



Triangle J Council of  
Governments

# Smart Growth Collaborative & Water Resources Collaborative Joint Meeting

## Meeting Focus: Smart Tech & Resilient Infrastructure

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Thursday, September 19, 2019

2:00 pm – 4:00 pm

Triangle J Council of Governments  
4307 Emperor Blvd, Durham NC 27703

### **Attendees:**

Alexander Cahill, City of Durham  
Kevin Boyer, City of Raleigh  
Bob Deaton, NCDOT  
Heather Dutra, City of Raleigh  
Amy Farinelli, City of Raleigh  
Adam Davis, DRMP  
Hannah Barg, TJCOG  
Maya Cough-Schulze, TJCOG  
Terry Yates, Town of Cary  
Tom Snyder, NC RIoT  
Billy Lee, Town of Cary  
Rick Savage, CaRWA/Cary  
Beth Quinn, City of Raleigh  
Mark Young, City of Raleigh  
Allison Weakley, Town of Chapel Hill  
Charlie Stillwell, USGS  
Andrea Medenblick, USGS  
Jessica Cain, USGS  
Jason Fine, USGS  
Carmela Teichman, City of Raleigh  
Ruth Rouse, OWASA  
TJ Cawley, Town of Morrisville  
Steve Rao, Town of Morrisville

### **Presentation on Smart Technology and Data Sharing for Smart Growth**

*Terry Yates, Smart Cities & IT Project Manager, Town of Cary*

Framed topic using their “One Cary” vision: interconnect data with operations so that Town knows about any issues before citizens do (360 degree view of the town, 360 degree view of the citizen)

- Information flow back and forth between citizens and internal town operations through 911 and 311 (general services, street flooding, wastewater system overflowing, etc)
- Cary has a Drone Subcommittee: includes reps from police, fire, general services. All pilots. Approved purchase of 6 drones in the budget to help make infrastructure more resilient.

Current/potential drone applications in Cary:

- Communication infrastructure inspections: takes 2 weeks to schedule a person to climb (a lot of coordination, safety issue.) Drone—much quicker response time!  
Communication is vital for disasters
- Damage assessments (fire, natural disaster)
- Wastewater plan at New Hill: used drone footage to create a video rendering, VR of the site prior to building new infrastructure
- Utility line inspection of leaks when do smoke tests
- Construction mapping

Data integration: drone interacts with Boomi, SAS, Salesforce, ESRI, Box and O365

Regional partnerships: Awarded a \$23 million grant (to Raleigh, Cary, other partners) to test all kind of infrastructure using drone technology!

### **An Adaptive Approach to Stormwater**

*Billy Lee, Stormwater Engineering Manager, Town of Cary*

Started with a Downtown Stormwater Working Group (10 stakeholders); turned into a stormwater steering committee that oversees a bunch of other subcommittees composed of 43 staff from across town that met monthly for a year

- Pilot area: Walnut Creek: developed flood model, impacts to open space, stormwater condition assessment program
- Maintenance program: likelihood and consequence of failure to target pipe maintenance
- Cary Town Hall and downtown part of “innovation district” living lab where can test out various initiatives
- Started using seven Greenstream water level sensors to calibrate model. Putting them up and downstream of culverts. Rain gages also used to calibrate model. Applications:
  - Just upstream of culverts: early warning for road overtopping
  - Monitor how successful stormwater improvement projects are

Terry addendum:

- Plan to share data with the state via the state FIMAN site so they can use it to populate their systems. May share with citizens, others in future.

Sensor collects data → downloaded to integrated technology platforms → ESRI populates data on map

Recommendations for other municipalities considering using drones for planning:

- Use pilots to test solutions
- Leverage existing platforms/networks
  - Each new application must consider privacy, security
- Define what goals you're trying to achieve using smart technology (faster response, quicker inspections)
- Treat Smart Cities and IOT as a utility
- Standardization: Open API, data dictionary and schema, integrate with security systems

### **NC RIoT (no presentation title)**

*Tom Snyder, Executive Director, NC RIoT*

What is NC RIOT? Two parts:

- 501c3 organization focused on economic development (based in DT Raleigh)
- Wireless research center (based in Wake Forest)

RIoT's goal is establishing SE as global center of excellence for IoT

- Currently work in Triangle, Charlotte, Atlanta, Wilson
- Able to be a neutral third party that provides solutions
- Work with corporate sponsors and a few municipal and academic members who pay annual fee
- RIoT convenes people at large scale events, such as for citizen hackers
  - Example: mapped all sidewalks in Durham for handicapped accessibility
  - All events free and open to the public
- NC EDA gave them half a million to create a startup accelerator
- Working in Wilson, NC to start programs for rural communities, which often don't get the same attention from tech companies as urban areas do

### Project examples

- 1) Via national-level NIST hackathon, a number of local partners tried to solve #1 cause of fatality for firefighters: cardiac arrest
  - Earpiece to connect first responders with firefighters
  - Collect data via earbud that sends data to hospital on who needs help first
  - DOD learned about this and scooped up the project; no longer in Triangle
- 2) New project to replace analog 911 communication with digital. Partnering with NC DIT and currently evaluating how to make this economically feasible
- 3) New project for stormwater management data sharing
  - Stormwater doesn't follow jurisdictional boundaries, so we need to be able to share data regionally accordingly
  - Each municipality is working on stormwater separately, including getting flood sensors

- RIOT working to bring municipalities together on this to share the workload—project managers, translatable data, no duplicative work
- Want data to be shareable and usable by multiple municipalities
- July: CISCO expressed interest; RIOT serving as neutral entity

Need to consider:

- Developing data sharing reference architecture
  - Open source, so everyone can use
  - Data aggregation, storage, structure
  - ESRI layers
- Developing legal constructs around data rights
  - Best practices
  - Minimum requirements
  - Privacy and security
- Playbook for joining
  - MOU

Terry: If you get the data structure/format right, different organizations can use different types of sensors. This is true both on the front end and back end.

- 4) Drone project in Wilson: Assess flood damage, share footage with Wilson police
- 5) Advanced wireless communications: NCSU and partners (Raleigh, Cary, Wireless research Center, AERPAW) got \$23 million to understand how to effectively develop 5G technology to build resilient networks in future
  - Goal: to be at the front of 5G (new radio spectrum, higher frequency)
    - Really fast connectivity—important for autonomous vehicles
    - Serves lots of people
    - Doesn't penetrate walls well—implications for sensitive material sharing within municipalities, like in hospitals

Today, wireless is in fixed locations. 5G range is much smaller than cellular, so towers need to be closer together (harder to cover rural areas, not a problem for cities). Drones can become mobile base stations. Could stand up connectivity by launching a bunch of drones. Useful after an emergency.

Terry: City perspective: provide lab to test solutions  
 ie, when get a 911 call, could send out a drones with defibrillators  
 Use drones to scope out interference issues

## Questions & Open Discussion

TJ Cawley: Cary does water for us but Morrisville has separate SH20 utilities; can we get in on Greenstream?

Tom: Welcome to listen in on conference calls; can introduce them to Greenstream if want to deploy sensors

NC Emergency Management Department has contract with Greenstream, USGS sensors

Terry: Working with NCEM on what format they want data in, and how to share it

Tom: This is a use case; doesn't just have to be for stormwater. Greenstream sensors are equipped to able to add other capabilities

Allison Weakley: Are they considering water quality?

Tom: Not yet, though we've seen a lot of interest; would require sampling

Terry: Not Greenstream, but related: Cary's WQ data comes to Town Hall through SCADA system from WWTPs, etc.

Tom: Company called Proaxin makes sensors that can predict failure of rotating machinery by sensing vibrations--has applications for WWTPs

Charles Stillwell (USGS): Billy, how is Town of Cary defining Walnut Creek pilot as successful?

Billy: Already seeing success—model ID'd downtown areas that flood frequently, and Cary is using this information in development projects going forward

Rick Savage: Model has also ID'd properties that Cary bought out to restore floodplain

Billy: Our best mitigation strategy is open space. Currently planning greenway trail with this goal in mind.

Ruth Rouse: Cary has an advanced metering system; considering upfitting for pressure monitoring/detecting leaks in water distribution system?

Terry: Working on trying to tie this in; not there yet

Heather: Have you had to overcome privacy concerns with drones?

Terry: In SOP: Always need to have a work ticket when flying drones for utility monitoring; clearly communicate purpose of data collection, so staff can tell the public.

Allison: How do developers feel about drones over development sites? Chatham Park—citizen drones banned

Terry: Haven't had issues since drones have been written into contracts

Tom: Industry deploying drones for safety—making sure workers wearing hard hats

Terry: Doing work with Duke on drone detection devices

Terry: When have ideas that aren't on the market, work with NCSU student teams. Currently exploring smart storm drains—what one would be, how to propagate signal. Students currently interviewing professionals before making a prototypes. Contact him if interested!

John HC: Before hurricanes, local govts have to clear storm drains. Could we figure out to detect whether storm drains are clear or not?

Tom: Company in Charlotte puts cameras on trash trucks to look at road quality. Can provide an introduction if want to incorporate storm drains. Can train AI to know what a clogged or open drain looks like. (Need smart architecture to put this data into, of course.)

Hannah: How to get public/students involved to create resilient communities?

Terry: ISAB—info services advisory board—take info to them, they disperse info to community Also, have an intern program

Tom: RIOT doesn't have the whole answer, but it's an important question. Have allowed some Wake Co teachers to sit in on startup accelerators, take content for curriculum. A couple teachers will run entrepreneurship classes using some of this info.

Billy: Outreach person in stormwater group visits 20-30 schools/year

Tom: Organizations like NC Openpass welcome public involvement

Kevin Boyer: Raleigh recently invested in stream gages in partnership with USGS, as well as closed-circuit TV cameras. Discovered a hurricane preparedness lesson: Traffic cameras are close to critical creeks! Have reoriented some of those cameras to look at creeks, and installed more just for that purpose. Emergency command center in office showing camera footage.

Also working with View and Associates to use stream gage and weather data to predict where might have roadway flooding. Goal: push info to traffic signals, emergency barricades.

Tom: RIOT has received a request to consolidate duplicated effort around cameras, video data

Andrea Mendenblik: Enjoy being able to look at map interface of Raleigh's monitoring data; would be great if could look beyond city limits

Steve Rao: Greatest challenge: how do we share best practices? Don't make it about the technology, but about the problems we all face, like stormwater, transportation, energy efficiency.

### **2019 Meeting Calendar**

Mark your calendars! The meeting schedule for 2019 has been set. All meetings will be held from 2-4pm @ TJCOG.

**Thursday, December 12th** - Joint Smart Growth & Water Resources Collaborative meeting (Topic TBD)