030	0.000	0.00	0.00	0.00	0.00	-0.54	0.00	0.00	-0.54	12.95
Total	0.430	6.425	-0.045	2.91	-2.48	15.04	-2.72	-0.54	0.01	0.73	12.95	12.95
end	0.000	1.030	0.000	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	13.49
Total	0.970	6.425	-0.045	2.91	-2.48	15.04	-2.72	0.00	0.01	0.73	13.49	13.49

Meggett SUVs include two punt returns in Buf-01 (in Nyg-01, 20 yards from Nyg 11 for +1.21) and Buf-09 (in Nyg-10, 17 yards from Nyg 13 for +1.03).

Buf Summary												
DRIVE	Kelly	Thomas	Reed	kick	run	pass	pen.	kneel	punt	FG	SUM	CUMU
01	-0.845	0.000	-0.345	1.21	0.00	-1.19	0.00	0.00	-0.89	0.00	-0.87	-0.87
02	-0.305	-0.080	0.000	1.53	-0.08	1.97	0.00	0.00	0.00	0.28	3.70	2.83
03	1.475	0.850	1.865	0.00	2.75	3.87	0.10	0.00	0.00	0.00	6.72	9.55
04	1.190	0.980	-1.230	0.00	-0.71	-0.04	0.40	0.00	0.14	0.00	-0.21	9.34
05	-3.240	0.000	0.000	0.91	0.00	-3.24	0.00	0.00	1.88	0.00	-0.45	8.89
06	-0.270	1.705	-0.365	0.00	1.23	-0.04	-0.50	0.00	-0.59	0.00	0.10	8.99
half	-0.660	0.000	0.000	0.66	0.00	0.00	0.00	-0.66	0.00	0.00	0.00	8.99
07	-2.730	0.300	0.000	1.99	-2.54	0.11	-1.61	0.00	0.94	0.00	-1.11	7.88
08	0.220	3.165	0.000	0.00	3.68	0.44	0.00	0.00	0.00	0.00	4.12	12.00
09	-1.580	0.650	0.000	0.78	-0.53	-0.74	0.00	0.00	1.88	0.00	1.39	13.39
10	0.440	2.610	0.070	0.00	3.30	0.00	0.00	0.00	0.00	-3.81	-0.51	12.88
Total	-6.305	10.180	-0.005	7.08	7.10	1.14	-1.61	-0.66	3.36	-3.53	12.88	12.88
half	0.000	0.000	0.000	0.66	0.00	0.00	0.00	0.00	0.00	0.00	0.66	13.54
Total	-5.645	10.180	-0.005	7.08	7.10	1.14	-1.61	0.00	3.36	-3.53	13.54	13.54

Again, the green highlighted entries remove the SUVs for kneel-downs. The SUVs for both teams are essentially equal, consistent with the closeness of the game and the fact that both teams scored two touchdowns and drove far enough for two field goal attempts each, with Buffalo missing its last one (partially compensated with the safety).

Another streamlining effort for a future time would be to assign EXCEL Name Labels to each specific triplet of field position, down and yards to go, such that, rather than looking this up from the tables manually, they could automatically be entered into a spreadsheet. For example, if “1<sup>st</sup> down, 10 yards to go, from 55 yards away” (SUV = 1.79) were labeled as “55\_1\_10-,” entering this directly would automatically provide the SUV (note the “10-“ where the minus sign means the SUV is the same for all 1<sup>st</sup> and 10 yards or less).

### 3. SUV BASKETBALL

SUV for NCAA Men's basketball begins with the concept of the worth, in points, of a possession where there is an attempted score. Reference [11] lists the shooting percentages for 351 NCAA Men's teams for the NCAA season 2015-16. These are listed below, accompanied by their statistics.

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
1	Michigan St	43.4%	1	Belmont	62.6%	1	Connecticut	79.3%
2	Oklahoma	42.2%	2	Villanova	57.4%	2	Villanova	78.2%
3	S Methodist	42.0%	3	Marshall	57.2%	3	Norfolk St	78.1%
4	Indiana	41.5%	4	Iowa State	56.7%	4	WI-Milwkee	77.5%
5	Kansas	41.3%	5	St Marys	56.4%	5	NW State	77.4%
6	St Marys	41.0%	6	Indiana	56.2%	6	St Bonavent	77.3%
7	Wofford	40.9%	7	Maryland	55.8%	7	Incarnate Word	77.1%
8	N Florida	40.9%	8	Utah	55.5%	8	Oakland	77.0%
9	IPFW	40.3%	9	E Washingt	55.4%	9	Denver	77.0%
10	Virginia	40.2%	10	Richmond	55.4%	10	Maryland	76.9%
11	Oakland	39.8%	11	Weber State	55.3%	11	Monmouth	76.8%
12	Arkansas	39.7%	12	Wm & Mary	54.7%	12	Davidson	76.3%
13	E Kentucky	39.5%	13	N Florida	54.7%	13	High Point	76.0%
14	Butler	39.3%	14	Ste F Austin	54.5%	14	N Iowa	75.8%
15	Lehigh	39.3%	15	Creighton	54.5%	15	Gonzaga	75.8%
16	Middle Tenn	39.2%	16	Gonzaga	54.3%	16	Oral Roberts	75.7%
17	Harvard	39.1%	17	Denver	54.3%	17	Pittsburgh	75.6%
18	Incarnate Word	38.9%	18	Furman	54.2%	18	Wofford	75.4%
19	Jacksonville	38.9%	19	E Kentucky	54.2%	19	Ohio	75.4%
20	USC	38.7%	20	Hawaii	54.1%	20	Geo Wshgtn	75.3%
21	Iowa State	38.7%	21	N Carolina	53.9%	21	Virginia	75.2%
22	Colorado	38.6%	22	Winthrop	53.9%	22	Albany	75.2%
23	Duke	38.5%	23	Boise State	53.7%	23	Georgetown	75.1%
24	E Washingt	38.4%	24	Rice	53.4%	24	Winthrop	75.1%
25	BYU	38.4%	25	Massachusetts Lowell	53.2%	25	Neb Omaha	74.9%
26	Denver	38.3%	26	Evansville	53.2%	26	Rice	74.9%
27	E Tenn St	38.3%	27	Miami (FL)	53.2%	27	Miami (FL)	74.9%
28	Vanderbilt	38.2%	28	Duquesne	53.1%	28	Toledo	74.8%
29	Akron	38.2%	29	Notre Dame	52.9%	29	Hartford	74.8%
30	Vermont	38.2%	30	Kentucky	52.9%	30	Ste F Austin	74.8%
31	AR Lit Rock	38.2%	31	Purdue	52.8%	31	TN Tech	74.7%
32	Charlotte	38.2%	32	Portland St	52.7%	32	N Carolina	74.7%
33	Drake	38.2%	33	Kansas	52.7%	33	S Dakota St	74.7%
34	Ohio	38.2%	34	Oregon	52.6%	34	Illinois	74.6%
35	High Point	38.2%	35	Vermont	52.6%	35	Purdue	74.4%
36	Columbia	38.1%	36	UAB	52.6%	36	Texas Tech	74.2%
37	Princeton	38.1%	37	Miss State	52.6%	37	Notre Dame	74.2%

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
38	Arizona	38.1%	38	Virginia	52.6%	38	Mercer	74.2%
39	Oral Roberts	38.0%	39	Neb Omaha	52.6%	39	TX A&M-CC	74.1%
40	Michigan	38.0%	40	Elon	52.6%	40	Canisius	74.1%
41	Utah State	37.9%	41	Michigan	52.6%	41	Manhattan	74.0%
42	Gonzaga	37.9%	42	Iona	52.5%	42	Michigan	74.0%
43	Wright State	37.8%	43	S Methodist	52.5%	43	Jksnville St	73.8%
44	W Illinois	37.8%	44	Marquette	52.4%	44	New Mexico	73.8%
45	Miami (FL)	37.5%	45	TX Southern	52.3%	45	NJIT	73.7%
46	Notre Dame	37.4%	46	St Josephs	52.3%	46	Fairfield	73.7%
47	Iowa	37.4%	47	Ohio	52.3%	47	Chattanooga	73.5%
48	Oregon St	37.4%	48	Arizona	52.2%	48	Miami (OH)	73.5%
49	Baylor	37.4%	49	Houston	52.1%	49	E Kentucky	73.5%
50	Montana	37.3%	50	Florida St	52.1%	50	Nevada	73.4%
51	St Bonavent	37.3%	51	Liberty	52.0%	51	Loyola-Chi	73.4%
52	Northeastrn	37.2%	52	Princeton	52.0%	52	Marist	73.3%
53	Central Ark	37.2%	53	WI-Milwkee	52.0%	53	Central Mich	73.3%
54	N Iowa	37.2%	54	LA Tech	52.0%	54	Citadel	73.3%
55	Wyoming	37.2%	55	LSU	52.0%	55	Columbia	73.3%
56	Stony Brook	37.2%	56	Louisville	51.9%	56	Colorado	73.3%
57	Montana St	37.2%	57	Albany	51.8%	57	Indiana	73.3%
58	Geo Wshgtn	37.1%	58	Montana	51.8%	58	N Hampshire	73.3%
59	UAB	37.0%	59	Toledo	51.7%	59	Arkansas St	73.2%
60	Iona	37.0%	60	Northwestern	51.6%	60	Butler	73.1%
61	Youngs St	37.0%	61	Dayton	51.6%	61	Xavier	73.0%
62	Colgate	37.0%	62	W Kentucky	51.5%	62	Houston Bap	73.0%
63	Ball State	36.9%	63	Fla Gulf Cst	51.5%	63	Drake	73.0%
64	Ste F Austin	36.9%	64	Yale	51.4%	64	Nebraska	73.0%
65	Florida Intl	36.8%	65	Michigan St	51.4%	65	E Michigan	73.0%
66	Georgia	36.8%	66	Georgetown	51.4%	66	Oklahoma St	72.9%
67	Wm & Mary	36.8%	67	Texas A&M	51.3%	67	Michigan St	72.9%
68	UMKC	36.8%	68	TN Tech	51.3%	68	Idaho State	72.9%
69	Siena	36.8%	69	TX El Paso	51.3%	69	AR Lit Rock	72.9%
70	North Dakota	36.7%	70	U Penn	51.3%	70	Portland	72.8%
71	UC Irvine	36.7%	71	N Iowa	51.3%	71	Belmont	72.8%
72	Lg Beach St	36.7%	72	Fordham	51.2%	72	Liberty	72.7%
73	Purdue	36.7%	73	Bucknell	51.2%	73	Marquette	72.6%
74	Kentucky	36.6%	74	Davidson	51.1%	74	Evansville	72.6%
75	Monmouth	36.6%	75	Tulsa	51.1%	75	N Florida	72.6%
76	Duquesne	36.6%	76	California	51.1%	76	Utah Val St	72.6%
77	SE Louisiana	36.5%	77	NJIT	51.1%	77	Loyola Mymt	72.6%
78	Detroit	36.5%	78	NC-Wilmgton	51.0%	78	Howard	72.5%
79	Lafayette	36.5%	79	Boston U	51.0%	79	Tennessee	72.5%

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
80	TX El Paso	36.5%	80	Duke	51.0%	80	Washington	72.5%
81	Connecticut	36.5%	81	New Mexico	51.0%	81	N Colorado	72.5%
82	Rhode Island	36.5%	82	Austin Peay	51.0%	82	Miss State	72.5%
83	Valparaiso	36.5%	83	S Illinois	51.0%	83	Valparaiso	72.5%
84	Belmont	36.4%	84	James Mad	50.9%	84	Providence	72.5%
85	N Colorado	36.4%	85	Wyoming	50.8%	85	Baylor	72.5%
86	South Dakota	36.4%	86	Central Mich	50.8%	86	Utah	72.4%
87	F Dickinson	36.4%	87	Siena	50.7%	87	Fla Atlantic	72.4%
88	Winthrop	36.4%	88	N Mex State	50.7%	88	Lehigh	72.4%
89	Idaho	36.4%	89	Stony Brook	50.7%	89	Clemson	72.3%
90	S Utah	36.4%	90	Florida Intl	50.7%	90	Duke	72.3%
91	Abilene Christian	36.3%	91	Chattanooga	50.7%	91	Campbell	72.3%
92	Utah	36.3%	92	Samford	50.6%	92	Memphis	72.2%
93	Portland	36.3%	93	Lipscomb	50.6%	93	GA Tech	72.2%
94	Xavier	36.3%	94	Detroit	50.6%	94	Northeastrn	72.2%
95	NC-Grnsboro	36.3%	95	Columbia	50.5%	95	Oklahoma	72.2%
96	W Kentucky	36.3%	96	South Dakota	50.5%	96	Siena	72.2%
97	UCLA	36.3%	97	Pittsburgh	50.4%	97	Arizona	72.1%
98	New Mexico	36.3%	98	Wake Forest	50.4%	98	Stetson	72.1%
99	Toledo	36.3%	99	Campbell	50.4%	99	IPFW	72.1%
100	Illinois	36.3%	100	E Tenn St	50.4%	100	Wm & Mary	72.0%
101	California	36.3%	101	Navy	50.4%	101	Dartmouth	71.9%
102	Stetson	36.2%	102	Maryland BC	50.4%	102	Wichita St	71.9%
103	Maryland	36.2%	103	Colgate	50.3%	103	Princeton	71.8%
104	Colorado St	36.2%	104	W Virginia	50.3%	104	Colorado St	71.8%
105	Villanova	36.2%	105	Wash State	50.3%	105	Iowa	71.7%
106	Morehead St	36.2%	106	NC-Asheville	50.2%	106	Cal St Nrdge	71.7%
107	Massachusetts Lowell	36.2%	107	BYU	50.2%	107	Oregon	71.7%
108	Boston U	36.1%	108	Central FL	50.1%	108	Samford	71.6%
109	Liberty	36.1%	109	Vanderbilt	50.1%	109	Bucknell	71.6%
110	S Dakota St	36.1%	110	Hofstra	50.1%	110	St Josephs	71.6%
111	Manhattan	36.1%	111	Murray St	50.1%	111	Santa Clara	71.6%
112	Murray St	36.1%	112	VCU	50.1%	112	Boston U	71.5%
113	Yale	36.0%	113	UNLV	50.1%	113	LIU-Brooklyn	71.5%
114	Syracuse	36.0%	114	TN State	50.1%	114	Presbyterian	71.5%
115	Evansville	35.9%	115	Citadel	50.1%	115	Murray St	71.5%
116	UC Davis	35.9%	116	LA Monroe	50.0%	116	UAB	71.5%
117	WI-Milwkee	35.9%	117	Fairfield	50.0%	117	TN Martin	71.5%
118	S Mississippi	35.9%	118	Connecticut	50.0%	118	Wash State	71.4%
119	TN Tech	35.9%	119	LA Lafayette	49.9%	119	Wyoming	71.4%
120	Brown	35.9%	120	Ball State	49.9%	120	Youngs St	71.4%
121	Northwestern	35.8%	121	Butler	49.9%	121	W Michigan	71.4%

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
122	Bucknell	35.8%	122	High Point	49.8%	122	Kansas	71.3%
123	St Fran (PA)	35.8%	123	TN Martin	49.8%	123	NC A&T	71.3%
124	UCSB	35.8%	124	North Texas	49.8%	124	Loyola-MD	71.2%
125	GA Tech	35.7%	125	Baylor	49.8%	125	S Car State	71.2%
126	SC Upstate	35.7%	126	Xavier	49.8%	126	Vermont	71.1%
127	Idaho State	35.6%	127	Longwood	49.7%	127	Iona	71.1%
128	Chattanooga	35.6%	128	S Dakota St	49.7%	128	UC Riverside	71.1%
129	Richmond	35.6%	129	S Car State	49.6%	129	VA Military	71.1%
130	Hofstra	35.6%	130	Rob Morris	49.6%	130	Buffalo	71.0%
131	N Illinois	35.6%	131	E Michigan	49.5%	131	W Illinois	71.0%
132	Grand Canyon	35.6%	132	NW State	49.5%	132	GA Southern	71.0%
133	App State	35.6%	133	Radford	49.5%	133	Maryland ES	70.9%
134	Weber State	35.5%	134	TX-Arlington	49.5%	134	S Utah	70.9%
135	Seattle	35.5%	135	Maryland ES	49.5%	135	Mississippi	70.9%
136	Houston Bap	35.5%	136	F Dickinson	49.5%	136	IUPUI	70.9%
137	Davidson	35.5%	137	LIU-Brooklyn	49.5%	137	Minnesota	70.8%
138	Cal Poly	35.4%	138	Stetson	49.4%	138	W Carolina	70.8%
139	S Carolina	35.4%	139	Nebraska	49.4%	139	Georgia	70.8%
140	Fairfield	35.4%	140	USC	49.4%	140	UCSB	70.8%
141	Bowling Grn	35.4%	141	Charl South	49.4%	141	Missouri	70.8%
142	Hartford	35.4%	142	Pacific	49.3%	142	Boise State	70.8%
143	N Kentucky	35.3%	143	UC Irvine	49.3%	143	Idaho	70.8%
144	Loyola-Chi	35.3%	144	Oakland	49.3%	144	Wagner	70.8%
145	Mercer	35.3%	145	Army	49.3%	145	South Dakota	70.7%
146	Central Mich	35.2%	146	Houston Bap	49.3%	146	Abilene Christian	70.7%
147	Creighton	35.2%	147	Sacred Hrt	49.2%	147	Brown	70.7%
148	VCU	35.2%	148	Utah State	49.2%	148	S Mississippi	70.6%
149	NJIT	35.1%	149	Clemson	49.2%	149	Houston	70.5%
150	Clemson	35.1%	150	Wichita St	49.2%	150	Cincinnati	70.5%
151	Kennesaw St	35.1%	151	Texas Tech	49.2%	151	Longwood	70.5%
152	Lipscomb	35.0%	152	Sac State	49.2%	152	NC-Wilmgton	70.5%
153	James Mad	35.0%	153	N Dakota St	49.1%	153	SIU Edward	70.4%
154	San Fransco	35.0%	154	SE Louisiana	49.1%	154	W Kentucky	70.3%
155	Pittsburgh	35.0%	155	NC-Grnsboro	49.1%	155	Wisconsin	70.3%
156	WI-Grn Bay	35.0%	156	Coastal Car	49.1%	156	App State	70.3%
157	Wisconsin	34.9%	157	VA Tech	49.1%	157	Saint Louis	70.3%
158	Georgia St	34.8%	158	Alab A&M	49.0%	158	E Tenn St	70.2%
159	Santa Clara	34.8%	159	Ohio State	49.0%	159	N Arizona	70.2%
160	NC State	34.8%	160	IPFW	49.0%	160	TX-Arlington	70.2%
161	Houston	34.8%	161	Kent State	49.0%	161	Iowa State	70.2%
162	VA Tech	34.8%	162	Buffalo	49.0%	162	TX-San Ant	70.1%
163	Cincinnati	34.8%	163	AR Lit Rock	48.9%	163	Coppin State	70.1%

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
164	Norfolk St	34.7%	164	Rider	48.9%	164	NC-Asheville	70.1%
165	Louisville	34.7%	165	N Colorado	48.8%	165	S Methodist	70.0%
166	Nebraska	34.7%	166	Florida	48.8%	166	Creighton	70.0%
167	Seton Hall	34.7%	167	U Mass	48.8%	167	U Mass	69.9%
168	Austin Peay	34.7%	168	Seton Hall	48.8%	168	NC State	69.9%
169	Texas Tech	34.6%	169	St Bonavent	48.8%	169	Fresno St	69.8%
170	Longwood	34.6%	170	UCLA	48.8%	170	TN State	69.8%
171	Fordham	34.6%	171	E Illinois	48.8%	171	Utah State	69.8%
172	Utah Val St	34.6%	172	Old Dominion	48.7%	172	Charlotte	69.8%
173	Wash State	34.6%	173	Kansas St	48.7%	173	LA Lafayette	69.8%
174	Jksnville St	34.5%	174	Loyola-MD	48.7%	174	Lipscomb	69.8%
175	LA Monroe	34.5%	175	North Dakota	48.7%	175	LA Monroe	69.7%
176	UC Riverside	34.5%	176	Iowa	48.7%	176	VA Tech	69.7%
177	Fresno St	34.4%	177	DePaul	48.6%	177	Kennesaw St	69.7%
178	NC-Wilmgton	34.4%	178	N Kentucky	48.6%	178	E Carolina	69.7%
179	E Illinois	34.4%	179	Lehigh	48.6%	179	Indiana St	69.7%
180	Oregon	34.4%	180	Alabama	48.5%	180	St Fran (PA)	69.6%
181	TN Martin	34.4%	181	WI-Grn Bay	48.5%	181	F Dickinson	69.6%
182	Radford	34.4%	182	CS Bakersfld	48.5%	182	American	69.6%
183	Dayton	34.4%	183	San Fransco	48.5%	183	Detroit	69.6%
184	CS Bakersfld	34.3%	184	Northeastrn	48.5%	184	Furman	69.6%
185	Dartmouth	34.3%	185	Mercer	48.5%	185	Penn State	69.6%
186	S Illinois	34.3%	186	Geo Wshgtn	48.4%	186	Florida St	69.5%
187	DePaul	34.3%	187	GA Tech	48.4%	187	Niagara	69.5%
188	NW State	34.3%	188	Texas	48.4%	188	Vanderbilt	69.5%
189	Fla Gulf Cst	34.2%	189	UCSB	48.4%	189	Morehead St	69.5%
190	Cornell	34.2%	190	SC Upstate	48.4%	190	Arkansas	69.4%
191	Central Conn	34.2%	191	Abilene Christian	48.4%	191	Georgia St	69.4%
192	Marist	34.2%	192	W Carolina	48.3%	192	BYU	69.3%
193	Quinnipiac	34.1%	193	Pepperdine	48.3%	193	Army	69.3%
194	TX A&M-CC	34.1%	194	Rhode Island	48.3%	194	Alabama St	69.3%
195	Sam Hous St	34.1%	195	Maine	48.3%	195	Marshall	69.3%
196	N Dakota St	34.1%	196	Wright State	48.3%	196	CS Fullerton	69.3%
197	Florida St	34.1%	197	Grand Canyon	48.3%	197	Miss Val St	69.3%
198	Texas A&M	34.1%	198	Valparaiso	48.3%	198	Hofstra	69.3%
199	TN State	34.1%	199	Harvard	48.2%	199	Sam Hous St	69.2%
200	American	34.1%	200	Oklahoma	48.2%	200	Mt St Marys	69.2%
201	Canisius	34.1%	201	San Jose St	48.2%	201	VCU	69.2%
202	Texas	34.1%	202	TX A&M-CC	48.2%	202	Montana	69.2%
203	Fla Atlantic	34.1%	203	Marist	48.1%	203	Grand Canyon	69.2%
204	Auburn	34.0%	204	Sam Hous St	48.0%	204	Lafayette	69.1%
205	Pepperdine	34.0%	205	Oral Roberts	48.0%	205	UCLA	69.1%

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
206	Col Charlestn	34.0%	206	Providence	48.0%	206	Drexel	69.1%
207	E Carolina	34.0%	207	Akron	48.0%	207	Wright State	69.1%
208	Alabama	33.9%	208	Idaho State	47.9%	208	Duquesne	69.1%
209	Marquette	33.9%	209	Lafayette	47.9%	209	Louisville	69.0%
210	NC Central	33.9%	210	Brown	47.8%	210	UNLV	69.0%
211	Elon	33.9%	211	E Carolina	47.8%	211	Kentucky	69.0%
212	Georgetown	33.9%	212	Oklahoma St	47.8%	212	New Orleans	69.0%
213	Maine	33.9%	213	Middle Tenn	47.8%	213	Montana St	68.9%
214	Charl South	33.8%	214	Charlotte	47.7%	214	Hawaii	68.9%
215	Loyola Mymt	33.8%	215	Presbyterian	47.7%	215	McNeese St	68.8%
216	TX Southern	33.8%	216	Cincinnati	47.7%	216	S Carolina	68.8%
217	Mississippi	33.8%	217	Nicholls St	47.7%	217	Lg Beach St	68.8%
218	Southern	33.8%	218	American	47.7%	218	St Marys	68.8%
219	W Michigan	33.7%	219	Southern	47.6%	219	Kansas St	68.8%
220	Marshall	33.7%	220	Missouri	47.6%	220	Sacred Hrt	68.8%
221	Buffalo	33.7%	221	Manhattan	47.6%	221	Syracuse	68.8%
222	Temple	33.7%	222	Canisius	47.5%	222	Arizona St	68.7%
223	Gard-Webb	33.6%	223	Illinois	47.5%	223	Holy Cross	68.7%
224	La Salle	33.6%	224	Beth-Cook	47.4%	224	Ball State	68.7%
225	Neb Omaha	33.6%	225	Stanford	47.4%	225	Central FL	68.7%
226	S Car State	33.6%	226	Tennessee	47.4%	226	Cleveland St	68.7%
227	Wagner	33.6%	227	Central Ark	47.4%	227	E Washingt	68.6%
228	Arizona St	33.6%	228	Hampton	47.3%	228	Prairie View	68.6%
229	TX Christian	33.5%	229	Washington	47.3%	229	S Illinois	68.5%
230	Army	33.4%	230	Syracuse	47.3%	230	Delaware	68.5%
231	Coastal Car	33.4%	231	Holy Cross	47.2%	231	Stanford	68.5%
232	Ohio State	33.4%	232	Montana St	47.2%	232	Alcorn State	68.4%
233	Coppin State	33.4%	233	Drake	47.2%	233	Temple	68.4%
234	Air Force	33.4%	234	Monmouth	47.2%	234	San Diego St	68.4%
235	N Arizona	33.4%	235	Kennesaw St	47.2%	235	Ohio State	68.4%
236	Miss State	33.4%	236	Georgia St	47.1%	236	Morgan St	68.3%
237	CS Fullerton	33.3%	237	Bowling Grn	47.1%	237	Fordham	68.3%
238	IUPUI	33.3%	238	Cal St Nrdge	47.1%	238	Maryland BC	68.3%
239	GA Southern	33.3%	239	Fresno St	47.0%	239	James Mad	68.3%
240	LA Tech	33.3%	240	St Peters	47.0%	240	UMKC	68.3%
241	Illinois St	33.3%	241	Portland	47.0%	241	North Dakota	68.2%
242	Alabama St	33.3%	242	UC Riverside	47.0%	242	N Dakota St	68.2%
243	McNeese St	33.2%	243	Air Force	47.0%	243	Alab A&M	68.2%
244	N Hampshire	33.2%	244	Bryant	46.9%	244	Cal Poly	68.2%
245	Maryland BC	33.1%	245	NC State	46.9%	245	Rider	68.2%
246	Washington	33.1%	246	Cornell	46.9%	246	UC Irvine	68.2%
247	Sac State	33.1%	247	Saint Louis	46.9%	247	Old Dominion	68.2%

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
248	TX-Pan Am	33.1%	248	Oregon St	46.9%	248	Rutgers	68.2%
249	U Mass	33.0%	249	Lamar	46.8%	249	Binghamton	68.2%
250	W Carolina	33.0%	250	Norfolk St	46.7%	250	Kent State	68.1%
251	Oklahoma St	32.8%	251	Boston Col	46.6%	251	Akron	68.1%
252	Saint Louis	32.8%	252	Arizona St	46.6%	252	Oregon St	68.0%
253	Kent State	32.8%	253	S Carolina	46.6%	253	DePaul	68.0%
254	UNLV	32.8%	254	Wisconsin	46.6%	254	Central Conn	67.9%
255	LSU	32.7%	255	S Utah	46.5%	255	Massachusetts Lowell	67.9%
256	Tennessee	32.7%	256	Colorado St	46.5%	256	Beth-Cook	67.9%
257	St Josephs	32.7%	257	Mississippi	46.5%	257	Pepperdine	67.8%
258	N Carolina	32.7%	258	Lg Beach St	46.5%	258	Missouri St	67.8%
259	St Peters	32.7%	259	TX-San Ant	46.5%	259	Colgate	67.8%
260	Drexel	32.7%	260	Wagner	46.4%	260	N Kentucky	67.7%
261	Holy Cross	32.6%	261	Towson	46.3%	261	Tulsa	67.7%
262	Tulsa	32.6%	262	San Diego St	46.3%	262	San Fransco	67.6%
263	Lamar	32.6%	263	Utah Val St	46.3%	263	Tulane	67.6%
264	Boise State	32.6%	264	Nevada	46.3%	264	USC	67.6%
265	San Diego St	32.6%	265	NC Central	46.3%	265	N Mex State	67.5%
266	N Mex State	32.5%	266	W Michigan	46.3%	266	N Illinois	67.5%
267	VA Military	32.5%	267	S Florida	46.2%	267	Texas State	67.5%
268	W Virginia	32.5%	268	St Fran (NY)	46.2%	268	Southern	67.4%
269	Delaware	32.5%	269	Niagara	46.2%	269	Weber State	67.4%
270	TX-Arlington	32.5%	270	Illinois St	46.2%	270	Illinois St	67.4%
271	Boston Col	32.5%	271	San Diego	46.1%	271	Air Force	67.4%
272	New Orleans	32.5%	272	Idaho	46.1%	272	Towson	67.3%
273	Memphis	32.4%	273	Arkansas	46.1%	273	W Virginia	67.3%
274	Maryland ES	32.4%	274	Texas State	46.0%	274	Pacific	67.3%
275	Delaware St	32.4%	275	W Illinois	46.0%	275	Yale	67.3%
276	Wichita St	32.3%	276	Gard-Webb	46.0%	276	Florida Intl	67.2%
277	Albany	32.3%	277	Penn State	45.9%	277	U Penn	67.2%
278	Hawaii	32.2%	278	Dartmouth	45.9%	278	NC-Grnsboro	67.2%
279	Samford	32.2%	279	Morehead St	45.8%	279	Texas A&M	67.2%
280	Pacific	32.2%	280	Wofford	45.8%	280	TX-Pan Am	67.2%
281	North Texas	32.2%	281	Geo Mason	45.7%	281	Stony Brook	67.1%
282	Rutgers	32.2%	282	Loyola Mymt	45.7%	282	Geo Mason	67.1%
283	Texas State	32.1%	283	TX-Pan Am	45.7%	283	TX Christian	67.1%
284	NC-Asheville	32.1%	284	VA Military	45.7%	284	Austin Peay	67.0%
285	Towson	32.1%	285	Loyola-Chi	45.7%	285	Sac State	67.0%
286	Providence	32.1%	286	Hartford	45.6%	286	S Alabama	67.0%
287	TX-San Ant	32.1%	287	Minnesota	45.6%	287	Bradley	67.0%
288	Bryant	32.0%	288	IUPUI	45.6%	288	Savannah St	66.9%
289	Cleveland St	32.0%	289	GA Southern	45.6%	289	Rhode Island	66.9%

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
290	Missouri St	32.0%	290	Col Charlestn	45.6%	290	LA Tech	66.9%
291	S Alabama	31.9%	291	Youngs St	45.5%	291	San Diego	66.9%
292	St Johns	31.9%	292	UMKC	45.5%	292	St Fran (NY)	66.8%
293	Rice	31.9%	293	UC Davis	45.5%	293	Dayton	66.8%
294	Furman	31.9%	294	Jackson St	45.4%	294	La Salle	66.7%
295	Florida	31.9%	295	La Salle	45.4%	295	Northwestern	66.7%
296	Central FL	31.8%	296	Grambling St	45.4%	296	Elon	66.7%
297	Stanford	31.8%	297	Missouri St	45.3%	297	Rob Morris	66.7%
298	NC A&T	31.8%	298	Alcorn State	45.3%	298	Texas	66.6%
299	Penn State	31.7%	299	St Fran (PA)	45.3%	299	Coastal Car	66.6%
300	Citadel	31.7%	300	Troy	45.3%	300	Seattle	66.6%
301	Mt St Marys	31.7%	301	S Mississippi	45.2%	301	Col Charlestn	66.6%
302	Wake Forest	31.6%	302	Santa Clara	45.2%	302	Jacksonville	66.5%
303	Arkansas St	31.5%	303	Binghamton	45.1%	303	Lamar	66.5%
304	Rider	31.5%	304	Memphis	45.1%	304	LSU	66.5%
305	Portland St	31.5%	305	S Alabama	45.1%	305	TX El Paso	66.4%
306	E Michigan	31.5%	306	Jacksonville	45.0%	306	NC Central	66.2%
307	Campbell	31.4%	307	Tulane	45.0%	307	Chicago St	66.1%
308	Troy	31.2%	308	N Hampshire	45.0%	308	S Florida	66.0%
309	LA Lafayette	31.1%	309	McNeese St	44.9%	309	Wake Forest	66.0%
310	Savannah St	31.1%	310	Rutgers	44.9%	310	Richmond	66.0%
311	Beth-Cook	31.1%	311	Cal Poly	44.9%	311	Portland St	65.9%
312	Sacred Hrt	31.1%	312	Temple	44.9%	312	Central Ark	65.9%
313	Minnesota	31.0%	313	Miami (OH)	44.8%	313	Seton Hall	65.8%
314	Navy	31.0%	314	Mt St Marys	44.8%	314	Bowling Grn	65.8%
315	Missouri	31.0%	315	N Illinois	44.8%	315	E Illinois	65.8%
316	Nicholls St	30.9%	316	NC A&T	44.8%	316	St Peters	65.8%
317	Presbyterian	30.8%	317	Georgia	44.7%	317	Nicholls St	65.7%
318	Miami (OH)	30.8%	318	Seattle	44.7%	318	California	65.6%
319	Jackson St	30.8%	319	Ark Pine Bl	44.7%	319	Maine	65.6%
320	Alcorn State	30.7%	320	Incarnate Word	44.7%	320	Hampton	65.6%
321	Hampton	30.5%	321	Indiana St	44.7%	321	WI-Grn Bay	65.6%
322	U Penn	30.4%	322	SE Missouri	44.6%	322	CS Bakersfld	65.4%
323	SIU Edward	30.4%	323	Arkansas St	44.5%	323	Gard-Webb	65.4%
324	IL-Chicago	30.4%	324	Florida A&M	44.4%	324	Cornell	65.3%
325	Loyola-MD	30.4%	325	SIU Edward	44.4%	325	Boston Col	65.1%
326	Florida A&M	30.4%	326	CS Fullerton	44.4%	326	Radford	65.1%
327	Miss Val St	30.3%	327	Auburn	44.3%	327	North Texas	65.1%
328	Ark Pine Bl	30.3%	328	Savannah St	44.2%	328	San Jose St	64.9%
329	St Fran (NY)	30.3%	329	St Johns	44.2%	329	Grambling St	64.8%
330	Cal St Nrdge	30.2%	330	Fla Atlantic	44.2%	330	Florida	64.8%
331	Old Dominion	30.1%	331	Colorado	43.9%	331	Quinnipiac	64.7%

<u>rank</u>	<u>team</u>	<u>3-pt</u>	<u>rank</u>	<u>team</u>	<u>2-pt</u>	<u>rank</u>	<u>team</u>	<u>free</u>
332	Morgan St	30.1%	332	Bradley	43.9%	332	Alabama	64.3%
333	Chicago St	30.1%	333	New Orleans	43.8%	333	SC Upstate	64.2%
334	Tulane	30.0%	334	Delaware	43.7%	334	Bryant	64.2%
335	Kansas St	30.0%	335	TX Christian	43.7%	335	Fla Gulf Cst	64.2%
336	Indiana St	29.9%	336	Alabama St	43.6%	336	UC Davis	64.0%
337	San Jose St	29.8%	337	Morgan St	43.6%	337	SE Louisiana	63.9%
338	LIU-Brooklyn	29.7%	338	Cleveland St	43.4%	338	SE Missouri	63.9%
339	Howard	29.5%	339	Howard	43.4%	339	Navy	63.8%
340	San Diego	29.2%	340	Jksnville St	43.2%	340	Troy	63.4%
341	Geo Mason	29.2%	341	App State	43.1%	341	Auburn	63.3%
342	Nevada	29.1%	342	Delaware St	42.4%	342	St Johns	63.2%
343	SE Missouri	28.8%	343	Central Conn	42.3%	343	TX Southern	63.1%
344	S Florida	28.6%	344	N Arizona	42.3%	344	Jackson St	63.0%
345	Binghamton	28.5%	345	Drexel	42.3%	345	IL-Chicago	61.9%
346	Alab A&M	28.4%	346	Prairie View	42.1%	346	Charl South	61.3%
347	Niagara	28.2%	347	Miss Val St	42.0%	347	Ark Pine Bl	61.1%
348	Bradley	27.7%	348	Chicago St	40.9%	348	Delaware St	60.9%
349	Rob Morris	27.6%	349	Coppin State	40.5%	349	Middle Tenn	60.6%
350	Grambling St	27.4%	350	IL-Chicago	40.3%	350	Harvard	59.0%
351	Prairie View	27.2%	351	Quinnipiac	38.3%	351	Florida A&M	58.9%
<u>stats</u>	<u>mean</u>	34.54%	<u>stats</u>	<u>mean</u>	48.66%	<u>stats</u>	<u>mean</u>	69.89%
	<u>stdv</u>	2.80%		<u>stdv</u>	3.26%		<u>stdv</u>	3.45%
	<u>5th%</u>	30.05%		<u>5th%</u>	43.75%		<u>5th%</u>	64.20%
	<u>95th%</u>	38.90%		<u>95th%</u>	54.20%		<u>95th%</u>	75.40%
	<u>median</u>	34.5%		<u>median</u>	48.7%		<u>median</u>	69.7%

These statistics imply the following point values of each type of shot: (1) 3-pt shot = (3)(0.345) = 1.04 ≈ 1.0; (2) 2-pt shot = (2)(0.487) = 0.97 ≈ 1.0; and (3) free = (1)(0.699) = 0.7. If we assume a possession with an attempted score corresponds to either a 3- or 2-pt attempt, the value of a possession is ~ 1.0, which is also the value of a 3- or 2-pt attempt. A free throw is worth 0.7. A special case can be made for a lay-up/dunk in that it should have an even higher percentage for success than a free throw. A value of 80% seems reasonable (the midpoint between 70% for a free throw and an assumed 90% for an uncontested lay-up/dunk), making its value (2)(0.8) = 1.6. With these values, we can assign an SUV to a “make” or a “miss” for each, as follows:

$$3\text{-pt "make"} = 3.0 - 1.0 = +2.0; 3\text{-pt "miss"} = 0 - 1.0 = -1.0$$

$$2\text{-pt "make"} = 2.0 - 1.0 = +1.0; 2\text{-pt "miss"} = 0 - 1.0 = -1.0$$

$$\text{free "make"} = 1.0 - 0.7 = +0.3; \text{free "miss"} = 0 - 0.7 = -0.7$$

$$\text{lay-up/dunk "make"} = 2.0 - 1.6 = +0.4; \text{lay-up/dunk "miss"} = 0 - 1.6 = -1.6$$

For the lay-up/dunk, credit should be given for an “assist,” that gets the ball right under the basket, whether this assist be from another player or the shooter himself. Consistent with the rest of the 2-pt shots, the value of a lay-up/dunk should be 1.0. Therefore, the “assist” should be +0.6, bringing the total SUV for a “made” lay-up/dunk to 0.4 + 0.6 = 1.0 and that for a “miss” to -1.6 + 0.6 = -1.0. Thus, a player who “drives” for a lay-up attempt earns 0.4 + 0.6 = 1.0 in SUV if successful, but loses -(-1.6 + 0.6) = 1.0 if he fails. Likewise, “assists” for 3- and 2-pt shots that are successful should be recognized. Thus, when either of these is “made,” the SUV earned is split equally between the scorer and

“assister” (i.e., +1.0 each on a successful 3-pt shot; +0.5 each on a 2-pt shot). Consistent with the lay-up/dunk valuation, a “tap-in,” by definition successful, is also worth an overall SUV of +1.0, but here the +0.4/+0.6 split goes to the shooter (who missed) and the “tapper” (who scored), i.e., the reverse of a successful lay-up/dunk. Of course, if the shooter taps in his own miss, he gets the full +1.0. For goaltending, if offensive, the goaltender, not the shooter, earns the -1.0. If defensive, then the shooter earns the full SUV (or half if there was an “assist”) as if the shot was made without the goaltending. Rebounds, offensive or defensive, equate to gaining possession in a “free ball” situation, so are worth +1.0. All this is summarized in the figure below, along with the SUVs for changes of possession via turnovers, fouls, etc.

A “self-induced” turnover, such as anything out of bounds, a clock violation, traveling, double-dribbling, getting “tied-up” and losing possession, changes your team’s possession to that of the other team, with an SUV = -1.0 - 1.0 = -2.0. A defensive foul that results in two free throws for the opponent can have any of four results: (1) both shots missed, with a probability of  $(0.3)^2 = 0.09$ ; (2) and (3) one shot made, one missed, with a probability of  $(2)(0.7)(0.3) = 0.42$ ; and (4) both shots made, with a probability of  $(0.7)^2 = 0.49$ . As required, the probabilities sum to 1.0. Thus, the SUV for a defensive foul resulting in two shots becomes  $(0)(0.09) - (1)(0.42) - (2)(0.49) = -1.4$ . For a three-shot foul, it becomes  $(0)(0.3)^3 - (1)(3)(0.7)(0.3)^2 - (2)(3)(0.7)^2(0.3) - (3)(0.7)^3 = -2.1$  (note that there are three ways each to score only 1 point or 2). For a “1 + 1” situation, the SUV is  $(0)(0.3) - (1)(0.7)(0.3) - (2)(0.7)^2 = -1.19 \approx -1.2$ . For non-shooting fouls, there is still a negative SUV as each one counts toward the opponent reaching the “1 + 1” bonus. After six such non-shooting fouls, the opponent earns a “1 + 1” on the seventh, so a reasonable SUV for a non-shooting foul is -1.2/7 or -1.4/7, both of which equate to  $\sim -0.2$ . Offensive fouls that yield opponent foul shots cost the fouler’s team a possession, so the SUV is reduced by another 1.0, bringing the SUVs for a “1 + 1” and 2-shot free throw opportunity to  $-1.2 - 1.0 = -2.2$  and  $-1.4 - 1.0 = -2.4$ , respectively. In a non-shooting situation, the offensive foul still costs the fouler’s team possession and yields it to the opponent, so it equates the same as a turnover, i.e., -2.0. A technical or intentional foul not only provides the 2-shot free throw opportunity, but costs possession after that, so there is an additional decrement of 1.0 in SUV, i.e.,  $-2.4 - 1.0 = -3.4$ .

A steal is equivalent to a turnover, but it is not considered “self-induced.” Therefore, the “stealee’s” SUV is only -1.0 while the “stealer” earns +1.0. A successfully blocked shot, where there is a change of possession, yields a -1.0 SUV for the shooter (and is offset by the +1.0 for successfully rebounding the block). If the blocker recovers the ball, he earns the full +1.0 for possession change. If a teammate recovers, the SUV is split between the blocker (+0.5) and the “recoverer” (+0.5). Finally, breaking a full-court press changes a “contested” possession into an “actual” possession, so earns the “breaker” +1.0 SUV (which may be split if more than one player deserves the credit). As mentioned above, all of these are summarized in the figure below.

Two of the more recent NCAA Men’s Championship games have been selected to illustrate the use of SUV for basketball. The first, Connecticut’s 60-54 victory over Kentucky in 2014, illustrates a relatively low-scoring game (play-by-play from Reference [12]). The second, Villanova’s buzzer-beating 77-74 win over North Carolina in 2016, illustrates a fairly high-scoring game (play-by-play from Reference [13]). Included with each are the overall SUVs for two players from each team (as shown by the yellow and green highlighting).

An illustrative series from 1:52 to 1:31 of the second half of the Villanova-North Carolina game demonstrates the use of the SUV for basketball:

- 1:52 – Justin Jackson commits personal foul (shooting, 2 shots) = -1.4 (Jackson [green highlight, since Jackson is a tracked player])
- 1:52 – Justin Hart misses first free throw (-0.7), but makes the second (+0.3), both in green highlight since Hart is a tracked player
- 1:38 – Mikal Bridges blocks Marcus Paige’s 2-point lay-up, but North Carolina recovers = -1.0 (Paige [yellow highlight since Paige is a tracked player])
- 1:31 – Marcus Paige makes 3-point jump shot with assist from Brice Johnson = +1.0 (Paige [yellow highlight]) and +1.0 (no highlight, since Johnson is not a tracked player)

A play at 0:09 from the first half of the same game illustrates a play where tracked players from both teams record SUVs. Josh Hart blocks Justin Jackson’s 2-point lay-up, earning a +1.0 for Hart and -1.0 for Jackson.

Turnover (self) = -2.0  
(OOB, travel, clock violation,  
lost tie-up ...)

Foul (defense):  
Non-shooting = -0.2  
Shooting:  
1 + 1 = -1.2  
2 shots = -1.4  
3 shots = -2.1  
+1 = -0.7

Foul (offense):  
Non-shooting = -2.0  
Shooting:  
1 + 1 = -2.2  
2 shots = -2.4

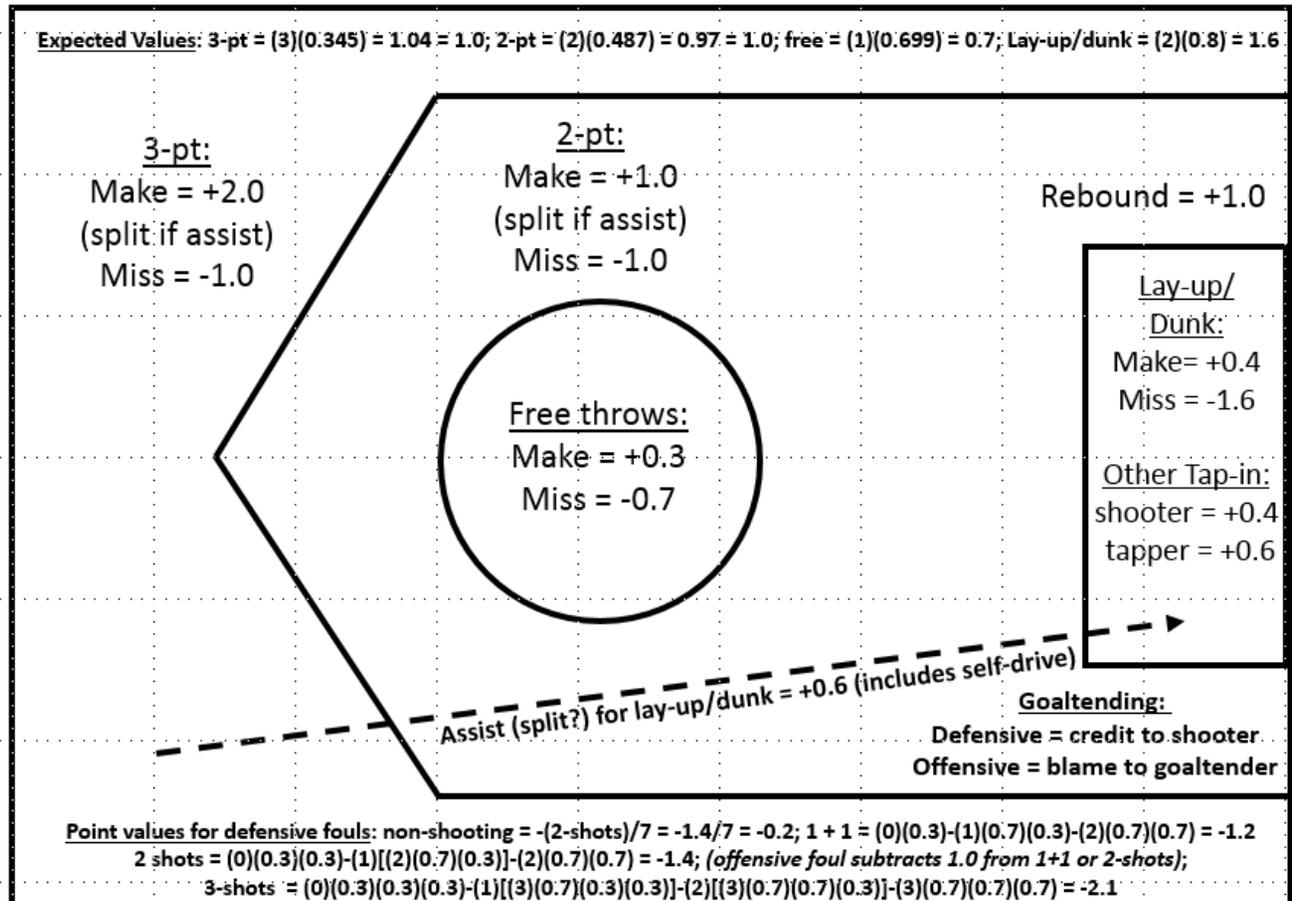
Foul (technical/intentional) = -3.4  
(double loss of possession)

Break full-court press = +1.0 (split?)

Steal:  
Stealer = +1.0  
Stealee = -1.0

Blocked shot:  
Shooter = -1.0 (& +1.0 if recovers)  
Blocker recovers = +1.0

Other recovers = +0.5 (blocker)/+0.5 (recoverer)



2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels	
													Start of 1st Half													KENTUCKY				UCONN				
														20:00		Start of the 1st Half																		
														19:43		DeAndre Daniels misses a jump shot from 16 feet out.	-1.0																	-1.0
														19:43		Phillip Nolan with an offensive rebound.							1.0											
														19:38	0-2	Ryan Boatright makes a layup shot.				0.4		0.6												
														19:06		Andrew Harrison with a lost ball turnover: Lost Ball	-2.0																-2.0	
														18:54		Ryan Boatright with a lost ball turnover: Lost Ball												-2.0						
														18:43		Julius Randle misses a layup shot.																		
														18:43		Dakari Johnson with an offensive rebound.																		
														18:36		Dakari Johnson misses a layup shot.																		
														18:36		DeAndre Daniels with a defensive rebound.																		1.0
														18:25		Shabazz Napier misses a 3-point jump shot from 25 feet out.	-1.0																-1.0	
														18:25		Andrew Harrison with a defensive rebound.																		1.0
														18:14	2-2	Dakari Johnson makes a layup shot. Andrew Harrison with the assist.																	1.0	
														17:53	2-4	DeAndre Daniels makes a dunk shot.				0.4		0.6											0.6	
														17:31		Andrew Harrison misses a jump shot from 9 feet out.	-1.0																	-1.0
														17:31		Ryan Boatright with a defensive rebound.																		
														17:16	2-6	Niels Giffey makes a layup shot. Ryan Boatright with the assist.				0.4		0.6												
														17:10		Shooting foul committed by DeAndre Daniels.																		-1.4
														17:10	3-6	James Young makes free throw 1 of 2.																		0.3
														17:10	4-6	James Young makes free throw 2 of 2.																		0.3
														16:41		DeAndre Daniels misses a 3-point jump shot from 23 feet out.	-1.0																	-1.0
														16:41		Aaron Harrison with a defensive rebound.																		1.0
														16:14	6-6	James Young makes a jump shot from 9 feet out.																		1.0
														15:49		Niels Giffey misses a 3-point jump shot from 23 feet out.	-1.0																	

2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels	
						1.0							Alex Poythress with a defensive rebound.	15:49		Niels Giffey misses a 3-point jump shot from 23 feet out.		-1.0																
													Andrew Harrison with a lost ball turnover. Lost Ball	15:49																				
											-2.0		Shooting foul committed by Alex Poythress.	15:45																			-2.0	
												-1.4		15:42																				
														15:42		Official's timeout.																		
														15:42	6-7	Ryan Boatright makes free throw 1 of 2.				0.3														
														15:42	6-8	Ryan Boatright makes free throw 2 of 2.				0.3														
			-1.6		0.6								Alex Poythress misses a layup shot.	15:23																				
														15:23		Amida Brimah with a defensive rebound.								1.0										
														15:19	6-10	Lasan Kromah makes a jump shot from 13 feet out. Shabazz Napier with the assist.	0.5					0.5											0.5	
													Aaron Harrison with a backcourt turnover. Backcourt Turnover	15:09																			-2.0	
														14:53	6-13	Shabazz Napier makes a 3-point jump shot from 24 feet out.		2.0																2.0
			-1.0										James Young misses a 3-point jump shot from 23 feet out.	14:33																				
														14:33		Amida Brimah with a defensive rebound.								1.0										
														14:04		Lasan Kromah misses a layup shot.				-1.6		0.6												
						1.0							Julius Randle with a defensive rebound.	14:04																				
														13:56		Shooting foul committed by Lasan Kromah.																		-1.4
			0.3										Julius Randle makes free throw 1 of 2.	13:56	7-13																			
			0.3										Julius Randle makes free throw 2 of 2.	13:56	8-13																			
														13:37		Shabazz Napier misses a 3-point jump shot from 24 feet out.		-1.0																
														13:37		Niels Giffey with an offensive rebound.								1.0										
													Personal foul committed by Marcus Lee.	13:30																				
														13:29	8-15	Shabazz Napier makes a layup shot. Lasan Kromah with the assist.				0.4		0.6												0.4
													Andrew Harrison misses a layup shot.	13:15																				
														13:15		Ryan Boatright with a defensive rebound.								1.0										
														13:08	8-17	Ryan Boatright makes a layup shot.				0.4		0.6												

2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels	
	-1.0												Ky take a 20-second timeout.	13:08																				
													Aaron Harrison misses a 3-point jump shot from 26 feet out.	12:42																	-1.0			
													Ryan Boatright with a defensive rebound.	12:42									1.0											
													Lasan Kromah misses a jump shot from 3 feet out.	12:31			-1.0																	
						1.0							Alex Poythress with a defensive rebound.	12:31																				
													Personal foul committed by Amida Brimah.	12:31														-0.2						
			-1.6		0.6								Andrew Harrison misses a layup shot.	11:57																	-1.0			
						1.0							Alex Poythress with an offensive rebound.	11:57																				
			0.4		0.6								Alex Poythress makes a dunk shot.	11:48	10-17																			
													Ryan Boatright makes a jump shot from 13 feet out.	11:42	10-19		1.0																	
	-1.0												Alex Poythress misses a 3-point jump shot from 23 feet out.	11:20																				
						1.0							Dominique Hawkins with an offensive rebound.	11:20																				
													Shooting foul committed by Ryan Boatright.	11:20															-1.4					
													Official's timeout.	11:20																				
		-0.7											Dominique Hawkins misses free throw 1 of 2.	11:20																				
													Ky with an offensive rebound.	11:20																				
		-0.7											Dominique Hawkins misses free throw 2 of 2.	11:20																				
													Terrence Samuel with a defensive rebound.	11:20									1.0											
													Shabazz Napier misses a layup shot.	11:02								-1.6		0.6								-1.0		
						1.0							Dakari Johnson with a defensive rebound.	11:02																				
													Andrew Harrison with a lost ball turnover. Lost Ball.	10:34																				
													DeAndre Daniels misses a layup shot.	10:00									-1.6		0.6									
													Niels Giffey with an offensive rebound.	10:00										1.0										
													UConn with a turnover: Shot Clock Turnover	10:00															-2.0					
	1.0												Andrew Harrison makes a jump shot from 18 feet out.	9:41	12-19																	1.0		
													Terrence Samuel makes a layup shot.	9:18	12-21							0.4		0.6										
													Dakari Johnson misses a layup shot.	8:46																				
						1.0							Dakari Johnson with an offensive rebound.	8:46																				

2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels	
			-1.6		0.6								Dakari Johnson misses a layup shot.	8:46																				
														8:46		Amida Brimah with a defensive rebound.								1.0										
														8:29	12-24	Shabazz Napier makes a 3-point jump shot from 24 feet out.		2.0														2.0		
	1.0				1.0								Andrew Harrison makes a 3-point jump shot from 24 feet out. Dakari Johnson with the assist.	8:05	15-24															1.0				
														7:50	15-26	DeAndre Daniels makes a jump shot from 12 feet out.	1.0															1.0		
	-1.0												James Young misses a 3-point jump shot from 23 feet out.	7:22																-1.0				
														7:22		Shabazz Napier with a defensive rebound.								1.0								1.0		
														7:15		Amida Brimah misses a layup shot.				-1.6			0.6											
													Julius Randle with a defensive rebound.	7:15																				
														7:15		Official's timeout.																		
														6:39		Aaron Harrison with a lost ball turnover: Lost Ball																-2.0		
														6:39	15-28	Shabazz Napier makes a layup shot. Ryan Boatright with the assist.				0.4			0.6									-2.0		0.4
														6:26		James Young with a out of bounds turnover: Out of Bounds																		
														5:59		Shooting foul committed by Alex Poythress.																		
														5:59	15-29	Niels Giffey makes free throw 1 of 2.				0.3														
														5:59	15-30	Niels Giffey makes free throw 2 of 2.				0.3														
														5:41		Personal foul committed by DeAndre Daniels.																-0.2		-0.2
														5:29	18-30	James Young makes a 3-point jump shot from 24 feet out. Dakari Johnson with the assist.																1.0		
														5:18		Ryan Boatright with a lost ball turnover: Lost Ball																-2.0		
														5:12	20-30	Aaron Harrison makes a dunk shot.																	1.0	
														5:12		UConn take a 20-second timeout.																		
														4:46	20-33	Shabazz Napier makes a 3-point jump shot from 26 feet out. Lasan Kromah with the assist.																	1.0	
														4:19		James Young misses a jump shot from 20 feet out.																		-1.0
														4:19		Aaron Harrison with an offensive rebound.																	1.0	

2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels		
														4:19		Personal foul committed by Ryan Boatright.												-0.2							
	-1.0												Aaron Harrison misses a 3-point jump shot from 22 feet out.	4:12																		-1.0			
														4:12		Lasan Kromah with a defensive rebound.							1.0												
														3:54		Phillip Nolan misses a layup shot.				-1.6		0.6													
						1.0							Andrew Harrison with a defensive rebound.	3:54																			1.0		
	1.0				1.0								James Young makes a 3-point jump shot from 23 feet out. Andrew Harrison with the assist.	3:39	23-33													1.0		1.0					
														3:28		Lasan Kromah with a lost ball turnover: Lost Ball											-2.0								
	1.0				1.0								Andrew Harrison makes a 3-point jump shot from 24 feet out. Julius Randle with the assist.	3:02	26-33																		1.0		
														2:34		Shabazz Napier misses a 3-point jump shot from 24 feet out.		-1.0																-1.0	
						1.0							Aaron Harrison with a defensive rebound.	2:34																				1.0	
														2:24		Personal foul committed by Phillip Nolan.												-1.4							
														2:24		Official's timeout.																			
	0.3												Dakari Johnson makes free throw 1 of 2.	2:24	27-33																				
	-0.7												Dakari Johnson misses free throw 2 of 2.	2:24																					
														2:24		Shabazz Napier with a defensive rebound.							1.0												1.0
														2:19		Shabazz Napier misses a 3-point jump shot from 24 feet out.		-1.0																	-1.0
						1.0							Andrew Harrison with a defensive rebound.	2:19																					1.0
											-2.0		Julius Randle with a lost ball turnover: Lost Ball	1:51																					
														1:51		UConn take a 20-second timeout.																			
														1:32	27-35	Shabazz Napier makes a layup shot.				0.4		0.6													1.0
			0.4		0.6								Julius Randle makes a layup shot. Andrew Harrison with the assist.	1:03	29-35																				0.6
														00:28.1		Terrence Samuel with a lost ball turnover: Lost Ball											-2.0								
			0.4		0.6								Julius Randle makes a layup shot. Andrew Harrison with the assist.	00:03.0	31-35																				0.6
														00:03.0		Shooting foul committed by Amida Brimah.												-1.2							
	-0.7												Julius Randle misses free throw 1 of 1.	00:03.0																					

2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels			
														00:03.0		Lasan Kromah with a defensive rebound.							1.0													
													James Young with a defensive rebound.	0:00		Lasan Kromah misses a 3-point jump shot from 41 feet out.			-1.0											1.0						
						1.0								0:00																						
														0:00		End of the 1st Half																				
0.0	-1.0	-1.3	-9.2	0.0	11.2	16.0	0.0	0.0	0.0	-14.0	-3.0	0.0	-1.3	Start of 2nd Half	1.8	0.5	-1.0	0.2	-4.8	0.0	9.3	15.0	0.0	0.0	0.0	-10.0	-7.4	0.0	-0.4	-2.2	4.3	-1.6				
														20:00		Start of the 2nd Half																				
	1.0					1.0							Lasan Kromah makes a 3-point jump shot from 23 feet out. Julius Randle with the assist.	19:40	34-35														1.0							
														19:29		DeAndre Daniels misses a 3-point jump shot from 25 feet out.			-1.0														-1.0			
													Andrew Harrison with a defensive rebound. James Young misses a layup shot.	19:29															1.0							
														19:16																						
														19:16		DeAndre Daniels with a defensive rebound.								1.0										1.0		
														18:53	34-37	Ryan Boatright makes a jump shot from 20 feet out.	1.0																			
														18:31		James Young misses a 3-point jump shot from 23 feet out.																		-1.0		
														18:31		Shabazz Napier with a defensive rebound.								1.0										1.0		
														18:31		Personal foul committed by Dakari Johnson.																				
														18:05		Phillip Nolan misses a layup shot.																				
														18:05		UConn with an offensive rebound.																				
														17:44		Amida Brimah misses a layup shot.																				
														17:44		Amida Brimah with an offensive rebound.																				
														17:35		Ryan Boatright misses a 3-point jump shot from 23 feet out.																				
														17:35		James Young with a defensive rebound.																			1.0	
														17:17		Shooting foul committed by Amida Brimah.																			-1.4	
														17:17		Dakari Johnson misses free throw 1 of 2.																				
														17:17		Kty with an offensive rebound. Dakari Johnson misses free throw 2 of 2.																				
														17:17																						
														17:17		DeAndre Daniels with a defensive rebound.																				1.0
														17:01		Ryan Boatright with a lost ball turnover: Lost Ball																			-2.0	
														16:52		Andrew Harrison misses a layup shot.																				-1.0

2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels		
														16:52		Niels Giffey with a defensive rebound.																			
														16:27		DeAndre Daniels misses a jump shot from 19 feet out.	-1.0																	-1.0	
						1.0								16:27		Dakari Johnson with a defensive rebound.																			
			-1.6		0.6									16:04		James Young misses a layup shot.																		-1.0	
						1.0								16:04		James Young with an offensive rebound.																		1.0	
											-2.0			15:32		James Young with a lost ball turnover: Lost Ball																		-2.0	
														15:32		Niels Giffey misses a 3-point jump shot from 24 feet out.		-1.0																	
						1.0								15:32		Julius Randle with a defensive rebound.																			
			0.4		0.6									15:20	36-37	Aaron Harrison makes a layup shot. Julius Randle with the assist. Shooting foul committed by Aaron Harrison.																		0.4	
											-1.4			15:13																				-1.4	
														15:13		Official's timeout.																			
														15:13	36-38	Shabazz Napier makes free throw 1 of 2.			0.3																0.3
														15:13	36-39	Shabazz Napier makes free throw 2 of 2.			0.3																0.3
											-2.0			14:48		Offensive foul committed by Alex Poythress. Alex Poythress with a turnover.																			
														14:10		DeAndre Daniels misses a jump shot from 9 feet out.	-1.0																		-1.0
						1.0								14:10		Julius Randle with a defensive rebound.																			
		-1.0												13:46		Alex Poythress misses a 3-point jump shot from 22 feet out.																			
														13:46		Shabazz Napier with a defensive rebound.								1.0											1.0
														13:40		Shabazz Napier with a bad pass turnover: Bad Pass												-2.0							-2.0
			-1.6		0.6									13:18		Julius Randle misses a layup shot.																			
						1.0								13:18		Julius Randle with an offensive rebound.																			
			-0.7											13:18		Shooting foul committed by Phillip Nolan.													-1.4						
														13:18		Julius Randle misses free throw 1 of 2.																			
			0.3											13:18		Kty with an offensive rebound. Julius Randle makes free throw 2 of 2.																			
														13:18	37-39	Julius Randle makes free throw 2 of 2.																			
														12:49		Phillip Nolan misses a layup shot.			-1.6				0.6												
						1.0								12:49		James Young with a defensive rebound.																			1.0



2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels	
														9:29		Niels Giffey misses a hook shot from 7 feet out.	-1.0																	
						1.0							James Young with a defensive rebound.	9:29															1.0					
			0.4		0.6								Dakari Johnson makes a layup shot. Andrew Harrison with the assist.	9:21	45-48															0.6				
														9:00		UConn take a full timeout.																		
														8:49		Shabazz Napier misses a jump shot from 21 feet out.	-1.0															-1.0		
						1.0							Julius Randle with a defensive rebound.	8:49																				
	-1.0												Andrew Harrison misses a 3-point jump shot from 25 feet out.	8:18																	-1.0			
						1.0							James Young with an offensive rebound.	8:18															1.0					
														8:13		Shooting foul committed by Phillip Nolan.												-1.4						
			0.3										James Young makes free throw 1 of 2.	8:13	46-48														0.3					
			0.3										James Young makes free throw 2 of 2.	8:13	47-48														0.3					
														7:54		Official's timeout.																		
														7:41		Shabazz Napier with a bad pass turnover: Bad Pass											-2.0				-2.0			
	-1.0												Aaron Harrison misses a 3-point jump shot from 22 feet out.	7:23																	-1.0			
														7:23		Lasan Kromah with a defensive rebound.							1.0											
														6:50	47-51	Shabazz Napier makes a 3-point jump shot from 24 feet out.	2.0														2.0			
			0.4		0.6								Julius Randle makes a layup shot.	6:36	49-51																			
														6:18	49-54	James Young makes a 3-point jump shot from 24 feet out. Shabazz Napier with the assist.	1.0					1.0									1.0			
	-1.0												James Young misses a jump shot from 19 feet out.	5:45																-1.0				
														5:45		Lasan Kromah with a defensive rebound.								1.0										
														5:13		DeAndre Daniels misses a 3-point jump shot from 23 feet out.												-1.0					-1.0	
						1.0							James Young with a defensive rebound.	5:13																1.0				
														5:04		Shooting foul committed by Niels Giffey.												-1.4						
		0.3											Julius Randle makes free throw 1 of 2.	5:04	50-54																			
		-0.7											Julius Randle misses free throw 2 of 2.	5:04																				
														5:04		Shabazz Napier with a defensive rebound.								1.0								1.0		

2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels				
														5:01		Shabazz Napier with a lost ball turnover: Lost Ball																					
										-2.0			Andrew Harrison with a lost ball turnover: Lost Ball	4:53																							
														4:48		Shabazz Napier with a lost ball turnover: Lost Ball																					
														4:48		Personal foul committed by Shabazz Napier.																					
													Aaron Harrison misses free throw 1 of 1.	4:36																							
														4:36		DeAndre Daniels with a defensive rebound.																					
														4:05	50-56	Ryan Boatright makes a jump shot from 19 feet out.	1.0																				
													Julius Randle misses a layup shot.	3:47																							
													Alex Poythress with an offensive rebound.	3:47																							
													Alex Poythress makes a dunk shot.	3:47	52-56																						
														3:47		Shooting foul committed by Niels Giffey.																					
														3:47		Official's timeout.																					
													Alex Poythress misses free throw 1 of 1.	3:47																							
														3:47		Niels Giffey with a defensive rebound.																					
														3:22		Shabazz Napier misses a 3-point jump shot from 24 feet out.																					
													Alex Poythress with a defensive rebound.	3:22																							
														3:09		James Young misses a jump shot from 8 feet out.																					
														3:09																							
														2:47	52-58	Niels Giffey with a defensive rebound.																					
														2:47		DeAndre Daniels makes a layup shot. Shabazz Napier with the assist.																					
														2:22		Julius Randle misses a jump shot from 8 feet out.																					
														2:22		Lasan Kromah with a defensive rebound.																					
														1:50		Niels Giffey misses a jump shot from 18 feet out.																					
														1:50		Lasan Kromah with an offensive rebound.																					
														1:49		UConn take a 20-second timeout.																					
														1:20		DeAndre Daniels misses a 3-point jump shot from 23 feet out.																					
														1:20		Kry with a defensive rebound.																					

2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	KENTUCKY	TIME	SCORE	UCONN	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Young	Harrison	Napier	Daniels
			0.4		0.6								James Young makes a layup shot. Julius Randle with the assist.	1:07	54-58														0.4				
											-0.2		Personal foul committed by Aaron Harrison. Kty take a 20-second timeout.	00:54.1																-0.2			
											-1.2		Shooting foul committed by Alex Poythress.	00:25.0																			
														00:25.0	54-59	Lasan Kromah makes free throw 1 of 2.			0.3														
														00:25.0	54-60	Lasan Kromah makes free throw 2 of 2.			0.3														
	-1.0												Aaron Harrison misses a 3-point jump shot from 24 feet out.	00:08.8																-1.0			
						1.0							Andrew Harrison with an offensive rebound.	00:08.8																	1.0		
	-1.0												Andrew Harrison misses a 3-point jump shot from 22 feet out.	00:02.6																	-1.0		
														00:02.6		Ryan Boatright with a defensive rebound.								1.0									
														0:00		End of the 2nd Half																	
														0:00		End of the Game																	
-3.0	-5.0	-2.5	-5.6	0.0	7.6	17.0	0.0	0.0	0.0	-12.0	-4.6	0.0	-8.1	End of Game		-6.7	-1.0	-5.0	1.8	-6.0	0.6	5.4	19.0	0.0	0.0	0.0	-10.0	-11.5	0.0	-0.5	-7.9	-3.0	-2.4
-3.0	-6.0	-3.8	-14.8	0.0	18.8	33.0	0.0	0.0	0.0	-26.0	-7.6	0.0	-9.4	Team Total		-4.9	-0.5	-6.0	2.0	-10.8	0.6	14.7	34.0	0.0	0.0	0.0	-20.0	-18.9	0.0	-0.9	-10.1	1.3	-4.0

<http://www.ncaa.com/game/basketball-men/d1/2014/04/07/kentucky-uconn/play-by-play>

The overall negative SUVs for the two teams indicate a game that was on the sloppy side (especially in the second half, since at least Connecticut had a positive SUV for the first), but more so for Kentucky, who lost. Of the tracked players, only Shabazz Napier finished with a positive SUV (due mostly to his first half performance).



2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	VILLANOVA	TIME	SCORE	N. CAROLINA	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Booth	Hart	Paige	Jackson	
-1.0													Ryan Arcidiacono misses two point jump shot	15:56																				
														15:54		Joel Berry II defensive rebound							1.0											
														15:44		Marcus Paige misses two point jump shot	-1.0																-1.0	
														15:42		Marcus Paige offensive rebound							1.0										1.0	
											-0.2		Kris Jenkins personal foul (Marcus Paige draws the foul)	15:41																				
													TV timeout	15:41																				
														15:33		Marcus Paige misses three point jump shot		-1.0																-1.0
														15:31		Isaiah Hicks offensive rebound							1.0											
														15:31	7-9	Isaiah Hicks makes two point layup				0.4		0.6												
1.0														15:06	9-9	Ryan Arcidiacono makes two point jump shot																		
														14:39		Joel Berry II misses two point layup				-1.6		0.6												
														14:37		Kennedy Meeks offensive rebound							1.0											
														14:36		Marcus Paige misses two point jump shot	-1.0																	-1.0
						1.0								14:34		Josh Hart defensive rebound																	1.0	
	-1.0													14:17		Josh Hart misses three point jump shot																		-1.0
														14:15		Tar Heels defensive rebound							1.0											
														13:51		Nate Britt misses three point jump shot		-1.0																
						1.0								13:49		Daniel Ochefu defensive rebound																		
			0.4		0.6									13:29	11-9	Daniel Ochefu makes two point layup																		
														13:16		Isaiah Hicks misses two point jump shot	-1.0																	
						1.0								13:14		Mikal Bridges defensive rebound																		
														12:53	14-9	Josh Hart makes three point jump shot																		2.0
														12:34	14-11	Brice Johnson makes two point dunk (Theo Pinson assists)				0.4		0.6												
											-0.7			12:34		Mikal Bridges shooting foul (Brice Johnson draws the foul)																		
														12:34	14-12	Brice Johnson makes free throw 1 of 1			0.3															
														12:07		Theo Pinson personal foul (Phil Booth draws the foul)													-0.2					
														11:44		Marcus Paige personal foul (Jalen Brunson draws the foul)													-0.2					-0.2
														11:44		TV timeout																		
														11:20	17-12	Phil Booth makes three point jump shot (Daniel Ochefu assists)																		1.0







2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	VILLANOVA	TIME	SCORE	N. CAROLINA	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Booth	Hart	Paige	Jackson				
-1.0													Kris Jenkins misses two point jump shot	16:34																							
														16:32			Brice Johnson defensive rebound						1.0														
													Jalen Brunson defensive rebound	16:17			Kennedy Meeks misses two point layup			-1.6		0.6															
						1.0								16:15																							
														16:13			Kennedy Meeks personal foul (Jalen Brunson draws the foul)										-0.2										
1.0													<b>Daniel Ochefu makes two point jump shot</b>	15:58	40-43																						
													Josh Hart personal foul (Justin Jackson draws the foul)	15:43																			-0.2				
													TV timeout	15:43																							
													Mikal Bridges shooting foul (Brice Johnson draws the foul)	15:40																							
														15:40			Brice Johnson misses free throw 1 of 2																				
														15:40			Tar Heels rebound (deadball)																				
														15:40	40-44		<b>Brice Johnson makes free throw 2 of 2</b>																				
1.0													Josh Hart makes two point jump shot	15:20	42-44																			1.0			
													Darryl Reynolds personal foul (Justin Jackson draws the foul)	15:09																							
														14:59			Joel Berry II misses two point jump shot																				
													Mikal Bridges defensive rebound	14:57																							
													Darryl Reynolds misses two point jump shot	14:39																							
-1.0														14:37			Marcus Paige defensive rebound																				
														14:16			Joel Berry II offensive foul (Ryan Arcidiacono draws the foul)																				
														14:16			Joel Berry II turnover																				
													Mikal Bridges makes two point dunk (Ryan Arcidiacono assists)	14:05	44-44																						
													Ryan Arcidiacono personal foul (Brice Johnson draws the foul)	13:46																							
														13:45			Marcus Paige misses three point jump shot																				
														13:43			Nate Britt offensive rebound																				
													Mikal Bridges personal foul (Nate Britt draws the foul)	13:43																							
														13:42			Nate Britt turnover (bad pass)																				
1.0													<b>Phil Booth makes two point jump shot</b>	13:26	46-44																					1.0	
														13:13	46-46		Marcus Paige makes two point layup																				1.0
														12:43	49-46																						2.0



2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	VILLANOVA	TIME	SCORE	N. CAROLINA	2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal	Booth	Hart	Paige	Jackson	
														8:25	57-53	Marcus Paige makes three point jump shot (Joel Berry II assists)		1.0				1.0											1.0	
	2.0												Kris Jenkins makes three point jump shot	7:52	60-53																			
													Darryl Reynolds misses two point jump shot	7:38	60-55	Marcus Paige makes two point layup				0.4		0.6										1.0		
-1.0														7:16																				
														7:14		Kennedy Meeks defensive rebound								1.0										
														7:06		Marcus Paige misses two point layup				-1.6		0.6											-1.0	
														7:04		Kennedy Meeks offensive rebound								1.0										
														7:04		Phil Booth blocks Kennedy Meeks's two point layup								1.0										
														7:02		Kennedy Meeks offensive rebound										-1.0								
														7:02		Kris Jenkins shooting foul (Kennedy Meeks draws the foul)																		
														7:02		TV timeout																		
														7:02	60-56	Kennedy Meeks makes free throw 1 of 2				0.3														
														7:02	60-57	Kennedy Meeks makes free throw 2 of 2				0.3														
														6:50		Kris Jenkins offensive foul (Joel Berry II draws the foul)																		
														6:50		Kris Jenkins turnover																		
														6:34		Marcus Paige misses three point jump shot				-1.0														-1.0
						1.0								6:32		Josh Hart defensive rebound																1.0		
	2.0													6:18	63-57	Ryan Arcidiacono makes three point jump shot																		
														6:00		Kennedy Meeks misses two point jump shot																		
						1.0								5:58		Ryan Arcidiacono defensive rebound																		
														5:58		Theo Pinson personal foul (Daniel Ochefu draws the foul)																		-1.4
		0.3												5:58	64-57	Ryan Arcidiacono makes free throw 1 of 2																		
		0.3												5:58	65-57	Ryan Arcidiacono makes free throw 2 of 2																		
														5:47		Marcus Paige misses two point layup																		
														5:45		Justin Jackson offensive rebound																		1.0
														5:31		Joel Berry II misses two point jump shot																		
							1.0							5:29		Phil Booth defensive rebound																		1.0
														5:29		Justin Jackson personal foul (Phil Booth draws the foul)																		-1.4
		0.3												5:29	66-57	Phil Booth makes free throw 1 of 2																		0.3

VILLANOVA													TIME	SCORE	N. CAROLINA														Booth	Hart	Paige	Jackson							
2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal			2-pt	3-pt	free	layup	tap	asst	rebd	steal	block	press	turn	foul	goal												
		0.3											Phil Booth makes free throw 2 of 2	5:29	67-57															0.3									
														5:10																									
													Josh Hart defensive rebound	5:08																			1.0						
													Ryan Arcidiacono turnover (bad pass) (Isaiah Hicks steals)	4:44																									
													Josh Hart personal foul (Joel Berry II draws the foul)	4:42																									
														4:42	67-58																								
														4:42	67-59																								
													Isaiah Hicks blocks Josh Hart's two point layup	4:23																									
														4:21																									
													Marous Paige defensive rebound																										
													Daniel Ochefu blocks Isaiah Hicks's two point layup	4:15																									
														4:13																									
													Brice Johnson offensive rebound																										
													Brice Johnson makes two point dunk	4:11	67-61																								
														4:11																									
													Brice Johnson blocks Phil Booth's two point layup	3:52																									
														3:50																									
													Isaiah Hicks defensive rebound																										
													Joel Berry II makes three point jump shot (Marcus Paige assists)	3:40	67-64																								
														3:03	69-64																								
													Phil Booth makes two point jump shot	3:03	69-64																								
														2:46																									
													Marous Paige misses two point jump shot	2:46																									
														2:44																									
													Justin Jackson offensive rebound	2:44																									
													Daniel Ochefu personal foul (Justin Jackson draws the foul)	2:44																									
														2:44																									
													TV timeout	2:44																									
														2:44																									
													Justin Jackson misses free throw 1 of 2	2:44																									
														2:44																									
													Tar Heels rebound (deadball)	2:44																									
													Justin Jackson misses free throw 2 of 2	2:44																									
														2:44																									
													Daniel Ochefu defensive rebound	2:44																									
														2:20																									
													Isaiah Hicks personal foul (Kris Jenkins draws the foul)	2:20																									
														2:20																									
													Kris Jenkins misses free throw 1 of 1	2:20																									
														2:20																									
														2:12																									
													Brice Johnson defensive rebound																										
														2:10																									
													Joel Berry II misses two point jump shot	2:10																									
														2:10																									
													Daniel Ochefu defensive rebound	2:10																									



## 4. SUMMARY

To demonstrate how the SUV can be used for both “per play” and cumulative comparisons, we examine these for players from each of the example games, starting with SUV Baseball.

### SUV Baseball

Since both example games involved the Cubs, we can estimate a cumulative SUV for players who participated in both games. Since there were several, only the following four will be examined: Rizzo, Bryant, Ross and Lester (a pitcher). For a batter, any plate appearance, including walks, hit by pitch, etc., is a “play.” For a pitcher, a “play” is an inning.

Player	Washington at Chicago		Chicago at Cleveland		Cumulative		Average SUV
	“Plays”	SUV	“Plays”	SUV	“Plays”	SUV	
<b>Rizzo</b>	4	0.54	5	1.49	9	2.03	0.226
<b>Bryant</b>	4	-1.10	5	-0.58	9	-1.68	-0.187
<b>Ross</b>	3	-0.81	2	1.41	5	0.60	0.120
<b>Lester</b>	7	-1.76	3	-0.41	10	-2.17	-0.217

Considering the three batters, we see Rizzo with a positive cumulative SUV over three times higher than the next best, which is Ross, although his average SUV is a bit less than double that of Ross. Bryant clearly is in the rear in both. If evaluating player performance over an entire season, one would have to judge Rizzo as best, although Ross, with a lower cumulative SUV due to less “plays,” still was productive when he played. Lester would be compared to other pitchers, for whom negative SUVs are desirable, and would be seen as productive both cumulatively and on average.

### SUV Football

An approach parallel to that for SUV Baseball can be performed for Football, although the luxury of having the same team in both examples does not exist. For this case, we decided to form a set of “composite” players, consisting of the winning quarterbacks, running back and wide receivers from the two games, as follows: (1) winning quarterbacks = Roethlisberger + Hostetler = Roethstetler, (2) losing quarterbacks = Smith + Kelly = Smelly, (3) winning running backs = Bell + Meggett = Bellett, (4) losing running backs = Hill + Thomas = Hillmas, (5) winning wide receivers = Brown + Bavaro = Brovaro, and (6) losing wide receivers = Kelce + Reed = Kreed. “Plays” includes all entries for each player, including penalties due to the player.

Player	Pittsburgh at Kansas City		NY Giants vs. Buffalo		Cumulative		Average SUV
	“Plays”	SUV	“Plays”	SUV	“Plays”	SUV	
<b>Roethstetler</b>	34	-13.700	38	0.970	72	-12.730	-0.177
<b>Smelly</b>	37	-12.985	35	-5.645	72	-18.630	-0.259
<b>Bellett</b>	32	5.815	16	6.425	48	12.240	0.255
<b>Hillmas</b>	12	3.525	20	10.180	32	13.705	0.428
<b>Brovaro</b>	8	4.860	6	-0.045	14	4.815	0.344
<b>Kreed</b>	6	1.025	9	-0.005	15	1.020	0.068

It is likely inappropriate to compare players from different positions (e.g., quarterbacks can accrue negative SUVs quickly with just a few incompletions, while running backs and wide receivers only can do so when losing yardage relative to the line of scrimmage, not too common). Therefore, for the quarterbacks, it is clear that both cumulatively and on average, Roethstetler was more productive (less unproductive?) than Smelly. The case is not as clear for the running backs, as their cumulative SUVs are about equal. However, clearly Hillmas, the “losing” running back with 33% less “plays,” has the noticeably higher average SUV, indicative of better performance “per play.” The wide receiver comparison clearly favors Brovaro in both categories.

### SUV Basketball

A parallel approach to that for Football is appropriate here as well, since no team played in both games. This time, we combine the higher scorers and lower scorers separately for the winner and losers as follows: (1) winning higher scorers = Napier + Booth = Nooth, (2) losing higher scorers = Young + Paige = Yaige, (3) winning lower scorers = Daniels + Hart = Dart, and (4) losing lower scorers = Harrison + Jackson = Harjack. “Plays” include shot attempts, assists, rebounds, fouls, etc.

Player	Kentucky vs. Connecticut		Villanova vs. N. Carolina		Cumulative		Average SUV
	“Plays”	SUV	“Plays”	SUV	“Plays”	SUV	
<b>Nooth</b>	32	1.3	16	10.8	48	12.1	0.25
<b>Yaige</b>	32	-0.9	35	2.4	67	1.5	0.02
<b>Dart</b>	23	-4.0	29	5.4	52	1.4	0.03
<b>Harjack</b>	42	-10.1	22	-1.7	64	-11.8	-0.18

Again, it may be inappropriate to compare all players together, as they have different roles which may give some more opportunities for positive SUVs (negative ones) than others. Still, since “play-makers” can get credits for positive non-shooting “plays,” e.g., steals and assists; “rebounders/defenders” for positive “plays” such as rebounds, both offensive and defensive, blocks, and tap-ins; and, of course, “shooters” for 2- and 3-pointers; plus free throws for all, comparison among all four is more even than it might be for football. In the examples, there is clear dominance in both cumulative and average SUV by Nooth, and clear “non-dominance” by Harjack. Both Yaige and Dart performed comparably, with a slight edge to Dart for amassing a similar cumulative SUV with less “plays” (indicated by the higher average).

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