Flagstick Tool for Pace of Play

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USGA

Golfer Experience

Factors that are critical in contributing to golfers' enjoyment of a round of golf:

- Conditioning of golf course (76% of respondents)
- People you play with (75%)
- Cost (72%)
- Pace of play (67%)

Golfers vs. Facilities

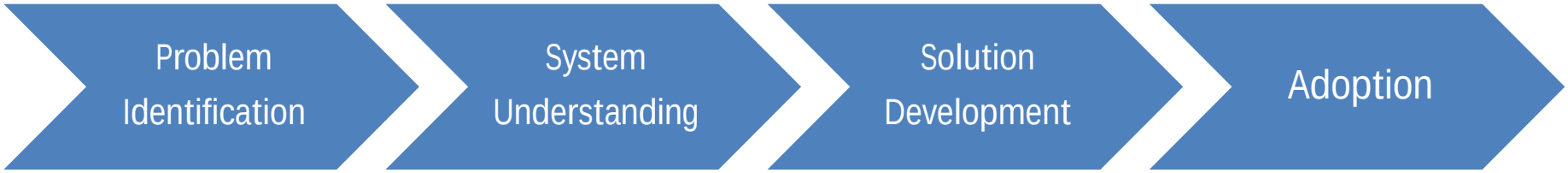
GOLFERS

- 50% believe bottlenecks are more bothersome than the length of the round
- 74% believe pace of play is crucial in contributing to one's enjoyment of golf
- 41% of golfers believe pace of play can be significantly improved at the course they play most frequently

FACILITIES

- 75% believe reducing overall time would be more enjoyable than reducing bottlenecks
- 23% have formal programs in place to improve pace of play
- 18% believe pace of play can be significantly improved at their courses

Process


Problem Identification
System Understanding
Solution Development
Adoption

Process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System Understanding
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Defining Pace of Play

- Golfer experience is determined by flow, not round times
- Improving flow will improve round times

The Experience of Time

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4 hours 39 minutes

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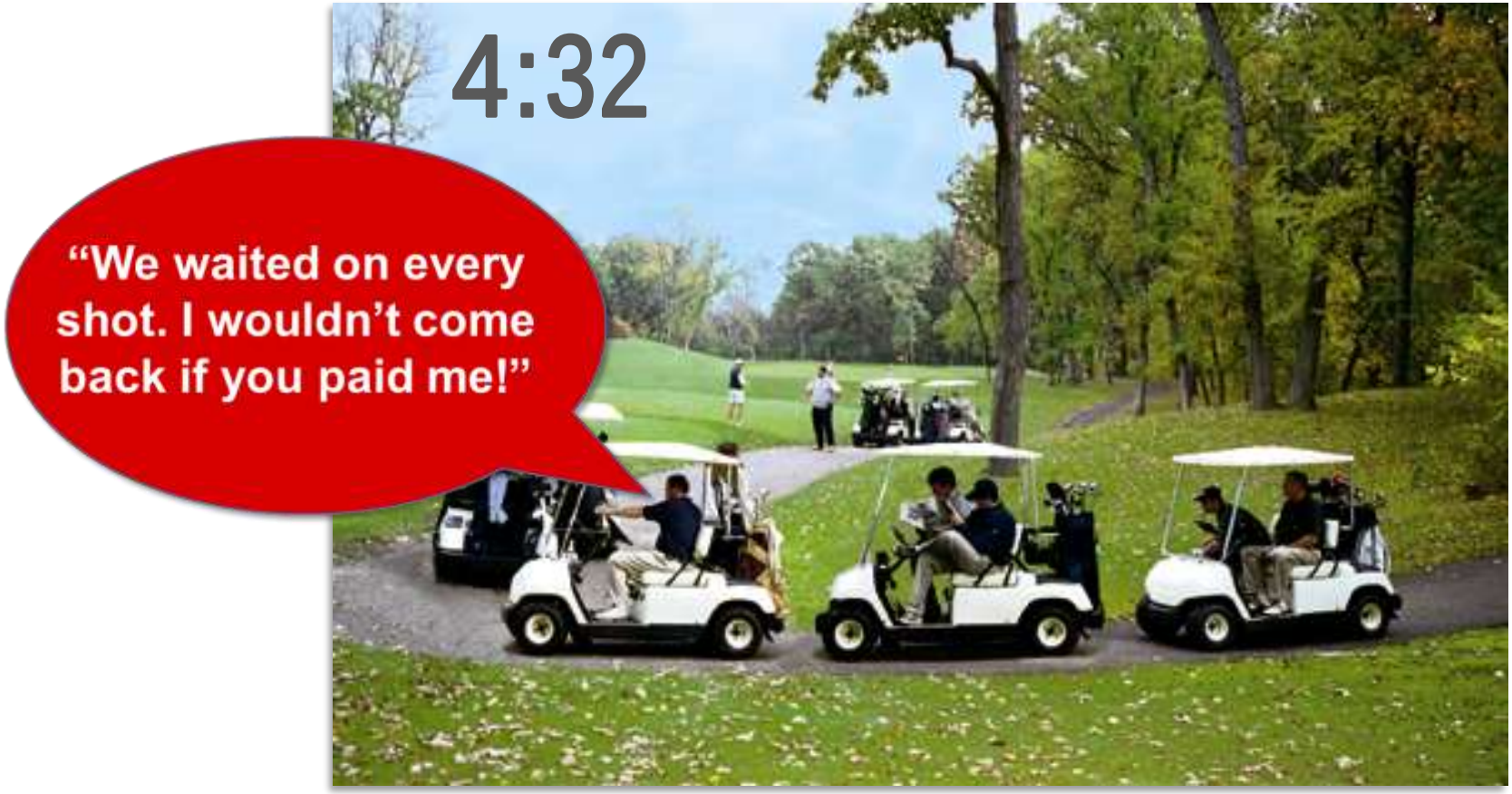

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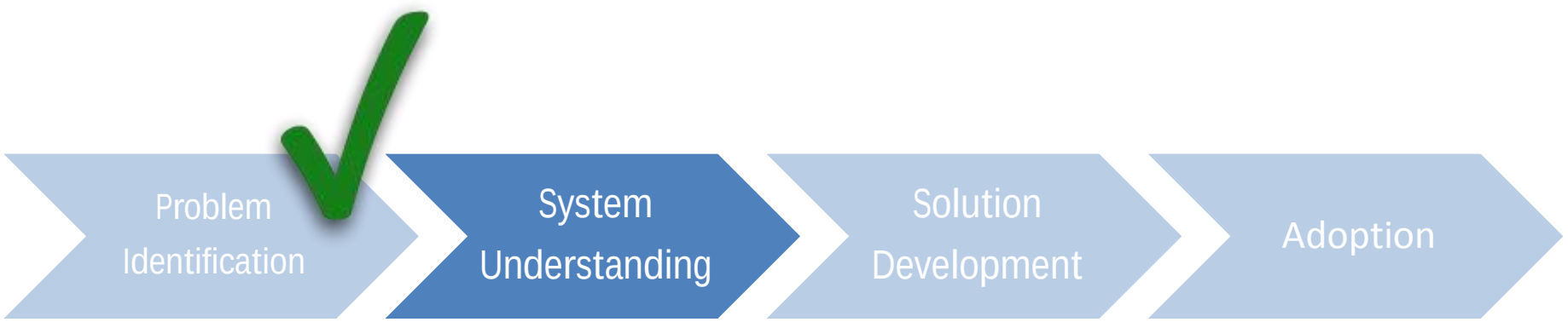
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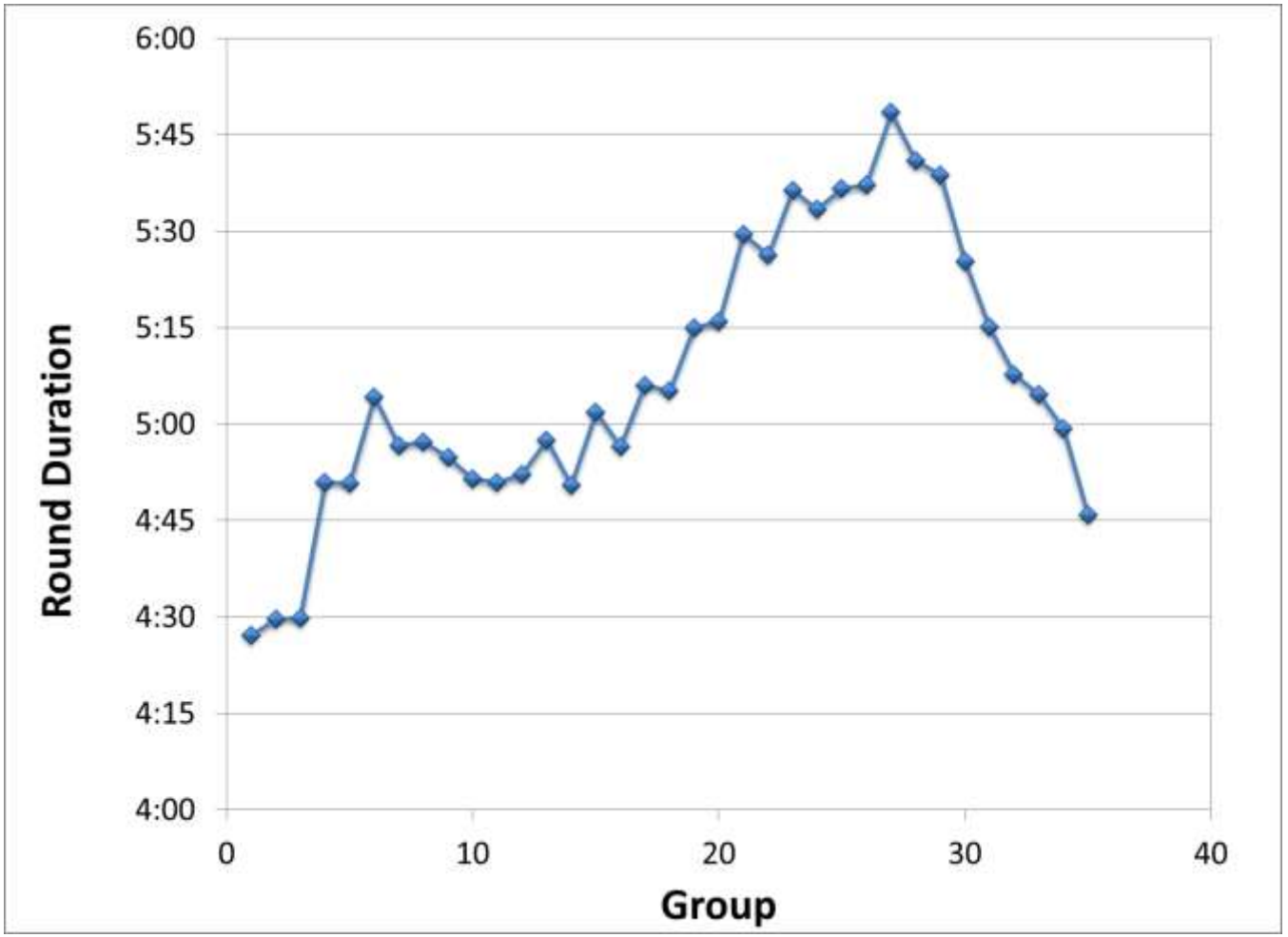
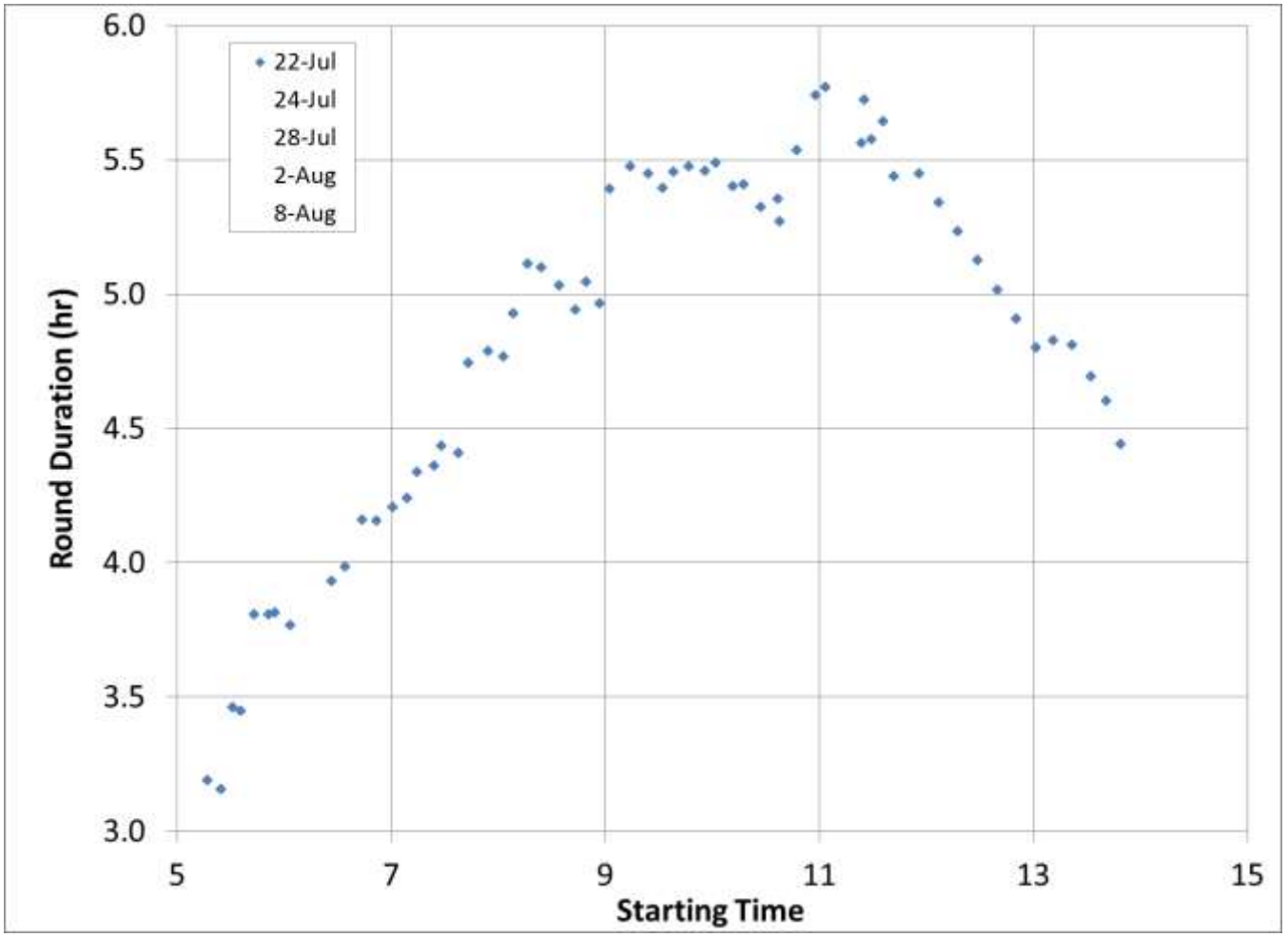
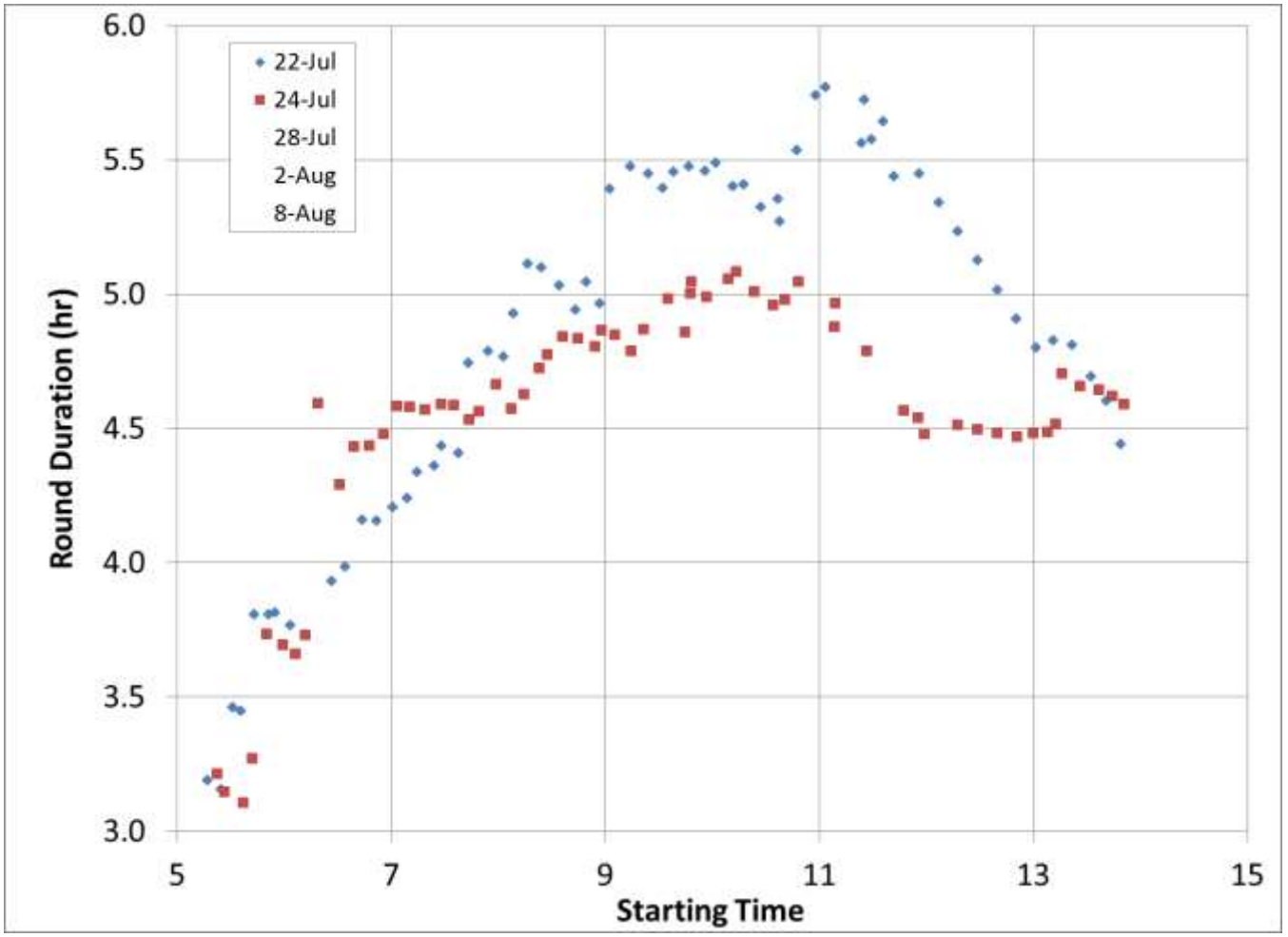
Round Times


6:00
5:45
5:30
5:15
5:00
4:45
4:30
4:15
4:00
Round Duration
0
10
20
30
40
Group

Round Times


22-Jul
24-Jul
28-Jul
2-Aug
8-Aug
Round Duration (hr)
6.0
5.5
5.0
4.5
4.0
3.5
3.0
5
7
9
11
13
15
Starting Time

Round Times


22-Jul
24-Jul
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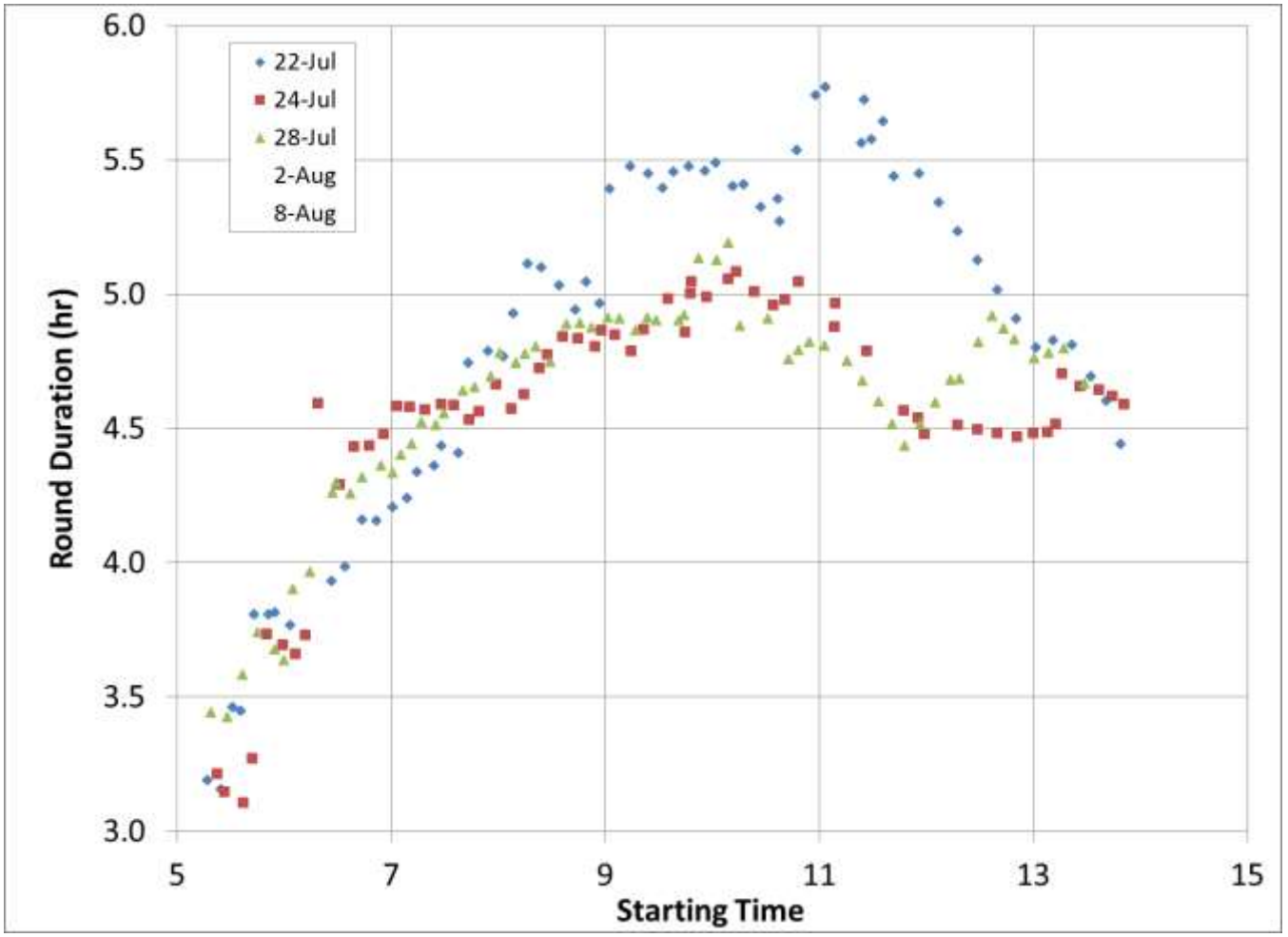
8-Aug
Round Duration (hr)
6.0
5.5
5.0
4.5
4.0
3.5
3.0
5
7
9
11
13
15
Starting Time

Round Times


6.0
5.5
5.0
4.5
4.0
3.5
3.0
Round Duration (hr)
22-Jul
24-Jul
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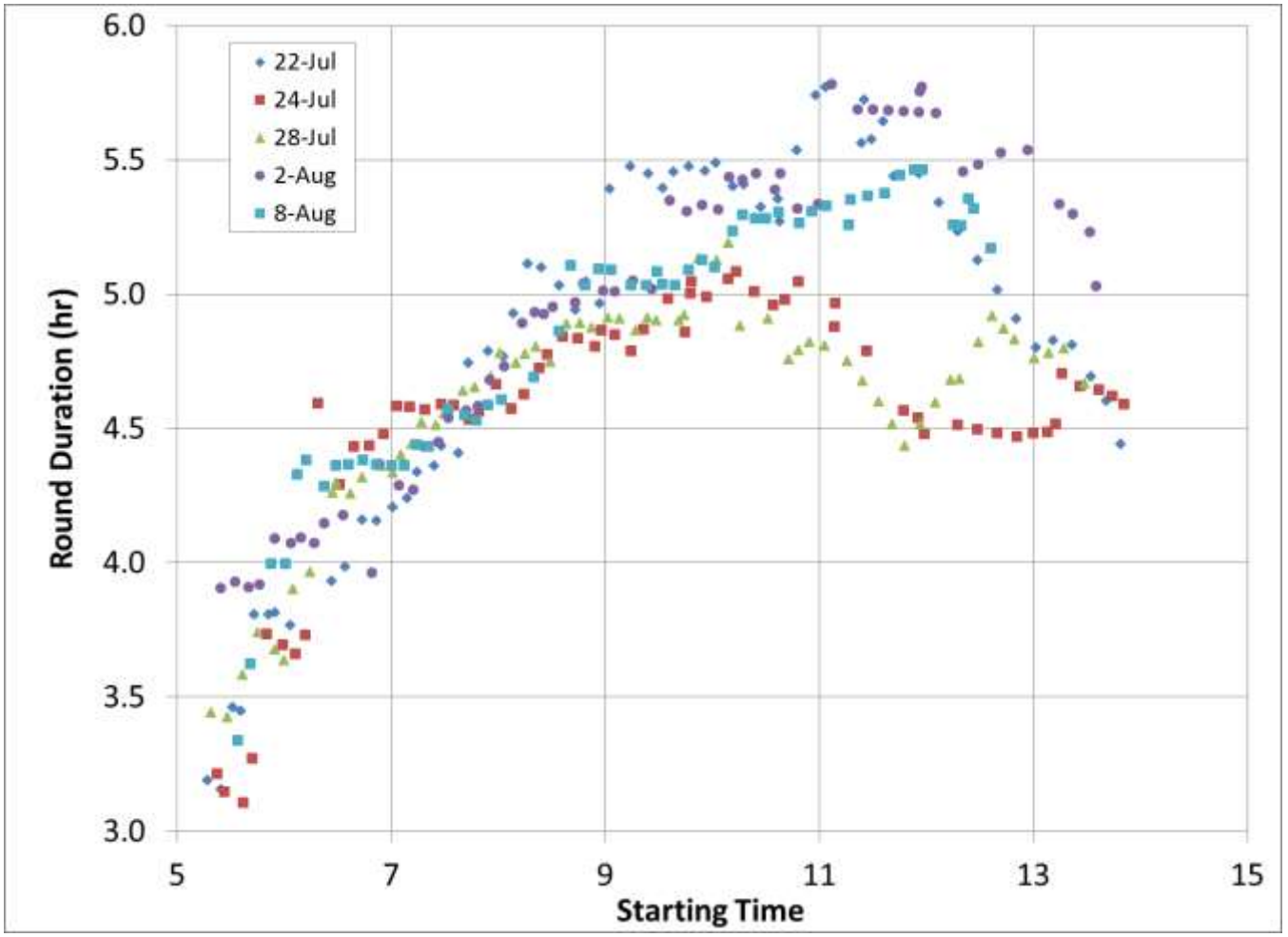
7
9
11
13
15
Starting Time

Round Times


6.0
5.5
5.0
4.5
4.0
3.5
3.0
Round Duration (hr)
22-Jul
24-Jul
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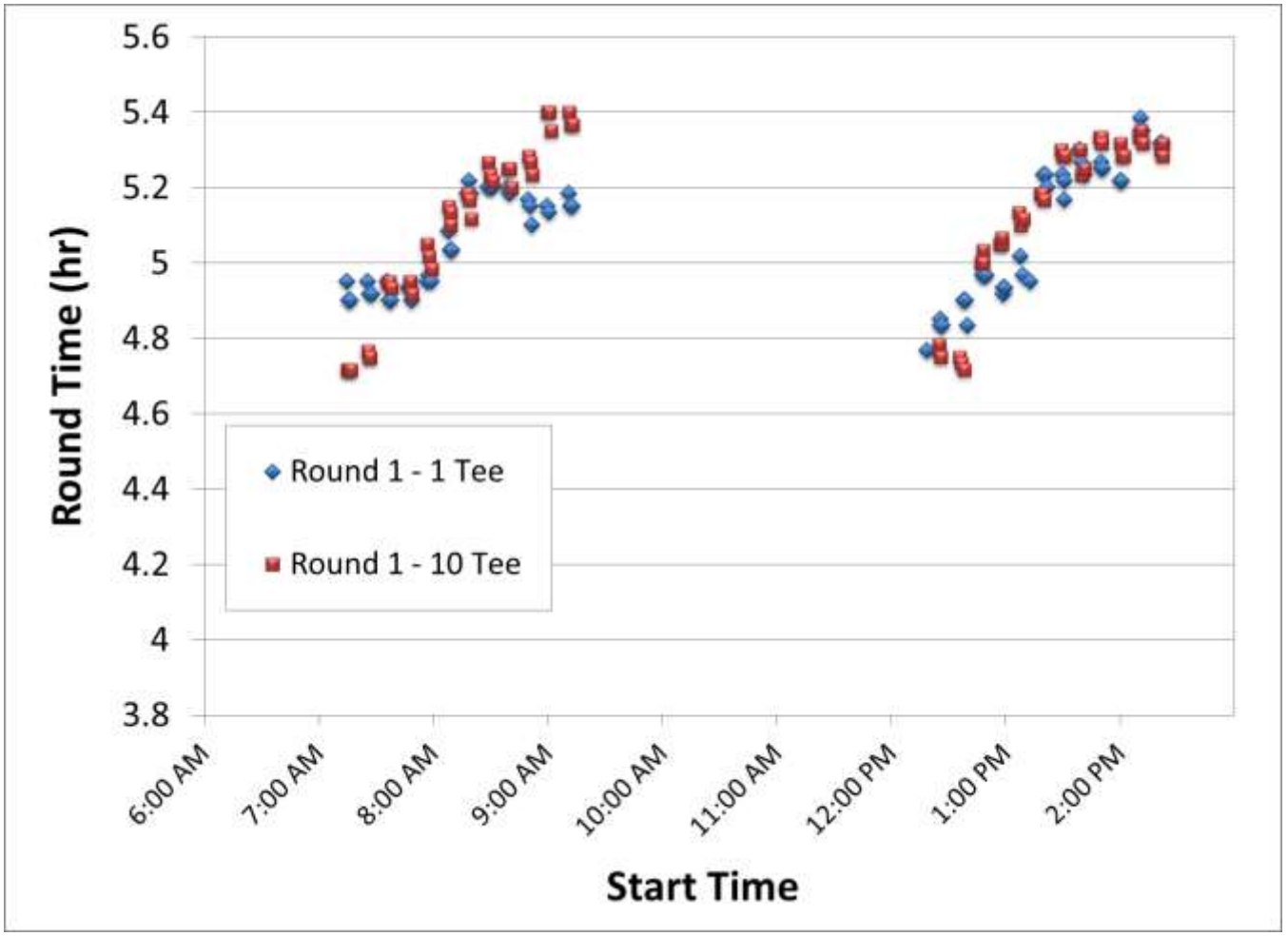
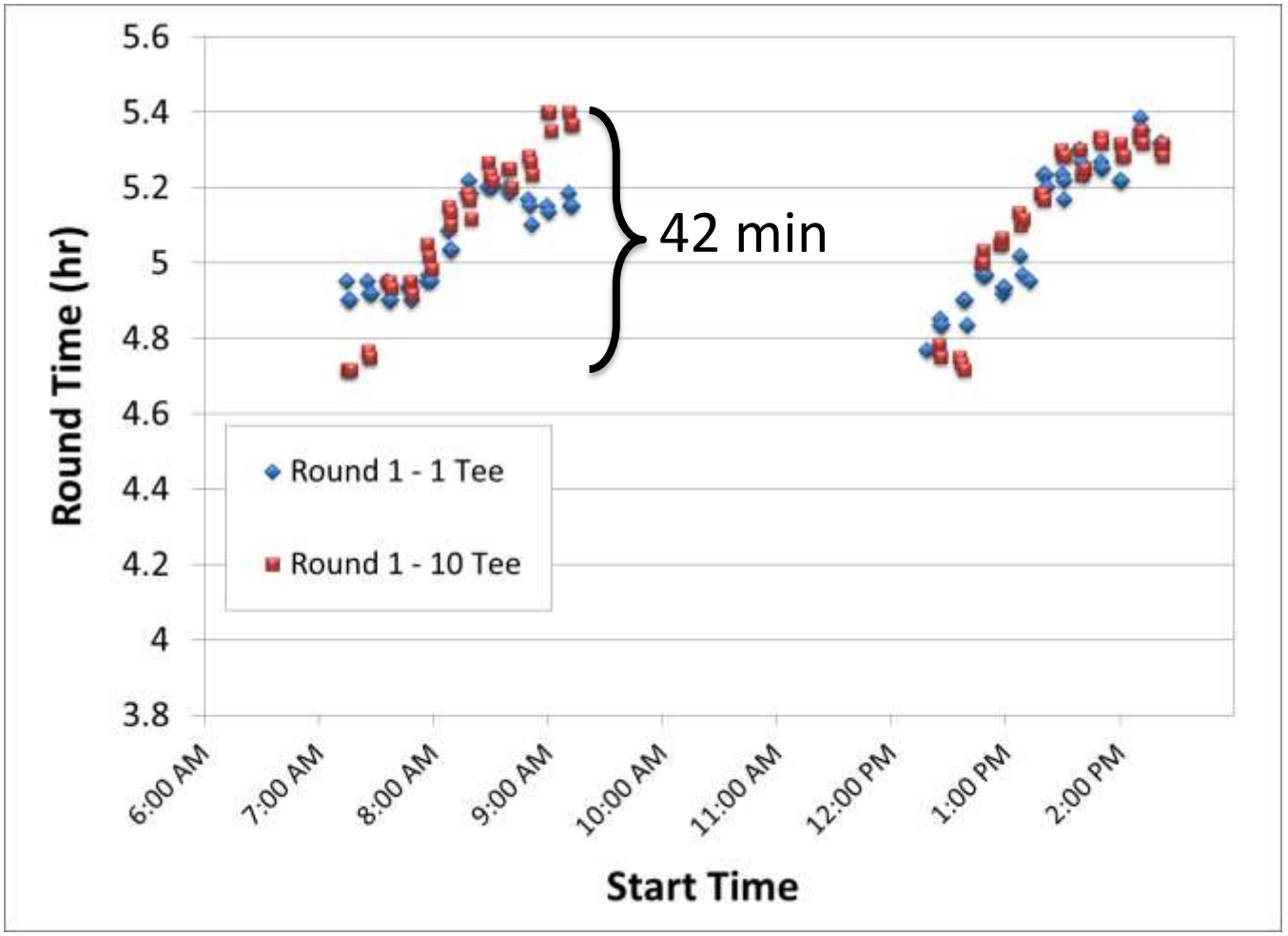
5
7
9
11
13
15
Starting Time

Round Times

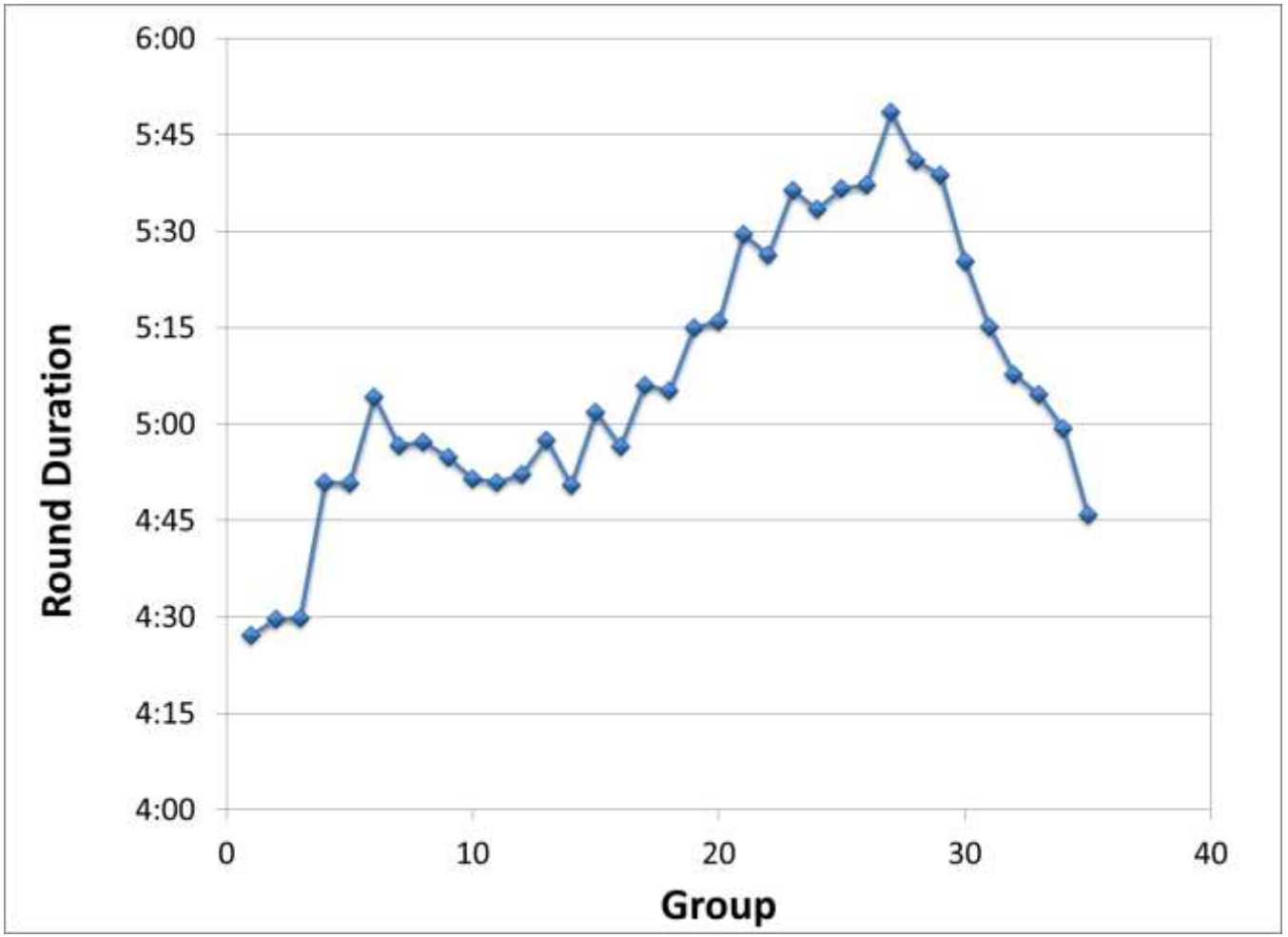

Round Time (hr)
5.6
5.4
5.2
5
4.8
4.6
4.4
4.2
4
3.8
Round 1 - 1 Tee
Round 1 - 10 Tee
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
Start Time

Round Times


5.6
5.4
5.2
5
4.8
4.6
4.4
4.2
4
3.8
Round Time (hr)
42 min
Round 1 - 1 Tee
Round 1 - 10 Tee
6:00 AM
7:00 AM
8:00 AM
9:00 AM
10:00 AM
11:00 AM
12:00 PM
1:00 PM
2:00 PM
Start Time

The Experience of Time

Round Times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5:15
5:00
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40
Group

Engineering Problem

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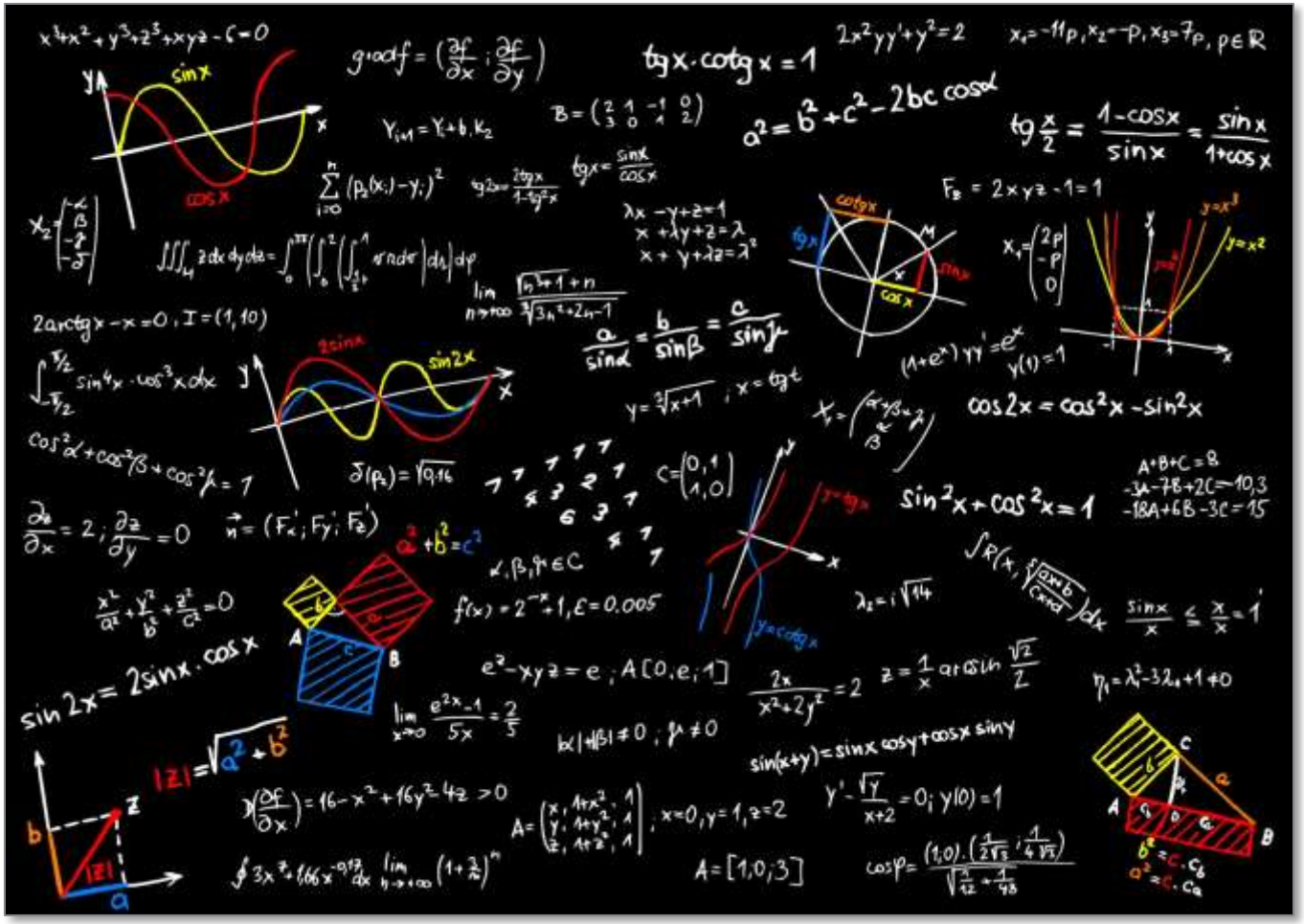

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Fundamentals of Pace

$$T_{round}^{6} = T_{round}^{1} + \Delta T_{finish}^{6} - 5\Delta T_{tee}$$
$$+ \Delta T_{finish}^{5}$$
$$+ \Delta T_{finish}^{4}$$
$$+ \Delta T_{finish}^{3}$$
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1. Lead Group

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$$+ \Delta T_{finish}^{5}$$
$$+ \Delta T_{finish}^{4}$$
$$+ \Delta T_{finish}^{3}$$
$$+ \Delta T_{finish}^{2}$$

2. Tee Interval

Fundamentals of Pace

1. Lead Group
2. Tee Interval

Fundamentals of Pace

$$T_{round}^{6} = T_{round}^{1} + \Delta T_{finish}^{6} - 5\Delta T_{tee}$$

$$+ \Delta T_{finish}^{5}$$

$$+ \Delta T_{finish}^{4}$$

$$+ \Delta T_{finish}^{3}$$

$$+ \Delta T_{finish}^{2}$$

3. Cycle Time

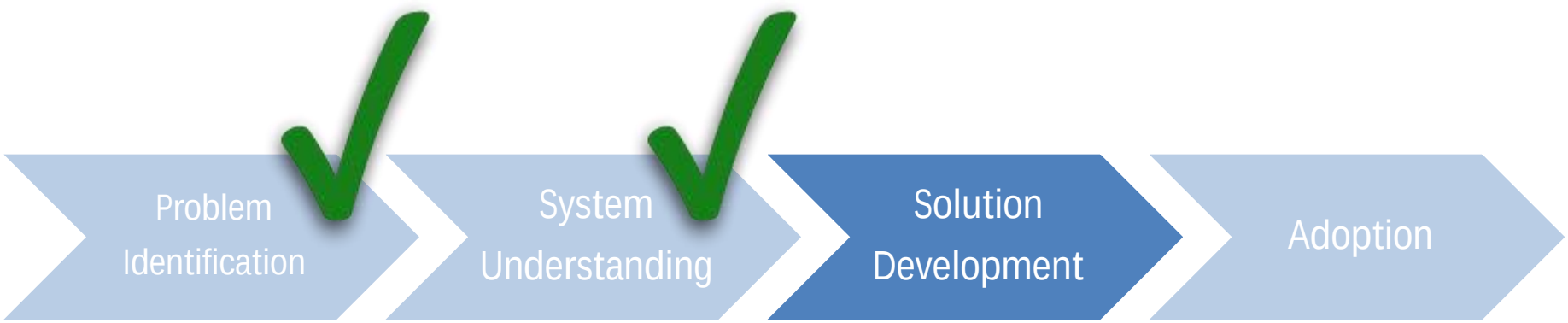
Fundamentals of Pace

1. Lead Group
2. Tee Interval
3. Cycle Time

Success on LPGA Tour

Round Times	Tee Interval/Pace Policy			Change
	10	11	11*	
Average	4:54	4:49	4:40	0:14
Average Longest	5:12	5:04	4:54	0:18
Longest	5:35	5:24	5:13	0:22

Process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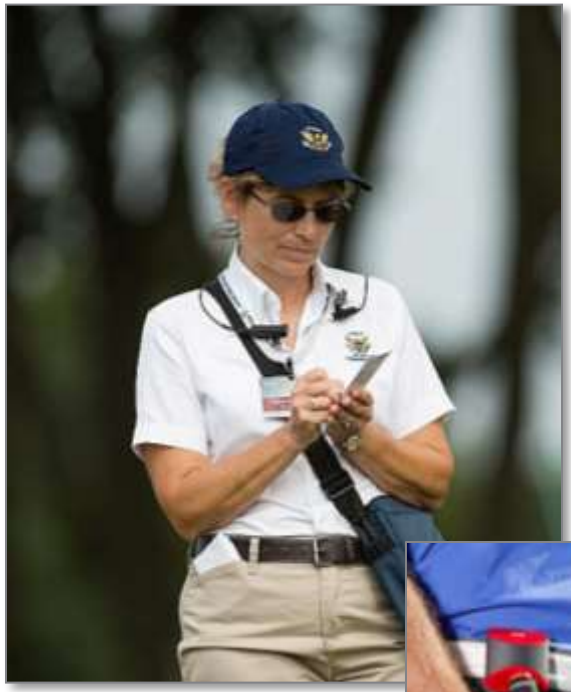
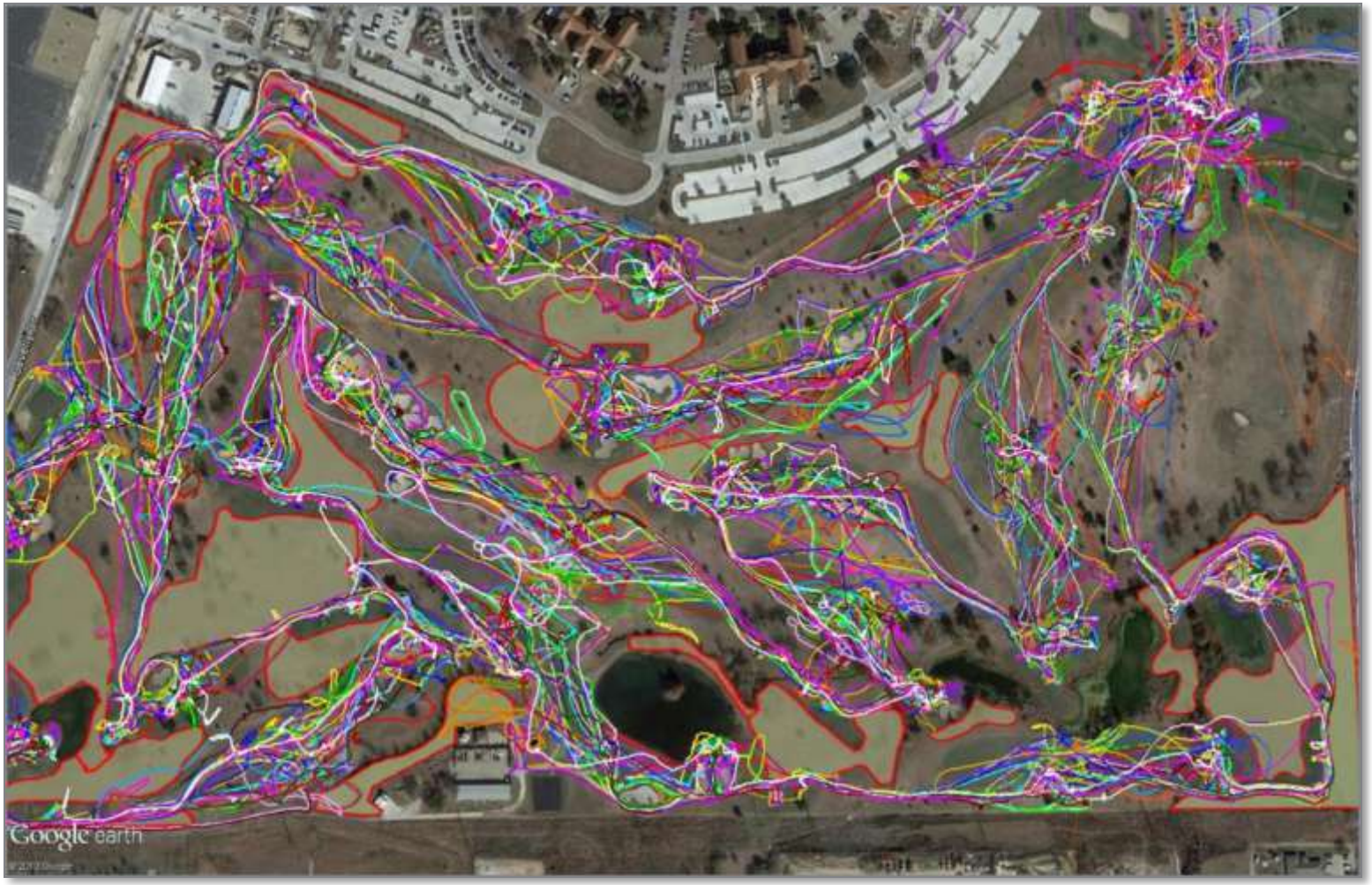
2. The lead group sets the pace potential for the entire day. Their pace requirements should be aggressive.
3. Pace of play policies for non-lead groups must control the cycle time between groups.
4. Tee-time intervals must balance realistic cycle times for your golf course and your golfers, and they must be controlled.

Data Collection



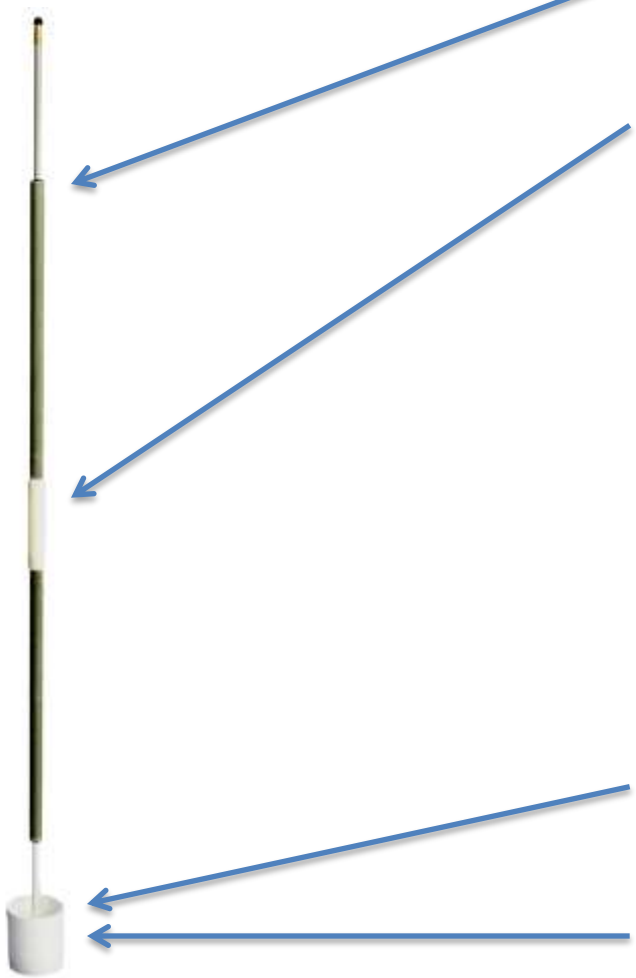
Ways to Measure Pace

GPS Loggers



Flagstick Tracking Tool

The Flagstick



Radio Antenna

Processing and Communications Unit

- Mesh radio
- GPS receiver
- Central processor
- LEDs
- Hall switch (multi-function)
- Battery/charging option

Ferrule Sensing Unit

Hole Liner with Magnet

Key Operational Points

- Doesn’t affect play
- Rugged
- Long battery life (28 days)
- Simple, wireless charging rack
- GPS (any flagstick in any hole)
- User interface allows easy view of all holes
- Ability to send alerts

User Interface

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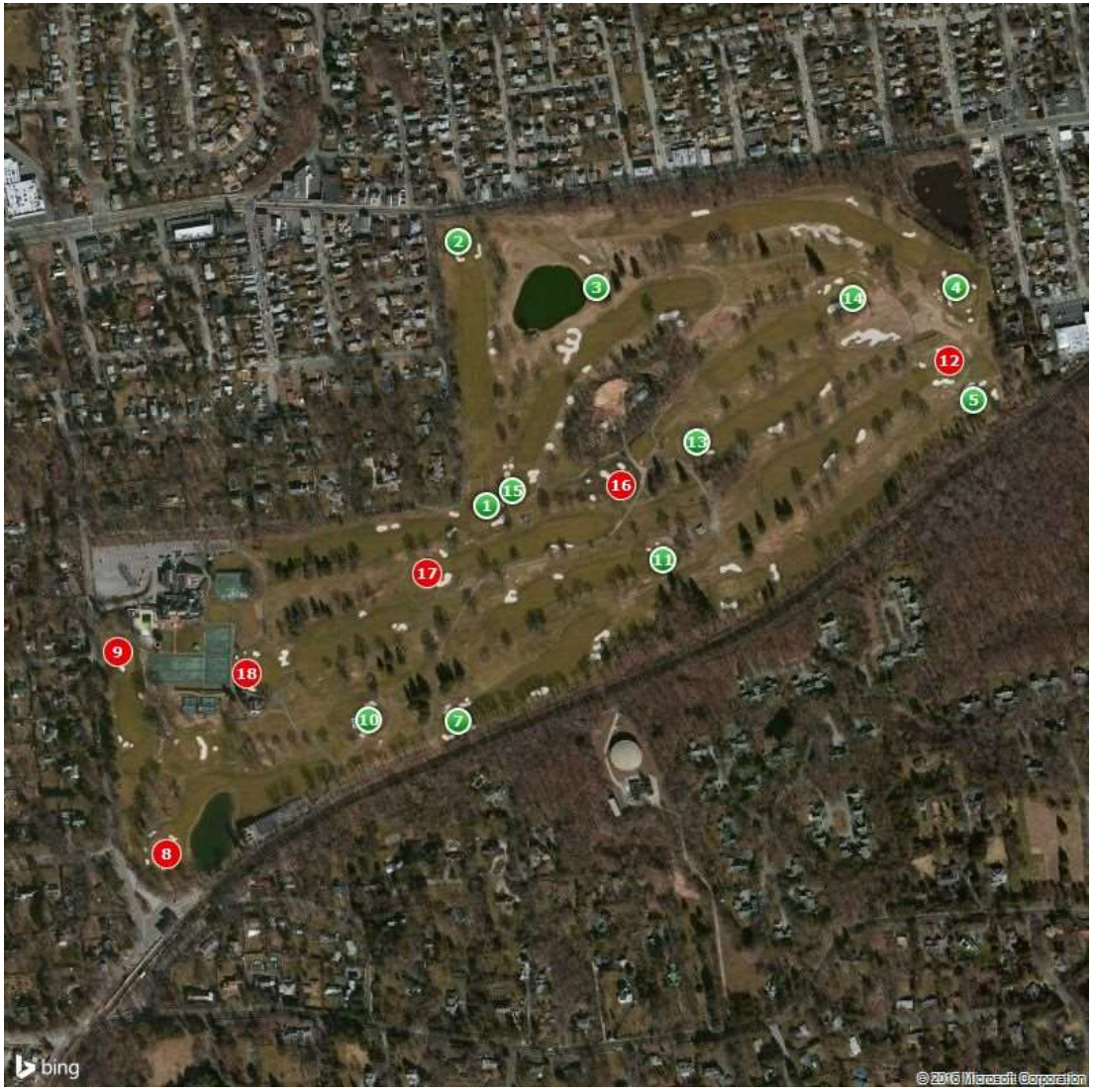
User Interface



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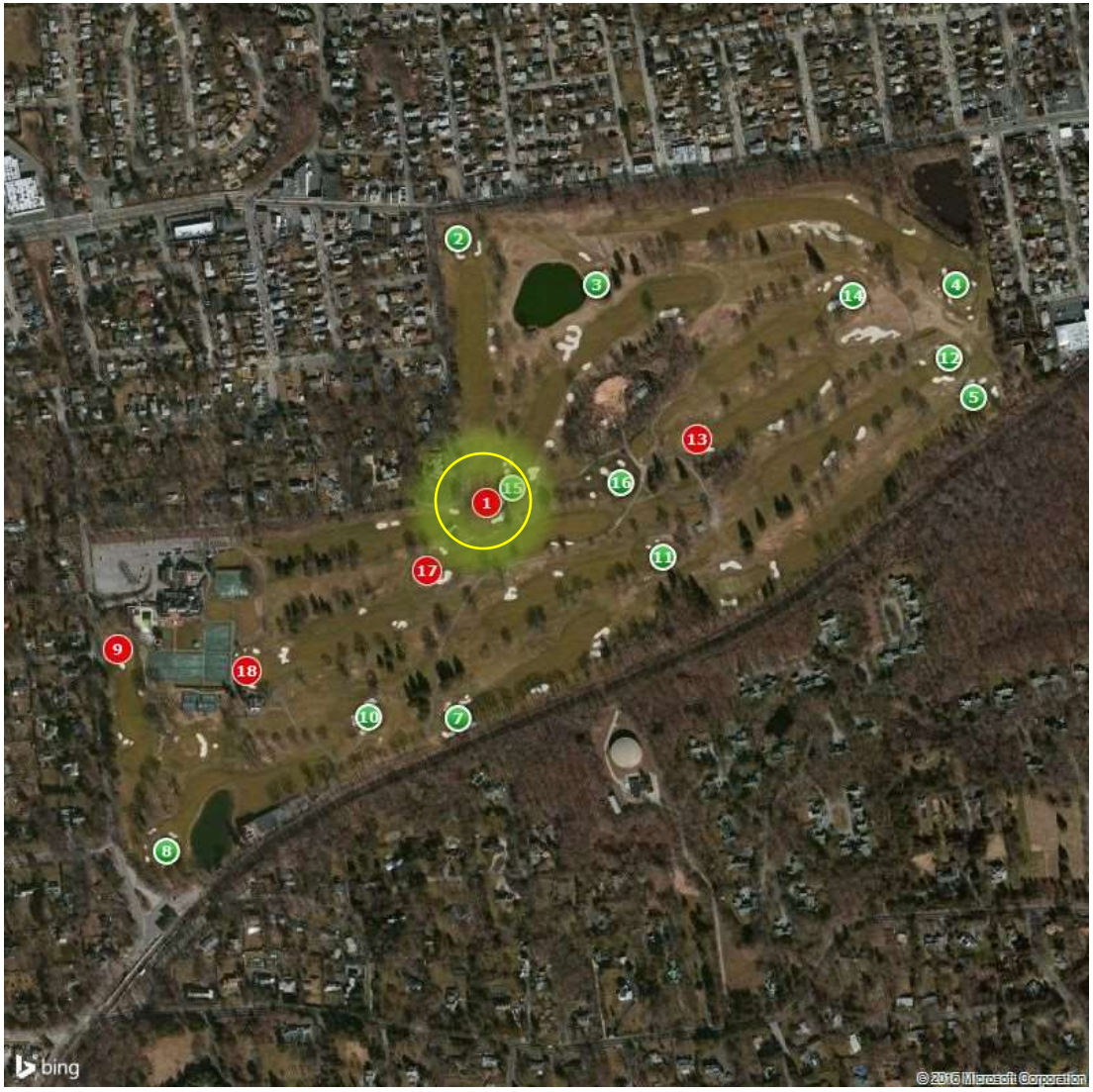

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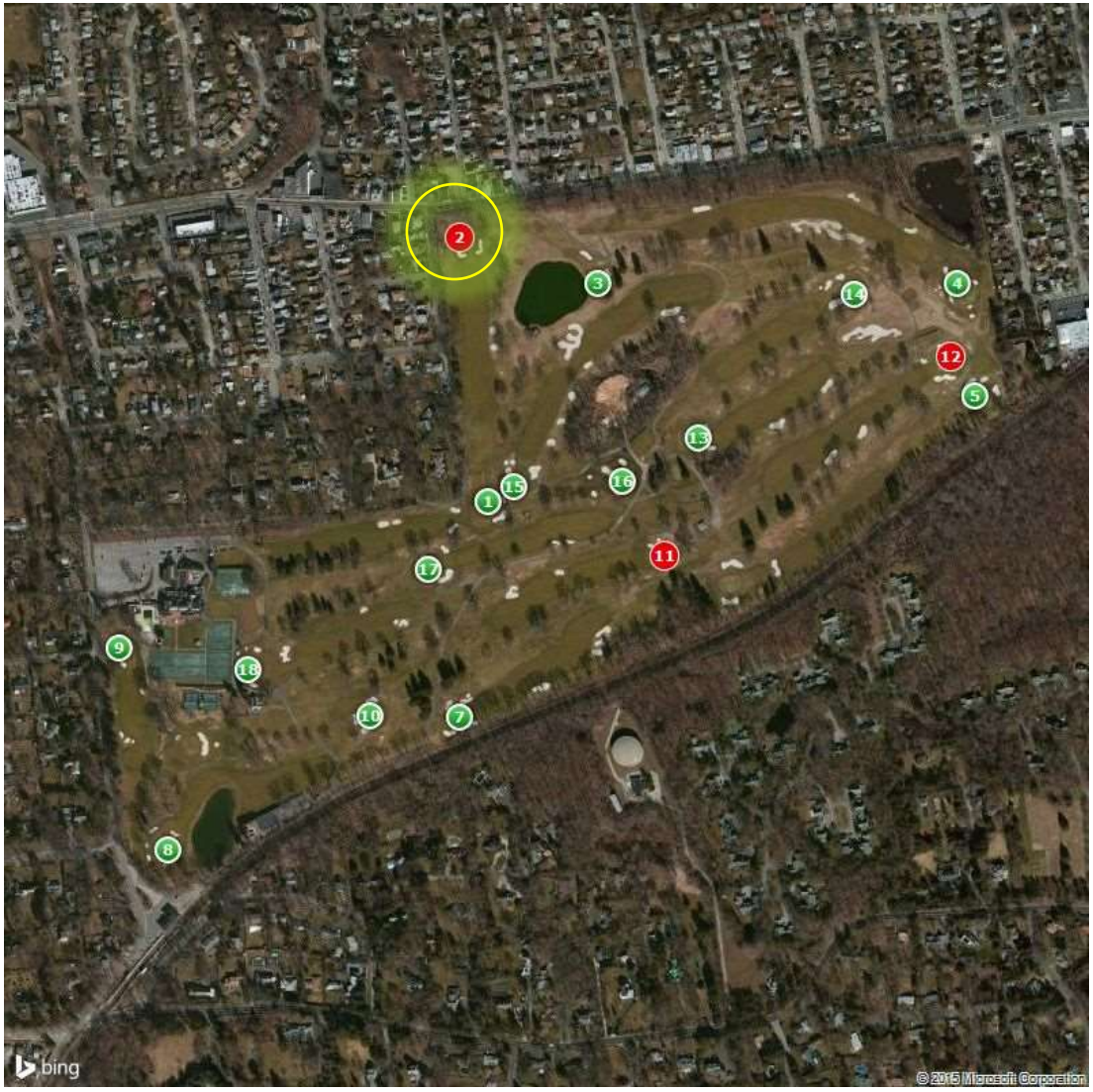

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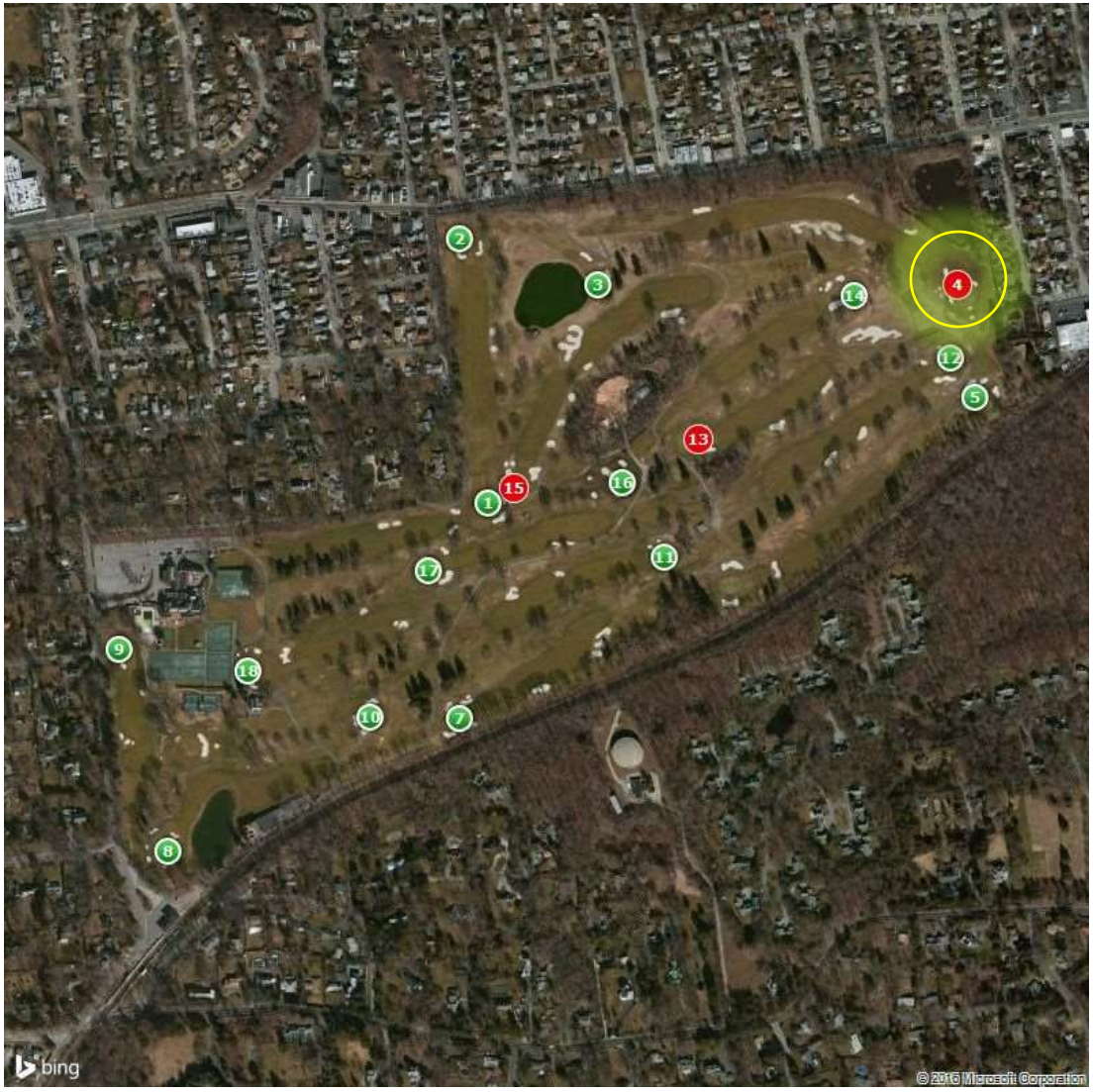

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2016 Plan: Beta Testing

Competitive Play

- USGA championships
- SRGAs
- AJGA
- Symetra Tour

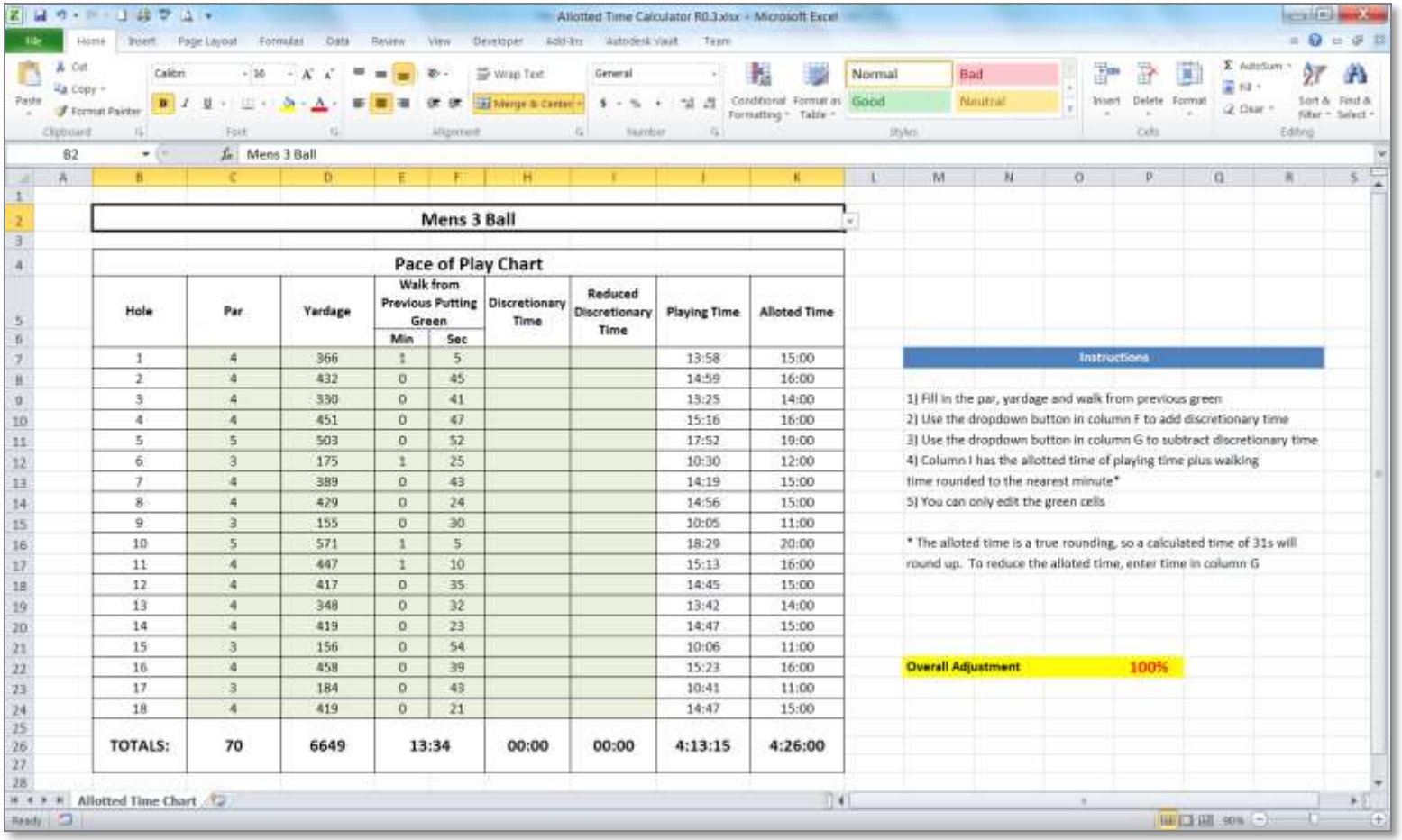
Recreational Play

- Multi-course operators
- Public facilities
- Private clubs
- Course diagnosis
- Operations: tracking

Feedback

- Setup procedure
- Hardware
  - Durability
  - Battery life
  - Repeaters
- User interface
- Communication
  - Topography
  - Distance
- Price models
  - Purchase
  - Lease

Pace Calculator



Allotted Time Calculator R0.3.xlsx - Microsoft Excel

Mens 3 Ball

Pace of Play Chart

Hole	Par	Yardage	Walk from Previous Putting Green		Discretionary Time	Reduced Discretionary Time	Playing Time	Alloted Time
			Min	Sec				
1	4	366	1	5			13:58	15:00
2	4	432	0	45			14:59	16:00
3	4	330	0	41			13:25	14:00
4	4	451	0	47			15:16	16:00
5	5	503	0	52			17:52	19:00
6	3	175	1	25			10:30	12:00
7	4	389	0	43			14:19	15:00
8	4	429	0	24			14:56	15:00
9	3	155	0	30			10:05	11:00
10	5	571	1	5			18:29	20:00
11	4	447	1	10			15:13	16:00
12	4	417	0	35			14:45	15:00
13	4	348	0	32			13:42	14:00
14	4	419	0	23			14:47	15:00
15	3	156	0	54			10:06	11:00
16	4	458	0	39			15:23	16:00
17	3	184	0	43			10:41	11:00
18	4	419	0	21			14:47	15:00
TOTALS:	70	6649	13:34		00:00	00:00	4:13:15	4:26:00

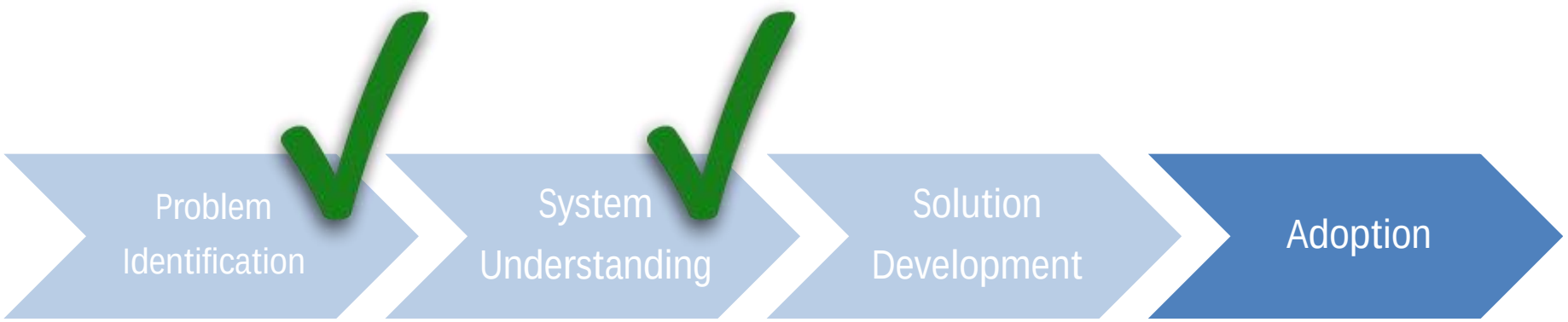
Instructions

1) Fill in the par, yardage and walk from previous green
2) Use the dropdown button in column F to add discretionary time
3) Use the dropdown button in column G to subtract discretionary time
4) Column I has the allotted time of playing time plus walking time rounded to the nearest minute*
5) You can only edit the green cells

* The alloted time is a true rounding, so a calculated time of 31s will round up. To reduce the alloted time, enter time in column G

Overall Adjustment 100%

Process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Thank you