How Newport News is leading the region in innovation

Louis Martinez, Newport News Waterworks

Director

Jessica Hou, P.E., BCEE, ENV SP, Gannett Fleming

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Newport News Waterworks Department

Gannett Fleming

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INTRODUCTIONS AND AGENDA

- Why should water utilities be involved in Smart Cities?
- Practical Applications of Smart Cities Capabilities
- Newport News Readiness Workshop
- Waterworks Department AMI

HOW TECHNOLOGY INFLUENCES OUR LIVES

Technology has changed *the way* we live for some time

At some point we started using technology *to* live

Really, we want smart technology to *help* us live

Everyday our world is becoming more connected – it is becoming smarter

- Internet of things
- Machine learning
- Big data
- Social change

WHAT THE PEOPLE WANT: IMPROVED QUALITY OF LIFE

Stop me if you've heard this before...

- This technology stuff sounds like a good idea, but it will never work in our industry.
- If it ain't broke, don't fix it.
- There is no way we can do that, given our fiscal situation.

We are already doing it: Use the Data We Have!

- According to the AWWA State of the Water Industry Survey

1/3

Use data for system understanding

25%

Use data to improve customer understanding

- Regulators can encourage increased integration of data through updating regulations and incentivizing smart operations.

Why we shouldn’t do it alone….

- How big is the problem?

56 years
Age of average dam

6B gallons
Treated drinking water lost everyday

25% ⬆ 15 years
Anticipated wastewater demand

- Smart cities technology can
  - conserve our water resources
  - save money and energy
  - improve the quality of life for the people we serve

Water and other Departments

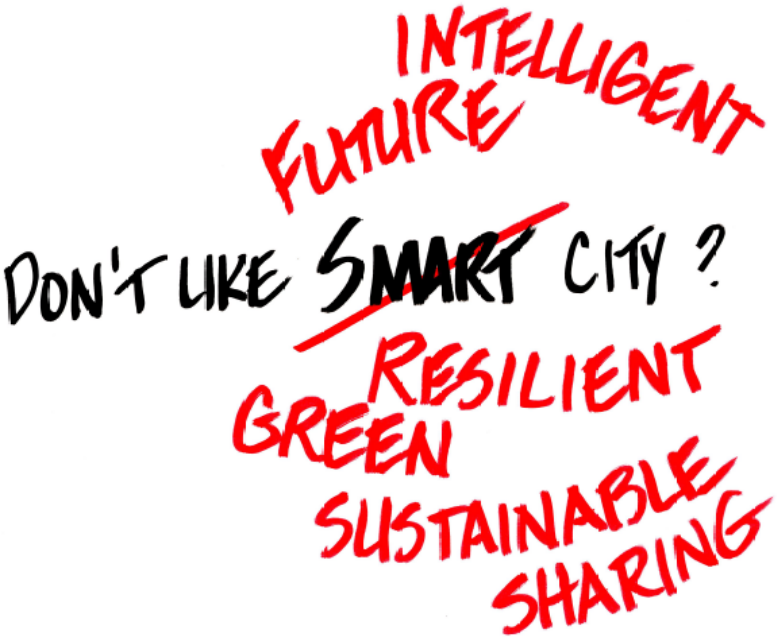
- Infrastructure beyond life expectancy
- Increased demand without increased capacity
- Transitioning workforce
- Uncertain technology impacts
- Forces of change

What is a Smart City?

- A smart city uses information and communications technology to enhance livability, workability, and sustainability.

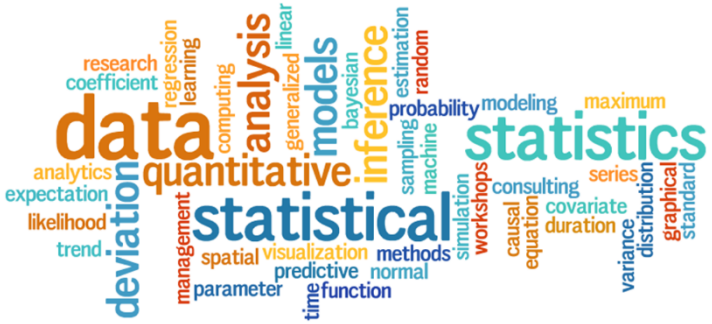
What does “Smart” City mean?

- Future City
- Intelligent City
- Resilient City
- Green City
- Sustainable City
- Sharing City
- Compassionate City
- …. or Community?



Workforce Strategies

- Welcome next generation of water professionals by bolstering adoption of data analytics and smart technology processes
- Learn basic data analytics and problem-solving skills that will improve success as an operator for a rapidly evolving future
- Expanded skill set attracts more young talent



SMART CITIES COUNCIL

SmartCitiesCouncil®

Livability
Workability
Sustainability

- Launched in 2012
- Regional Councils in North America, Europe, India and Australia/New Zealand
- Comprised of more than 120 partners
- 10,000+ smart city projects past and present
- Smart Cities Readiness Guide provides guiding principles and best practices for an integrated, cross-cutting smart city
  - Framework used to produce Readiness Workshops, which are delivered all over the world to help cities create their smart city roadmaps

Readiness Challenge Grant Program

- Over 130 cities applied, including Newport News
- The winning cities received a tailored Readiness Workshop
  - to develop a roadmap for applying smart technologies to further innovation, inclusion and investment within their cities
  - receive supporting products and services from Council member companies and advisors
- Focus on breaking down the departmental silos is a key challenge in developing a smarter city.
  - Key element for selection: demonstrated ability to work across departments to solve problems
- Goal: make smart use of technology to become more livable, workable, sustainable and resilient

Newport News Smart Cities Readiness Workshop

- Goal: work with internal and external partners to encourage innovative projects within the City and the region.
- Led by the City IT Department
  - Smart Cities Council, Gannett Fleming and Sensus

Agenda Highlights

- Over 125 in attendance across the region
  - Cities, universities, businesses, regional entities
- Mayor McKinley Price, Newport News
- Andy Stein, Director of IT, Newport News
- Opening Keynote : Karen Jackson, Former Virginia Secretary of Technology
- Setting the Foundation for a Smart City
- Pillars of a Smart City
  - Communications
  - Solution Showcase – Smart Cities Council Partners

Over 125 in attendance across the region


SMARTCities
NEWPORT NEWS
Breakout

Breakout Sessions

- Emergency Management
- Transportation
- Public-Private Partnerships
- Utilities
- Open Data
- Public Safety

Results from Smart Utilities Breakout Session

- Focus on conservation, rain capture and leak capture
- Collaboration with private utilities
- Gamification
- Raise customer awareness and improve their experience.
  - Explain benefits of the system and provide anecdotal evidence to build the case for further investment.
  - Fully integrate remote meter reading to reduce intrusion and resources needed to acquire data.
  - Educate citizens on how to budget energy use as part of their personal financial planning.
  - Inventory existing environmental conservation and sustainability groups to start the education process.

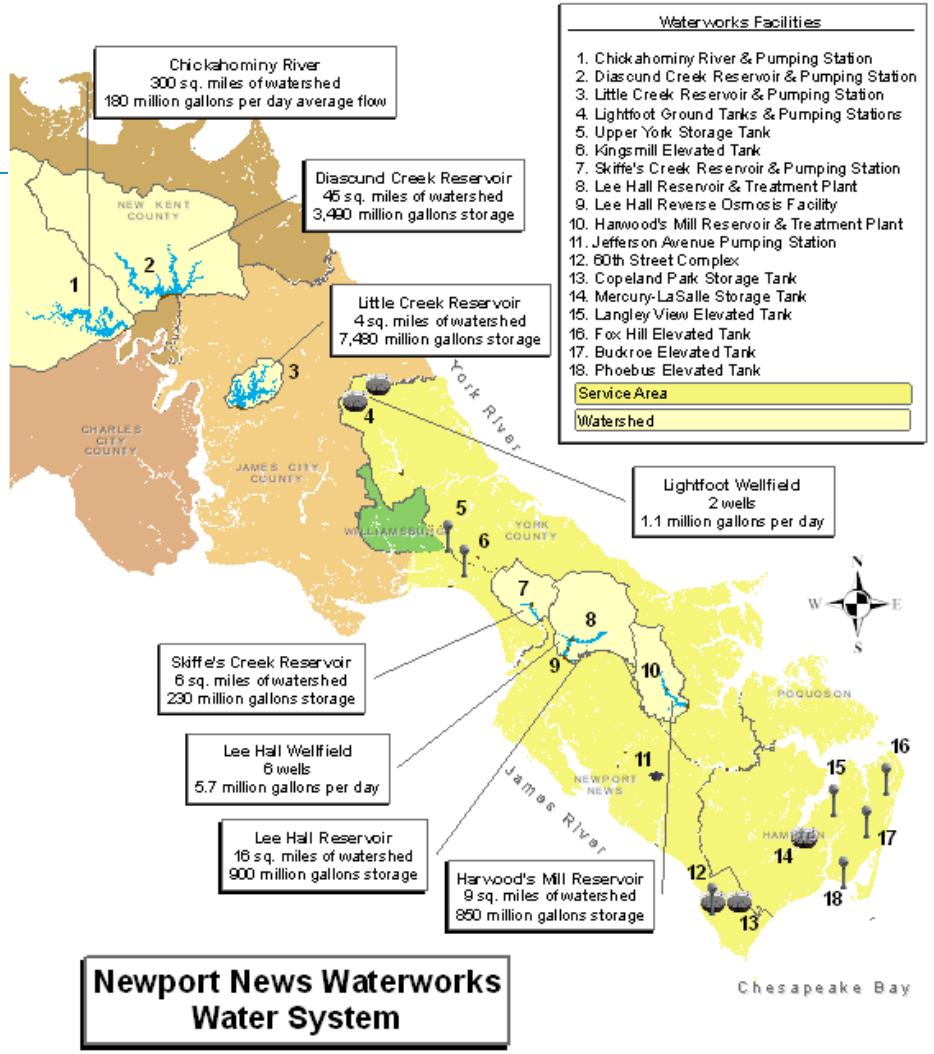
StormSense: Predicting Flooding from Storm Surge, Rain and Tides

- Dr. J. Derek Loftis, Research Scientist
- Funded by NIST : Replicable Smart City Technologies Grant
- Ultrasonic sensors on structures
- Skiffe’s Creek Dam

How Waterworks is leading with the first AMI in the region

Newport News Waterworks

- Regional Utility
- Owned and operated by the City of Newport News
- Serves over 400,000 people in Hampton, Newport News, Poquoson, York County and part of James City County
- System beyond borders of City of Newport News
- 130,000+ connections



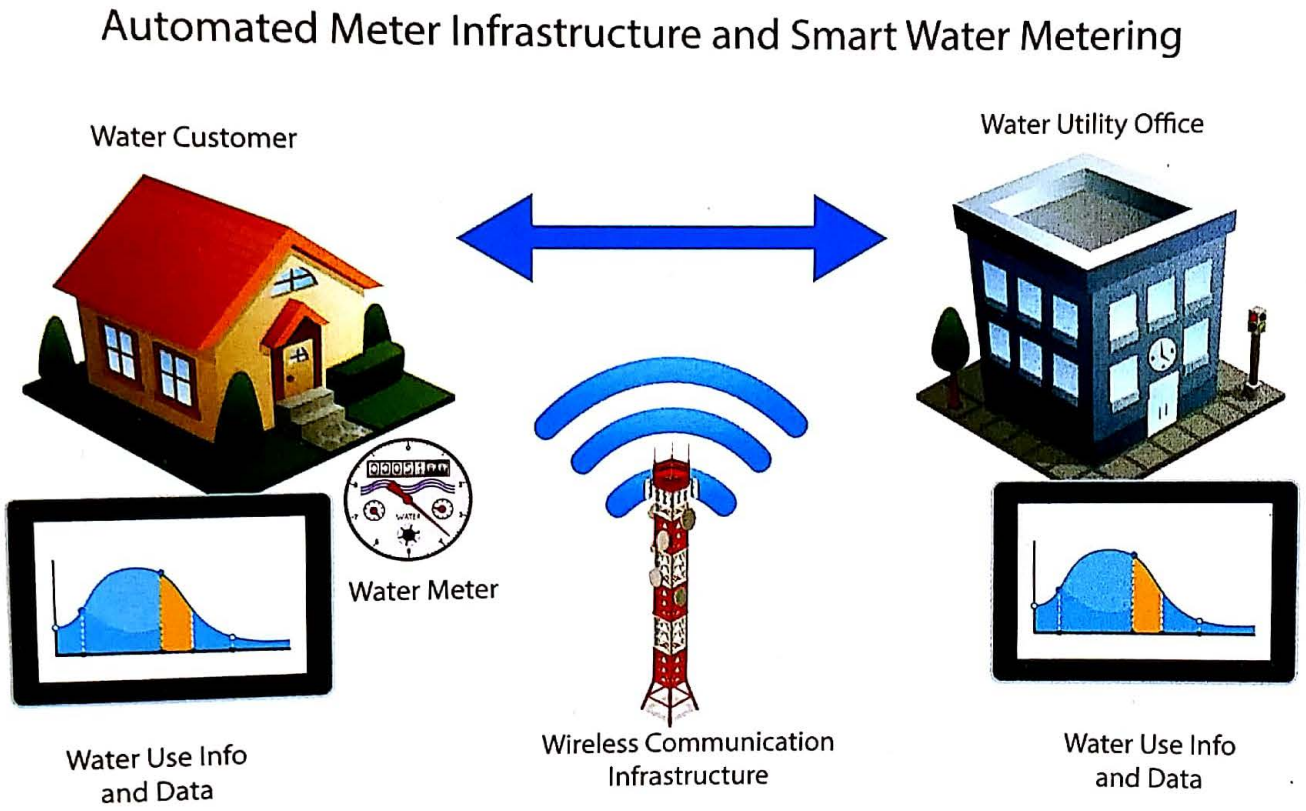
Advanced Metering Infrastructure

- Goals
  - Improve customer service and system efficiency
  - Desire real-time reads
  - Remote meter turn on – turn off
  - Eliminate re-reads
  - Water quality enhanced data/ leak detection
- Solution: AMI
  - Innovation/ Embrace Smart Technology

Philosophy of Financials

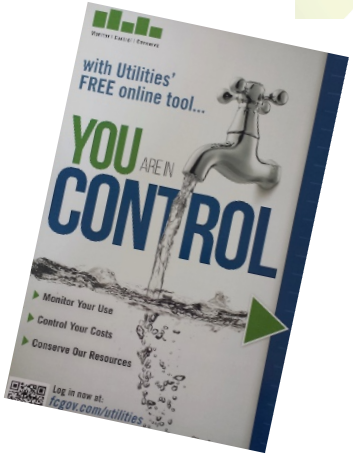
- ROI not immediate
- Plan CIP in advance (not 2-year budget cycle)
- Buy-in from City leadership as part of Smart Cities drive toward innovation and technology

Phase 1 To-Be System/Logical Architecture



Schedule and Phasing

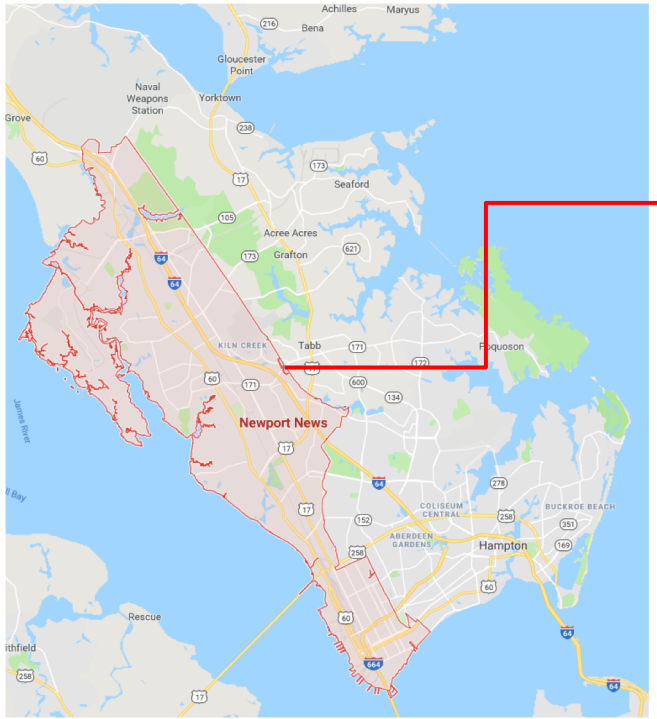
- Phase 2 Professional Services / Expertise
  - Design, Plan and Procurement Strategy
  - Refresh Architecture Solutions and Components
  - RFP to Vendors / Vendor Evaluations (NOW)
- Phase 3 Implementation
  - Project Management
  - Stakeholder Engagement
  - Business Process Transformation
  - Systems Testing & Acceptance
  - Org Change as needed/ Operational Training

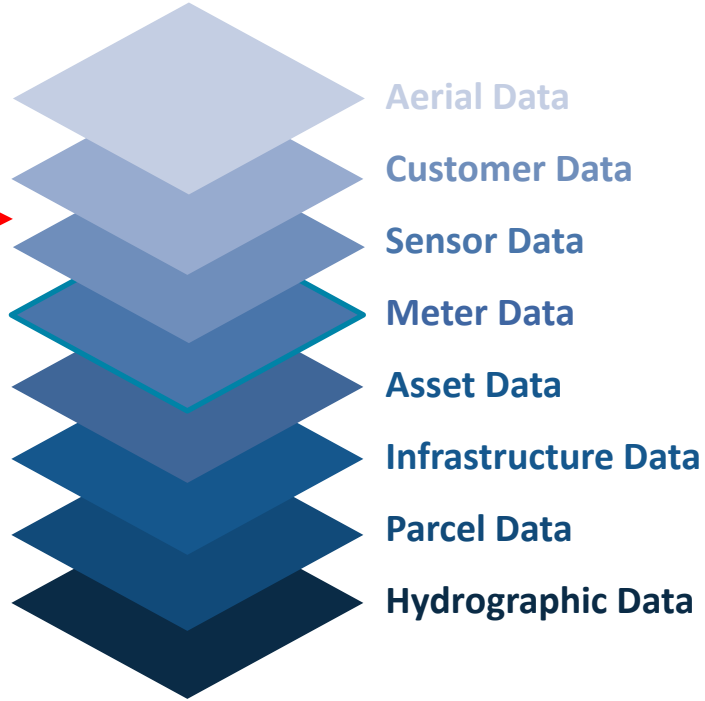


What do you want to collect from AMI?

- Register reads for billing
- Interval data for display, analysis/analytics, distribution planning, etc.
- Event/alarms
- “Information” via analytics

Meaningful metrics for daily operations





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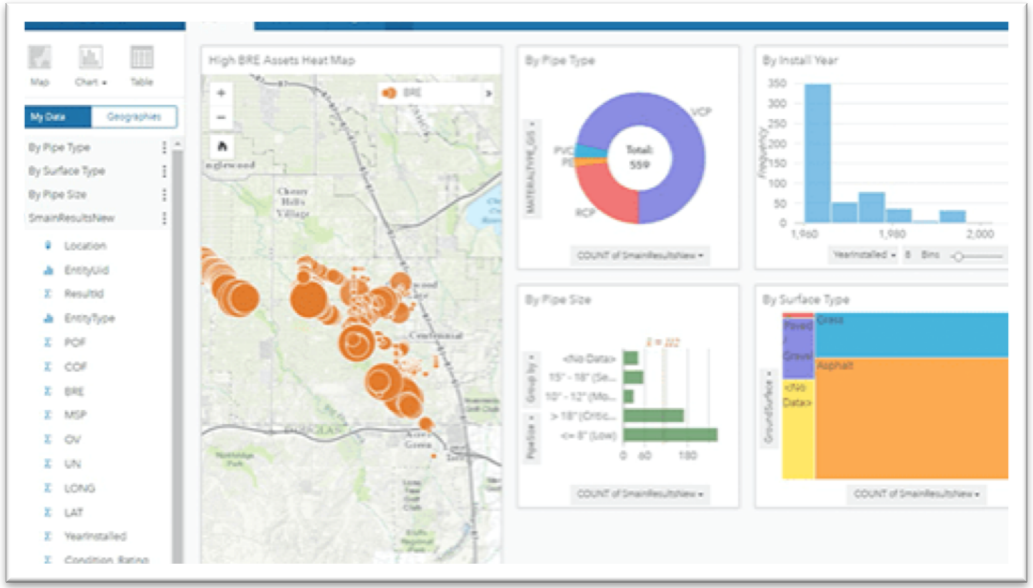
Potential Improvements and Benefits

- Customer Portal
  - Credit card services
- Leak Detection
  - Customer – via analytics
  - System leaks
- Leveraging AMI network for Operations
  - Reduce Physical and Data Errors – Reduce Expenditures (Meter Reading)
  - Pressure Monitoring
  - Water Quality Monitoring
  - Fire Demand Support
- Leveraging AMI data in Analytics
  - Choices in platforms

Can we take it even further?

- Leverage geospatial data within system
  - Correlation with location
  - Discover trends and patterns
- How AMI data might be relevant to other departments or the private sector
  - Traffic predictive analysis
  - Collaboration with private utilities (gas)



Graphic courtesy of esri

Thank you!

Louis Martinez
lmartinez@nnva.gov

Jessica M. W. Hou
jhou@gfnet.com

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