

## Presentation Topic Ideas: What Do APWA Members Want to Learn About?

**Primary Education Tracks:** APWA members and committees were recently surveyed in a Call for Ideas about the topics they would expect a solutions-oriented, trailblazing PWX. Review the topic suggestions below as you begin framing your proposal submission. Please note that the themes for the 2021 Public Works Stormwater Summit are listed under the Water Resources: Stormwater track. Transportation: Winter Maintenance is listed under Winter Maintenance.

### Asset Management

#### **Technology uses and trends:**

- Software and database solutions, mobile technologies, web-based tools, cloud technology, 3-D modeling, enterprise solutions for reporting
- Data collection technologies: unmanned aerial vehicles (drones), LiDAR mapping, GIS, GPS, telematics, time-phased photographic inspection, robotics, AVL, RFID

#### **Issues/Solutions:**

- Leveraging asset management into daily public works operations – solutions for small city, large city, county systems
- Dealing with siloed operations / departments, determining what to measure and how to use the data, communicating with the public and stakeholders about asset management, getting buy-in from officials and staff
- Explaining the foundational components of a good asset management system. Success stories that demonstrate the process, challenges, and solutions. Where to begin and how not to be overwhelmed
- Examples! Tools, templates, road maps and sample documents
- Workforce issues: the skills public works professionals need to implement asset management, maximizing productivity with minimal staff
- Funding/budgeting: cost-effective asset management; creative budgeting, grants, and other financial options to implement asset management; funding solutions for small cities
- Asset management as a tool for disaster response, recovery, and obtaining FEMA reimbursement

#### **Future Trends:**

- Asset management in the Internet of Things (IoT) era
- Less field work and more desktop reconnaissance
- Asset management for green infrastructure
- Smart cities, smart assets
- Artificial Intelligence (AI) based asset management
- State governments requiring asset management plans from public agencies

### Emergency Management

#### **Technology uses and trends:**

- Emergency management software, tablets and phones replacing desktop solutions
- GIS mapping, use of drones in post-disaster inspection
- Traffic Incident Management: Automated Flagger Assistance Devices, portable traffic signals
- Role of smart cities technologies in emergency management
- Cybersecurity – what are the threats, what are the best solutions?

#### **Issues/Solutions:**

- Public Works as First Responders
  - Collaborating with Police and Fire
- National Incident Management Command (NIMs)
- Tracking the right data for FEMA reimbursement, FEMA pre-certification
- Mutual aid programs
- Risk assessment and resiliency planning
  - Factoring climate change into emergency management planning and preparedness
  - Dam safety requirements, flood preparedness and response
  - Rapid damage assessment, post disaster condition assessments, cleanup, debris management
- See something, Say Something – Public Works role in threat identification

- Active shooter training
  - Outlines and templates for Active Shooter tabletop exercises or drills

**Future Trends:**

- Trends and new developments in cybersecurity programs
- Mobile alert systems – targeting devices by physical location rather than area codes
- Increased focus on cybersecurity tactics and solutions

[Engineering, Construction / Project Management](#)

**Technology uses and trends:**

- Data collection and construction inspection using drones, GIS, tablets, and smart phones
- Web-based tools for plan submission and reviews
- Electronic bidding technologies, electronic plan reviews, submissions, and approvals
- Project management software

**Issues/Solutions:**

- Innovative budgeting and funding solutions for capital improvement programs (CIP)
- RFP process, bid and contract management, consultant and contractor relationships
- Project management skills / project tracking systems

**Future Trends:**

- 5G installation and capital improvement program management
- More use of 3D construction plans, 3D modeling, 3D printing
- New CIP funding models to replace gas taxes and other funding mechanisms

[Facilities Management](#)

**Technology uses and trends:**

- Energy efficiency: renewable energy production in buildings, distributed heat and power, solar, heat pumps, etc., smart meters to measure energy use, water conservation
- Computer Aided Facility Management (CAFM); Computerized Maintenance Management Systems (CMMS)
- Drones related to facilities and grounds inspections

**Issues/Solutions**

- Building security: risk assessments, workplace violence
- Developing a municipal facility maintenance plan (maintenance, repair)
- Americans with Disabilities Act (ADA) issues and solutions

**Future Trends**

- Augmented reality for building management
- Self-powered and smart buildings
- Building security advancements, i.e. proximity door locks
- Sharing economy – maximum use of facilities

[Fleet Management](#)

**Technology uses and trends:**

- Fleet management software
- On-board GPS, cameras for route optimization
- Fuel station software
- Fleet Management of autonomous and connected vehicles
- Electric vehicles (EVs) and charging stations

**Issues/Solutions**

- Workforce solutions: technician recruitment and retention, performance measures for fleet professionals, essential skills and knowledge for new fleet managers,
- Fleet operations as part of the emergency response team
- Vehicle and equipment replacement programs
- Managing fleet budgets, internal services fund approach, lease/purchase pros and cons

- Guidelines for ethical fleet management

### **Future Trends**

- Car sharing vs. owning fleet
- Converting fleets to electric
- Biometric logins
- Driverless truck technology
- New fuel requirements, alternative fuels management

## Grounds, Parks, and Urban Forestry Management

### **Technology uses and trends:**

- Tree inventory technologies: GPS systems, drones for canopy management
- Internet of Things (IoT) relating to parks and grounds management
- Computerized Maintenance Management Systems (CMMS)

### **Issues/Solutions**

- Urban Forestry Plans: forestry practices and standards for maintenance
- ADA accessibility for parks and trails
- Utilities issues: canopy issues and underground utilities, tree trimming and above-ground utilities, tree species that can be planted near utilities
- Emerald Ash Borer (EAB): strategies for obtaining funding for dealing with EAB; how are different agencies dealing with EAB?
- Green infrastructure solutions for stormwater management, stormwater management through park design
- Trail construction and management

### **Future Trends**

- Advances in solar lighting options
- Impacts of climate change, extreme weather, long-term droughts
- Maximizing ecosystem services, passive park lands and educating users on their design and purpose

## Leadership, Professional Development, Workforce Solutions

### **Leadership:**

- Strategic planning and decision-making, Bringing clarity to vision
- Using the community approach to deal with pace of change/technology use and integration
- Diversity and inclusion strategies: What is workplace diversity?
- Managing and engaging staff from different generations.
- How to stretch shrinking budgets by leveraging resources, shared services, shared equipment, mutual aid, shared facilities, grants

### **Professional Development**

- Developing presentation and communication skills
- Ethics for public works professionals at all levels
- Educating future leaders in the functional aspects of public works

### **Workforce Issues and Solutions**

- Succession planning: recruitment, retention, engagement
- Rethinking the performance management and evaluation process
- Developing programs to transfer knowledge and skills from retiring boomers to new workforce
- Balancing outsourced and in-house staff

### **Technology uses and trends**

- Training software and technologies
- Computerized workforce management programs
- Asset management and benchmarking to inform levels of service

### **Future trends:**

- Identifying, creating and/or rebooting workplace culture: framing and implementing the change process, building capability and engagement.

- More emphasis on finding a trained workforce for public works functions that require specialized skills but not necessarily college degrees.
- Shared services and positions across communities.

## Solid Waste Management

### **Technology uses and trends:**

- Advanced software for route planning, GPS routing systems, mobile apps for tracking in real-time
- Landfill technologies: bioreactors, emission measurement using drones, bio-covers, waste to energy technologies

### **Issues/Solutions**

- Diminishing markets for recyclables: impact of tariffs and China's ban on contaminated recyclables, what are cities doing with their recyclables?
- Circular economy strategies
- Composting – food waste
- Leaf pick-up programs
- Post-disaster debris management
- Managing solid waste contracts

### **Future Trends**

- Bans on plastics – establishing public policy.
- Internet of Things (IoT) impact on collection and management
- Mining and reclamation in old landfills

## Sustainability / Resiliency

### **Technology uses and trends:**

- Electrification of fleets
- Localized climate modeling to inform infrastructure decisions
- One Water framework for sustainable water systems
- Triple bottom line software

### **Issues/Solutions**

- Creating the business case for sustainability/resiliency. Understanding the true life-cycle costs of implementing sustainability into projects vs. the costs of not doing so.
- Incorporating social equity into decision-making
- Climate mitigation, Changing decision-making to reduce impacts
- Impact of workforce diversity in building more sustainable solutions
- Green Infrastructure (GI) / How do cities plan for resilient infrastructure
- Permeable pavements as a resilience strategy
- Climate adaptation for coastal areas, sea level rise

### **Future Trends**

- Use of "Green Bonds" for infrastructure
- Using the Internet of Things - real-time data for decision-making
- Regulation of Autonomous Vehicles (AVs) to reach city livability goals
- Building community resilience
- Building learning communities (how do we educate our community members to reach more informed outcomes?)
- Public Works and creating "circular economies"

## Transportation: Streets/Roads/Bridges, Traffic Engineering, Bicycle/Pedestrian Infrastructure, Transit

### **Technology uses and trends:**

- Autonomous/Connected Vehicles
- Intelligent transportation systems
- Next generation GPS, LiDAR

- Smart cities technologies and apps
- New technologies for making work zones safer, automated flagger assistance devices, portable traffic signal solutions.
- Cybersecurity for traffic management systems and networks

### **Issues/Solutions**

- Innovative funding options for transportation projects: options to replace gas taxes, public/private partnerships, economic development programs, transportation corporations, revolving funds, TIFIA, federal funding, project streamlining
- Infrastructure readiness for connected and autonomous vehicles
- Infrastructure for bikeable/walkable communities
- Infrastructure for mass transit

### **Future Trends**

- Autonomous/connected vehicles will change the face of infrastructure and how people live
- How will a mostly electric vehicle (EV) fleet change American infrastructure?
- More bicycles, e-bikes, e-scooters, hover boards
- Will driverless vehicles impact mass transit?
- Traffic engineering for low flying vehicles, delivery drones
- Solar roads, bike paths, sidewalks

## Utilities / Public Right-of-Way Management

### **Technology uses and trends:**

- Subsurface Utility Engineering (SUE), drones for mapping SUE, ground penetrating radar
- AMI (advanced metering infrastructure) and IoT (Internet of Things) for data gathering, measurement
- Trenchless technologies

### **Issues/solutions:**

- Legislative proposals that preempt local zoning regulations allowing 5G “small cell” installation in the public rights-of-way or on public assets/facilities such as streetlights
- Cost of replacing or upgrading aging infrastructure
- Dealing with the jungle underground – separate cable systems, lines, borings
- Dig Once Policies – multiple telecommunication companies accessing ROW at different times

### **Future Trends**

- Changes in the role of utility coordinators.
- Small cell, 5G technology installations and their impact on the right-of-way
- Impact of drone technology and new right-of-way access laws
- Internet of Things (IoT) impact on collection and management

## Water Resources: Stormwater

### Public Works Stormwater Summit Themes

APWA’s Water Resources Management Committee will select presentations for the Public Works Stormwater Summit portion of PWX 2021. The Public Works Stormwater Summit occurs in two 1/2 day sessions. The committee has selected its themes for 2021 and is looking for proposals on the topics listed below.

Day One – Maintenance & Restoration Case Studies: Proposals should focus on lessons-learned on one or more of the following topics:

- Post Construction BMPS & Green Infrastructure designs, installation and maintenance
- Capital improvement projects for replacement and restorative infrastructure options
- Utilizing asset management technologies
- Restoration of wetlands and other environmental areas
- Creative financing strategies for O&M (public/private agreements)

Day Two – Emergency Response Operations: Proposals should focus on lessons-learned on one or more of the following topics:

- Preparing and/or implementing an emergency response plan  
Flood control
- Pandemic-related operations
- Emerging contaminants
- Impacts of climate change

## Water Resources: Potable/Drinking Water, Wastewater/Sewers

### **Technology Uses and Trends:**

- Trenchless technology for pipe repair and replacement
- Smart water meters

### **Issues in Need of solutions:**

- Climate change impacts on water quality
- Waters of the United States (WOTUS): Impacts of WOTUS rules on local projects and political support, state reactions to WOTUS rule changes
- Coastal management, sea level rise
- Renewable water resources, aquifer storage and recovery
- Crisis management – what to do when water isn't safe to drink
- Water meter replacement programs, including options for when residents own the meter

### **Future Trends:**

- Combined water treatment plants for sanitary and potable water systems
- Aquifer storage recovery (ASR)
- Expansion of water reuse technologies and approaches

## (Transportation) Winter Maintenance, Snow and Ice Control

- Snow and ice control methods and technologies
- Emergency management in severe winter events
- GPS/AVL uses
- Chemical, liquids usage and selection