Three dimensional printing has already had quite an impact on the field of engineering. The popular opinion now is that its influence will continue to grow. Three dimensional printing, or additive manufacturing, goes beyond the capability of printing in the traditional sense of ink on paper, allowing for 3D objects to be physically printed in great detail. 3D printers allow you to create prototypes, models and products out of materials such as plastics and metals. The printers do this by creating layer upon layer of your design in your chosen material until the final product is formed.

There are many different ways 3D printing is utilized in architecture and engineering. Among the most frequent are creating low-cost, realistic, and detailed architectural models, often used to promote a project by showcasing the final result in 3D. These models are often much more cost efficient when manufactured through the process of 3D printing, versus traditional methods. Utilizing the process of 3D printing also saves time. Models can be produced in-house, in a matter of hours.

3D models also make it easier to understand and visualize a design than the traditional floor plan method. They can have removable tops and sides, allowing a side and interior view of floors, walls, doors, etc. This gives a more complete picture of a project, so changes can easily be incorporated before a design is finalized.

C&S has a large-build, full-color 3D printer that produces photo-realistic full spectrum models to better evaluate your design intent in the colors you had specified. For smaller projects C&S also has a tabletop 3D printer that can produce plastic and nylon models in ultra-high resolution.

Despite the fact that 3D printing is a relatively new practice, through its utilization, you are not just limited to basic shapes and models. The possibilities are nearly endless.
The environment. It is the central point of everything that we as a society do. For what do we have if there is not a healthy environment and sustainable community on which to rely on? Professor Guy McPherson, an American scientist at the University of Arizona, once said “If you really think that the environment is less important than the economy, try holding your breath while you count your money”.

In the realm of environmental planning, the purpose of planning is to both prepare for the future, and more ambitiously, create better futures. A blueprint used in planning is referred to as the “Three E’s of Sustainability”, which includes economic development, social equity, and the environment. Balancing these three components is key to creating thriving and sustainable communities.

However, the BOA program is more than just brownfield planning at the surface. The three-step program ultimately results in the complete transformation of a community, by encouraging site cleanup, neighborhood beautification, and business attraction. Through extensive collaboration with governmental agencies, local community members, and stakeholders, the BOA program is able to create a vision for a community’s future and then develop a unique redevelopment strategy to enhance economic viability and urban vibrancy. BOA planning is often the only form of a long term or comprehensive plan some communities possess.

The BOA program also works in partnership with the New York State Department of Environmental Conservation (DEC) Brownfield Cleanup Program (BCP) by encouraging the remediation and redevelopment of plaguing brownfield properties with both tax credits and liability relief. Tax credits are provided for site remediation and preparation as well as tangible property development, which strongly incentivizes developers to invest in a community.

There is no denying that a substantial portion of the revitalization and redevelopment activities within the City of Buffalo, New York and surrounding region can be contributed to brownfield redevelopment and the NYS BCP. Other communities have yet to take advantage of these programs and incentives to successfully develop projects.

Additional opportunities for brownfield remediation/redevelopment and downtown revitalization is expected in the future due to New York State’s move to encourage both downtown revitalization and brownfield redevelopment through widespread collaboration. New York State has committed significant amounts of funding for the purpose of downtown beautification, new infrastructure, private investment and job creation through the Downtown Revitalization Initiative, announcement of the Buffalo Billion II, and pledge of future funds for the BOA program.

Brownfield planning is exceedingly successful in producing plans which substantially heighten municipal eligibility and competitiveness for this widespread state funding. Specifically stated, the BOA program, and brownfield planning in general, acts as a primer for these on-going initiatives.

Communities that C&S has specifically worked with to advance brownfield redevelopment and downtown revitalization include the City of Jamestown, Village of Gowanda, and City of Lackawanna, all located in New York State. In 2016, C&S led the Village of Gowanda Pre-Nomination Study, which was awarded the 2017 Outstanding Planning Award for Comprehensive Planning by the American Planning Association New York Upstate Chapter, Western New York Section. The Village of Gowanda plans to double their BOA plan as their comprehensive redevelopment plan for a successful and vibrant future.

You can find out more information on the BOA program at https://www.dos.ny.gov/opd/programs/brown-FieldOpp/
Project delivery can take many forms. All have been developed in an effort to find a better way to ensure the successful execution of construction projects. Private owners have ultimate flexibility, while some public owners are restricted based on municipal bidding laws. Each delivery method has its advantages and disadvantages and should be assessed on a project by project basis.

Advantages:                    Disadvantages:
Historically accepted
Price fixed before construction
Transparent, competitively bid process

Design-Bid-Build

With the design-bid-build method, the owner has a contract with a design firm and separate contracts with a contractor(s). In New York State, public work is governed by Wicks Law, which requires a minimum of four separate contracts be bid to include general construction, electrical, HVAC, and plumbing. In many cases, an owner’s representative/construction manager is employed to oversee the work of the contractor(s), on behalf of the owner, while the design firm provides as-needed technical support during construction.

Design-Build

A second delivery method is design-build. With this method, the owner enters into a single contract for a turn-key approach to a project. Depending on the project type and method of procurement, this method many times will require preliminary design and detailed scoping effort to facilitate establishing a firm price for the work.

Advantages:                    Disadvantages:
Single source of responsibility
Shorter delivery time
Increased owner control/ involvement compared to design-build

Construction Management At Risk

A third delivery method is construction management at risk (CM@R). With this method, the owner enters into a contract with a designer and construction manager; however, the construction manager is responsible for the overall project, has authority over managing the designer, and holds all the construction subcontracts. Many times this method of contracting will be on an open-book basis where the CM gets an agreed-to management fee and mark-up on subs who may be mutually selected by the owner and CM through competitively bidding.

There are many derivations of the three basic project delivery approaches as it relates to contract terms and pricing. Regardless of the method used, the proper execution of project management techniques and principles is necessary for a successful construction project.

Advantages:                    Disadvantages:
Single source of responsibility
Typically guaranteed maximum budgets but not a firm fixed price established at outset
Mutual agreement required on self-perform vs. sub-contracted competitively bid work by the CM@R
Maintaining harmony between the designer and CM@R can be a challenge

C&S was selected to design-build GA Braun’s 100,000-square-foot addition to their present manufacturing facility.
A Tale of Two Airports

In the mid-1990s, Rome, New York, was faced with a unique situation. The County operated Oneida County Airport, a relatively successful facility with 35,000 annual aircraft operations, more than 20 charter flights to Atlantic City, 90 based aircraft, an active airport that was already running smoothly, but now had the opportunity to use Griffiss Airfield, a facility with an 11,800-foot runway capable of handling any aircraft, 470,000-square-foot and 150,000-square-foot hangars, its own air traffic control tower, and more than 70 acres of aircraft parking. The County had to choose between trying to operate both airports or closing one facility.

County leadership undertook an airport master plan study and an options analysis study for Griffiss. The master plan provided the county with a prioritized road map for the redevelopment of Griffiss as a civilian airport, including a cost estimate for completing essential projects. The options analysis provided comparative economic data, including capital and operating costs for maintaining both airports versus a single airport. A major impact on the economic analysis was that the level of aviation activity in Oneida County did not justify FAA Airport Improvement Program Funding for both airports.

While the decision process proceeded, the County managed to keep operating both airports. The combination of Air Force caretaker revenue to help maintain aviation facilities and a contract with an aircraft maintenance repair and overhaul company (MRO) helped offset initial expenses of maintaining the two airport facilities.

At the same time, Griffiss Air Force Base, a 3,552-acre facility also located in Rome, was recommended for closure or realignment by the 1993 Defense Base Realignment and Closure (BRAC) Commission. After government consideration, Griffiss was realigned in September 1995. The last military aircraft left the facility in September 1998, and the airfield was made available for civilian use for the first time.

Oneida County was faced with a major decision. They had an active airport that was already running smoothly, but now had the opportunity to use Griffiss Airfield, a facility with an 11,800-foot runway capable of handling any aircraft, 470,000-square-foot and 150,000-square-foot hangars, its own air traffic control tower, and more than 70 acres of aircraft parking. The County had to choose between trying to operate both airports or closing one facility.

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In 2003, county and state officials announced a long-term contract with Empire Aero Center (EAC), an experienced and well-financed MRO that relocated to Griffiss from Miami. Local officials secured millions of dollars of state money to improve the largest hangar at the airport, including an addition that permitted EAC to work on 747 aircraft.

This anchor tenant set the wheels in motion. The airport master plan was executed, public benefit conveyance documents prepared, and an application for Military Airport Program (MAP) funding was submitted. The decision was made to move forward with the redevelopment of Griffiss International Airport as the county’s only airport.

Anthony J. Picente Jr.’s Arrival

Shortly after the decision was made by the Board, Mr. Picente was appointed to the position of Oneida County Executive. He saw great potential in Griffiss as both an anchor tenant set the wheels in motion. The airport master plan was executed, public benefit conveyance documents prepared, and an application for Military Airport Program (MAP) funding was submitted. The decision was made to move forward with the redevelopment of Griffiss International Airport as the county’s only airport.

According to the 2008 State of the County address, after only two years of full-time airport operations at Griffiss, the county cost of airport operations was reduced by $700,000. The first airport improvements were completed, which included the addition of several new hangars, conversion of a former hangar for commercial use, construction of a temporary FBO facility, and installation of a modern Instrument Landing System and Approach Lights.

With regard to development at the airport, a long term vision helped drive the successful transition. “We didn’t want to bite off more than we could chew,” said Mr. Picente. “We created a plan for responsible growth and built within capacity, with room to expand in the future.”

Great Potential, Great Challenges

Converting a decommissioned Air Force base into a successful county airport didn’t happen without significant challenges. Mr. Picente said that first, the public had to be convinced that the investment in the airport would be worth the cost. “Once we had the vision for the airport, we had to prove why the investment would be beneficial. We received a lot of funding from outside sources, but it still required significant investment by the County. Together with the Board of Legislators, we have always been cautious to be sure that any investment led to a benefit for the public.”

Another challenge was updating the facilities at the airport that had not been maintained since the base closure in 1998. New facilities were built for general aviation operations, including hangars, fuel facilities, and a new terminal and Federal...
Inspection Services (FIS) building. Some structures left from the Air Force base have been updated and remain in use, while others have been demolished to create sites for new construction.

**Griffiss Becomes a UAS Test Site**

In 2013, Griffiss was named one of seven FAA Unmanned Aircraft Systems (UAS) test sites along with New Mexico, Nevada, Texas, Alaska, Virginia and North Dakota. Since its inception, there has been over 100 tests done, experimenting with flying drones beyond the visual line of sight. The testing is done in all aspects of potential drone use, including rescue and recovery, agriculture, delivery systems, and software development. To aid in testing, the airport installed a $4 million range instrumentation system, the first of its kind in the United States. They also became a contracted partner with NASA, sharing test data to ensure safety for everyone in the national airspace. This UAS test site continues to gain recognition and is a prestigious achievement for the area. “This research helps us further the economic and commercial plan for the airport,” said Picente.

**A Bright Future Ahead**

In part, because of County Executive Picente’s vision for the airport, public support, and careful planning, Griffiss International Airport continues to be an anchor for development in the Mohawk Valley region. A Griffiss UAS Innovation Center is planned, including the renovation of Building 100 to create a space for research, development, testing, and manufacturing of UAS systems. The airport is also partnering with Mohawk Valley Community College (MVCC) to develop a UAS Technology Business Incubator that will be on the frontline of creating high tech businesses in the unmanned aviation industry. This center will expand current offerings to create a two-year UAS degree program at MVCC.

In addition to the UAS development, Mr. Picente is hopeful that commercial air service can once again return to Oneida County, after a 24-year hiatus. “We can handle it, there is a market for it, and we have a niche that can be served. We want to give the community another shot at having commercial air service in a limited, but beneficial capacity.”

>>> Anthony J. Picente, Jr. is the Oneida County Executive. He was appointed to the position in 2006, followed by his election to full four-year terms in 2007, 2011, and 2015. Mr. Picente was named Regional Director of Empire State Development (ESD) in 2001 and, two years later, was promoted to ESD vice president, a position he held until 2006. He is the immediate past president of the New York State Association of Counties as well as a former president of the New York State Association of County Executives.

>>> The new facilities feature a “modern rustic” aesthetic that highlights the airport as a gateway to the Adirondacks.

“This building is a strategic piece to the economic development puzzle not only here at the airport, but in the entire region.”