

# GolfTraxx.com



## The Strategic Pillars for GolfTraxx in 2020: How they all fit together

One of my all-time favorite components of architecture has been pillars. My grandparents houses both featured them. The old victorian where I grew up had many through portion of the home including the entry and front porch. Where they're lining one or more sides of an open air structure, like on the White House north lawn, they're collectively known as a promennade.



These pillars convey the notion of a cohesive and well-organized structure (regardless of your thoughts about the current administration), visually attractive, and pleasant to take walks through the open air breezeway provided by their structure and relation to each other.

Today I want to lay out for you today the pillars of the GolfTraxx database and website that form the foundation, and how they interrelate, and where we are with regard to completing this multi-year MEGA GolfTraxx database build out we started back in 2006.

As everyone knows back in 2006, GolfTraxx started with a trio of columns:

1. Course Scorecards
2. Hole-by-hole GPS coordinates for Front, Center, Back, and Tee target
3. "Extras" such as reach and carry markers for obstacles on each hole such as bunkers, lakes, streams.

Today, GolfTraxx features 40,000 courses in its database from 101 countries and each of these first three pillars contains in excess of 30,000 courses. As time goes on, we will continue to pour the concrete (courses) into our pillars, both in terms of more courses from more countries, until we reach the worldwide population of an estimated 40,000 courses for all three of these pillars. ...a majestic set of pillars to be sure!

As you've seen in the past several months, GolfTraxx has introduced additional pillars for each course, so let's identify those next:

4. The next pillar in the grand design that we deployed earlier this year was the *wireframe-hubspoke* design. With our patent pending design, each mapped course in our database now has reverse-geocoded course address using Google API's into GPS coordinates dropped as a placemark on that exact point in the middle of the Google map for that course. We then positioned the green center pins pulled from the database (pillar two) for the 18 holes of the course and positioned them around the address location. This enabled us to verify course addresses as well as ensure congruence between course addresses and supplied/collected coordinates for each course. We discovered in many cases either the Google address was mapped incorrectly, or we had obtained an incorrect address or incorrect coordinates for the course, so in this way we were able to reconcile the two pillars FAR more precisely and get better, more cohesive and accurate data..
5. We also began to work on the fifth pillar: *TheTipsTee*. A few months back, we began to drop into our course and hole maps a new extra placemark called *TheTipsTee* for each hole on each mapped course, and we have completed adding these new extras for approximately 20,000 of our courses. All 30,000 mapped courses are planned to be completed by later this year. We are now in the process of positioning the Tips Tee extras and Tee Target location correctly for each hole in all of our mapped courses. With Tips Tee and Tee Target deployed, we can also do an end-to-end hole mapping and reconciliation of the scorecard distance as shown from the back tee of the course scorecard for each hole, and the data points we have for each hole. With the Tips Tee and Tee Target in place, two line segments are formed on each hole. The first segment stretches from The Tips Tee to the Tee Target and the second from the Tee Target to Green Center. The distance in yards or meters for the sum of the distance of the two line segments of each hole will *exactly equal* the back tee yardage of the hole by *design*. Especially on doglegs this will provide a way for us to analyze the data we store for each hole and correct where we discover issues between hole yardages and or mapping and the auto-calculated end-to-end distances for each hole. So you can see how this new pillar truly integrates and ties out the other pillars. It also enables us to continue to “catch” where the “hackers” introduced incorrect data into our database, which to a large extent has been like finding a needle in a haystack with so many courses and so many gigabytes of data.
6. Simultaneous with the launch of The TipsTee extras, we introduced a new site feature called *flyovers*, which is of course our sixth pillar. We now have close to 2,000 courses in the database having either a course flyover, or hole flyovers or both. Course flyovers can be from the course website or YouTube or Vimeo, or another site such as the pga tour, anywhere where great video content for the course exists, while hole flyovers are embedded videos stored in the YouTube and vimeo databases. The flyovers have been extremely well received and average page views per visit have again exceeded 50 pages per visit. Two of the FANTASTIC side benefits of adding course and hole flyovers are that: (1) it represents a new data source for finding and adding courses to our database, which we are doing every single day, and where the videos include hole yardages it gives us another audit check between our scorecard and the video content. Of course a third major benefit is the added audio track feature we have included

so you can hear playing tips for each hole on the course as you watch the video. With the advent of personal drones under \$500 the availability of course and hole flyover videos is skyrocketing. We predict we will have over 10,000 course and hole flyovers with the next 12-18 months. Collecting and organizing the incredible amount of data is no small undertaking. Just consider that adding even a single attribute for each hole means for a database of 40,000 courses adding close to three quarters of a million data points.

7. The seventh pillar was started as a conceptual framework for grouping courses together into course collections. We now have close to 100 collections and these collections are a HIT! Clicking on a link steps you through a collection of courses, ranging from two to 60, whether those are Tour courses being played in particular week or OPEN venues from the past 130 years. More content is being added to course collections on a daily basis and we expect that these will continue to be a great hit for the website. Course collections has been another way for us to identify missing or “hacker”-deleted courses and get them re-added into the database. The more collections that get added the more complete our *entire* database becomes. One of the super popular collections just added is the [Central Oregon Golf trail](#) featuring 30 courses in beautiful central Oregon, where I spent a great deal of time in years past golfing, fly fishing, bicycling, camping, and skiing in winter. [Central Oregon Golf Trail](#) already featuring flyovers for most courses. If you haven't seen central Oregon golf and scenery, I encourage you to have a look as the views and landscapes are incredible. Work is underway on a courses in SE Utah collection as well where unbelievable rock features and vistas will take your breath away. We are offering many course flyovers in SE Utah as well.
8. For some of you strong GolfTraxx supporters who read the News articles I publish here, you have already heard me talking about this next pillar: [RTK](#). RTK stands for Real Time Kinematic. What it means to you is ultra high precision GPS coordinates. And when I say ultra precise, I mean don't to less than an inch, and used in high tech farming to save money is applying chemicals, and watering and even seeding. So... [RTK](#) gives GolfTraxx the ability to adjust the Google mapping layer more precisely to terra firms, just as a transparency might need to be shifted in a classroom for a better fit on the display (for those of you who still remember those...lol!).

So when and how will [RTK](#) be implemented by GolfTraxx you ask? Well... believe it or not, it already has soft launched. When was the last time you looked at the list of available extras for mapping courses? If you looked recently, you noticed several new Extra names in the list... all of them preceded with three letters: RTK!! These first RTK-extras for visible features within the course map are for features found on MANY of the courses in our database. The club swimming pool and Tennis Court #1 (closest to Clubhouse). We need a corner of one of these two course features, either NW, NE, SW, or SE corner of the pool itself, or NW, NE, SW, or SE corner of the court itself. The concept is so simple that you wont believe it. RTK points for each course are points that are visible on the Google map that can also be easily RTK measured. Those RTK-extras can be placed with precision on the course map on any hole map but we're suggesting using hole number 18. Just placing the RTK extras on the Google map by adding RTK extras on hole 18 captures the Google Map coordinates. These two club features are often times reasonable close to the clubhouse and hole 18 anyway. Then, we just need you to provide the RTK coordinates for those points. We automatically calculate the variance between the Google map coordinates and the RTK coordinates, and apply that variance to the other coordinate pairs on the course...with exactly the same result as sliding the transparency on the overhead projector. When the lines match up, we've got our real RTK-offset coordinated for every mapped point in our database for the course. Basic F, C, B, and T placemarks AND ALL

extras! This simple step completely eliminates any variance between the Google mapping layer and the “true” ultra precision coordinates captured by RTK. This is WHY we patented the technology.

9. The relevance of the “Tips Tee” to Tee Target measurements and Tee Target to Green Center measurements now becomes obvious as we add RTK verification. The rubber hits the road when measured yardages between start and end points for a hole are compared with the stated length of the hole from “the tips.” These points (known to correspond with RTK) measured and summed and “tied out” to hole distance from back tee yardage does an end-to-end reconciliation on every single hole that we can accomplish it on. As we embark on the journey to add Tips Tees and our visually verifiable RTK points for each mapped course for over 500,000 hole around the world, you'll notice it start to take shape.
10. So you ask, if every hole scorecard yardage and Google-measured distance stored in the GolfTraxx database corresponds *exactly* with what the hole-by hole video and/or course website shows, and RTK technology eliminates any variance in coordinates between terra firma and the Google mapping layer itself, AND every course address corresponds with the green centers for each hole on the course thanks to *wireframe-hubspoke* thereby eliminating the possibility of wrong course for the address, where could there **possibly** be an error?

Well, as hard core GolfTraxx fans will recall, and as it had always been, data capture errors in the devices still can introduce those yards of error. But the GREAT news is bluetooth RTK compatible receivers are dropping substantially in price. GPS receivers that can provide sub-meter precision down to inch precision depending on how close the nearest RTK base station offers a clear vision of one inch precision everywhere in the next 5-10 years. But coordinates stored in applications need to be updated to reflect these RTK corrected points. Devices able to receive and process the RTK compatible receiver data will become the new standard of precision.

11. In late 2019, many of you know GolfTraxx launched an HTML 5 page that can be used to keep score, obtain yardages, and upload round stats to your profile on GolfTraxx.com. We believe that the stats we capture for you are an integral part of increasing awareness of your games strengths and weaknesses and enjoying the game more. To build out this last pillar, we don't need more courses. We need more of YOU to login to your profile on [GolfTraxx.com](http://GolfTraxx.com) using your FaceBook credentials, customize your clubs to match whats in your bag and how far you hit those clubs, keep score of your rounds and upload your stats, and MOST importantly let us know what we can do to make using golftraxx a better experience for you. The new pillars were created this past year to provide a richer content experience while playing golf such that these last pillars can be enjoyed on and off the course. These were essential steps to be completed prior to our re-launch of the iPhone and Android applications, which are planned to integrate these same rich content features we have developed, and we are hopeful will be coming soon.
12. Envisioning, collecting and organizing the incredible amount of data is no small undertaking here at GolfTraxx. Just consider what adding even a single attribute for each hole means for a database of 40,000 courses. Hole flyovers for all 40,000 courses alone represents close to three quarters of a million links....NEW data elements to be captured organized, and added to the site. Fourteen years ago, we didn't have enough courses. Fourteen years ago we didn't have these integrated pillars worked out. Today we do. Your support and appreciation goes a long ways towards letting the team know that you appreciate what we're doing here.

Wishing you all the best as we face these uncertain times with corona and praying for a speedy recovery for all countries and courses and players financial and physical health and MANY, MANY more enjoyable rounds of blue sky golf hopefully with a least just a hint of a breeze like your walking through the breezeway formed by our columns around each of your home courses around the world!

Frank

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With the advent of low cost drones able to capture vivid 4K imagery on smooth flyovers in the past several years, the opportunity for every golf course to have its own course flyover(s) and hole flyovers has come easily within reach.

Adding these videos to your existing website, or creating a YouTube or Vimeo channel also creates greater visibility for your business and your website. Adding appropriate metadata for your videos will “get them found” in video searches on both sites.

Our prediction is within the next 18-24 months, many thousands of additional courses will have created these flyovers for their respective courses. While currently, perhaps one in ten properties has flyovers available on their websites, 24 months from now, we expect 70-80% of the surviving courses will have flyovers available from their website as well as in video channels such as YouTube and Vimeo.

Think of the flyovers as a great way to introduce the course and the property amenities to prospective players, guests, members at your property. We expect that these course and hole flyovers will become part of the expected user experience, even prior to visiting your property and prior to prospective guests ever playing even a single round on one or more of your courses. Players planning to come and spend several hours on your property (and hopefully hundreds of dollars as well, in addition to green fees for a SINGLE round) have a reasonable right to know what to expect. Many players already spend hours prior to every round studying all available information for a course. Of course, brief glimpses of other on-site property features you show in the video such as the golf shop, the restaurant, or other resort features, or lodging, or casino, or even the Sunday brunch layout (whenever THAT becomes a possibility again) after a round may tip the scales in your direction, thereby winning you that unexpected group of customers, simply by showing prospective guests what they can expect.

All players want to perform our best on these outings, and also expect the best for their hard-earned dollars. Yet perhaps only one in ten properties currently provide access to the correct information to adequately inform those guests what to expect. Dissatisfied customers is the LAST thing ANY of us want as golf rebounds from the COVID-19 financial disaster. One dissatisfied customer can now in a single click inform thousands of prospective customers about their level of dissatisfaction.

The main challenges we see most courses having are: 1. there is not always as clear vision or agreement about what the powers that be want; 2. single malt whiskey “tastes” and a beer budget (eg. wants everything high end, but has a \$500 budget) and 3. how to get started on the video creation process to complete the process efficiently.

## **We Can Help**

Our first suggestion is to identify, collect, digitize, and share ALL the features on your property that you wish to highlight. Remember that all shots in the flyover videos do not have to be taken by drone, so identify other digital assets that can complement the drone flyovers to complement your final product. What are the most photographed locations on your property? What are the most famous or infamous holes? What other features does your property offer that a visitor would be interested to know or might sway him/her/them in your direction?

Two: Our second suggestion is to identify and collect all branding digital imagery that you wish to feature within the videos. Logos, Signage (including hole signs), Graphics, Fonts, Well-known Photos, and/or Most Photographed locations of Property features. This includes the digital assets of parent corporation or management company for the purpose of rebranding the video (which will be very well-received)

Three: Our third suggestion is to check out our collection of course flyovers here:

[https://golfraxx.com/view\\_golfcourses\\_by\\_holeflyovers.php](https://golfraxx.com/view_golfcourses_by_holeflyovers.php)

The main idea here is to select the features within our collections of course flyover and hole flyover videos that you would like to include on your course and hole flyover videos. If you want to write a great novel, a good starting point is to read a great novel. The same holds true for drone footage of a golf course. Begin watching drone footage of golf courses by those who have come before you. Note what features you're attracted to. Note specific starting positions and elevations for hole flyovers that you find most appealing, altitudes, and speed of drone flight.

Take note of specific shots that are done well and, perhaps even more importantly, what's been done badly. Note how things that may not have even occurred to you such as flyover length on longer holes that may result in you tuning out on the long hole flyovers...or worse...closing the browser. Note how poor flight path on one or more holes results in disengagement. Note how inconsistent video features leave you wishing they had thought of THAT. Brainstorm on what else could be included that would make it more useful to prospective visitors and to players. Keep a log of links to these videos so that you may revisit them during the storyboarding and shot list phase. These videos are personalized to YOUR course and should give viewers a true sense of what makes your property unique, special, and worth the visit.

One of the areas that we recommend ALL courses incorporate in their flyovers on a CONSISTENT basis is the green flyovers. Remember that all video footage need not be taken by the drone.

For reference, consider the article from Golfworld:

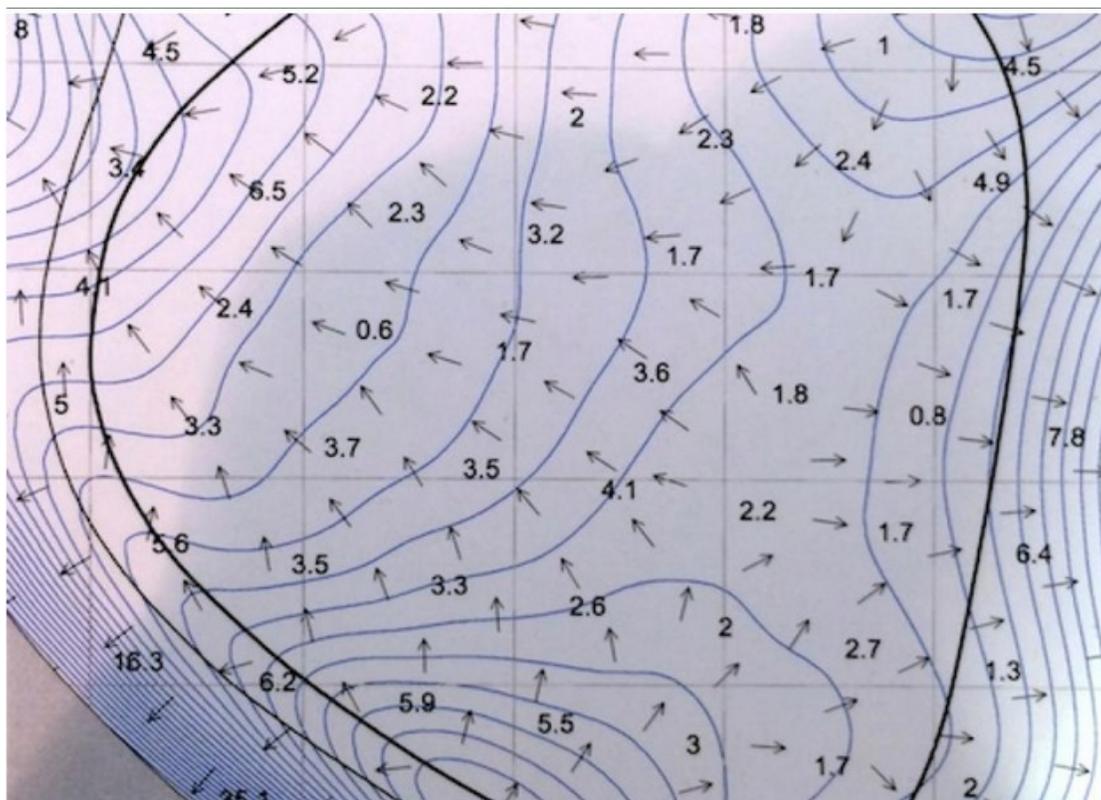
<https://www.golfdigest.com/story/gimme-a-break-green-reading-maps>

Many current hole flyovers include a segment where the drone circles the green to give information about the slopes, ridges, and undulations on that green. While these do help to show the undulations, ridges and slopes, MANY or most fail to provide “player perspective.” In other words, from what

angle am I looking towards the green as the footage of the green in the flyover is presented?

We recommend that each green be presented in the hole flyover from the perspective of the player approaching the green from fairway center as a starting point. What does the player see as s/he approaches the green? The question to be answered is clear, given the present, pin location AND the player's current location where is the PRECISE place the upcoming shot should land to stop next to the pin.

Green maps used by touring pros provide the detailed information to make the decision for what break to be played on the upcoming putt, but these contours can also inform the approach shot:



Animated techniques are becoming more widely available to show direction of ball travel on the green which inform the viewer about slopes and undulations such that if shown from the same angle that a player approaches the green can become quite informative. These have been recently used by CBS Sports in televising golf events.

Dustin Johnson stated in the Golfworld article referenced above that he spends as much time studying the green maps from the fairway as he and his caddy do while on the green sizing up the upcoming putt.

Provide as much “local knowledge” as possible for each hole so that the player playing for the first time could be nearly as well-informed after watching the flyover as the person who plays it every day. Based upon the pin's current location, which way will a shot bounce as it lands on the green struck in the direction of the pin? How far will the ball bounce and roll from the point where it lands? Given the pin location, where can is the safest place to leave the shot where I can have a straight putt towards the

hole? Where are the “sucker” pin locations where my ball is likely to roll off the green if I try to attack the pin?

Another technique now being utilized in some flyovers is on and around the green is “eye” view as well as sky (overhead drone) view. The “eye view” as the names implies shows hole and/or green features from eye level much the same as it you were there on the hole playing the shot.



Eye view allows viewers to gain a FAR greater appreciation for hole features such as the Road Hole (#17) green side right bunker at Saint Andrews Old Course.

<https://www.youtube.com/watch?v=xBU630yolFU>

Four: Identify and share the location of the digital asset repository and its owner such that there is no question about the location of these digital assets, where their backups are stored, what off-premise location stores the non-editable copies, and who has access. Storing video backups in non-editable file format and media in at least one off-premise location is strongly suggested so that footage is NEVER unrecoverable. NOTE: Accidental, unintended edits and have destroyed tens of thousands of hours of irreplaceable footage and WILL continue to do so in the future for unsuspecting and unknowing videographers. <https://www.youtube.com/watch?v=xBU630yolFU>

Five: If you have been keeping up with the new features and business model for golftraxx, you're already no doubt aware of RTK-confirmed GPS coordinates offset and RTK-confirmed coordinates for “extras” on your course. GolfTraxx is now offering RTK-equipped drone flyovers to capture the RTK-verified coordinates for those identified “extras” on your course as well simultaneously capturing the drone video footage to “true up the GPS coordinates for visually identifiable extras in your course.

<https://www.dronepilotgroundschool.com/drone-mapping-software/>

### **Playing Tips from the Pro**

One often forgotten source of information to be digitized is Playing Tips. These can simply be placed into a word document hole-by-hole for what information helps players perform better on the hole.

At golftraxx, we have broken the playing tips into three main categories, which are tidbits of advice

from “the pro” for the hole: from the tee; from the fairway, and for the green for each hole on the course. These playing tips can be shown on the screen as the hole flyover is played, or spoken in a Google text-to-speech voice, or recorded as voice clips and added as separate tracks in the video editing process.

One way to personalize these for your course is to record each of these tips in the voice of the golf professional or of some other desired (and available) announcer. Perhaps we would all love Jim Nance to be the commentator for each hole on the course, but availability and cost may be prohibitive.

### **Find a Professional pilot**

Smooth flyover footage is critically important. In recent years, certain flyover and large search engine companies created tens of thousands of flyover videos only to discover that NO ONE wants to watch their jerky video clips. The latest technology in drones has made this far smooth flight more achievable. But just because someone is good at the controls on video games does NOT make them a professional drone pilot.

It is extremely important to ensure that the planned flyover shoot complies with all local ordinances and FAA regulations. Be sure that the golf course lies in a zone that doesn't conflict with any neighboring restricted airspace. If it does, be sure that you take the necessary steps in ensuring that you submit a request with the FAA so that you're shooting within legal bounds. Don't forget to notify any neighboring airspace facilities, such as Naval bases, that you will be flying in the area as well. We are assuming that your pilot possesses a UAV license, which is a necessity if you're flying your drone in any capacity for commercial purposes (steep fines await if you fail to acquire a license before attempting to fly commercially).

### **Create Realistic expectations for your ideal timeline and budget for having this footage produced**

1. What is your budget?
2. Do you have a plan to measure ROI?
3. Will the video be part of a bigger plan or a stand-alone piece?
4. Are there particular holes that you'd like featured, and, if so, what holes are they and what is special about these particular holes?
5. Do you have preexisting logo/animations/branding materials or do you need these produced/edited? If preexisting, assign a resource to begin gathering these as soon as possible.
6. Where will this video live in its final format (i.e., if just for web/social vs. for potential broadcast?)
7. What's the approval process looking like? Will the final product be reviewed by a single person or will it run through a chain of command?
8. Can you describe any experiences you've had with video in the past that might help narrow the focus for this project?
9. What is your expected duration of video? (A 30 sec clip v.s. a 10 minute clip)
10. Do you envision the footage having captions of specific information about the course such as course history, course accolades, hole distance, par information, etc.?
11. Do you want this video to be more informative or to be more exhibitivite (quicker cuts, shorter)?
12. Would it be helpful to see a storyboard of the shots we plan to take?
13. Above all else, what can we do to make you love this video?
14. Are there certain times of the day that will be better for shooting certain holes? What day(s) and time(s) will be allowed to film? Will there be golfers on the course that day? If so, will I need to avoid filming holes while the golfers are present?
15. Will access to a golf cart be provided and who is the contact upon arrival in order to gain access to said golf cart?

16. Is there a possibility of visiting and surveying the course before the day of the film shoot?
17. Is there a course map that is available online that you know of or can I get my hands on a printed version from your establishment?
18. Who are the contacts throughout the consultation process either for acquiring branding materials or golf carts, and what are their current contact details (office phone, cell phone, email, skype (or whatever else they use).

## Research

Once you have an idea of what you want, it's time to move to the *research* phase. At this point, all you may have concluded is that you want the video(s) to "Make us look cool", and that's okay! That was your plan from the beginning anyway, so all the better. More often than not, though, you will have a pretty clear idea on some specific holes on the course and other property features that for one reason or another are the key holes you'll be aiming to capture.

With this information, plan each and every shot that you wish to take, documenting as much as you can about the holes and/or other property features-which ones have interesting features such as deep bunkers, water features such as streams or fountains and anything else that makes them unique.

If you know what time of day you'll be allowed to film, use GolfTraxx.com to determine which direction the course holes are oriented and be sure that your lighting environment will be in congruence with your film process. You don't want to land in a situation where all of your drone footage includes the drone's shadow in the frame. Early mornings are typically best for avoiding such a situation. This is important, and one shouldn't plan to "Get Lucky" with ideal conditions.

## Plan

So, you've consulted with your partner, you have an idea of the layout of the holes you'll be capturing, and now it's time to start *planning* your shoot. For this phase, you'll need to develop a shot list and storyboard for the film. We've included links at the bottom of this article to printable PDF's for you to use as templates for creating these for your convenience in case you need them.

To ensure that you maximize your time at each hole, you'll want the specific shots you wish to capture for each hole before you arrive for the day of the shoot. To ensure consistency, you'll want to capture a run of similarly executed shots for each hole, and a few shots unique to each hole based on their specific features. When you move to the post-production editing phase or pass your footage off to a post-production editor, you'll want to be sure that your shots at each hole flow together seamlessly. This will take the guesswork out of your process, will save you a ton of time and allow you enter the day of your shoot with maximum ease and relaxation. Unless the course will be completely empty, there will be limited amount of time at each hole to begin with, and having this plan together will ensure that you won't be idle on the sidelines of the golf course holes waiting thirty minutes for a fivesome searching for their balls to complete the hole so you can go back to shooting drone footage.

So, you can use the outlines provided here or your own to map out the specific shots you want to achieve, print them out and have them ready the day of to check off each shoot as you finish it. This will ensure you keep track of all of the footage you're shooting, what order you're shooting each hole in and-let's face it, there's a certain satisfaction boost that comes with striking a check through a "to-do" box no matter what task you're looking to accomplish. You can even keep a time log for each hole so that when you go out for shooting your next project, you'll have a better idea of how long the film process will take and can plan accordingly.

It can also be helpful, if you've identified a series of video links of example holes or course flyovers in

your search through the golftraxx.com course and hole flyovers (or elsewhere) that you wish to emulate, to utilize the golftraxx.com hole flyovers tool and piece together a video sequence of footage that you can easily view on your mobile device so you'll have on hand the day of the film shoot.

Below is a screenshot example of the form on the golftraxx.com website:

Hole No	Hole Name	Text To Speech	Flyover Url
1	Broadhurst	<p>A lone fairway bunker guards the right side of the fairway in the landing area which can be carried with a 210 yard shot. A left to right tee shot affords the best angle to the green.</p> <p>From the TEE</p> <p>A left to right second allows you to skirt the green front bunkers and run onto the green. If you're out of position off the tee, lay up to 100 yards short of the green.</p> <p>From the Fairway</p> <p>The green slopes back to front. Leave your approach below the hole for your best shot to make that birdie</p> <p>On the Green <span>play</span></p>	Please mention URL here
2	Eaves Knoll	<p>Two bunkers on the right invite you to try to cut the corner on this short par 4 with a left to right tee shot which will leave you with just a pitch or short iron into the green..</p> <p>From the TEE</p> <p>A ditch runs along the left of the fairway and behind the green.</p> <p>From the Fairway</p> <p>The green slopes back to front and is over 40 yards in length. Check pin position and yardage for best birdie opportunity.</p> <p>On the Green <span>play</span></p>	<a href="https://www.youtube.com/embed/OKg-D009H-8?start=46">https://www.youtube.com/embed/OKg-D009H-8?start=46</a>
3	White	<p>A short and seemingly driveable par 4 except for the tree lined narrow landing area which is guarded by bunkers on left, right and green front. A 5 iron to right center fairway leaves you a wedge</p> <p>From the TEE</p> <p>The deep green front bunker must be avoided, as well as the hidden two bunkers along the right side of the green.</p> <p>From the Fairway</p> <p>Please mention text here</p> <p>On the Green <span>play</span></p>	<a href="https://player.vimeo.com/video/187143224">https://player.vimeo.com/video/187143224</a>
4	Jim Riddick	<p>Please mention text here</p> <p>From the TEE</p> <p>Please mention text here</p>	Please mention URL here

NOTE that different repositories (such as YouTube, Vimeo) can be specified for the same course and specific start times for each video as allowed by the video repository itself. You can also specify the EXACT start time for each video and include the text-to-speech as simple text blocks for 'From The Tee', 'From The Fairway', and 'On The Green' within the form for each hole. This will enable you to electronically create a storyboard of your flyover ideas and storyboard to gain consensus. What is put into this form drives the content of the hole flyovers for your course. GolfTraxx can add a "new mockup course" just for the purpose of creating your flyover mockup if you desire.

In addition, we recommend that you download the YouTube and/or Vimeo reference videos using a free online service such as KeepVid and cut the video clips using your preferred editing software, whether it be Adobe Premiere Pro, Adobe After Effects or Final Cut Pro.

The day before the shoot, you may want to put together a check-list of hardware and equipment preparation to ensure you can walk out the door the day of the shoot without any loose ends. This list should probably include things like making sure that you have all of your memory cards cleared, all of your batteries charged and all of your necessary equipment components packed and ready to roll. Speaking of batteries, you should have at least two more batteries than you think you might need. Drone batteries have notoriously short lives, and you don't want to end up on the course without any

power. We cannot emphasize enough how important this is. If you're an experienced drone pilot, you probably know this.

You may want to plan on bringing an external storage device to your shoot, in case you run out of memory. If you're shooting in 4K, the memory can go quickly just as with the drone batteries. Always be prepared to run back into the clubhouse to charge your batteries you aren't using while you run back out to continue filming or to do a data dump from your drone memory to your laptop. Again, this may not be necessary, but you have to be prepared for the worst case scenario, just in case.

Lastly, be sure that you have that list of names and phone numbers of your partner and anyone else involved printed out or stored in your mobile device to ensure you will be able to get in contact with them during your shoot should you find yourself in a situation where you need to contact them. You never know when you might be driven up a tree on the course by a menacing black swan that's laid claim to Hole 13 and need to call the course manager for help.

### **Publish a Schedule**

Depending on time of day that the flying is scheduled, and when the best times are for shooting particular holes or other features are, a schedule **MUST** be created. The golf cart will be immensely helpful at this point, as well as having someone at the course who knows the shortest way to get there from here.

### **Execute**

The day has come. You're prepared for the shoot, you have all of your necessary documentation on hand. You get to the course early and you're ready to set flight. There may be temptation to start experimenting, ideas may be flying wildly around in your head, you may even be fearful. Refer to your shot list, start with your first shot and execute. Cast aside your aspirations for perfection. Just do it. Stay on schedule or holes won't get shot at the desired times. Execute your first shot, check off the box in the schedule and move on to the next shot. If you've done the prep work up to this point, you'll be just fine. Stick to the plan, take the risks necessary to achieve each shot and just get it done. You'll learn a lot from this first shoot, and your second one will be even better than the first. But you have to execute and stick to the plan for this first one. And you have to cast aside the idea of perfection. If you get hung up on perfection, you'll never leave the first hole, and you'll find yourself steamrolled by the golfers on the course coming up from behind.

### **Learn**

Be sure to take physical or mental notes of what worked and what didn't during your first drone footage execution of a golf course. The point is to get it done, learn from your mistakes and make your next execution better than the first. As with any creative production process, you must learn from your process what worked and what didn't, and seek to improve upon it for the next go-round in continuation of providing the highest quality product for your partner that you can. Do the best you possibly can and move forward.

## **An Iterative Process**

Virtually no full course flyover is EVER achieved on a single day of shooting. There are just too many things that can go haywire. Respect that everyone's time is valuable for required re-takes and edits.

Virtually no video is ever filmed and done, and so it is part of the process that even after it is posted online, further edits will be iterative. Don't wait for it to be perfect or it will never get done. Just DO it! Post it online. Solicit feedback and make edits. Rinse and repeat.

## **Re-useable Components**

Remember that video clips or snippets from other digital assets can easily be incorporated into current projects. So for example, that video produced by the marketing department can be included in hole flyover videos as appropriate. Edits of digital assets such as flyovers will be FAR more achievable without requiring complete re-creations if a digital asset management approach is embraced.

You can think of reusability across two dimensions. The first and likely most familiar dimension is the notion of tracks. Video editing software allows digital asset synthesis by adding tracks to existing digital assets and synchronizing the tracks so that the digital content is played at the correct times. A sound track is added to a video as track 2 then synchronized so that as each hole is being displayed by track one the correct words are spoken in track two.

Video editing software also allows you to “pull in” digital assets from other repositories and then add that content either as additional tracks or “splice” it into an existing tracks content. However this means that you now have multiple copies of the same asset, and no way of knowing when the asset you have “pulled in” needs to be updated.

The other dimension demonstrated on golftraxx.com, when you view hole flyovers for the holes of a course, you may be viewing 18 separate clips within a single video or you may be 18 separate videos. Each separate hole clip may be accompanied by scrolling text or text-to-speech text, or by a separate sound clip with specific start and end times. Each hole may be accompanied by separate graphics overlay. These components are all examples of digital assets. They may live in completely separate repositories. Example of repositories are YouTube, Vimeo, Dropbox. To efficiently utilize these repositories you need a framework that enables you to leverage the digital assets stored in the cloud repositories seamlessly. Where the content lives *should* make no difference. It could be in Vimeo, in YouTube, in Dropbox, or any other publicly available storage repository. An infrastructure that enables your inventory of digital assets to be leveraged as necessary no matter where they live WILL simplify your life immensely.

You instruct the framework where to find the digital asset once (its URL), and for each specific incorporated asset, supply instructions on when, where and how to include it and you're done.

However, just to provide complete disclosure, this approach also has limitations. When digital assets are updated in other repositories there can be unexpected results. You may have received notification that assets in other repositories were updated and you have not yet reviewed the impact on your integrated framework. Perhaps the timing of the voice over for a hole is now off due to the fact that extra unexpected words were added.

## **Post-Production**

It goes without saying that you'll need to log all of your RAW files in a safe place, whether that be in cloud storage or on an external drive. Regarding any other post-production processes, the possibilities

here are endless. Here, you are free to experiment and have fun with *intros* and *outros*, title sequences, hole information display animations or anything you can imagine. If you've done the preparation work up to this point, you will already have on hand the logos, websites, course information, hole descriptions or any other pertinent information or content that you need to zip up your production into a neatly packaged video production.

Be sure that to follow best practices when rendering your video for web or for broadcast. There are endless resources out there available that detail the optimization settings for producing video for specific media outlets.

### **Post-Capture Processing**

It goes without saying that you'll need to keep all of your RAW files in a safe place, whether that be in cloud storage or on an external drive. We recommend creating your own YouTube and/or Vimeo channel as well. Think of the video editing process as a layering of content. Whatever is captured separately can be layered in, on, or over as needed.

So if you'd like each hole sequence to show the hole number, par, yardages, and handicaps accurately for years to come, even AFTER yardages are slightly updated next year on the scorecard, we can do that. If you hope to convince a celebrity to do voice-overs for each hole in the future, by storing the RAW drone footage separately, you CAN do that. If you want to show specific yardages within the video at certain distances on each hole to hole features from the tee or to the green center, it can be also added as an additional layer.

Regarding any other post-production processes, the possibilities here are endless. Here, you are free to experiment and have fun with *intros* and *outros*, title sequences, hole information display, animations or anything you can imagine. If you've done the preparation work up to this point, you will already have on hand the logos, websites, course information, hole descriptions or any other pertinent information or content that you need to zip up your production into a neatly packaged video production.

Be sure that you are following best practices when rendering your video for web or for broadcast. There are endless resources out there available that detail the optimization settings for producing video for specific media outlets.

### **Share**

The more people that find their way to viewing videos of your professionally produced flyovers the better. Some sites have taken the attitude that that video is their property and NO ONE ELSE shall ever show it.

While it is YOURS and you're free to do as you wish, our recommendation is to allow these videos it to be shared and found in main stream channels , thereby increasing your exposure to prospective visitors.

### **We Can Help**

Want to save yourself the trouble of all of this and get professional results produced for you? We're up for that. Are you a client with no drone capabilities that has arrived here looking for someone to capture drone, video, 360 video or photography for your purposes? We do more than just golf courses.

### **Contact Us**

Let's get to work. We're here to help in any capacity that works for you. Let's get ourselves on the

road to financial recovery from this COVID-19 crisis. Check out our video flyover collection today here: [https://golfraxx.com/view\\_golfcourses\\_by\\_holeflyovers.php](https://golfraxx.com/view_golfcourses_by_holeflyovers.php)

I appreciate you taking the time to read this, and truly hope it provides some insight and/or inspiration on producing YOUR course flyover(s). For those of you still deciding on what features to include in your flyovers, I believe the time viewing our existing hole flyovers will be time well spent. We would of course be honored to assist your efforts in anyway possible and to include any of the videos on our site, as an informational resource for prospective visitors to your course. In just in this past month alone, we had a record 400,000 page views on the site.

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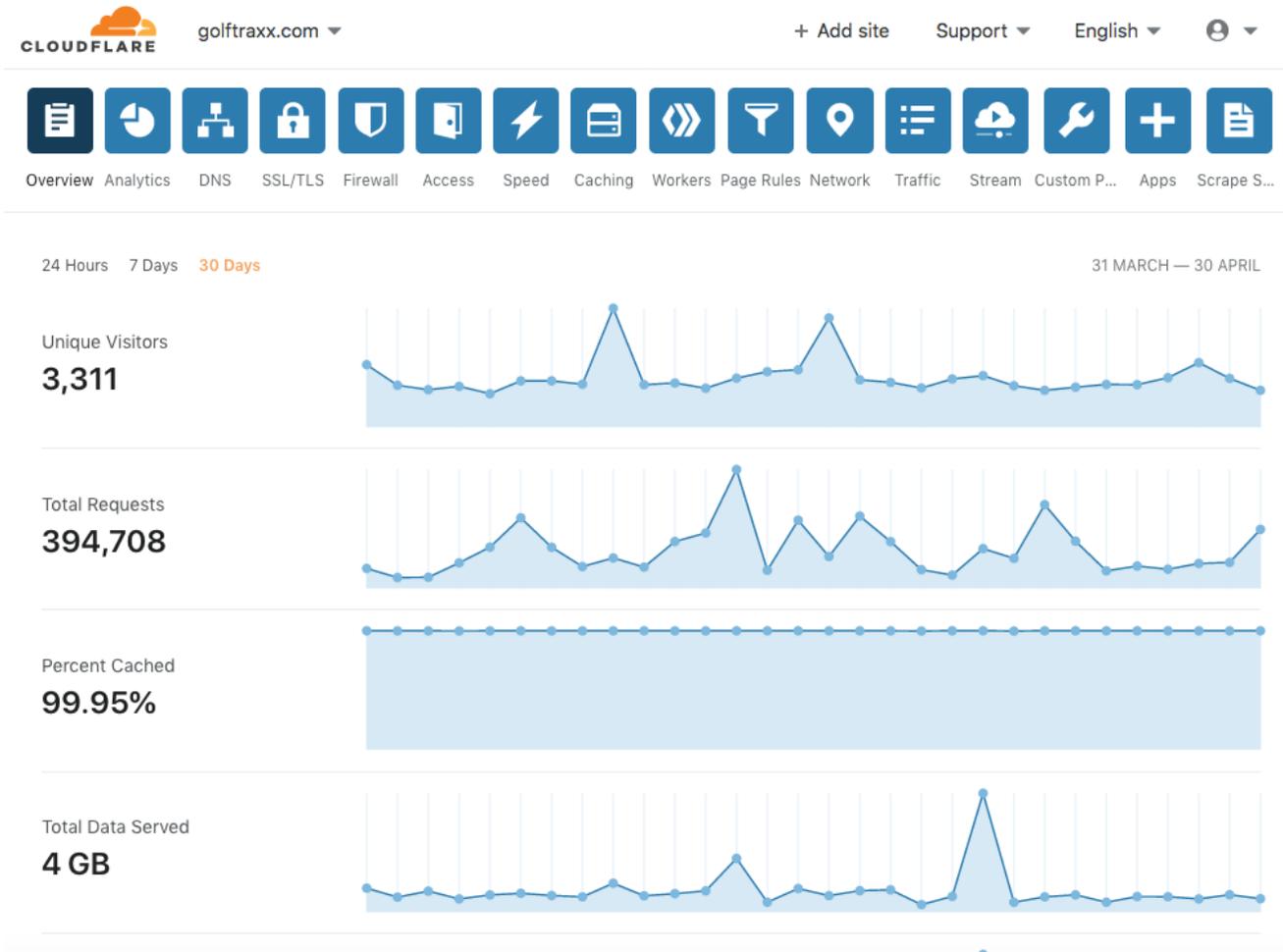
***April 30, 2020 Q & A Session with Golfraxx Founder, Frank DeBenedetti with latest updates on GolfTraxx, RTK, Precision Golf , his new Patent Pending technology, and his vision for the future of GolfTraxx***

*Q: Frank Thanks for agreeing to talk with us. Since our last meeting back in December, 2019, we see Golfraxx has been pretty busy adding courses. How many courses are in your database now?*

*A: It's a pleasure. Just this month we reached a milestone that 14 years ago when I started this venture, I wasn't sure we could EVER reach. 40,000 golf courses in over 100 countries are now in the Golfraxx database. We believe this is now close to 97% of the world supply of golf courses.*

Every single one of these courses is at least partially mapped, in as much as we now use Google's reverse geo-code API's to return the coordinates for each property in the database. The reverse-geocode API is how we are able to provide course layouts in our maps, even where we have not yet completed hole-by-hole mapping for the course. Over 32,000 of these courses now have scorecards and hole-by-hole GPS coordinates. Over 10,000 courses now also feature course flyovers. It is our plan to feature course and/or hole flyovers for every course in the database over the next 6 months.

From the very first versions of our our product, we were light years ahead of our competition, and dare I say, our latest product and site features are right on track to do the same thing AGAIN. We reached another milestone this month is that we had our very first 400,000 page views month here at golfraxx.



*Q: Wow! That's some pretty INCREDIBLE growth... both in terms of courses in your database and site visitors and page views. How was this possible in the midst of the COVID-19 outbreak?*

For the past year, we have been working to become as close to 100% green as possible, and to reduce our carbon footprint as close to zero as possible, and I saw a remote workforce as central to that vision. We are also planning to re-locate our operations to a location where all of our electrical consumption here in the US is generated by wind-turbines. This remote workforce strategy has turned out to be a fortunate strategy as it has allowed us to continue working through the worldwide crisis, albeit 100% remotely, despite receiving no revenues, we continue to make great progress. I also believe some of the growth came, similar to Netflix due to folks being able to stay home to look at more courses.

*Q: So besides the additional courses you have added to the database, and course and hole flyovers you're implementing worldwide, what else has been happening at GolfTraxx?*

A: One of the projects that's been on the back burner for many years has been the notion that we need a better way to ensure that the addresses for courses and the GPS coordinates for that course are consistent. Ancillary to that notion was, of course, finding ways to eliminate the “shiftiness” of the Google Earth imagery overlay itself, so that the coordinates in our database more closely correspond with **terra firma** and were not subject to whims or satellite orbit path deviations or other “shiftiness.”

The solution which I can now FINALLY discuss publicly is our *patent pending* **wireframe-hub spoke** design. In **wireframe-hub spoke**, the reverse-geocoded address coordinates are mapped concurrently with each set of course coordinates, and then ranked based on the proximity between the courses address coordinates and the green coordinates. This allows us to immediately see and update any courses where the address does not correspond with the coordinates.

Secondly, **wireframe-hub spoke** instantly calculates precise distances in yards and precise headings from the address coordinates for the property (or from any other RTK-verifiable points) to the other course coordinates stored in our database, which makes the distance calculations and headings themselves measurable and verifiable.

*Editor's Note: For those unfamiliar with RTK GPS receivers and the relevance to precision GPS coordinates, Minnesota DOT prepared a remarkably thorough and easy-to-understand report:*

<http://www.dot.state.mn.us/research/reports/2018/201810.pdf> which is also available here:

[https://golfraxx.com/201810\\_DOT\\_MN\\_RTK\\_assessment.pdf](https://golfraxx.com/201810_DOT_MN_RTK_assessment.pdf)

In addition, thanks to a whole host of now-available and low cost/free RTK subscription services and public base stations, RTK has become widely available here in the US and its reach is expanding rapidly internationally.

<https://www.gpsworld.com/finally-a-list-of-public-rtk-base-stations-in-the-u-s/>

We have created a short YouTube video on the GolfTraxx YouTube channel to demonstrate how our patent pending **wireframe-hub spoke** works. In it you can actually see the calculations being done as reverse-geocoded addresses are returned by the Google API:

[https://www.youtube.com/watch?v=Z\\_j8hYoY9p8&feature=youtu.be](https://www.youtube.com/watch?v=Z_j8hYoY9p8&feature=youtu.be)

Third, utilizing “extras” for the course (points visible within the imagery), a concept we coined 14 years ago, whether those “extras” be in-ground fairway yardage markers, or street corners, or swimming pool corners, tennis court corners, or driveway corners, literally *anywhere* where it is possible to obtain RTK coordinates, **wireframe-hub spoke** instantly calculates the precise distances and headings to the all of the course coordinates in our database.

Fourth, **wireframe-hub spoke** instantly calculates the delta or “offset” between visible points in the Google Earth imagery and the RTK-verified points. This allows the precise location of that extra to be determined (to within 1-2 centimeters), and for the coordinates associated with that “extra” to be updated in our database. However, **the BIG WIN is that all nearby coordinates stored in our database can also be instantly “trued-up” by the exact same amount required to true up the visible “extras” in the imagery to their RTK-verified positions.**

*Q: Wow GolfTraxx!! A patent?! That IS Exciting News! Can you explain for our non-technical viewers what that means for GolfTraxx and its users?*

Over the past decade we have discovered that some of the Google Earth Maps had errors as large as 10-15 yards in some areas where the Google Earth mapping overlay itself needed to be adjusted. When I met with Google in 2008, they told me that what Golftraxx was doing would help them improve their

mapping. The placemarks we have been adding in our course maps using Google API's have provided Google a way to "true up" their Google Earth maps to known positions. Now, with RTK-verified viewable locations, that level of precision can finally reach the less-than-one-inch level of precision.

Think of the Google satellite imagery as an overhead transparency, that can be laid directly over terra firma, and think of terra firma as the overhead projector stage. If placed precisely enough, then there is no variance between the coordinates stored in the Google transparency layer and those of terra firma itself. However, as demonstrated by Google for the past 12 plus years, every time shifts in their satellite imagery occur, it introduces a variance or "error" between what their transparency shows as the coordinates for the position and what the position of terra firma actually is.

These variances are often referred to as offsets. The precise distance or coordinate required to "true up" the coordinates shown in the imagery for the location with the actual coordinates for the location. Our patent pending **wireframe hub spoke approach** calculates the distances and headings automatically between ANY visible RTK-verified (or RTK-verifiable) point and the other point stored for the course in our database, allowing every single one to be trued up precisely as the RTK point itself. The BENEFIT is that the calculations from where a player is standing to the the target pin become more precise by eliminating error caused by the Google transparency layer heretofore.

To identify and map the RTK-verifiable "extras" themselves and then confirm corresponding RTK-verified locations, we WILL need the cooperation of the user community in identifying, mapping, and capturing these RTK-verifiable locations.

Until the present, whenever Google decides on their own accord to make those adjustments to maps, we would see the placemarks of groups of courses in the same geographic area shift several yards when viewed in Google Earth or Google Maps. Of course, we never receive any notification that it was going to happen...it would just happen. There are still courses in our database to this day that reflect those "shifts" in the underlying imagery.

*Q: Thanks for clarifying this for non-technical users. That IS Exciting News! Where are you heading next from here?*

Well, with all the excitement about the patent I forgot to mention our worldwide deployment of weather on our site. We have implemented that just in the past few weeks as well.

Also as a follow-up to the last time we spoke, I had mentioned that we were in the process of implementing stats tracking. The stats we are now collecting for rounds played can now be uploaded to golfers profiles through Facebook integration with our HTML 5 application and some of our prior versions serve as the basis for us to provide "post-round analysis and recommendations" for improving your game." Think of it as taking a playing lesson, where the pro goes with you on the course and makes recommendations that can save you considerable amounts of shots by playing smarter golf during that round and in future rounds. Our stats analysis will help golfers identify weaknesses in their game and give actionable feedback to help improve their games.

*Q: So 14 years later you are still supporting those prior versions?*

Those devices still run our software AND they're REALLY CHEAP, so why not? I have heard of Treos being purchased for \$5. One of the things we recognized with advent of FCC radio devices and the imposed restrictions on GPS precisions way back in 2008 was that we needed to have the ability to

receive coordinates through a means other than the internal GPS receiver offered inside \$500 iPhones or Androids. Our solution back then, as many of you know, was bluetooth. Bluetooth was the recommended approach for GPS connection to achieve the **highest precision possible**. Our bluetooth approach was visionary, as RTK-enabled GPS receivers today connect to your device via bluetooth. Today, if you want the highest precision possible, a bluetooth connection to RTK-compatible receiver is what you need.

*Q: So what can you tell us about the new HTML 5 app? What's different and why did you create it?*

A: From the start, we have been a scorecard, GPS distances, and stats application, but not a course map application. We wanted a version that could be used by everyone, where maintenance costs would be substantially reduced by maintaining a SINGLE code base, versus for Android and IOS application revisions for every OS upgrade or release. We also wanted to integrate map imagery, and were excited about the new version of Google Map 3.3 API's, post the map corrections so that the higher precision maps would also demonstrate the quality of the course mappings we have created using Google Maps themselves. In addition, Golftraxx has always been a take-everywhere app that works even where there is no wi-fi or 3G/4G/5G and we wanted to preserve that feature in our next gen version.

One of the other things we learned and focused on, even from our earliest versions was that “too many clicks spoil the soup!” For on-course stats to be tracked and for scores to be kept, and ALSO for ready-golf to continue to be played, the scoring and stats capture MUST be accomplished with the fewest clicks possible. We figured that out way back in 2007 on our Garmin version, and from what we can tell, not one of our competitors has come close, even to this day. To make it happen, we select your club for you based on the distances you hit your clubs, and we determine your lies, and your clubs, and your chips and putts, and whether you hit fairways or greens in regulation based on location, such that 80-90% of your shots required just ONE click per shot to capture scoring AND accurately record your playing stats.

Of course the Google Earth imagery embedded in our html 5 app and in our website speaks for itself and is the big new feature. It accurately depicts where you are on the course, and where landmarks and hole features are relative to you in stunning imagery.

HTML5 also now provides support for “Where Am I?” which enables us to provide dynamic lists of hundreds of nearby courses that can be selected to play a round of golf in a few seconds, and provide turn-by-turn directions through Google Maps to arrive at the course.

These were some of the have-to-have qualities we wanted to offer in our html5 version of golftraxx.

*Q: Wow! And you were able to do all this in HTML5?*

A: Yes, I am quite pleased with the HTML 5 app we have brought to life for golfers worldwide in this newest version of golftraxx against some remarkably stacked odds against us. Of course, it relies heavily on the database that we created 12 years ago and continue to update with additional courses and further tuning. As you have already heard we have been under hacker attacks non-stop for the past several months, deleting data, changing site pages, and wreaking havoc. But through all that, our users stayed quite happy.

Month-over-month we are achieving record numbers of page views on the site, even after excluding the hacker traffic. This past month we received over 400,000 page views on the site, a new all-time high.

Just like the earliest versions, the course can be downloaded to your browser ONCE and then the entire round played without ever re-connecting to the internet. Shots are captured in a single click including club selection, lie, distance to target. GIRs, Fairways Hit, Chips, and Putts are all tracked automatically.

*Q: Where are you heading next from here?*

A: Besides the flyover videos, we are continuing with our **scorecard update project** which is now close to 15,000 updated course scorecards and adding links to golf course websites. It is our hope that all 40,000 courses in the database will have had editor review within the next 6-12 months.

“Extras” for courses from around the world continue to be added to courses in the database. This is an on-going process.

Every single new courses that's been mapped and/or scorecard-ed will be available to every device platform within the next 60 days.

We are planning a relaunch of the iPhone and Android versions of our software, with more to follow soon on both. This time we'll be ready, with courses in every corner of the earth ready to be downloaded and experienced. We are considering different strategies for how that software will be distributed.

CloudFlare content caching has been incredible in terms of enabling us to provide imagery instantly to our site visitors, so of course our site visitors can consume more content in shorter periods of time since pages of amazing imagery are delivered instantly. Our site stickiness is still **over 62 pages/per visit**.

There are 209 countries in the world with golf courses. While close to 50 of the remaining 100 countries not yet in our database are “single-course countries, it is our goal to have courses in every single one of the 209 golfing countries in the world. Our new website makes it easy to navigate in a single click to any continent or country in the world, to see the list of courses we have in each country or state or zip, and to view the scorecard and course maps for each course in our database thanks to Google Maps API 3.3 mapping technology. Even where the courses have not yet been mapped you can now see the course layout for each of the 40,000 courses in the database.

*Q: With all the new features you have brought into the Golftraxx website and application, some might say that Golftraxx is becoming the “Google of Golf Worldwide” Any comments?*

A: Yes, I am quite pleased with our recent strides forward. It is clear that the market is taking notice. These strides have come as the result of considerable effort and sacrifice of the team and I am grateful to each and every one for their contributions. On average each month, between 1,500-2,000 hours go into making golftraxx a better site for the world.

*Q: Has Google been back in contact with you since 2008?*

A: Unfortunately, as you may already know if you've been following our Press Releases, the only contact made by Google towards us have been those actions they took which I reported to the FBI and the California Attorney General.

1. Google bot delivered SQL-injection attacks

2. Google-created links to thousands of our course scorecard edit pages used by our content editors
3. Subsequent Pakistani requests for those scorecard edit pages also numbering close to 20,000 per month.
4. Google's declination to respond to our filed complaint

In addition there have recently been:

5. Unusual activities on my laptop and home network, reported by my ISP where dozens of unauthorized devices were added to my home network, and by the company providing support and service on my computer equipment whose software was hacked, which was discovered for the very first time anywhere on MY laptop...No other client of their many thousands of clients have they EVER seen their software modified after installation. I am waiting for the report from the firm, but their engineers first question was HOW is it possible that they were able to modify our PRIVATE source code? What level of access to the OS is required to do this?

*Q: Frank, Thanks for taking the time to speak with us. Best of luck with everything in this blossoming venture!*

Frank DeBenedetti  
*GolfTraxx.com*