

THREE 45 GOLF ASSOCIATION

In cooperation with

GPS Industries

The Status of Pace of Play in American Golf

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“Advocates for a Quicker Pace of Play”

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Executive Summary

The following report is the first annual Three 45 Golf Association's Pace of Play Status Report. It presents the results of a comprehensive study on the state of American Golf's Pace of Play using GPS collected data rather than estimated times from surveys or questionnaires. It is based on a sample of 175 American golf courses, both private and public. The data was analyzed for eighteen hole play during the *first week of June of 2013*. The data base consisted of 40,460 eighteen hole rounds. The data was supplied by GPS Industries. GPS Industries installs advanced GPS systems for golf carts. Their technology not only provides GPS data for shot length purposes but also collects precise information on the time it takes to play.

Significant Findings

For the Period Studied

1. The average time it took to play 18 holes in America was 4 hours and 17 minutes.
2. There is great variation in playing time from course to course, day of the week, time of day and type of course. Overall the distribution of times was normally distributed.
3. Nineteen percent (18.9%) of the *courses* in the sample had average times less than 4 hours.
4. Twenty-nine percent (28.5%) of *all rounds* for all courses were played in less than 4 hours.
5. Thirty-five percent (34.6%) were played between 4 hours and 4 and one half hours.
6. Twenty-six percent (26.5%) were played between 4 and one half hours and 5 hours.
7. Ten percent (10.4%) were played in over 5 hours.

8. Fifty percent of the rounds were played between 3 hours and 56 minutes and 4 hours and 40 minutes.

9. The top five “fastest” courses averaged 3 hours and 36 minutes. *They were all **private** courses.*

10. The five “slowest” courses averaged 4 hours and 50 minutes. *They were all **public** courses.*

11. The “best” days to play were Monday through Thursday (average time 4 hours and 13 minutes) and the worst days were found to be Friday through Sunday (average time 4 hours and 23 minutes.)

12. The data indicates (as expected) that morning rounds were played faster than afternoon rounds. Morning rounds averaged 4 hours and 2 minutes and afternoon rounds averaged 4 hours and 21 minutes.

13. For all courses taken together, the average time for the first round of the day was 3 hours and 46 minutes. The pace typically increased throughout the morning, stabilized in the early afternoon and decreased slightly as the day wore on.

14. Time to play was mildly, positively correlated with course length but that relationship was not found to be significant statistically. No relationship (correlation essentially zero) could be found between time to play and USGA Course Rating® or Slope Rating®. These results could be a selection issue (better/faster golfers choose more difficult courses.) Or it could also be the result of the data having too much of a mixture of factors, i.e. the courses chosen for the study or other confounding factors having too much of an influence to determine the true effect of these factors. But if true, the implication could be that “Play it Forward” may not help quicken the pace much.

15. As postulated by simulations and other analyses by this author and others, a positive, statistically significant relationship was found between Time to Play and the number of rounds recorded per course. Courses with a high number of rounds per day (like a crowded highway) had elapsed times higher than courses with lower amounts of play. Although the relationship was statistically significant it was nowhere near as positive as the simulations would predict. That weakness, however, is most likely due to the fact that not all rounds at a course may have been monitored thus setting up a bias which could lead to the lack of a stronger result. However an analysis comparing the five “fastest” courses with the five “slowest” courses indicates that the “slowest” likely had

two and one half times more play than the “fastest”, adding strong evidence to the importance of tee intervals as the main culprit of slow elapsed times.

Please note that although there is mention in this report of the “Fastest” and “Slowest” golf courses and this report provides a listing of the pace of play at all of the courses in the study, this is in no way an indication of the quality of a course or the experience of players at a course. The purpose of this report is not to recognize specific courses for how they are doing but to provide a baseline from which improvements can be measured and find the factors which when improved will most likely result in a quicker pace of play.

Also since this report is based on data from 2013, some courses may have implemented improved practices. For example I have been told that Harbor Links which has an average time of 4:46 in this report has followed the recommendations of the Three 45 Golf Association and has lengthened tee intervals and increased green fees slightly to maintain revenues, and as a result, has seen a substantial improvement in playing times. The Association encourages these kinds of improvements. The hope is reports such as this one will lead to better playing times and more enjoyment for golfers.

Introduction

Pace of Play has become a major concern for the game of Golf. Many people have said and some studies have shown that pace is a major cause of the drop in participation in the game. Both the number of people playing the game and the number of rounds each player on average plays is down from historic highs just 10 years ago. Of course it can be argued that there are other more critical factors influencing the drop in participation such as the cost to play (economic factors), competition from other activities (electronic games), or just generational effects (a bulge in the population below the typical golfer age.) No matter what the reason, improving the pace of play cannot be considered a bad thing for the game. No one ever argues that the pace is too fast.

A fair amount of research has been conducted using computer simulations and other analytic techniques to estimate the nature of the problem and parcel out the effects of the different influencing factors such as individual golfer walking speed, number of strokes, group movement strategies, course conditions, and tee intervals, to name just a few. Unfortunately few studies have been conducted with actual data.

There are pluses and minuses to approaching the problem either way. The simulations, although not done in the real world, provide great power to isolate the individual and combined effect of various factors. [See Riccio, Tiger.] On the other hand, real world data comes with the credibility of indicating what actually is happening, but lacks the ability to guarantee that the proper variations are present to test true effects. [See Yates, Kimes and Shruben.]

This study (believed to be the first or at least the most comprehensive of its kind) is an attempt to document the actual pace of play in America and to use real world data to determine if such data can be helpful in finding ways to improve the situation.

The Data

GPS Industries provides state-of-the-art GPS systems for golf carts for hundreds of courses worldwide. Their technology not only provides information but it collects data on the time it takes to play a round of golf.

For this study, data was acquired from the GPS Industries data bank on the time to play every recorded round from a sample of 175 American courses for the first week of June 2013. Only 18 hole rounds were used. In total 40,460 were deemed useful for this analysis. Although the sample was large, it likely did not include every round played during the time since not all players at all courses use the carts with the GPS technology. Some rounds were 9 hole rounds and some were rounds of other numbers of holes. It was not always known if the play was in a foursome or just a twosome. Also it was not known if large gaps in data were the result of no play or golfers playing without the GPS technology.

The large set of data was then programmed into Excel spreadsheets for compilation and advanced statistical analysis. Elapsed times were available for each round by course and day of week. The data was sorted by course, time of day played, and other factors such as course difficulty measures. No information was available about the golfers themselves (handicap etc.) Volume of rounds could only be inferred by the volume recorded.

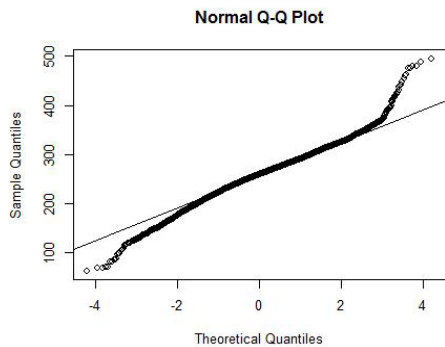
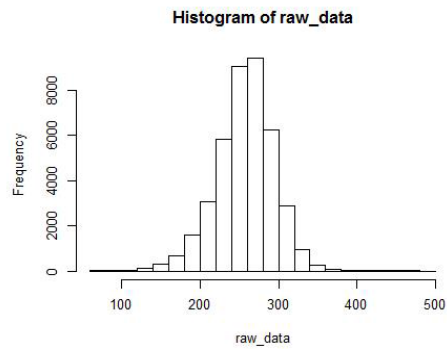
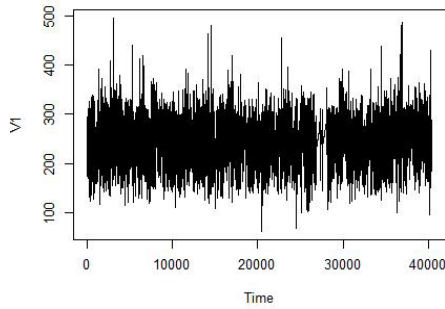
Nonetheless it proved a rich data base of facts useful for several tests. Below is an example of the raw data as it was provided before it was “cleaned up” for the needs of this study. Each line represents a round. The data includes the date of the round, its start time, end time and elapsed time. There is also a column for the weather but we did not find it useful for study. The number of holes recorded is the last column. From this it can be seen that there were many rounds of 9 holes, some of 16, and some of 8 which might be particular to the configuration of a specific course as some members may choose something other than a full round of 18.

Gpsid ID	Car	Start	End	Weather	Elapsed	Pace	Holes	
31745	56	22-Apr-2014 08:00:06	11:55:11	-	03:55:05	00:09:55 ahead	18	View detail
31728	27	22-Apr-2014 08:06:31	12:04:15	-	03:57:44	00:07:16 ahead	18	View detail
31798	65	22-Apr-2014 08:06:54	12:04:17	-	03:57:23	00:07:37 ahead	18	View detail
31743	72	22-Apr-2014 08:38:40	-	-	-	-	19	View detail
31737	25	22-Apr-2014 08:49:12	12:31:58	-	03:42:46	00:22:14 ahead	18	View detail
31790	20	22-Apr-2014 09:12:57	10:41:00	-	01:28:03	00:21:57 ahead	8	View detail
31785	33	22-Apr-2014 09:18:23	12:36:58	-	03:18:35	00:46:25 ahead	18	View detail
31749	48	22-Apr-2014 09:18:33	12:36:47	-	03:18:14	00:46:46 ahead	18	View detail
31774	67	22-Apr-2014 09:30:46	10:50:20	-	01:19:34	00:25:26 ahead	8	View detail
31776	32	22-Apr-2014 09:31:14	10:50:15	-	01:19:01	00:25:59 ahead	8	View detail
31746	41	22-Apr-2014 09:35:06	14:00:13	-	04:25:07	00:20:07 behind	18	View detail
31752	49	22-Apr-2014 09:35:12	14:00:20	-	04:25:08	00:20:08 behind	18	View detail
31735	7	22-Apr-2014 09:45:04	-	-	-	-	17	View detail
31788	16	22-Apr-2014 09:45:08	14:09:09	-	04:24:01	00:19:01 behind	18	View detail
31781	26	22-Apr-2014 09:45:17	14:08:54	-	04:23:37	00:18:37 behind	18	View detail
31769	3	22-Apr-2014 09:54:58	14:14:42	-	04:19:44	00:14:44 behind	18	View detail
31796	11	22-Apr-2014 09:55:01	14:15:26	-	04:20:25	00:15:25 behind	18	View detail
31772	22	22-Apr-2014 09:58:29	12:52:05	-	02:53:36	00:14:24 ahead	14	View detail
31775	59	22-Apr-2014 10:05:39	12:16:58	-	02:11:19	00:11:41 ahead	11	View detail
31797	61	22-Apr-2014 10:11:04	11:06:24	-	00:55:20	00:01:20 behind	4	View detail
31778	15	22-Apr-2014 10:11:05	11:06:23	-	00:55:18	00:01:18 behind	4	View detail
31795	52	22-Apr-2014 10:19:11	14:06:16	-	03:47:05	00:08:05 behind	16	View detail
31760	30	22-Apr-2014 10:19:14	12:28:12	-	02:08:58	00:03:58 behind	9	View detail
31762	12	22-Apr-2014 10:27:17	-	-	-	-	14	View detail
31738	4	22-Apr-2014 10:34:49	-	-	-	-	8	View detail

After screening, the data base was whittled down from more than 160,000 entries to 40,460 eighteen hole rounds. Below is another display of the data for a few courses with their average, minimum, and maximum play (elapsed) time, the number of rounds *in the data base* recorded that week at that course, the USGA Course and Slope Rating® for that course, the course yardage, and a ratio of average play time divided by yardage. This is just one example of spreadsheet combinations used to test various attributes of the data and to determine the influence on pace of various factors.

Overall the data of Elapsed Times of all rounds formed a normal distribution. The figure below shows the normal plot charts. The fit is good even though the ends diverged somewhat from the expected amount.

Course's Name:	Average	Max	Min	Number of Rounds	USGA Rating	Slope Rating	Yardage	Ratio
A H Blank	4:12:33	5:14:04	2:49:23	279	70.6	123	6465	0.03906
Angeles National	3:48:19	5:26:17	2:03:15	197	72.1	136	6597	0.03461
Arcadia Bluffs	5:00:11	5:37:48	2:07:22	409	72.8	137	6702	0.04479
Atlantic National	3:52:18	4:32:57	2:20:14	191	69	127	6142	0.03782
Aviara GC	4:19:58	6:31:15	2:38:47	406	73.4	138	6591	0.03944
Bay Creek	4:13:23	6:12:12	1:55:48	254	73.5	140	6832	0.03709
Bayside resort	4:20:51	5:20:31	2:55:18	127	73.2	142	6835	0.03816
Bell nob GC	4:11:27	5:34:20	2:20:45	208	71.5	121	6449	0.03899
Belmar	4:01:14	5:55:45	2:40:01	148	69.5	115	6094	0.03959
Black Bear	3:42:19	4:47:39	2:14:39	129	72.4	141	6334	0.0351
Black Jack's	4:03:51	6:47:43	2:12:20	32	71.9	126	6858	0.03556
Bolingbrook	4:23:36	5:53:32	2:24:08	338	72.8	135	6777	0.0389
Bonita Bay	3:49:22	8:15:18	2:47:22	110	73.4	144	6141	0.03735
Boothbay Harbor	4:21:06	5:50:01	3:18:07	102	68.2	131	6084	0.04292
Brentwood CC	4:08:09	5:18:27	2:41:19	59	71.9	124	6035	0.04112
Carolina CC	3:57:44	4:50:04	2:34:40	54	69.9	132	6540	0.03635
Casperkill GC	4:29:07	6:02:00	3:14:47	112	71	129	6153	0.04374
Chaska Town	4:18:17	5:36:22	2:39:32	247	72.2	137	6531	0.03955
Circling Raven	4:27:59	6:18:27	2:17:02	305	71.6	137	6578	0.04074
City Club Marietta	4:02:54	5:07:44	2:29:23	333	66.4	118	5396	0.04502
Club at Mediterra	3:43:03	5:11:34	1:54:34	40	72.9	132	6735	0.03312
Colorado National	4:30:39	5:27:49	2:33:03	396	74.3	140	7404	0.03655
Congressional CC	4:12:10	5:16:16	1:59:37	221	75.4	138	7278	0.03465
Conklin Players	4:42:30	5:55:08	3:11:55	258	69.5	121	6128	0.0461
Contraband Bayou at L'Auberge du lac	3:53:42	7:19:23	1:59:54	321	71.2	120	6531	0.03578
Copperleaf	3:53:08	4:31:04	2:14:20	197	72	129	6631	0.03516
Coral Creek	4:13:10	5:16:02	2:08:10	447	71.5	131	6347	0.03989
Coral Ridge CC	3:21:29	3:56:19	2:17:38	55	72.8	129	6731	0.02993



The Analysis

Several analyses were conducted using the data. This report begins by documenting the status of play in America. The courses in the sample were ranked by pace of play. Analyses were conducted on the effect of day of week, time of day, course difficulty and type of course on pace of play.

The Average Pace in America

The first effort was to document the status of play in the country as a whole (descriptive analytics.) As pointed out in the summary of findings, average times were produced for all courses and for all the data as individual rounds.

The overall average of all 40,460 rounds was 4 hours, 17 minutes and 19 seconds. This compares well with self-reported surveys by the National Golf Foundation and PGA of America which found the average time in recent years to be 4 hours and 14 minutes and 4 hours and 16 minutes respectively. A 1989 self-reported survey of 1800 courses by the PGA of America found an average time of 4:15 with 44.2% of the rounds being played in less than 4 hours. A 2011 survey by the PGA of America with the GCSAA and the CMAA of 13 courses found an average of 4:14. A 2012 NGF survey of 722 courses found an average time of 4:16. And a PGA Tour study of its TPC courses found an average of 4:10 on the private clubs and 4:30 on its public courses. Although this study has a slightly higher average, it cannot be inferred that there has been an increase in the time to play in recent years.

There is a huge amount of variability in the time to play 18 holes: from course to course, from time of day, from day of the week, from type of course. Although the average was well above the target of 4 hours, slightly more than one quarter (28.5%) of all rounds were played in less than 4 hours. On the other end, about one in ten (10.4%) took more than 5 hours. The smaller percentage of play under 4 hours in this study when compared to the 1989 PGA of America survey could indicate a breakdown at the low end.

The percentages were not evenly distributed. Some course had few rounds below 4 hours and some had no rounds above 5 hours. The distribution of the average time to play also varied greatly, from a low of 3 hours and 21 minutes (3:21:29) to a high of 5 hours and 2 minutes (5:01:54.)

A bright spot in the data was that almost one in five (18.9%) of the courses recorded an *average* time of less than 4 hours. One of the goals of the Three/45 Golf association is to get the average for all courses below 4 hours. It is hoped that future Status Reports will show progress on this measure.

But even the “slowest” courses had “fast” rounds. Industry Hills with an average round length of 4:47:19 had one round played in 2:08:07. Harbor Links with an average of 4:46:12 had one round of 3:10:15. So there is hope for even the “slowest” courses. Clearly there must be factors other than just the course itself which create the conditions for the slow rounds.

Nearly half of the rounds are played between 4 hours and 4 hours and 40 minutes. That fact in conjunction with the fact that 28% are played in less than 4 hours indicates that an improvement of about 15 to 20 minutes (about one minute per hole) could boost the percentage of rounds played in less than four hours to almost 50%. Efforts to improve pace can likely have demonstrable results. It is the position of the Three/45 Golf Association that it is worth making the effort.

These facts were all found the old fashion way of averaging and creating the distributions of the data. Although there are no big surprises in any of this data, this is likely the most thorough documentation of the average and range of actual times to play over the whole country for such a large data base of courses and rounds played. The procedure is a sampling procedure, but the large data base size would portend that the results are probably quite accurate.

As for interpreting these results, keep in mind that some are based on all of the rounds individually and some are based on averages across course. For example, although the percentage of rounds played in less than 4 hours is 28% when all rounds are considered as a unit, for some courses it is much higher and for others much lower. Coral Ridge in Florida, the “fastest” course in the sample, had a percentage of 100%, and Quarry Golf in Texas, the “slowest” course, has a sub-four hour percentage of 3.6%.

Listing the Courses

Appendix A is an alphabetical listing of the courses with their average Time to Play (elapsed time), the number of rounds recorded, USGA ® Course and Slope Rating. Appendix B lists the courses from the fastest to the slowest pace with course yardages.

The following are the five “fastest” courses:

Course name	Average Play time	Max Play time	Min Play time	No. of Rounds	Location of Course	Type of Course
Coral Ridge	3:21:29	3:56:19	2:17:38	55	FL	Private
Stoney Brook	3:22:31	4:41:09	2:16:28	163	FL	Private

Grande Oaks	3:35:53	4:34:03	2:24:56	81	FL	Private
Imperial Golf	3:36:43	4:20:08	1:47:39	206	FL	Private
Shadow wood	3:42:00	4:14:23	2:03:47	234	FL	Private

Interestingly, all of these courses are in Florida. You might expect that they are short or executive courses. Their yardages and USGA Course and Slope Ratings[®] belie that possibility. Here are the figures:

Course	Yardage	Course Rating	Slope Rating
Coral Ridge	6731	72.8	129
Stoney Brook	6652	72.6	137
Grande Oaks	6363	71.1	132
Imperial Golf	6602	72.5	130
Shadow Wood	6312	71.7	140

These figures do not indicate that these courses are pushovers. They are not monsters either but they look like courses with above average difficulty. Of course these may be the figures on the scorecard and, in fact, the players may tee off using the short tees regularly, but that is probably true of most courses in the study.

At the other end of the spectrum, here are the five “slowest” courses in the sample:

Course name	Average Play time	Max Play time	Min Play time	No. of Rounds	Location of Course	Type of Course
Stonewall	4:44:35	6:26:42	2:22:19	192	WV	Public
Harbor Links	4:46:12	7:28:50	3:10:15	320	NY	Public
Industry Hills	4:47:19	6:28:49	2:08:07	769	CA	Public
Arcadia Bluffs	5:00:11	5:37:48	2:07:22	409	MI	Public

Quarry 5:01:54 9:58:08 2:34:08 358 TX Public
Golf

Yardage and rating figures for these courses indicate they are challenging, perhaps more challenging than the “fastest” courses:

Course	Yardage	Course Rating	Slope Rating
Stonewall Resort	6726	73.2	141
Harbor Links	6490	71.0	128
Industry Hills	6818	73.2	135
Arcadia Bluffs	6702	72.8	137
Quarry Golf	6740	72.4	132

As noted, the data did not indicate which set of tees are used for any course. The variation is great at many courses. For example, Quarry is a beautiful daily fee course with several sets of tees. The figures above are for their Professional Tees. Their regular tees were just 5576 yards with a rating of 66.7/117. Their data indicates that many handicap players may be playing from the back tees. But as it will be pointed out later, if one group plays from the back tees and plays slowly, all groups play slowly even if they play from the front tee and play using the Three/45 Golf Pace of Play Principles®.

However on inspection, it does seem that this collection of “slowest” courses is more difficult than the “fastest” five. The average Course Rating is 73.2 for these courses verses 71.3 for the “fastest” courses. Since Course Rating is designed for the scratch golfer, the difference of two strokes would not seem to be a big factor. The Slope Rating would perhaps be a bigger indicator of course difficulty and therefore pace difficulty for the handicap golfer. Although the Slope rating was higher (134.6 vs. 133.6) for the “slowest”, the difference is not enough to indicate significantly more playing difficulty. The yardage difference is also small (6595 vs. 6532.) However as stated above, it was not known which set of tees were predominately used.

Private vs. Public

Of note is that the five “fastest” were all private member clubs and the five “slowest” were public access courses. There are a couple of reasons for this remarkable if not unexpected result.

First membership club management has some control over the pace of play behavior of its members. Peer pressure is perhaps the best way to regulate behaviors, and membership clubs have a variety of behavioral modification tools at their disposal. Public access courses have far less control and far fewer leverage tools to work with.

Secondly and probably most significantly, the average rounds played in the data base at the five “fastest” courses was 147.8 and at the five “slowest” courses 409.6 indicating that the “slowest” courses likely had two and one half as many golfers on their courses as the “fastest.” This substantiates the contention of this author and that of Yates that tee interval and “traffic” congestion is probably a far stronger factor when it comes to determining a course’s pace as does its set up and perhaps even player behaviors, the number one target of most critics.

Day of Week

The average golfer knows that pace of play varies by the day of the week – actually weekday vs weekend day. The data confirms that. The average time for Monday through Thursday was 4 hours and 13 minutes while the average for Friday through Sunday was 4 hours and 23 minutes. The extra ten minutes can be significant particularly in the percentage of rounds less than 4 hours or the total time waiting for the group ahead to clear, a greater concern some might say than the overall pace.

Here are the average times by day of the week:

Monday	4:15:59
Tuesday	4:13:16
Wednesday	4:10:08
Thursday	4:15:09
Friday	4:24:45
Saturday	4:26:05
Sunday	4:20:10

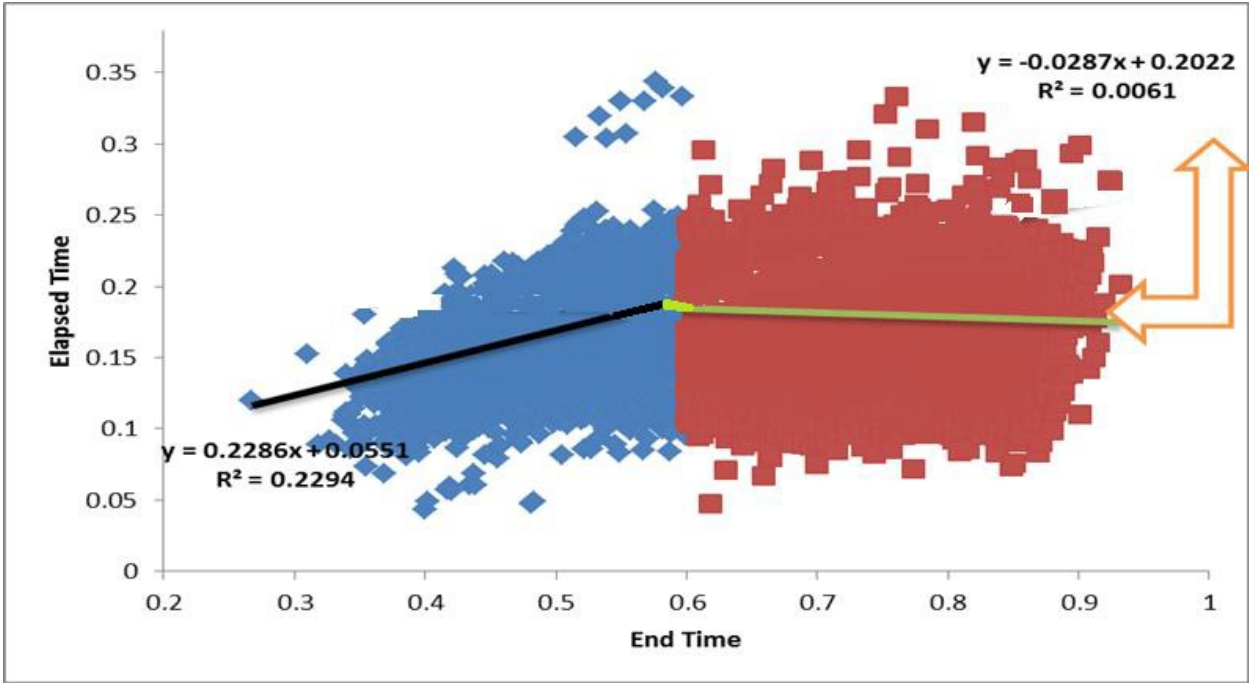
The best day was Wednesday (the doctors know what day to take off) and the worst day was Saturday. No surprise there. There could be multiple reasons for the variation. Weekend golfers may not be as aware of their pace responsibilities. But more likely it is purely a volume issue. The tee sheets are full on the weekend; not so full on weekdays.

Time of Day

As has been pointed out, there was quite a large amount of variability in the per-round data. However faster play in the morning rounds (started before 10:30am) could be noticed in amongst the variability. Morning rounds averaged 4 hours and 2 minutes while afternoon rounds averaged 4 hours and 21 minutes.

The majority of that difference is due to the very early rounds. The overall average of the first round of the day for all courses and all days was 3 hours and 46 minutes. In general the pace then slowed over the course of the morning as the courses filled up, peaked in the mid afternoon and then decreased very slightly.

The following is the plot and regression fit of the elapsed time vs. the time the round ended:



The times on the scales represent proportion of the day. As such 0.6 is 0.6 of 24 hours or 2:24pm in the afternoon. As can be seen there is great variability in the data, but there is a

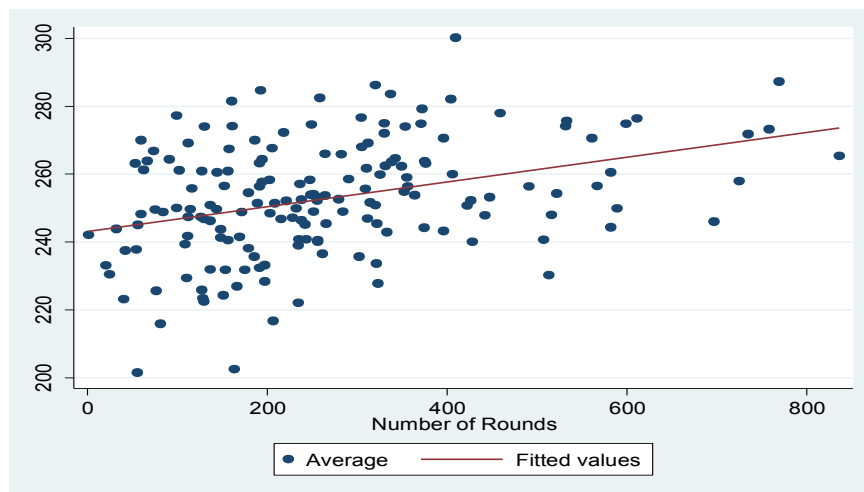
message in it. As volume builds up, pace slows down, just like a highway. That topic is examined further below.

Volume of Play

In my previous work ([Golf's Pace of Play Bible](#)) and the work of others, particularly Yates, the volume of play has often been found to be the most significant factor influencing pace of play. As just mentioned, like a highway, the more golfers you put on the course the more congestion and the more delays will be realized.

A specific example of this is the number of rounds recorded at the five “fastest” courses verses the average at the five “slowest” courses. There were 2048 eighteen hole rounds recorded at the five “slowest” and only 739 recorded at the five “fastest.” Volume may be the significant factor separating these two groups.

However the overall data was less revealing. Here is the plot of average elapsed time to play vs. the number of rounds recorded at each course:



As can be seen, there is a positive linear relationship, albeit a mild one, relating pace to the number of rounds. As such it can be said the data used in this report substantiates the relationship, but not to the extent the simulations would predict. The discrepancy is likely due to the fact that not all rounds were reported since not all golfers used the GPS systems. In addition the wide variety of course types and other conditions could cloud the results. For example even on a day with few groups on the course, one slow group could set the pace for all those that follow. In such cases, the slow pace is more a factor of one group being an obstacle or poor ranger influence.

Lastly saturation may be achieved at a reasonably low volume of play and any amount above that has less effect thus spoiling the statistical analysis. The early morning vs. afternoon experience, it is believed, is more indicative of the volume effect than the admittedly real self-selection effect of faster golfers wanting to play early. There are plenty of golfers who play later in the day who also have the desire to play faster but are impeded by the volume of groups on the course.

Course Difficulty and Other Factors

It would be reasonable to believe that the more difficult the course, the slower the pace. Unfortunately that relationship could not be found using this data. The models of average elapsed time vs. yardage and USGA Course and Slope Ratings[®] resulted in coefficients of either zero or too close to zero to be anything else for each of those factors. Yardage was the most “positive”, but even that was not significantly different from zero.

That does not mean there are no relationships to pace for these factors. It just means this data did not yield that result. As discussed before, there are so many competing issues, it may be just too hard to find the relationship from generally collected data rather than a specifically designed experiment. It is clearly reasonable to believe that a long, difficult course will take more time to play than a short open one. It is possible this study’s sample did not present the amount of variability needed to find the relationship, or that other factors such as volume confound the results. If you put too many golfers on an easy course it may have the same effect as many golfers on a hard course. More specifically designed studies need to be done.

For argument sake, what if the analysis is right, that yardage, Rating and Slope do not have much of an effect? Perhaps volume (tee interval) is so dominant, individual golfer behaviors are so dominant, and wave up and other course management strategies are so dominate, that course difficulty is not that important. One implication is that “Play It Forward” will not have much of an effect on pace. But on the positive side, it could be inferred that no matter how difficult the course it, a sub-four hour round average is possible. I think both are true.

Conclusions

This is the first in what is hoped to be a series of studies of the pace of play in American golf. Now the status of pace can be said with a new level of precision. A baseline has been established for the average time to play and the percentage of play less than the goal of four hours.

It has also proven the effectiveness of data and data collection technology for illuminating a subject which heretofore had to rely on either self-reported data or anecdotal evidence. It is hoped that this report will inspire golfers and golf course managers to “kick it up a notch” when it comes to improving pace of play. Comparisons should be made between courses and findings about what works and what doesn’t should be circulated.

Lastly the report indicates that there is good reason to believe that courses implementing a pace of play strategy will see improvement. Some courses have “figured it out.” Lessons can be learned and transferred.

Three/45 Golf Association Plan

The following is a suggested approach to improving American golf's pace of play. The Three/45 Golf Association is a not-for-profit membership organization established to be advocates for a quicker pace of play. Research indicates that improving the pace of play is a complicated issue and will require just about everyone to get involved if we wish to make progress – individual golfers, course managers and course designers. The organization's mission and purpose is the following:

- To teach the principals of a quicker pace of play
- Bind and link like-minded golfers who want the pace to speed up
- Create members who serve as role models and teachers
- Help course management understand and control pace of play
- Link architectural design to pace of play concerns

As a result of research, the following is the Three/45 Golf Association Plan for improving pace of play:

- First, tee intervals have to be set to match course and golfer characteristics to increase the chances that a 4 hour pace is possible. As golfers get better at pace of play behaviors, the interval can be shortened. To balance revenues, the Association approves raising green fees since the golfing experience has been improved.
-
- Second all golfers have to be instructed, trained, encouraged, and rewarded for moving directly to their own ball at a pace of at least 3 mph, hitting every shot in less than 45 seconds and getting their group to clear the green within 3 minutes *every time*.
-
- Third reduce the variability of play by reducing the time to look for a lost ball (no more than 3 minutes), picking up when out of the hole, and giving short putts when pace is an issue.
-
- Fourth get course management to understand the pace consequences of their course set up conditions, to monitor pace of play status at all times using modern technology like that provided by GPS Industries, and reward "fast play" golfers.
-

For more information about the Association, go to www.three45golf.org. Courses who want to be accredited Three/45 Golf Courses, they should email info@three45golf.org.

GPS Industries

GPS Industries, LLC is the world's leading provider of GPS fleet management solutions for golf courses and resort properties. Formed in 2009 by the combination of the two industry leaders, GPS Industries provides its clients with real time tracking of their golf car fleet and maintenance vehicles, the ability to control the speed and areas the golf car is allowed to enter, and delivers information and other features to the occupants via a full color high definition 10.1" touchscreen mounted under the roof of the vehicle. GPS Industries partnered with Club Car, the world's leading provider of golf cars, to launch the industry's first CONNECTED® golf car, the Club Car [Precedent i3](#), in 2014. In addition, GPS Industries is expanding the scope of its offering to provide location-based services for both commercial and consumer applications, as well as leveraging its platform to create a national digital media network with the ability to deliver addressable content to a targeted demographic.

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Appendix A:

Alphabetic List of Courses with Times, Rounds and Ratings

<u>Course's Name:</u>	<u>Average</u>	<u>Max</u>	<u>Min</u>	<u>Number of Rounds</u>	<u>USGA Rating</u>	<u>Slope Rating</u>
A H Blank	4:12:33	5:14:04	2:49:23	279	70.6	123
Angeles National	3:48:19	5:26:17	2:03:15	197	72.1	136
Arcadia Bluffs	5:00:11	5:37:48	2:07:22	409	72.8	137
Atlantic National	3:52:18	4:32:57	2:20:14	191	69	127
Aviara GC	4:19:58	6:31:15	2:38:47	406	73.4	138
Bay Creek	4:13:23	6:12:12	1:55:48	254	73.5	140
Bayside resort	4:20:51	5:20:31	2:55:18	127	73.2	142
Bell nob GC	4:11:27	5:34:20	2:20:45	208	71.5	121
Belmar	4:01:14	5:55:45	2:40:01	148	69.5	115
Black Bear	3:42:19	4:47:39	2:14:39	129	72.4	141
Black Jack's	4:03:51	6:47:43	2:12:20	32	71.9	126
Bolingbrook	4:23:36	5:53:32	2:24:08	338	72.8	135
Bonita Bay	3:49:22	8:15:18	2:47:22	110	73.4	144
Boothbay Harbor	4:21:06	5:50:01	3:18:07	102	68.2	131
Brentwood CC	4:08:09	5:18:27	2:41:19	59	71.9	124
Carolina CC	3:57:44	4:50:04	2:34:40	54	69.9	132
Casperkill GC	4:29:07	6:02:00	3:14:47	112	71	129
Chaska Town	4:18:17	5:36:22	2:39:32	247	72.2	137
Circling Raven	4:27:59	6:18:27	2:17:02	305	71.6	137
City Club Marietta	4:02:54	5:07:44	2:29:23	333	66.4	118
Club at Mediterra	3:43:03	5:11:34	1:54:34	40	72.9	132
Colorado National	4:30:39	5:27:49	2:33:03	396	74.3	140
Congressional CC	4:12:10	5:16:16	1:59:37	221	75.4	138
Conklin Players	4:42:30	5:55:08	3:11:55	258	69.5	121
Contraband Bayou at L'Auberge du lac	3:53:42	7:19:23	1:59:54	321	71.2	120
Copperleaf	3:53:08	4:31:04	2:14:20	197	72	129
Coral Creek	4:13:10	5:16:02	2:08:10	447	71.5	131
Coral Ridge CC	3:21:29	3:56:19	2:17:38	55	72.8	129
Cowboys	4:37:56	6:59:35	2:10:04	459	72.6	135
Cranberry Highlands	4:14:53	5:16:45	2:43:43	352	68.5	126
Crane's Landing at Marriotts'	3:50:22	4:44:17	2:07:57	24	69.6	127

Cumming Cove	4:07:17	5:09:56	2:38:14	112	69.1	131
Currituck	3:55:39	4:52:08	1:59:07	185	71.5	129
Dacotah Ridge	4:11:21	6:01:27	2:02:59	189	72.6	142
Dakota Dunes	4:36:35	6:12:45	2:28:15	304	73.4	135
Desert Willow Golf Resort - CA	4:33:15	6:03:19	2:28:31	758	71.5	128
Disney Magnolia and Palms - FL	4:14:17	5:43:06	2:06:21	522	70.1	123
Dove Mountain, Ritz Carlton - AZ	4:23:10	5:24:06	2:24:07	376	73.9	146
Eagle Falls Golf Course at Fantasy Springs Resort - CA	4:11:38	5:24:23	2:33:09	314	68.4	116
Eagle Ranch Golf Club - CO	4:06:41	5:03:46	2:22:43	215	72.7	135
Eagle Springs Golf & Country Club - CA	4:41:31	5:50:56	3:18:20	160	70.9	131
EagleVail Golf Course - CO	4:16:22	5:34:14	1:58:34	356	69.1	128
East Ridge Country Club - LA	3:45:52	4:32:07	2:23:12	127	70.5	127
Elmwood Park Golf Course - SD	4:05:13	4:56:10	2:41:17	242	67.3	115
Emerald Bay Plantation - FL	3:47:46	4:50:26	2:05:23	323	71.6	137
Fairview Farm Golf Course - CT	4:29:57	5:45:56	2:32:23	186	69.5	121
FarmLinks Golf Club - AL	4:14:35	5:23:57	2:36:56	179	73	131
Firewheel at Garland - Bridges Course - TX	3:54:57	5:47:44	1:49:43	393	72.7	129
Flamingo Lakes Country Club - FL	3:51:50	4:51:44	2:11:07	136	66.7	118
Forest Ridge Golf Club - OK	4:12:14	5:48:32	2:26:19	426	74.1	145
Fossil Trace Golf Club - CO	4:35:35	5:14:45	2:29:49	533	71.4	136
Four Oaks Country Club - MA	4:20:53	5:52:10	2:10:47	156	66.4	108
Fox Hills Golf & Banquet Center - MI	4:29:10	6:30:44	2:36:45	312	68	123
Gaylord Springs Golf Links - TN	4:17:00	5:27:23	2:33:52	236	72.3	133

Glen Oak Golf Course - NY	4:34:49	5:41:41	3:01:45	371	72	123
Glendarin Hills Golf Club - IN	4:10:51	5:47:36	2:21:46	136	72.7	136
Golf Club At North Hampton - FL	3:55:41	5:12:32	2:39:15	302	72.8	143
Gordon Lakes Golf Course - GA	4:18:18	6:29:00	2:09:27	202	72.9	136
Grand Geneva Resort - WI	4:01:39	8:32:42	2:11:10	111	72.2	127
Grand Golf Club at The Grand Del Mar - CA	4:10:38	5:59:05	2:18:31	422	73	136
Grand View Lodge - MN - Pines Course	4:06:41	5:55:10	2:25:56	129	72	139
Grande Oaks Golf Club - FL	3:35:53	4:34:03	2:24:56	81	71.1	132
Greensboro National Golf Club - NC	4:07:19	6:10:29	1:53:49	126	70	123
Harbor Links Golf Course - NY	4:46:12	7:28:50	3:10:15	320	71	128
Hawks Landing Orlando World Center Marriott - FL	4:02:02	4:02:02	4:02:02	1	70.3	129
Hawktree Golf Club - ND	4:13:39	5:29:24	2:32:27	264	74	135
Heritage Hills Golf Resort - PA	4:37:14	6:11:11	3:15:47	99	70.7	125
Heritage Palms Golf & Country Club - FL	3:43:23	4:49:47	2:32:56	128	71.2	130
Heritage Shores Golf Course - DE	4:15:45	5:18:57	2:05:42	116	70.5	138
Hickory Heights Golf Club - PA - 2	4:21:45	5:46:53	2:08:57	310	70.8	134
Highland Meadows Golf Club - CO	4:19:45	7:42:37	1:59:26	325	70.2	128
Highland Rim Golf Course (Through the Green)- TN	4:16:17	7:59:49	2:31:19	191	66.5	115
Hillcrest Country Club - CA	3:59:20	5:51:37	2:39:53	108	72.1	131
Imperial Golf Club - FL	3:36:43	4:20:08	1:47:39	206	72.5	130
Indian Wells Golf Resort - CA	4:25:18	5:40:36	2:08:10	836	72.5	132

Industry Hills Golf Club at Pacific Palms - CA	4:47:19	6:28:49	2:08:07	769	73.2	135
International Golf Club & Resort - MA	4:39:15	6:58:55	1:59:40	372	72.5	129
Iron Horse Golf Course - TX	4:07:45	5:39:57	2:26:50	442	70.8	124
Isleta Eagle Golf Course - NM	4:07:54	6:20:44	2:16:27	516	73.3	130
Ka'anapali Golf	3:50:08	1:02:18	5:19:24	513	72.10	128.00
Kapalua Bay Course	4:03:17	2:20:11	6:05:00	396	71.20	134.00
Kapalua Plantation Course	4:18:55	2:39:02	5:30:45	355	75.20	142.00
Kennington Golf	4:13:50	2:19:48	5:29:58	364	72.50	134.00
Ko Olina	4:31:50	2:08:36	5:27:39	735	71.60	130.00
Koasati Pines	4:13:58	2:19:04	5:52:11	248	73.80	127.00
Lake Presidential	4:33:54	2:17:42	5:50:15	353	72.10	137.00
Lake Toxaway Country Club	3:57:33	2:51:04	5:02:34	42	69.50	132.00
Lakewood Country Club	4:23:19	3:06:41	5:43:38	191	68.10	121.00
Ledgestone Country Club	4:22:25	2:33:09	5:35:36	331	70.90	128.00
Legends Golf & CC	3:58:03	2:56:41	4:26:12	179	71.70	131.00
Makai Golf Club at Princeville	4:08:23	2:37:30	5:02:17	203	71.40	127.00
Maroon Creek	3:45:39	2:24:26	5:07:06	76	71.40	134.00
Meadows at Mystic Lake	4:25:47	2:17:19	5:32:10	282	72.40	141.00
Medina Country Club	3:51:42	2:18:37	7:34:25	153	72.20	131.00
Montauk Downs State Park	4:24:22	2:48:30	5:13:55	194	73.20	139.00
Nashawtuc Country Club	4:16:24	2:04:57	5:09:12	152	72.70	137.00
Nemacolin Woodlands Resort	4:30:38	2:31:17	6:35:43	561	71.10	131.00
Nob North	4:05:21	1:08:06	5:14:54	265	70.20	126.00
North Ranch	4:00:02	2:17:58	5:32:48	428	72.40	133.00
Oak Creek	4:34:02	1:38:47	5:57:45	532	71.40	126.00
Ojai Valley Inn and Spa	4:09:54	2:22:00	5:23:47	232	69.30	126.00
Old Edwards Club	4:09:35	1:43:30	5:31:48	114	69.90	141.00
Olde Stonewall Golf Club	4:08:49	2:00:26	5:32:51	171	72.20	144.00
Pelican Lakes	4:18:13	2:05:17	5:45:45	349	63.60	111.00

PGA Golf Club	4:05:59	2:26:36	5:12:09	697	73.10	141.00
Prairie Green	4:00:31	2:45:45	5:08:35	256	73.10	125.00
Presidio Golf	4:20:31	2:24:41	5:37:42	582	70.70	129.00
SilverRock Resort	4:33:56	2:23:02	5:39:06	130	74.40	136
Shoal Creek	4:26:47	2:29:39	5:11:08	73	70.60	127
Shingle Creek	4:16:19	2:07:11	5:29:44	491	72.10	130
Shale Creek	4:23:50	2:37:43	9:58:55	66	71.60	130
Shadow Wood Preserve	3:42:00	2:03:47	4:14:23	234	71.70	140
Santaluz Club	3:56:31	1:59:08	5:26:54	261	72.50	133
Sandy Pines	4:06:52	2:34:46	6:27:03	311	70.70	128
Sandia Golf Club	4:34:35	3:12:23	6:32:15	249	72.90	128
Salish Cliff Golf	4:23:07	2:25:37	6:11:33	53	72.60	133
Riviera Country Club of Coral Gables	3:46:53	2:38:04	4:31:03	166	70.60	127
River Valley Ranch	4:00:43	2:09:20	5:14:01	243	70.60	129
Regatta Bay Golf Club	4:10:49	2:48:40	5:15:02	320	71.50	131
Red Hawk	4:10:01	1:45:43	5:52:39	552	65.50	123
Quarry Golf	5:01:54	2:34:08	9:58:55	358	72.40	132
Princeville Prince Course	4:12:12	2:47:40	5:43:19	255	75.00	133
Presidio Golf	4:21:14	1:08:06	5:37:42	62	70.70	129
Preserve on Rathbun Lake	4:20:30	1:08:06	5:34:07	144	71.20	128
Prairie Green	4:00:31	2:45:45	5:08:35	156	71.20	128
Poipu Bay Resort	4:04:13	2:23:04	5:15:18	374	71.30	126
PGA Golf Club	4:00:33	2:02:43	5:12:09	507	73.10	141
Pelican Lakes	4:18:13	2:05:17	5:45:45	606	63.60	111
Parc Robert Hersant	4:30:02	2:30:15	5:41:01	59	70.10	121
Olde stonewall Golf Club	4:08:49	2:00:26	5:32:51	84	72.20	144
Old Edwards Club	4:09:35	1:43:30	5:31:48	143	69.90	141
Old American club	3:58:55	1:42:23	5:29:42	234	74.50	141
Ojai Valley Inn and Spa	4:09:54	2:22:00	5:23:47	589	69.30	126
Oak Creek	4:34:02	1:38:47	5:57:45	161	71.40	126
North Ranch	4:00:02	2:17:58	5:32:48	256	72.40	133
Nob North	4:05:21	1:08:06	5:14:54	322	70.20	126
New Mexico State University	3:53:00	2:25:54	4:42:05	20	68.90	124
Nemacolin Woodlands Resort	4:34:57	2:31:17	6:35:43	330	71.10	131
Nashawtuc Country club	4:16:24	2:04:57	5:09:12	567	72.70	137

Murder Rock	4:22:21	2:23:27	5:50:54	349	69.20	124
Montauk Downs State Park	4:24:22	2:48:30	5:13:55	91	73.20	139
Southern Dunes	4:08:51	4:48:06	2:16:48	251	75.1	138
Sportsman's Country Club	4:06:23	4:59:41	2:37:17	238	69.1	123
Spring Run	3:44:19	5:17:18	2:10:40	151	71.8	132
St. James Bay	4:06:14	5:18:27	3:14:27	136	69.8	124
Stanley Golf Course	4:27:38	6:31:24	3:14:32	205	68.3	111
Stonewall	4:14:04	5:48:14	2:32:01	251	72.1	141
Stonewall Resort	4:44:35	6:26:42	2:22:19	192	73.2	141
StoneyBrook Estero	3:22:31	4:41:09	2:16:28	163	72.6	137
Sycuan Golf Resort	4:17:52	5:56:09	2:15:32	725	70.9	126
TeraVista	4:04:20	7:17:51	2:04:11	582	72.6	135
The Bridges	4:09:31	5:35:43	2:41:37	75	71.4	138
The Challenge at Mane	4:01:26	5:46:29	2:42:57	169	72.1	130
The Lakes Golf Club_A	4:29:45	5:09:58	2:22:32	109	60.6	99
The Legacy Golf	4:32:14	5:52:10	2:25:56	218	72.2	129
The Preserve Golf	4:09:56	5:55:00	2:46:04	99	70.5	135
The President Country	3:51:47	5:12:51	1:51:29	175	72.6	137
The Ridge GC - CA	4:15:36	6:15:34	2:38:03	309	68.2	117
Thousand Oaks Golf Club	4:25:57	6:13:09	2:30:01	264	72.3	139
Tiburon Golf Club	4:12:28	5:25:51	2:18:41	238	71.1	140
Tidewater Golf Club	4:42:05	5:59:55	3:06:04	404	72.6	138
Tiffany Greens	4:24:38	7:28:46	1:39:04	342	72.1	132
TPC River Highlands	4:27:19	7:39:43	2:30:07	157	71.2	129
TPC San Antonio	4:34:50	8:07:49	2:18:46	599	74.7	145
Tuhaye Golf Club	4:05:05	5:20:11	1:59:34	56	74.2	140
Twin Warriors	4:23:45	5:58:38	2:17:07	375	73.5	140
Waialeale	4:36:22	5:27:43	2:47:19	611	70.3	127
Waldorf Astoria	4:17:39	5:56:00	2:26:45	194	72.9	131
Waveland Golf	4:08:52	5:31:29	2:46:26	284	70	120
Westin Diplomat Golf & Spa	4:03:46	6:03:23	2:18:55	148	70.2	132
Whiskey Creek Golf	4:43:33	5:42:27	3:07:58	337	72.1	136
White Deer Run	4:18:32	6:02:29	3:03:00	290	72.9	144
Wilderness at Fortune	4:31:59	5:47:44	2:35:29	330	73.2	137
Wintonbury Hills	4:07:06	5:38:48	1:36:09	228	70	128
Woodmont Country Club	4:00:47	7:10:23	2:31:18	235	72	130

Appendix B:

Courses Listed by Average Time with Yardages and Ratio of Times to Yardages

<u>Course's Name:</u>	<u>Average</u>	<u>Yardage</u>	<u>Ratio</u>
Coral Ridge CC	3:21:29	6731	0.02993
StoneyBrook Estero	3:22:31	6652	0.03044
Grande Oaks Golf Club - FL	3:35:53	6363	0.03393
Imperial Golf Club - FL	3:36:43	6602	0.03283
Shadow Wood Preserve	3:42:00	6312	0.03517
Black Bear Club at Mediterra	3:42:19	6334	0.0351
Heritage Palms Golf & Country Club - FL	3:43:23	6405	0.03488
Spring Run	3:44:19	6554	0.03423
Maroon Creek	3:45:39	6914	0.03264
East Ridge Country Club - LA	3:45:52	6349	0.03558
Riviera Country Club of Coral Gables	3:46:53	6208	0.03655
Emerald Bay Plantation - FL	3:47:46	6521	0.03493
Angeles National	3:48:19	6597	0.03461
Bonita Bay	3:49:22	6141	0.03735
Ka'anapali Golf	3:50:08	6267	0.03672
Crane's Landing at Marriotts'	3:50:22	5949	0.03872
Medina Country Club	3:51:42	7007	0.03307
The President Country	3:51:47	5865	0.03952
Flamingo Lakes Country Club - FL	3:51:50	5562	0.04168
Atlantic National	3:52:18	6142	0.03782
New Mexico State University	3:53:00	5432	0.04289
Copperleaf	3:53:08	6631	0.03516
Contraband Bayou at L'Auberge du lac	3:53:42	6531	0.03578
Firewheel at Garland - Bridges Course - TX	3:54:57	3320	0.07077
Currituck	3:55:39	6404	0.0368
Golf Club At North Hampton - FL	3:55:41	6753	0.0349
Santaluz Club	3:56:31	6661	0.03551
Lake Toxaway Country Club	3:57:33	6148	0.03864
Carolina CC	3:57:44	6540	0.03635
Legends Golf & CC	3:58:03	6191	0.03845

Old American club	3:58:55	6728	0.03551
Hillcrest Country Club - CA	3:59:20	6447	0.03712
North Ranch	4:00:02	6245	0.03844
North Ranch	4:00:02	6352	0.03779
Prairie Green	4:00:31	6667	0.03608
Prairie Green	4:00:31	6087	0.03951
PGA Golf Club	4:00:33	6656	0.03614
River Valley Ranch	4:00:43	6600	0.03647
Woodmont Country Club	4:00:47	6609	0.03643
Belmar	4:01:14	6094	0.03959
The Challenge at Mane	4:01:26	6725	0.0359
Grand Geneva Resort - WI	4:01:39	6554	0.03687
Hawks Landing Orlando World Center Marriott - FL	4:02:02	6165	0.03926
City Club Marietta	4:02:54	5396	0.04502
Kapalua Bay Course	4:03:17	6051	0.0402
Westin Diplomat Golf & Spa	4:03:46	6500	0.0375
Black Jack's	4:03:51	6858	0.03556
Poipu Bay Resort	4:04:13	7123	0.03429
TeraVista	4:04:20	6637	0.03681
Tuhaye Golf Club	4:05:05	6680	0.03669
Elmwood Park Golf Course - SD	4:05:13	4902	0.05002
Nob North	4:05:21	6109	0.04016
Nob North	4:05:21	6109	0.04016
PGA Golf Club	4:05:59	6580	0.03738
St. James Bay	4:06:14	6374	0.03863
Sportsman's Country Club	4:06:23	6010	0.041
Eagle Ranch Golf Club - CO	4:06:41	7151	0.0345
Grand View Lodge - MN - Pines Course	4:06:41	6471	0.03812
Sandy Pines	4:06:52	6276	0.03934
Wintonbury Hills	4:07:06	6283	0.03933
Cumming Cove	4:07:17	6158	0.04016
Greensboro National Golf Club - NC	4:07:19	6417	0.03854
Iron Horse Golf Course - TX	4:07:45	6264	0.03955
Isleta Eagle Golf Course - NM	4:07:54	6943	0.03571
Brentwood CC	4:08:09	6035	0.04112
Makai Golf Club at Princeville	4:08:23	6476	0.03835

Olde stonewall Golf Club	4:08:49	6681	0.03724
Olde Stonewall Golf Club	4:08:49	6681	0.03724
Southern Dunes	4:08:51	7307	0.03406
Waveland Golf	4:08:52	6282	0.03962
The Bridges	4:09:31	7021	0.03554
Old Edwards Club	4:09:35	5335	0.04678
Old Edwards Club	4:09:35	6002	0.04158
Ojai Valley Inn and Spa	4:09:54	5962	0.04192
Ojai Valley Inn and Spa	4:09:54	5901	0.04235
The Preserve Golf	4:09:56	6500	0.03845
Red Hawk	4:10:01	6544	0.03821
Grand Golf Club at The Grand Del Mar - CA	4:10:38	6811	0.0368
Regatta Bay Golf Club	4:10:49	6490	0.03865
Glendarin Hills Golf Club - IN	4:10:51	6668	0.03762
Dacotah Ridge	4:11:21	6642	0.03784
Bell nob GC	4:11:27	6449	0.03899
Eagle Falls Golf Course at Fantasy Springs Resort - CA	4:11:38	6140	0.04098
Congressional CC	4:12:10	7278	0.03465
Princeville Prince Course	4:12:12	6567	0.0384
Forest Ridge Golf Club - OK	4:12:14	6826	0.03695
Tiburon Golf Club	4:12:28	6522	0.03871
A H Blank	4:12:33	6465	0.03906
Coral Creek	4:13:10	6347	0.03989
Bay Creek	4:13:23	6832	0.03709
Hawktree Golf Club - ND	4:13:39	6444	0.03936
Kennington Golf	4:13:50	6669	0.03806
Koasati Pines	4:13:58	7185	0.03535
Stonewall	4:14:04	6582	0.0386
Disney Magnolia and Palms - FL	4:14:17	6339	0.04011
FarmLinks Golf Club - AL	4:14:35	6970	0.03653
Cranberry Highlands	4:14:53	6021	0.04233
The Ridge GC - CA	4:15:36	6345	0.04028
Heritage Shores Golf Course - DE	4:15:45	6477	0.03949
Highland Rim Golf Course (Through the Green)- TN	4:16:17	5573	0.04599
Shingle Creek	4:16:19	6260	0.04095
EagleVail Golf Course - CO	4:16:22	6189	0.04142
Nashawtuc Country club	4:16:24	6434	0.03985

Nashawtuc Country Club	4:16:24	6434	0.03985
Gaylord Springs Golf Links - TN	4:17:00	6516	0.03944
Waldorf Astoria	4:17:39	6657	0.0387
Sycuan Golf Resort	4:17:52	6429	0.04011
Pelican Lakes	4:18:13	6566	0.03933
Pelican Lakes	4:18:13	6566	0.03933
Chaska Town	4:18:17	6531	0.03955
Gordon Lakes Golf Course - GA	4:18:18	6784	0.03807
White Deer Run	4:18:32	6851	0.03774
Kapalua Plantation Course	4:18:55	6674	0.0388
Highland Meadows Golf Club - CO	4:19:45	6349	0.04091
Aviara GC	4:19:58	6591	0.03944
Preserve on Rathbun Lake	4:20:30	6269	0.04155
Presidio Golf	4:20:31	6096	0.04274
Bayside resort	4:20:51	6835	0.03816
Four Oaks Country Club - MA	4:20:53	5789	0.04507
Boothbay Harbor	4:21:06	6084	0.04292
Presidio Golf	4:21:14	6424	0.04066
Hickory Heights Golf Club - PA - 2	4:21:45	6181	0.04235
Murder Rock	4:22:21	6206	0.04227
Ledgestone Country Club	4:22:25	6420	0.04087
Salish Cliff Golf	4:23:07	6312	0.04169
Dove Mountain, Ritz Carlton - AZ	4:23:10	7240	0.03635
Lakewood Country Club	4:23:19	6729	0.03913
Bolingbrook	4:23:36	6777	0.0389
Twin Warriors	4:23:45	7284	0.03621
Shale Creek	4:23:50	6652	0.03966
Montauk Downs State Park	4:24:22	6614	0.03997
Montauk Downs State Park	4:24:22	6598	0.04007
Tiffany Greens	4:24:38	6613	0.04002
Indian Wells Golf Resort - CA	4:25:18	6913	0.03838
Meadows at Mystic Lake	4:25:47	6668	0.03986
Thousand Oaks Golf Club	4:25:57	6677	0.03983
Shoal Creek	4:26:47	6833	0.03904
TPC River Highlands	4:27:19	6518	0.04101
Stanley Golf Course	4:27:38	5907	0.04531
Circling Raven	4:27:59	6578	0.04074

Casperkill GC	4:29:07	6153	0.04374
Fox Hills Golf & Banquet Center - MI	4:29:10	6431	0.04185
The Lakes Golf Club_A	4:29:45	5970	0.04518
Fairview Farm Golf Course - CT	4:29:57	6211	0.04346
Parc Robert Hersant	4:30:02	5340	0.05057
Nemacolin Woodlands Resort	4:30:38	6791	0.03985
Colorado National	4:30:39	7404	0.03655
Ko Olina	4:31:50	6432	0.04226
Wilderness at Fortune	4:31:59	6772	0.04016
The Legacy Golf	4:32:14	6378	0.04268
Desert Willow Golf Resort - CA	4:33:15	6676	0.04093
Lake Presidential	4:33:54	6725	0.04073
SilverRock Resort	4:33:56	5984	0.04578
Oak Creek	4:34:02	6567	0.04173
Oak Creek	4:34:02	6543	0.04188
Sandia Golf Club	4:34:35	6841	0.04014
Glen Oak Golf Course - NY	4:34:49	6638	0.0414
TPC San Antonio	4:34:50	7034	0.03907
Nemacolin Woodlands Resort	4:34:57	5989	0.04591
Fossil Trace Golf Club - CO	4:35:35	6577	0.0419
Waialeale	4:36:22	6261	0.04414
Dakota Dunes	4:36:35	6501	0.04255
Heritage Hills Golf Resort - PA	4:37:14	6223	0.04455
Cowboys	4:37:56	6563	0.04235
International Golf Club & Resort - MA	4:39:15	7138	0.03912
Eagle Springs Golf & Country Club - CA	4:41:31	6298	0.0447
Tidewater Golf Club	4:42:05	6771	0.04166
Conklin Players	4:42:30	6128	0.0461
Whiskey Creek Golf	4:43:33	6523	0.04347
Stonewall Resort	4:44:35	6726	0.04231
Harbor Links Golf Course - NY	4:46:12	6490	0.0441
Industry Hills Golf Club at Pacific Palms - CA	4:47:19	6818	0.04214
Arcadia Bluffs	5:00:11	6702	0.04479
Quarry Golf	5:01:54	6740	0.05414