

## APWA's 2019 Top 5 Trending Technologies in Public Works

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### 1 Introduction

The American Public Works Association (APWA) serves professionals in all aspects of public works—a fact that sets it apart from other organizations and makes it an effective voice of public works throughout North America. With a membership more than 30,000 strong, APWA includes not only personnel from local, county/regional, state/provincial, and federal agencies, but also private sector personnel who supply products and services to those professionals.

Although originally chartered in the United States in 1937, APWA has roots in two predecessor groups that reach back to 1894, and has 63 chapters in North America, which includes eight chapters in Canada. A 17-member Board of Directors, all of whom are elected by Association members, governs APWA as a whole.

As a comprehensive public works resource, APWA continues in its rich tradition of making a difference both on an individual and professional level. APWA is a not-for-profit, incorporated in the United States that prides itself on its ability to provide varied educational and networking opportunities that help public works personnel to grow in their professionalism and directly impact the quality of life in all the communities they serve.

To this end, APWA has established the Annual Top 5 Trending Technologies survey and report as an educational service to members. APWA proactively decided to focus on "trending technologies" rather than "emerging technologies." Not all emerging technologies are applicable to current work environments. Therefore, APWA endeavours to provide its members with practical and work-related education, resources and data to assist its members do their jobs.

So how does APWA select the top five trending technologies? APWA decided to have a little fun and employed the U.S. National

Collegiate Athletic Associations (NCAA) Basketball Championship bracket methodology. We gathered suggestions from members—of which nearly 1,500 members participated. APWA was then able to narrow down the suggestions to 16 technologies and from there we created the bracket. Using social media and other means of communications we sought input from our members. The bracket listed top seeded technologies based on voting and them against pitted lower seeded technologies. Ultimately, the following Top 5 were still left standing:

1. Smart Cities
2. Cybersecurity
3. Asset Management Technologies
4. Automated/Connected Vehicles
5. Augmented Reality

### 2 2019 Top 5 Trending Technologies in Public Works

#### 2.1 Smart Cities

The definition of Smart City can be defined in many different ways. APWA focuses specifically on areas of technology that will directly impact Public Works personnel and their communities. One definition of smart cities that appeared in APWA's Reporter Magazine is as follows: "Using technology, city officials can interact directly with both the community and its infrastructure, monitoring what is happening in the city now, and how the city evolves." [1]

#### 2.2 Cybersecurity

Cities, municipalities, states, provinces and other public agencies are no longer immune to cyberattacks. Based on responses to APWA's survey this year, many technologies focused on combatting cyber attacks on public infrastructure. Most recently in the U.S., San

Diego, Atlanta, and Baltimore have been struck with some of the most costly and malicious attacks. They are very costly to communities in terms of lost data and ransom payments.

### **2.3 Asset Management Technologies**

While Australia is a leader in Asset management technologies and Canada is beginning to follow the trend through Federal requirements, the U.S. lags far behind. While large cities and counties in the U.S. cannot operate without an asset management plan and technologies, mid-size and smaller cities either do not have very sophisticated plans or none at all. The necessity is becoming much more apparent.

### **2.4 Automated/Connected Vehicles**

Public Works professionals must begin to pay attention to the upcoming infrastructure needs of automated/connected vehicles. We all know that Public Works Departments throughout the world are faced with limited resources and not enough time in the day to keep up with maintenance of current infrastructure. How are they going to address the coming needs of Automated/Connected vehicles?

### **2.5 Augmented Reality**

According to a recent APWA Reporter Magazine article: "...first things first, augmented reality is not virtual reality, though both provide a visual experience via goggles, headsets or smart devices. While virtual reality (VR) implies complete immersion, augmented reality (AR) adds digital elements to a live view. Examples of AR include Snapchat lenses and the game Pokémon Go where players find and interact with characters by looking through their device's camera." [1]

In Public Works, augmented reality can be used to provide agencies a three-dimensional view of a building's layout prior to construction. Another way this technology is being used is to display underground utilities on a tablet or smart phone using GIS.

### **2.6 Educational Programs**

APWA works with its ten technical committees to produce educational programming centered around the Top 5 Trending Technologies in Public Works. These educational programs include Click, Listen and Learn Webinars, Talking Top Tech Video Panel Discussions, APWA Reporter Articles, Roving Reporter Education Series Videos, APWA's PWX and North American Snow Conference educational

sessions. APWA's technical committees are currently participating in work groups for these five trending technologies. They continue to produce educational products and intellectual property with respect to each of these five technologies.

## **3 Conclusions**

Public Works professionals are becoming more involved with technology in their day-to-day operations. The education provided through the Top 5 Trending Technologies in Public Works initiative ensure that the Public Works professionals are kept up to date about what is important to them. APWA is already working to develop the 2020 Top 5 Trending Technologies in Public Works. APWA Technical Committees will discuss the technologies at PWX and determine the top 16 technologies for the new bracket challenge. The bracket challenge will begin in September and the 2020 Top 5 Trending Technologies in Public Works will be announced in January 2020.

## **References**

1. Kelly Koepke, "Technology in 2019: The Five Key Trends in Public Works", *APWA Reporter*, vol.86, no. 1, pp.6-11.
2. Helen Horwitz, "Technology in 2018: The Five Key Trends in Public Works", *APWA Reporter*, vol. 85, no 3, pp 4-9.