

Meeting Notes

Texas Shared Technology Services
Geographic Information Systems Solution Group Meeting
July 16, 2019 • 2:00PM – 3:30PM

Texas Department of Information Resources
Wm. P. Clements Building – 13th Floor
Conference Room #4 (The Congress Room)

Meeting Chair Richard Wade (TWDB/TNRIS)
Co-Chair Ed Kelly (DIR)

Participants **(Attendees in Bold)**
Raj Nadkarni (TCEQ), Scot Friedman (GLO), Monica Watt (CSEC), Vonda Payne (CSEC), Felicia Retiz, **Gayla Mullins (TWDB/TNRIS), Chris Bardash (TxDOT), Travis Scruggs (TxDOT),** Jeremy Rogers (TxDOT), **Jeremy Nobles (TPWD),** Michael Kersey (DIR), **Susan Seet (CSEC),** Jodie Erickson (DIR), Jennifer Neutzler (DIR), **Jennifer Kirby (TCEQ),** Michael Chamberlain (TxDOT), Burhan Girgin, **Terese Shade (DIR),** Lorie Ramirez (DIR), Carrie Davie (Capgemini), **Brooks Myers (DIR),** Greg Smithhart (UT), Kate Fite (DIR), **Mark Howard (DIR), John Barton (TxDOT), Stephanie Harris (DIR), Kelly Parker (DIR), Jonathan Martin (TxDOT), John Andrade (DIR), Mary Ann Smither (Capgemini)**

Conference Number: 1-877-873-8018 Access Code: 3298261

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Welcome and Introductions (Richard Wade)

Agenda:

- Imagery Acquisition – An Alternative for Texas (Jonathan Martin / TxDOT)
- Google Cloud Platform Training Opportunity (Richard Wade)
- Group Discussion (Group)

Imagery Acquisition – An Alternative for Texas (Jonathan Martin / TxDOT)

- Is it possible for the State of Texas to do data acquisition on their own and can it be cost effective?
 - What are the State's alternatives?
 - Jonathan Martin (TxDOT) has talked to vendors and will provide compelling research and information



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- TxDOT has first-hand awareness of Google stepping out of the data acquisition role and what that may mean to the agency
 - Primary data acquisition was considered low-margin work, however with the economy doing well and with so much infrastructure work going on, it is now considered high-margin work
 - Cyclical occurrence - will be high-margin work for next 5 years
 - Primary data acquisition for aerial photography and ortho photos will cost more
 - Presents opportunities to do business differently (e.g. the State of Texas do this work)
 - State of Texas (TxDOT) used to do this, but discontinued because of internal issues
 - Film cameras sold and aircraft went to State pooling board
 - TxDOT now has aircraft again – houses and maintains all State aircraft at DPS
 - Currently does not have cameras
 - Looked at options for outsourcing (including Digital Globe)
 - Satellite imagery costs approximately \$7M/year to acquire images at 30cm
 - State of Texas taking on the data acquisition role
 - Capital acquisition cost
 - Total: ~\$4M – \$4.2M
 - Aircraft (Cessna Grand Caravan 208B – 214mph maximum)
 - Procurement
 - Installation of 2 ports and electrical systems
 - Maintenance: major overhaul every 5 years
 - Cameras
 - 2 framing camera options (more accurate)
 - Vexcel UltraCam Eagle Prime
 - Hexagon/Leica MC III f92mm
 - Scanning camera option
 - What group is used to
 - Leica AD5100
 - More efficient data collection for orthophotography but less accurate than frame cameras for mapping
 - Processing computers
 - (10) Dell T9710 2 Processors/10 Cores
 - Routers/Switches for clustering
 - Annual direct operating costs
 - Total: (1st Year) ~\$813K - \$933K (maintenance is free)
 - Total: (2nd & Subsequent Years) ~\$949K - \$1.1M
 - Camera system maintenance
 - Flight hours (cost includes fuel and aircraft maintenance)
 - 1013 hours (entire state at 15cm)
 - 76 hours for transit to/from project areas: (34) 100x100 miles blocks)
 - 391 'buffer' (unused hours)
 - Ground control
 - Hotel & per diem: 2 pilots/1 camera operator



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- Annual fixed costs:
 - Total: ~\$795K
 - Team (FTEs)
 - Pilot (2)
 - Camera Operator (1)
 - Certified Photogrammetrist/PM (1)
 - Scheduling/Assistant (1)
 - DTM Technicians (3)
 - Orthophoto technicians (3)
 - Other Costs
 - Aircraft Insurance
 - Aircraft hangar space
- **TOTAL FIRST YEAR COST (Entire State at 15cm): ~\$5.6M - \$5.9M**
 - Satellite imagery would be ~\$7.2M
 - Annual depreciated costs over 5 years (have built-in compounded growth rates for both direct and labor costs)
 - Total: ~\$2.6M - \$2.8M
 - Satellite imagery would cost the \$7M every year
 - Annual depreciated costs over 10 years (stable state)
 - Total: ~\$2.5M - \$2.7M
 - Includes complete replacement of camera system and processing computers and two major aircraft overhauls
- Current State DOTs with digital framing cameras: NV, WY, MT, ND, OH, LA, AR, TN, NC
- 3D City Mapping Capability
 - NOTE: If flying ortho photos, you will be flying at 11K ft., if flying city mapping photos, you will drop down to 6K ft., so would require multiple altitude flights
 - Option 1 (Oblique Camera – UltraCam Osprey: Photogrammetric/No LiDAR)
 - Total capital cost: ~\$943K
 - Camera
 - Additional hard drive
 - Gyrostablizer
 - GPS/IMU
 - Five year annual depreciated cost: ~\$189K
 - Direct Operating Cost (if combined with mapping camera)
 - Annual maintenance cost (starting 2nd year): ~\$84K
 - Option 2 (LiDAR scanner – Hexagon/Leica Hyperion 2: Includes Photogrammetric)
 - Total capital costs: ~\$1.9M
 - Camera
 - Installation/Training
 - Five year annual depreciated cost: ~\$394K
 - Direct Operating Cost (if combined with mapping camera)
 - Annual maintenance cost (starting 2nd year): ~\$80K
 - Unknown figures and information that would need more research



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- Business opportunity to sell this product (i.e. to a City) and recoup some costs every year
 - Even with more expensive 3D mapping camera, there is a good business case to look into this possibility
- Another aircraft option
 - Pilatus PC-12NG
 - Total capital costs: ~\$7.2M - \$7.3M
 - Aircraft
 - More expensive but faster (214 vs 328 mph)
 - Maximum speed for 15cm imagery is 350 mph before image is compromised
 - Greater range (100 x 100 mile block with no refuel)
 - All other costs basically the same as the Cessna
 - Annual direct operating costs
 - Total (1st Year): ~\$773K - \$893K
 - Total (2nd & Subsequent Years): ~\$909K - \$1.0M
 - Camera system maintenance
 - Flight hours (cost includes fuel and aircraft maintenance)
 - 620 hours (entire state at 15cm)
 - 64 hours for transit to/from project areas: (34) 100x100 miles blocks)
 - 796 'buffer' (unused) hours that could be used for other purposes (e.g. city mapping) versus 391 'buffer' hours for the Grand Caravan
 - Ground Control
 - Hotel & per diem: 2 pilots/1 camera operator
 - Annual fixed costs are the same as with the Cessna
 - **TOTAL FIRST YEAR COST (Entire State at 15cm): ~\$8.8M - \$9.0M**
 - Annual depreciated costs over 5 years: ~\$3.5M - \$3.7M
 - If interested, TxDOT can arrange to go out with any interested party and look at aircraft
- TxDOT interested in data acquisition prospect to be able to utilize resources efficiently and effectively
 - Timing is good because TxDOT is about to retire the Cessna 206 with camera port and the Cessna 182, so they have been looking at the Cessna Grand Caravan
 - **QUESTION:** If TxDOT is planning to buy a new aircraft, would that help with funding that would not have to be used for purchase of aircraft?
 - Jonathan is not in a position to answer that question
 - As part of TxDOT's second phase of replacing the two Cessnas, he is not sure how that would affect this group/opportunity
- Costs presented are to fly entire state every year at 15cm
 - There can be options to not fly yearly and fly other opportunities
 - Only metro areas every year/Refresh other areas every 3 years
 - The coast after a hurricane
 - Highway projects
- Ortho photography is something you always pay too much for
 - The proposed DTM (3) and Orthophoto (3) technicians will ensure integrity of seam lines



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- **QUESTION:** If we were to acquire all imagery at 6 inch, is there any sense of timing to process the imagery (taking hardware and staffing into consideration)?
 - (34) 100x100 square mile blocks
 - 2 to 3 weeks but that is dependent on sufficient processing power over 14 months to process the entire state
 - Some efficiency can be gained with parallel processing to cut down on time (12-15 months to process the whole state)
 - **SUGGESTION:** University of Texas super computer – would be interested if allowed to process this data
 - Possible Option: Condor Software (Distributive Processing) developed by University of Wisconsin uses idle computers within a building to do the processing
 - Processing is usually overnights and weekends
 - Distributed processing software is included with the processing software
- **QUESTION:** If the pricing looked good, would the entire state need to go 6 inch every year?
 - CSEC indicates that rural areas would need it every year
 - Most agencies in agreement to do 6 inch across the board every year
 - Legislative Appropriations Request (LAR) and Ownership
 - As owners, the state can do what is needed, as needed
 - Offshore platforms that are difficult to get to
 - Can't fly South Texas during military operations
 - The border – may be able to iron out issues sooner
 - How is ownership going to be defined? TxDOT, DPS, etc.?
 - How does the LAR come into account?
 - DCS and StratMap funds and also funds from TxDOT
 - How does this affect LAR for entire Water Board?
 - Opportunity to use the SPR funding along with StratMap funding to cover the first year
 - **QUESTION:** Chris Bardash (TxDOT) The disadvantage of this is that it is a bit more complicated and it's easier to hire a contractor who would be responsible for all the deliverables, but it is more expensive – **does Solutions Group want to entertain this idea?**
 - If so, discussions around aircraft purchases, FTEs and who would pay for it, etc. will be the next order of business
 - There are a lot of pros, but this looks like this may be a legislative action
 - GLO indicates this is worth pursuing, but had the same questions raised
 - TxDOT: if this group is interested in this opportunity, the next steps are to have representatives from GIS SG talk to flight services in TxDOT, work together to cover costs of purchasing aircraft, hardware, FTEs, etc.
 - **SUGGESTION:** Don't want competing interests between agencies – allot a percentage of time for planes to be used for acquisitions vs. a dollar amount and TxDOT can use for the



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- remaining time period (contract would include verbiage re: weather delays, etc.)
 - Assumption of an acquisition timeframe of 3 years for entire state
- TxDOT's current (tentative) contribution to StratMap is \$5M/year
- Regarding capital costs
 - (FTEs): pilots and post-processing would be a shared cost between agencies
 - First year to pay for aircraft, cameras, and flights and processing can be off-loaded to contractor
 - Figure out contractor processing costs vs. in-house processing now to be ready for March 2020 LARs
- **QUESTION:** What happens to the data now that it may be all state-funded?
 - Data does not have to be free but can be released to stakeholders first and then at a later date it can be released to public
- Consult with TxDOT regarding interest in working in a partnership with other agencies
- TCEQ wants to see image differences between the framing and scanning cameras
- **QUESTION:** Could AppGeo or some other 3rd party vendor do post-processing across the board with everyone in agreement to do 3 years / 6 inches over entire state? Further discussions re: leaf on/leaf off need to be had, etc.
 - Three years was the maximum, but if it can happen earlier that would be good
- HPIDS contract could be a vehicle for funding to offset costs for LiDAR or aerial acquisition
 - Some agencies have built applications with a 6 inch expectation
- Need to do a business model
 - Shared 'services' and associated costs
 - Will take about 1 year, so does not solve anything for the next few months
 - What to do with \$7M in pocket
 - Single sweep or catching up
 - Google is still to provide data for another year or so
- DIR: Someone needs to put a proposal with next steps to see if we can start to execute
 - Carry this to the next step with TxDOT along with anyone else interested
 - Notify TNRS of this opportunity (to provide a briefing in August)
 - Agree to move to a discovery phase
 - To include what impact this will have on StratMap contract
 - May be some backlash from 3rd party imagery vendors
 - Should be part of the consideration of the next steps
- Google did respond and indicated that they can work something out, but it has yet to be defined
- **COMMENTS:** CSEC – this sounds good in the discussion but the 'devil is in the details'
 - Would like to see how it moves forward realizing there are 1 to 2 years left with Google
 - CSEC would be interested in subscribing and obtaining the work products, but has no interest in owning planes or performing flights
 - CSEC's needs are primarily 'visual'



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- Will need to be able to identify subscription costs and factor that in for FY2022/23 LAR
- **QUESTION:** Are there any concerns about administration changes for TxDOT, TNRIS, or DIR down the line (2, 5, 10 years) and getting involved in the process?
 - If it is successful and showing value, not likely
 - Cost shift? Unlikely
 - Value proposition – use cases from other states to get continuous funding for documentation would be helpful
- How would your agency use this resource (Use Cases): provide data

Google Cloud Platform Training Opportunity (Richard Wade)

- Tere Shade (DIR) has bids coming in regarding training and how it will all work and is currently being defined and input of who wants to participate, timeframes, etc. has been received
 - Training will teach you how to use cloud platform for this type of processing
 - There are 3 parts to the training: attendance to all 3 is not necessary, so will need participant and specific session information to be submitted
 - Training tentatively set for late fall 2019

Next Agenda and Action Items

Action Items:

Owner	Description
TNRIS (Gayla offered to provide)	Imagery Acquisition - Provide images illustrating the differences between the framing and scanning cameras
GIS SG	Imagery Acquisition - Generate a proposal with next steps to see if we can start to execute
GIS SG	Imagery Acquisition - Provide use cases of how your Agency would use this resource
GIS SG	Platform Training – Submit participant and specific session information

Next Meeting: September 4, 2019 at 2PM

Next Meeting Agenda Items:

