

## GIS BILT Meeting – September 16, 2015

### Meeting Minutes

Meeting Link:

<https://meetings.webex.com/collabs/meetings/playRecording?recordID=17746891&meetingInstanceID=I12IA7OZ6RN57G13HKPU2DXIZK-B2LB>

#### **Welcome and Introduction – Philip Davis**

We are going to go ahead and get started. We have a draft agenda uploaded for everyone to see. If anyone wants to add anything to the agenda, please feel free to do so. I will review emerging technologies. This is the last formal meeting GIS BILT meeting under Collin College NISGTC. The current project ends in two weeks on September 30. At the conclusion of NISGTC, I'm inviting everybody who currently serves on the BILT to join and serve on the Del Mar College NISGTC BILT. Since all Texas degree programs require that we have an external advisory board, I want to continue with the BILT at Del Mar College. Our advisory board will include some local Nueces County members like clay, who is a part of our graduate program. I believe it is a good idea to have a national perspective on your programs. Thus, we would welcome Demetrio, Bob, and any of the former members to stay on the board.

#### **Review of Emerging Technologies:**

There are a couple of emerging technologies that I want us to review: UAS systems, open source software, and general autonomous systems. Bob and Demetrio could you recommend any technologies related to autonomous systems?

*Proposed UAS Course:* Currently, we do not offer an UAS course at Del Mar College. I propose that we offer a course that offers a general overview of UAS technologies. We are applying for a National Science Foundation grant with Texas A&M, Corpus Christi to build a UAS program at Del Mar College. After Del Mar students graduate complete a certificate or associate degree, they can enroll into enroll into the Texas A&M to get a bachelors degree in UAS technology. Texas legislature re-added career technology to secondary education two years ago; after, it was removed 15 years earlier. We propose to expand the UAS technology courses to high school juniors and seniors as dual credit. It will follow the same dual credit programs we offer at a couple of the local area school districts.

Since it is a long shot to secure a NSF grant or any other grant, we do not plan to rely solely on the grant to do accomplish this proposal. I want to start the process today by offering an introductory course that starts next summer. Our local committee will approve this curriculum

for the UAS course this fall. We plan to use a UAS course taught at Clark State College to be a template for our introductory UAS course. Currently, Clark State College has a rigorous UAS program. The difference between our program and Clark State is our program will focus on precision agriculture. We want to receive a certificate of authorization with the FAA in the spring of 2016. It will take about 2-6 months to obtain this certification. Once we receive certification, we would begin to train instructors and market the course this upcoming April. The first workshop will be offered in summer 2016 apart of continuing education as a dry run.

This is a quote from a study on UASs/UAVs that was just released. The use of unmanned aerial vehicles for civilian application will approach around \$82 Billions dollars. It will produce more than 100,000 new UAV related jobs by 2025. 2025 is only a decade away. In order to meet this goal in 10 years, we need to start training technicians immediately. There are only 20 community colleges and universities in the US and some 50 colleges worldwide that are training technicians. Universities will need to increase their programs. If you take 20 community colleges and divide it into 100,000, there's no way to be able to graduate enough people. More colleges need to be brought into the UAS world. This is my rationalization for wanting to start this program at Del Mar.

Let's take a look at the curriculum. This is a concept course based upon a syllabus and learning outcomes for a UAS course at Clark State. These courses will not have hands-on experience because we won't have a certificate of authorization until after the course is developed. The course would be a general overview of UAS that relates to its history and key concepts. We will review the system composition of the UAS and what goes into the platform itself. Next we will discuss the different types of payloads in terms of sensors. Since the focus is precision agriculture, we will review how the different types of payloads might change things. Issues related to data collection and privacy is another area of focus. There is a large concern for where you fly and the data you collect. We want our students and graduates aware of the proper uses of UAS and legal ramifications. UAS can be used in various industries that lead to a survey of different type of applications. In our local area, precision agriculture refers to search and rescues, first responders, and military usage of UAVs. Finally, we would explain the challenges and flight safety. FAA rules require training for their operators, helpers, and observers. They have to understand the idea of ACOLA and where they can and cannot fly. Clay and Demetrio, what do you think about the idea of building a UAS course or program at Del Mar?

Feedback on Course:

Clay believes this course is a very good idea. Nueces Electric, the company he works for, is seeking ways to acquire a drone to perform aerial inspections of their lines. There is a lot involved to acquire a drone. He argues that it is a good to have a class that discusses the different usages of drones and everything that is involved with them.

Demetrio – I’m with you. There’s a proliferation of ideas and certifications and trying to tease out what not to teach. We have... (mumbles something with strong Spanish accent) that deal with avionics and aviation schools. There’s interest in doing the (mumbles something with a strong Spanish accent) part of the systems, UAS proper, and censuring load. Course and/or program on UAS are timely and needed. As it relates to Cyber security, I can see someone use UASs to hack into an autonomous car or regular car. I’m not sure how we want to address cyber security in this course.

Philip – Do you have couple of references you can recommend on cyber security and UASs?

Demetrio – If you want me to, I can come up with a couple of references for the group to review. On NPR, there has been several articles about autonomous vehicles and how maps are different for these vehicles. People are hacking into regular vehicles. I can see someone messing with the collision avoidance system and turn it into something that it was not intended. There is always a risk for these things to be abused.

Bob – Demetrio, you are absolutely right about that. There are stories about people taking over cars and making them turn corners and do weird stuff. I am hesitant to have of this information in a single certificate program. This is a lot of information to cover in a short amount of time. Some states require you to have students to have an x number of credits to get a degree or certificate in UAVs. Will we discuss the avionics part of UAVS, such as the electronic components like aerodynamics?

Philip – I am recommending a single overview course. It has to be taught as a course in our current degree program; or else, I can’t do this. Most academic programs will offer “Special Topic” courses within their degree programs. These courses allow them to teach anything course that is “state of the art.” I desire for this course to be a bridge course between current offerings and what we plan to offer in a year once we receive the NSF grant. This could lead to a new certificate. We plan to build a 5 course certificate program that focus on UAVs. This program is dependent upon the approval of our NSF grant. Our students should be aware of the general understanding of UASs/UAVs. The six topics offered in this course will just be cover the core concepts. It is a course that is wide and shallow like the Mississippi river. We don’t want it to be deep like the ocean in terms of how deep we go into these concepts. We wouldn’t have any certifications to go into grave details about various concepts related to UASs/UAVs. Essentially, this is a special topics course within our existing GIS program. Does that make sense?

All – Yes, Got it.

Philip – The special topics course can be counted as the first course of a five-course certificate program.

Bob – That’s is where is I was going towards.

Philip – Clark State has certificate and associate degrees in UASs. The key concept course is the first course that Clark State students take.

Demetrio – Essentially, it is a fundamental course on UAVs/UASs.

Bob – It is a board, shallow overview.

Philip – Right! It's a theory course. Students will not go out and fly a drone. They will not even take one a part. In order to broaden the audience for this course throughout the State of Texas, I'm considering making this course available online. I am not aware of any course like this in the State of Texas. It is a first of its kind course that may lead to a more thorough review of it.

Right. It's own theory. You don't go out and fly a drone. You don't even take one a part. I'm even thinking about doing it as an online course. So, we can offer it to a broader audience in the state of Texas. Right now, I don't know of anything like this in the State of Texas. This would be kind of a first of course, and it could lead into a more thorough review of it.

Demetrio – This is a good source. It will be a 30,000 panoramic view of everything.

Philip – Right, it's a 30,000 view of UASs.

Demetrio – The software...you're using...mumbles something with strong Spanish accent.... before you tell them that they will encounter other commercial off the shelf software that have UAV/UAS data capabilities.

Philip – We will discuss the different types of software platforms, i.e. anything from open drones to tremble software sweeps.

Demetrio – He mumbles something with strong Spanish accent. That becoming a common place now to do... mumbles something with strong Spanish accent...

Philip – So, I wanted to ask the BILT members: Do you more or less support and approve of us adding a UAS course?

All – Yes.

Philip – I have not proposed this idea to my departmental chair, as of yet. I wanted to follow a logical path to determine if the BILT and industry believes this is a valuable course. I want to get your support it. If you all did, I would present him the same presentation to get his feedback.

Demetrio – This course covers sensors preloads without the remote sensing which is good. I was getting really confused about how to put all that information into a course. How you plan to structure the course is good. I say yes and go for it. The industry part, the industry application is of interest. You plan to use agriculture precision to help first and emergency responders. In Kentucky, I have seen them used in training exercises with first responders and fires.

*Open Source:* The next thing to address on the agenda is Open Source. Over the last two years, you all helped us to create the QGIS system and provide non-credit training in technology. We seek to commercialize this program. The target audience for this program is new and incumbent workers in the industry. I have some ideas on how to do that. We will address this at the conclusion of the grant.

The final item I want to get feedback on is the board and emerging field of autonomous systems. I call it the “New Internet of All Things Geospatial.” Google autonomous cars, Uber, Lyft, Amazon Delivery drones, and other applications that utilize autonomous pilots (car, truck, bus, drone, boat, ferries, and all means of transportation) are examples of “New Internet of All Things Geospatial.” Everyone has brought up something really important: hackers taking over vehicles. There were 19 Saudi Arabian men who snuck onto our planes and piloted those jets into the World Trade Center over 14 years ago. We don’t want to give these types of people the ability to remotely pilot one of our commercial jets, 18-wheeler, train, or any mode of transportation to commit the same type of attack. God forbid if they use a school bus. Google announced that Austin, Texas will be the second location for Google cars. While the Google X laboratories conduct research, Google autonomous vehicles will collect data from the streets of Austin. Google X laboratories are working to set up a research center with the University of Texas. This will be a big player in the forthcoming economy. Amazon has its drone program. Uber is a highly capitalized company. They are hiring all types of software developers and location based services. A couple years ago, we discussed how LBS would become a big deal when it was a way to help people navigate around the street in their cars or the exact location to meet someone nearby. They were cute and clever social applications. Now, most people drive commercial vehicles has geospatial technology. Geospatial technology is front and center. It helps ambulances deliver people to the hospital; fire trucks locate the quickest route to a fire. What are your thoughts about that?

#### *Feedback on Open Source and Autonomous Systems*

Demetrio – I am one of the Vice Chairs for the IGTF conference. The next conference will be in April 2016 in Fort Worth. This is one of the session topics for the conference. It is one of those things that people are falling in love with. It came together despite us not paying attention to how it happened. There is a matter exchange between devices and software, and it drives them. Earlier you quoted a statement about UASs/UAV accruing about \$82 billion, but the Internet will spur more growth than the complexity, synergy, and different manufactures that run them.

Clay – You can what if everything.

Demetrio – We can study what happens when we connect a car, a phone, and a drone together.

Clay – Does anyone offer an advanced degree in Geospatial technology on the graduate level?

Philip – There are a dozen schools that offer an advanced degree in Geospatial Technology. Locally, Texas A&M, Corpus Christi offers a Masters in Geomatics. My son graduated from that program last year. He professionally flies drones for the US Army Corp of Engineers in New Orleans. They are starting a Ph.D. program at Texas A&M, Corpus Christi. It will be housed jointly under Computer Science and Geospatial. Something like this has to be on their radar.

Bob – We use KMU to geocode addresses for a lot of the firms that register with us. We're using some emerging technology and geospatial to perform a multiple criteria decision analysis.

Philip – I don't know if you know Rick Smith. He is working with Texas A&M at College Station. They are finalist for \$10 million dollar grant from the NSF.. They will focus on work related to emergency management.

Demetrio – Let's leverage what we do have. I can envision a swarm of drones, intelligent agents working together and communicating with each other. The line of visual sight is going in that direction. You can have a visual line of sight from one to the next to the next. There can be a master drone that controls the other drones. That would be a leverage idea for having a UAS/UAV course. At the moment, we can see the mission that fly to capture terrain data via dense image matching. I have not followed this culture for a long time; although my background is geospatial. The company that does AG management keeps it very close to their heart. They have their own conference. We should reach out to someone at that conference to see how we can partner together.

Philip – So, approach them, right?

Demetrio – Yes. I don't know where that conference is. I haven't attended a conference in a long time. The last conference was probably in the Midwest somewhere. I believe they have their own association. There are places where people present on precision management. Maybe we should reach out to the leaders of the conference and see what needs they have and/or what the next course should be?

Bob – A train hit me on my way to work this morning. I'm being sent home. My ride should arrive in the next 5 minutes. I have to get off the call. If you want me to look at any documents, please send it to me and I will look over it as quickly as I can.

Philip – That is everything I had on my agenda for the day. I want to invite everyone to join us for the next meeting in the spring. If you want to continue to be a member of our extended local team, just let me know. Please contact me. Clay, I know I can count on you because you are local. Demetrio, we have known each other for decade. So, I hope you will stay with us.

Demetrio – I would like to do that. Like I said, it is a great opportunity to leverage what we're doing and what everyone else is doing in many ways. We will have a workshop on QGIS at the conference in Kentucky. Kentucky offers a certificate that is based on GIS.

Philip – That is good.

Demetrio – I will send it to you. We have a Kentucky GIS list serv. Information about the certificate was posted n there. They have a department of Geography.

Philip – I'd like to hear that story.

Demetrio – Yea, it's flourishing at the alternative to the expensive software. Yea, I would love to stay on. No problem

Philip – Lastly, there is a link for an event bright. The Geo-technology center is hosting a webinar in about 20 minutes. We will have an ARPRS representative to lead the webinar. If you're interested, you can joint the event.

Demetrio – I strongly suggest it because Michael Hawk is very knowledgably on this topic, the rules and regulations. The rules and regulations are very complex and changing every second.

Philip – Demetrio will you be at the coming to Cowtown in April?

Demetrio – Yes, I would be there. We're working hard to make it something useful and make it grow. The call for papers and the workshop proposals will come out soon. I will make sure you get it.

Philip – Do that. I will help market it in the state.

Demetrio – Please. There will be a session on UAVs.

Philip – You should send me a reminder because in Texas the biggest statewide conference is called the "Geo Rodeo," which is at TNRIS (The Texas National Resource Information System). It's in October Rick and I will give a paper on...didn't understand the name of the paper he said. I would love to put out a paper on your conference.

Demetrio – I will send it to you. Thank you. That's good.

Philip – Any last words of wisdom?

Clay - I think you all have pretty much covered it. It looks very interesting. I'd love to know more about what you have planned. Do you want to shoot me over an email about what you've been discussing I'd be more interested in reading it.

Philip – Sounds good. Thank you, everybody. Clay, we hope to have you a GIS Saves in November. Hopefully, you guys can come out and put a booth up or at least attend the conference.

Clay – Currently, that's in planning right now. I've already volunteered one of our staff members. We had the local meeting that JJ was hosting.

Philip – All right. Thank you everyone. Christina, that's all I've got. You got anything else.

Christina - No, we just want to thank again from other the other partners. We want to make sure we thank the BILT for their time and the guidance you guys have provided for NISGTC. We will make sure that Phil and JJ have the list that we've been using for NISGTC BILT; so that, they can continue to work with you guys.

Demetrio – Thank you Clay. Thank you Christina.