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*The following are some highlights of my published content. I can provide more samples upon request.*

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# POWERING AN OHIO TRANSFORMATION

*The conversion of a former landfill site into a solar farm  
is the largest project of its kind in Ohio*

By Julia Edinger

Photos courtesy of Enerlogics Solar

**A**fter having seen the wide, open plains of the Midwest, it is difficult to believe that this region has not fully capitalized on the potential value of this space as an opportunity for creating energy. A county in Ohio sought to change that, to electrify its region, and to build a foundation towards a more secure grid — all while creating jobs.

Not only was this project able to create jobs, but it was able to benefit the local economy in more ways than one. Using workers from Ohio for the construction, paired with Ohio-based manufacturers, the project has a uniquely community-driven feel.

“The project utilized an Ohio-centric team to ensure local and regional impact,” explained Scott

Ameduri, President of Enerlogics Solar LLC.

The former landfill has now become one of Ohio’s crowning energy achievements, both benefiting from and creating benefits for Ohio communities. With Enerlogics’ base in Youngstown, racking and foundations from Cincinnati-based RBI Solar, and photovoltaic modules from First Solar’s Toledo facility, the project is Ohio-made from the ground up. This team came together with a vision to overcome all of the red tape involved with developing on a former landfill in order to build something that will improve Ohio.

“Brooklyn had the land, Cleveland Public Power had the distribution system, we had the electricity needs, and Enerlogics had the development design

◀ Enerlogics Solar partnered with Cuyahoga County to transform a landfill site into a solar farm.





▲ The array features 35,520 solar panels on 17 acres of the closed, 75-acre landfill site.

*“This structure provides the County with long-term electricity cost savings.”*

*- Scott Ameduri, President, Enerlogics Solar LLC*

and know-how, but it was a first for all of us,” said Mike Foley, Director of Sustainability for Cuyahoga County. “And it is helping reuse land that can’t be used for anything else to be made productive for vitally important clean energy development.”

#### **A Parcel in Plain Sight**

The site of the Brooklyn Landfill acted as the perfect place for this project to begin. In the fall of

2015, Enerlogics Solar partnered with Cuyahoga County to create a transformative project for the region. The brownfield site was a perfect canvas to begin from. By September 2018, nobody would be able to guess that this spectacle was once a landfill.

“From a constructability perspective, the Brooklyn landfill was an ideal brownfield site,” explained Scott Ameduri, President of Enerlogics Solar LLC. “As one of the first landfill solar projects in the state, our design utilized a ballasted

racking system to preserve cap integrity, as well as other means to reduce any perceived risks to the landfill itself.”

The site provided a solid foundation, but it came with its own challenges, mostly in the structuring of the project. The construction process was straightforward, according to Foley, with one major guideline: “Don’t break the cap of the landfill.” Extending Cleveland Public Power lines to the site was the greatest construction challenge, but



collaborative efforts helped make that possible.

While the construction process was relatively simple, the regulatory restrictions and economic viability posed a greater challenge in the creation of this project.

“The project was funded via County electrical payments,” explained Foley. But were key details that influenced the project’s structuring. “We partially pre-paid dollars for energy usage in the amount of \$4 million, but also have monthly payments when certain thresholds of electricity are created. IGS Solar was the overall developer and put money into the deal.”

There was a complicated structure in the entities involved in the project’s development, as well. Some of the key players included Mayor Gallagher of the City of Brooklyn, Executive Armond Budish, and County Council President Dan Brady. According to Foley, there were many moving parts throughout the process.

“It was complicated, but we all worked hard to make it happen,” Foley stated. “To be honest, projects like this shouldn’t be so hard, but we think we have a great project that people can now point to as an example, and we hope to use this to replicate the model in other locations.”

#### Distinction in the Details

The solar farm makes use of 17 acres of the 75-acre landfill site. The array was carefully designed in order to preserve as much of the lush woods surrounding the site while repurposing a significant portion of the brownfield site.

The finished project is made up of an impressive array of 35,520 solar panels. The amount of energy that the site is producing is equivalent to having enough power for 500 residential homes. In terms of greenhouse gas emissions, it is equivalent to reducing the greenhouse gas emissions of 834 passenger vehicles.

“As part of our design process, our legal partner (McDonald Hopkins) and our construction partner (Conti Solar) worked with Brooklyn and Brooklyn’s environmental advisors to ensure that the construction methodology would preserve landfill cap integrity — including that of the gas collection system,” explained Ameduri. “Through utilization of lighter, tracked equipment, the project was able to minimize the impact on the cap during the construction process.”

When constructing a project on a site like this, the delicate nature of the cap has to be kept in mind throughout the designing and building process. It is a crucial factor in ensuring that both the environment and the surrounding community are protected from the harmful toxins that could escape if the cap was broken.



▲ The brownfield site provided a solid foundation for constructability.



▲ The design used a ballasted racking system to preserve cap integrity.



▲ The county will save about \$3 million in energy payments over a 25-year period.





▲ While structuring was complicated, the team hopes this project will serve as a model for other solar projects.

### Power to the People

This project has accomplished more than the revitalization of a brownfield site. It is bringing power back to the community of Cuyahoga County.

“The project is providing local-generated renewable energy under a power purchase agreement with Cuyahoga County to offset some of the consumption of County facilities,” Ameduri said. “This structure provides the County with long-term electricity cost savings.”

Additionally, repurposing this space provided relief, as the land was previously a burden for the community. The City of Brooklyn had to pay to maintain the property, but now, the land is being leased, so Brooklyn is actually making money from it.

“The County over a 25-year period estimates that it will save approximately \$3 million dollars in energy payments that it otherwise would have made under business-as-usual conditions,” stated Foley.

The reaction to this project has been quite positive, in part due to community involvement

throughout the planning. There are tours at the site with schools in the area on occasion, continually energizing the community involvement in the project. These types of tours can also spark an interest in sustainable careers for young students trying to see what they can do in the solar industry. Notably, there has been national recognition for this project. In 2018, the project received an award for Solar Project of the Year from Solar Builder Magazine.

The short-term benefits of this project, such as job creation through the construction of the project, have certainly impacted the local economy. The long-term benefits of this project, though, will transform the region. ●

**Julia Edinger** is the Editor for *American Infrastructure Magazine*. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com).

## PROJECT TEAM:

Cleveland Public Power

Enerlogics

Cuyahoga County

Eutectics

IGS Solar

McDonald Hopkins

Conti Solar

Ohio EPA





# ***BRIDGE OVER*** **INTERNATIONAL WATER**





## Bridge Project of the Year: Peace Bridge Rehabilitation Project



*This \$100 million renovation gave new life to the Peace Bridge, which connects the United States with Canada*

By Julia Edinger

**N**early a century ago in 1927, the Peace Bridge opened to the public. Prior to this bridge's construction, the International Railway Bridge was the main link

between the United States and Canada over Niagara River. With the birth and rapid adoption of the automobile, there was a need to create a new connection that would allow pedestrian and

automotive traffic to cross, as well.

Since its creation, the Peace Bridge has become an iconic landmark. Located near Buffalo, New York and Fort Erie, Ontario, it is the second

▼ The \$100 million improvement increased the functionality of this bridge connecting the US and Canada over the Niagara River.





▲ Prior to this project, the roadway surface of the bridge was the original concrete deck.

*“Beyond having a new bridge deck, improvements include everything from mitigating stormwater more efficiently to having an intelligent traffic control gantry system.”*

*— Thomas A. Boyle, Chief Operating Officer, Buffalo and Fort Erie Public Bridge Authority*

busiest border crossing between the two nations, with millions of vehicles crossing it annually. According to the Peace Bridge Authority website, \$40 billion in trade cross this bridge every single year. Still, despite its international importance, the bridge had never gone through a serious transformation — until now. The \$100 million improvement that increased the efficiency, functionality, and resilience of this bridge is *American Infrastructure Magazine’s* Bridge Project of the Year.

#### **Bringing New Life to Historic Infrastructure**

Prior to this project, the roadway surface of the bridge was the original concrete deck. There had been various repair programs throughout the decades, but even those were no longer sufficient. Many individual parts of the bridge needed attention. The project intended to replace the roadway deck; widen the structure to add a pedestrian walkway and observation platform; replace, rehabilitate, and strengthen the structural steel; install electrical and fiber infrastructure; and

install new architectural traffic control features. It was a huge undertaking.

“The difficulties associated with maintaining operations of a highly trafficked international border crossing and tolling facility during a complete rehabilitation of a complex bridge cannot be understated,” said Thomas A. Boyle, Chief Operating Officer of the Buffalo and Fort Erie Public Bridge Authority.

One particular challenge in the project’s construction was that much of it occurred during



winter months to limit impacts to traffic. Those who have visited the Northeast in winter can imagine the kind of forethought it would take to overcome the challenges posed by several feet of snow and arctic chills. To make it more challenging, road closure restrictions forced the team to do much of the work on the structural deck during nighttime hours.

“Despite the difficulties of the harsh conditions, the works were able to proceed on time and in compliance through very careful planning and scheduling,” Boyle explained.

Using a thin concrete-filled steel grid deck reduced the dead load of the deck by nearly 40 percent, which improved the bridge’s live load capacity – even with the addition of the widened pathway for bicyclists and pedestrians.

During the construction, traffic was rerouted towards the outermost limits of the bridge structure. This required that additional structural reinforcement be implemented because the construction traffic configuration conflicted with the original bridge design’s capability.

“Although a significant amount of the construction cost was related exclusively to temporary conditions, the overall investment will be greatly beneficial for decades to come,” Boyle said. “Beyond having a new bridge deck, improvements include everything from mitigating stormwater more efficiently to having an intelligent traffic control gantry system.”

The intelligent overhead gantry system will help to improve the efficiency and safety of the traffic flow across the bridge. The bridge’s bi-directional center lane is based on traffic, so this informative signage allows the Authority to display traffic directions with increased clarity.

The observation platform also provides those crossing the bridge with a unique opportunity, according to Boyle, to “take pictures with feet planted in different countries.”

### **An International Collaboration**

The project’s inception and design process started in 2012, and feasibility review was completed in late 2015. The construction contract was bid and executed in 2016 with American Bridge Company Canada. The project was financed through a bond issuance and toll revenue. The project was considered substantially complete by June of 2019, and the project was fully complete in October of 2019.

Extensive planning was required to coordinate with internal and external entities involved, two notable stakeholders being US Customs and Border Protection (CBP) and the Canada Border Services Agency (CBSA).



▲ This project sought to widen the bridge surface, replace the roadway deck, and more.



▲ American Bridge Canada was awarded the construction contract.



▲ The design details were so crucial that design engineer consultants were retained during construction.





The project followed a typical design-bid-build methodology. The Peace Bridge Authority worked with Parsons and CHA, the consulting engineering team, to inspect the bridge before the design process began. American Bridge Canada was awarded the construction contract, overseen by resident engineering firm LiRo Engineers.

“The design drawings and specifications were of such detail that minimal deviation from the plans was encountered,” Boyle explained. The design details were so crucial that design engineer consultants were retained during construction to maintain the project’s original vision.

The project was also constructed in a way to mitigate the traffic impacts on the public. Limiting lane closures to winter months helped limit the burden on the traveling public. The CBP and CBSA also worked hard to keep as many inspection lanes open as possible to keep things flowing smoothly. Each aspect of this project comes back to carefully planning the process, and those who regularly use this bridge certainly benefited from those preparations.

“Since substantial completion, the response by the community has been overwhelmingly positive with three travel lanes back in operation, a new, smooth roadway surface, and an aesthetically pleasing international gateway,” Boyle stated.

Investing in this infrastructure ensures that this bridge will continue to provide a crucial connection between the US and Canada for decades into the future. ●

**Julia Edinger** is the Editor for *American Infrastructure Magazine*. She can be reached at [julia@builder.media](mailto:julia@builder.media).

◀ Road closure restrictions forced the team to do much of the work on the structural deck during nighttime hours.



▲ The project was considered substantially complete by June of 2019 and fully complete in October of 2019.





# **A RIGHT TO POTABLE WATER IN PONCHA SPRINGS**





## *A sleepy town in Colorado gets a wake-up call and the community comes together to improve their water infrastructure*

By Julia Edinger

▲ Poncha Springs leaders united with the community to find a funding solution for a two-million-dollar municipal water project.

**I**n a small Colorado town in the Arkansas River Valley, a community came together for a purpose. Coined as the “Crossroads of the Rockies,” Poncha Springs found its city at a crossroads after discovering a problem with the water supply. Despite an initial lack of funding, the people of Poncha Springs united to resolve it.

The need for this project was discovered in 2006 after

the imposition of water restrictions in summer months. As the municipal water system had not undergone significant improvements since 1998, it was time for an upgrade.

The Town of Poncha Springs maintained a close watch on the water system, discovering that the storage system had no forms of redundancy. This meant that any malfunction would leave residents without an adequate supply of water. There was





▲ The project established multiple redundancies throughout the water distribution system, including well capacity and storage capacity.

**“The main challenges were associated with the exhaustive list of approvals needed throughout the design process and financing of the project.”**

— Brian Berger, Administrator/Treasurer/Clerk, Town of Poncha Springs.

one single connection between the storage and the distribution grid: a 34-year-old, 10-foot trunk line. There was no room for error. Something had to change.

#### ***Poncha Springs plans for improvement***

The Board of Trustees in Poncha Springs chose an engineering firm to start the process, and the engineers quickly found a site for the project. The engineering firms involved helped significantly; Joe Deluca with Crabtree Group Inc. and Andrew Rice with Providence Infrastructure Consultants guided the project process from design through construction.

Janet and Larry Sherwood of JLS were vital to

the project’s success. They helped contribute the land easements for the new tank and well site and the trunk line easement.

It did not take much to get community support behind the project; the majority realized that it was necessary for the wellbeing of all the residents of the town.

“The response from the public has been nothing but positive, and overall, this was a much-needed project that is a benefit to everyone in Poncha Springs, current and future,” stated Brian Berger, Administrator, Treasurer, and Clerk of the Town of Poncha Springs.

With a team of contractors for various features

of the project, and the steady support of members of the community, the plan was ready to take shape. The next challenge was finding funding.

#### ***A small town with substantial funding needs***

The question of the project’s necessity was answered. The next question was, “How does a town of 800 people fund a project with an estimated cost of \$2.4 million?”

It was a seemingly impossible predicament. The town’s enterprise fund balance was roughly \$100,000. A traditional loan’s interest rate would result in the too-high cost of annual payments than the net annual income allotted by the enterprise fund. Every grant and loan opportunity that was



available was considered for this project.

“An alternative loan through the State Revolving Fund at one- to two-percent interest seemed plausible, but would require a hefty 30- to 60-percent increase to monthly water fees for local residents in an identified disadvantaged community,” explained Berger.

Not wanting to substantially raise utility fees for residents, collecting a variety of grants seemed to be the best solution for the members of the community.

“The project was presented in front of a total of 11 boards in nine cities across the state,” said Berger. “What had started as a project with a lifetime cost of just over five million dollars (cash contributions, interest plus principal) and the need to increase monthly water rates by 30 to 60 percent, has resulted in a total out-of-pocket cost of just over \$500,000 — with no rate increase to local residents.”

The financing ultimately would result from a wide collection of grants and loans: \$640,000 EIAF grant from the Department of Local Affairs; \$30,000 CIF grant from Climax Area Community Investment Fund; \$10,000 planning grant from CDPHE; \$58,500 WSRF grant from the Colorado Water Conservancy Board, and more. These grants were in addition to the contributions from the Upper Arkansas Water Conservancy Board and local landowners providing land easements. The State Revolving Fund then loaned the remaining funds at zero-percent interest.

#### ***Implementing the design***

“The main challenges were associated with the exhaustive list of approvals needed throughout the design process and financing of the project,” Berger stated.

One design aspect that posed a particular challenge was the water storage tank’s height – 61 feet — that required approval by two entities. Both the Chaffee County Board of Adjustments and of the Federal Aviation Administration had to approve the project because of its proximity to the local airport. After a review, and relocation out of the airport’s protection zone, the approvals were finalized and the project began.

The project established multiple redundancies throughout the water distribution system, including well capacity and storage capacity. In terms of well capacity, the design created a well rotation that allows one well to be offline for repair and maintenance. In regards to storage capacity, it allows for old tanks to be offline for maintenance and provides reliable water if there is a problem with the aging trunk line.

“It helps alleviate risks,” Berger explained. “It will provide additional fire suppression capacity and alleviate the need for water restrictions that have been in place since 2006.”



▲ One design challenge was the water storage tank’s height, which required approval by two entities.



▲ Engineering firms, Crabtree Group Inc. and Providence Infrastructure Consultants, guided the project through construction.



▲ The financing ultimately would result from a wide collection of grants and loans to avoid raising utility fees for residents.





▲ Prior to this project, the municipal water system had not undergone significant improvements since 1998.

◀ This project contributed significantly to economic growth in the small Colorado town of Poncha Springs.

### *Poncha Springs sets an example*

Once considered a sleepy little town, the Town of Poncha Springs is experiencing growth. It is important that the existing infrastructure continues to advance with the growing town to support the community. With an increased market demand for housing that has led to residential and commercial growth, the economy of the town is growing.

The economic growth has led to the first grocery store within municipal limits being constructed, improvements of the Crossroads Welcome Center, and increased demand for housing in the town. With this growth, there is a need to further improve infrastructure. In turn, better infrastructure attracts more residents and helps the economy to grow.

"None of this would be feasible without the Water Infrastructure Improvement Project," said Berger.

Poncha Springs is an example of what a town can accomplish with the support of the community and an exceptionally motivated team. The commitment to the public guided this project's success, and as a result, the community will grow and flourish. ●

**Julia Edinger** is the Assistant Editor at *American Infrastructure* magazine. She may be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com)

## PROJECT INFO:

**PROJECT NAME:** Poncha Springs Water Infrastructure Improvement Project

**LOCATION:** Town of Poncha Springs, Chaffee County, Colorado

**TYPE OF PRODUCT:** Municipal Water Supply



## PROJECT PROFILE: COTTONWOOD PASS



▲ This \$20 million project to improve Cottonwood Pass provided more reliable access to Gunnison National Forest in Colorado.



# THE HIGH ROAD: Paving at 12,000 Feet

*Cottonwood Pass in Colorado is the fourth highest paved road in the nation, making this project an engineering feat.*

By Julia Edinger

In the heart of the Gunnison National Forest, mountains, pine trees, and lakes decorate a scenic Colorado landscape. Up until this project's completion, Cottonwood Pass was a gravel road wrapping around the sides of mountains. Now, it's the fourth highest paved road in the United States.

"The purpose of the project was to provide a safe and sustainable roadway that improved access to Gunnison National Forest lands while reducing Gunnison County maintenance costs," explained James Herlyck, Federal Lands Access Program Manager of the Federal Highway Administration's Central Federal Lands Highway Division (FHWA-CFLHD).

## Planning for a Mountain Pass

The project was a complex undertaking with multiple entities involved in bringing it to completion. Improvements to Cottonwood Pass have come in the way of two separate projects addressing rehabilitation on both the east and west side.

Not only did this Cottonwood Pass project pave the gravel road, it also adjusted lanes, shoulders, and drainage. Safety improvements were made through a number of features, including horizontal alignment changes, added signage, and striping.

A dedicated team worked on the project, with FHWA-CFLHD leading and United Companies as the builder. The Colorado Department of Transportation does not own or operate Cottonwood Pass, but did contribute Highway Safety Improvement Program funds and helped with public outreach during the project's construction.

Other key players included the project manager,

environmental protection specialist, geotechnical engineer, and lead highway design engineer.

When the project was given notice to proceed in the spring of 2017, the original cost estimate was \$27 million. Collaboration and innovative design allowed the project to be completed \$6.1 million under budget, according to Herlyck.

## Building At Great Heights

"The project began at an elevation of 9,363 feet and ended at the summit of 12,126 feet," Herlyck stated. "During construction, as one might suspect at these altitudes, weather and temperature were constant challenges."

The extreme altitudes posed several challenges. For example, crews could only work in the highest regions during the months of summer and early

fall, as rain and snow were common in the winter months. That weather wasn't always predictable, though; in June of 2019 there was a summer blizzard.

Subsurface water posed the other major challenge. The team included additional underdrain and sub-excavation to stabilize the roadway while controlling the flow of water.

"In all, 18,390 feet (almost 3.5 miles) of underdrain was installed and 22,830 cubic yards of sub-excavation was done," Herlyck summarized.

While many aspects of the project were complicated by the height, it is also one of the greatest sources of pride in regards to the project's success.

Said Herlyck, "This is the fourth-highest paved road in the United States, traverses a pristine



▲ The project reached a summit of 12,126 feet, making it the fourth highest paved road in the nation.





▲ The dedicated team at the Federal Highway Administration's Central Federal Lands Highway Division enabled the project's success.

**“The project began at an elevation of 9,363 feet and ended at the summit of 12,126 feet.” - James Herlyck, Federal Lands Access Program Manager of the Federal Highway Administration's Central Federal Lands Highway Division**

▼ The weather conditions of the extreme altitudes required teams to limit construction work to summer months.

▼ The 12.5 mile span of road was improved with pavement, lane adjustments, and drainage improvements.





## PROJECT INFO:

**PROJECT NAME:** CO FLAP 209(1)

Cottonwood Pass

**LOCATION:** Gunnison County, Colorado

**TYPE OF PRODUCT:** Transportation

**MONTH/YEAR STARTED/COMPLETED:**

April 2017 to September 2019

**ENGINEER:** FHWA-CFLHD

**OWNER:** County of Gunnison, Colorado

**BUILDER (DIVISION):** United Companies,  
A CRH Company

*Photos courtesy of the Federal Highway  
Administration, Central Federal Lands  
Highway Division*

natural environment home to many plant and animal species, and oversees a rugged landscape.”

### Environmental Matters

This picturesque mountain pass required careful environmental consideration to protect the surrounding lands, including plant and animal habitats.

FHWA-CFLHD completed National Environmental Policy Act compliance, an important measure in regulating large construction projects to protect the environment.

“We value strong Government-to-Government partnerships to successfully deliver projects,” Herlyck stated. The partnership between FHWA-CFLHD and Gunnison County allowed the project to address the key goals the project intended to address in a way that is conscious of

the surrounding environment.

The 12.5-mile span of road was adjacent to a number of precious wildlife habitats, including that of the Canada Lynx and a number of wetland ecosystems. The project not only restored over an acre of wetlands onsite, but also purchased several acres of wetlands nearby.

Other measures taken to protect the environment included using onsite material sources to create all of the rock and aggregate needed for the project, which also helped to reduce emissions from transporting materials. The use of rock buttresses, rather than man-made structures, also allowed the project to blend with the natural environment.

“The collaborative team effort identified these areas and the design resulted in the least amount of disturbance possible, while achieving the project





purpose and need,” Herlyck said. “We are proud that the public now has improved access to our national treasures through the investment of federal, state, and local resources.”

Not all road projects are able to take such careful consideration into the environment, but for a project that is so closely tied to precious federal lands, it was crucial that the team took a new approach. Because of the dedication to the project, Cottonwood Pass will provide safe, convenient access to Gunnison National Forest for years to come. ●

**Julia Edinger** is the Editor for *American Infrastructure Magazine*. She can be reached at [julia@builder.media](mailto:julia@builder.media).

▲ In total, 18,390 feet of underdrain was installed and 22,830 cubic yards of sub-excavation was done.

► The project's successful outcome was made possible through collaboration with the project manager, environmental protection specialist, and the engineers.







▲ Initially, the deficiencies were thought to be minor. Early in 2017, a storm hit that would shift this bridge replacement into high speed.





# Bridging the Gap:

## A Highway 1 Transformation

*Caltrans completed this innovative and award-winning bridge replacement project in less than eight months*

By Julia Edinger

**T**he landscape of coastal California is prone to landslides after a rainstorm, which makes building resilient infrastructure on this landscape quite a challenge. Caltrans accepted this challenge – embraced it. The award-winning Pfeiffer Canyon Bridge Replacement project exhibits the success of determined reconstruction efforts.

The structural issues with Pfeiffer Canyon Bridge were first brought to the surface after being noticed by a homeless man. He informed the local roadway maintenance engineer, and the bridge closed in less than 40 hours. While the risks seemed to be mitigated, the deficiencies were hidden below the surface, as is often the case with infrastructure.

Inevitably, in the months of late winter and early spring in 2017, a storm hit that would shift this bridge replacement into high speed. The storm exposed the extent of the bridge's deficits: the soil was moving underneath the column – so much so, that it was impacting the superstructure of the bridge.

The bridge plays a critical role for people living and working in the area. The Pfeiffer Canyon Bridge connects Highway 1, allowing people to travel and commute between parts of Monterey County. When those in the northern parts of Monterey County were isolated from those in southern Monterey County in Big Sur, it was clear that the damage demanded replacement. It created such a strain on the community that Caltrans had to act fast to restore travel on

Highway 1.

The brunt of the funding came from State Emergency Budget funding, as the deficits truly had created a state of emergency for the region. This state also allowed the state to apply for federal funds, which reimburse 75 percent. Caltrans would end up completing the project over two million dollars under budget, at \$21.7 million.

“Once the superstructure started deflecting,” said David Galarza, Structures Representative, D05 North, for Caltrans, “I think initially we thought we could just retrofit the damaged column by supplementing some additional columns and constructing an outrigger type of a bent scenario. But once that second storm hit and the superstructure was impacted, we pretty much knew the bridge was done for. And then we kicked it into high gear designing a replacement.”

The structural design was completed within three weeks, featuring steel spanning over where the landslide from the storm was. The steel was available, and the site did not require too much additional preparation before assembling steel girders and launching them over the canyon.

Caltrans was very engaged with the project throughout the process. Before the removal of the existing bridge was even complete, the department was seeking bids for steel suppliers. As the supply and finance aspects of the project were being determined, the old bridge was being removed, and new abutments were





*“We had some locals who would visit the job [...] and they would document that and they would put it up on social media.”*  
*- David Galarza, Structures Representative, D05 North, for Caltrans*

▲ The brunt of the funding came from State Emergency Budget funding, as the bridge's structural deficits had created a state of emergency for the region.

being constructed.

“The old bridge was a three-span bridge with two pile columns,” said Galarza. “Obviously one of them was compromised, so we wanted to work around that and have a simple stand. So we just had two abutments in the new design. We also had to construct temporary support to launch the girders once they were assembled across the canyon. So there was a bunch of fieldwork that was happening concurrent with the girders being fabricated.”

There were so many wheels spinning at one time in this project's implementation that it was completed quickly. Days after the abutments were completed, the assembly begun. First, the department had to align and assemble the girders. Then, they had to launch and lower the abutments to their seats about 18 feet down, a process which took about four days. After that, came lowering the girders, which took about two weeks, and was a challenge in the process. But after those parts were secured, conventional work methods allowed for quick completion of the forming and casting the reinforced concrete deck. The final touches – adjacent approach lodge, roadway section, barrier rail, profile grinding – were completed smoothly and efficiently, allowing the bridge to be

reopened to traffic on October 13th, 2017.

Caltrans could see that the community was enduring the difficulty of the situation while the road was closed; the community acknowledged the gravity of the project. Coastal projects can always be controversial due to the traffic, especially during the summer season when tourism already brings in a higher level of traffic. Caltrans worked with the community, involving them and educating them about the project, which made them much more respectful in regards to the inconveniences associated with the project.

We had some locals who would visit the job and schedule times, and we would give them impromptu tours to let them know what we were doing, and they would document that and they would put it up on social media,” said Galarza. “That way the community was almost being taken along through the life of the job so they could see what we were working on.”

While coastal projects on Highway 1 tend to be controversial for the impediments to traffic flow, there was strong support of the community for this project. Team members acknowledged the rarity of this, especially because working season for construction projects like this occurs





▼ As the financing and supply were being organized, the old bridge was being removed, and new abutments were being constructed.

► Caltrans completed the project over two million dollars under budget at \$21.7 million.

► The project received an award for "Best Use of Technology and Innovation" in 2018 from the 11th annual America's Transportation Awards competition.







▲ Caltrans effected community support by involving local residents and local business leaders.



▲ The bridge to be reopened to traffic on October 13th, 2017.



▲ Some final touches include an adjacent approach lodge and a barrier rail.

simultaneously with tourism season.

"You're restricting traffic in normal situations to one lane," Galarza explained. "The tourists don't mind, most of them, waiting a few minutes, but the locals can get upset from time to time."

For those commuting regularly between work and home, losing the only connection between northern and southern Monterey County was not a minor adjustment. The project leaders worked tirelessly to ensure that it was an inconvenience rather than a complete disarray. Educating and involving community members was a vital part in easing the public reaction, and ultimately, gaining community support.

By involving the local residents of the community, as well as local business leaders, Caltrans managed to maintain the community's support despite the project's challenges. Ultimately, that was a main factor that led to the project's success.

The project received an award for "Best Use of Technology and Innovation" in 2018 from the 11th annual America's Transportation Awards competition. The success of the \$24 million bridge project was undeniable. Rebuilding a bridge of this scale is usually a multi-year project, but Caltrans was able to finish the bridge replacement in less than eight months.

Galarza described the opportunity to work on the project as a, "Once-in-a-career type of job." He stated, "Myself and my staff all have 20-30 years worth of experience working in this area, and these jobs usually only come around once in a lifetime, and we were certainly proud to be a part of it." ●

**Julia Edinger** is the assistant editor at *American Infrastructure Magazine*. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com).



# Paving the Way for Innovation in URBAN COOLING

*The Los Angeles Bureau of Street Services paints the roads gray to combat rising temperatures*

By Julia Edinger



**T**he City of Los Angeles, California is known for ceaseless sunshine and warm weather. But with climate change leading to rising temperatures, the heat is testing the city's infrastructure. The Bureau of Street Services, in alignment with Mayor Garcetti's "Sustainability City pLAn," is exploring innovative solutions.

Rising temperatures are affecting infrastructure globally, but in locations like the San Fernando Valley, the effects of the sun on black streets can have shocking consequences. According to Greg Spotts, Assistant Director for the Los Angeles Bureau of Street Services (BSS), the Los Angeles heat can even have deadly consequences.

"Los Angeles has a significant number

◀ The Los Angeles Bureau of Street Services is aiming to mitigate urban heat through cooling efforts, such as this cool-paving project.





▲ San Fernando Valley is the hottest part of the city; it is also the location in which the Bureau of Street Services has a grant to plan a multifaceted neighborhood urban cooling project.

of heat-related deaths each year,” Spotts said, adding that it is one of the few cities with heat-related deaths in the winter, and a surprise heat wave in January can catch vulnerable populations by surprise. Spotts views this mission to find a solution as a matter of public health.

It may even become more dangerous, because according to Spotts, there is a projection that the number of deaths and illnesses caused by extreme heat will increase, and substantially, as California temperatures continue to rise. This is one reason that it is so important that changes to infrastructure are made with the environment and climate in mind; as climate changes, public health risks will increase. BSS sought to find a solution.

Spotts, in his role as Chief Sustainability Officer for BSS, was the Executive Sponsor of the project to test GuardTop CoolSeal — a reflective sealcoat with a light color designed to lower the surface temperatures of asphalt — on streets in Los Angeles. The Street Maintenance Division implemented the project with the leadership of Division Manager Sherman Torres and one of his deputies, Craig Shaw.

In May 2017, BSS began a pilot program,

testing CoolSeal on one residential block in each of the 15 council districts throughout the city. This pilot program followed a report BSS had found, stating that cool-paving products had only been tested in California parking lots. BSS made it their ambition to be California’s first jurisdiction to test a cool-paving product on a California public street.

According to Spotts, liability was a major concern because concrete and asphalt have been the two main tools used to build streets for the past 50 years. There were concerns about how the new product would respond to things like water, dirt, and erosion.

Because Los Angeles is so dry, and rain is infrequent, the streets lack the natural cleaning aids, from which cities with higher rainfall benefit. For this reason, dry solids may sit on the streets for longer periods, even months at a time. The public streets can be dirty, and on a light-colored street with a thin coating, a small number of stains and small amount of dirt can add up quickly, reducing the effectiveness of the project.

“It isn’t an easy place to be inventive, but there’s a way to do it,” Spotts said of the meticulous

testing process. “That’s why we started testing in the lab, then we tested it in off-street locations, then we tested it in low-speed residential streets. We’ve been rolling it out in a cautious way.”

Despite the cautious implementation of this project, positive findings have already been observed. A 10-degree drop in surface temperature has been observed, but Spotts said that before taking this project to scale, they would need to see a multi-year return on the benefits: a minimum of five years. However, even in the short time since the streets have been paved, residents have been very appreciative. Not only have residents had a positive reaction, their pets have, too — residents told Spotts that even their dogs gravitate towards the gray part of the pavement during walks.

In addition to the enthusiastic response from residents, BSS received similar reactions from cities interested in the project worldwide: Europe, South America, Australia, and Asia included. Spotts acknowledges the importance of this generated interest as part of a shifting conversation: “Carbon emissions are essential to control, but the conversation needs to be expanded to actual mitigation of climate change’s effects.”



*“Carbon emissions are essential to control, but the conversation needs to be expanded to actual mitigation of climate change’s effects.”*

*—Greg Spotts, Assistant Director for the Los Angeles Bureau of Street Services*



▲ The efforts are part of a larger plan: Mayor Garcetti’s Sustainability City pLAn. It is a comprehensive plan to improve the city of Los Angeles.

The next phase involves a larger set of cool pavement projects. BSS is seeking funding in the next fiscal year’s budget to test the streets in an entire small neighborhood that lacks excess traffic to see if there would be a cooling effect on a larger scale. The multifaceted cooling project in the works right now involves additional shade structures, cool surfaces, and cool roofs.

The efforts are part of a larger plan: Mayor Garcetti’s Sustainability City pLAn. Launched in 2015, the plan sets monumental goals to achieve a stronger Los Angeles: environmentally, economically, and equitably.

The plan was created for many reasons, but to put it simply, Mayor Garcetti wants to increase the city’s resiliency. The comprehensive plan begins with a complex vision, which covers many elements. It set basic goals, with outcomes that could be achieved by 2017, in hopes that it would create the foundation for monumental change in the next 10-20 years.

Mayor Garcetti is monitoring the progress carefully to ensure its success. Through appointing Chief Sustainability Officers in major departments, studying regular reports, monitoring the budget and data, and reviewing and releasing an annual report of progress, Mayor Garcetti can see where

improvement has been made and where more emphasis should be placed. Members of the public are also able to see the results. The most recent report displayed drastic improvements, including 28,500 new green jobs, a reduction of greenhouse gas emissions by 11 percent in one year, and the city has more installed solar power than any city nationwide.

The city has put significant emphasis on urban cooling efforts through this plan, as well. The last report indicated that in addition to installing cool pavement, over 39 million square feet of cool roofs have been installed throughout the city to help mitigate some of the effects of rising temperatures.

“My Sustainability City pLAn is delivering results,” Mayor Garcetti stated in a press release describing the plan’s progress, citing the importance of a vision and a strategy as the foundation for improvement.

One of the challenges with this cool-paving product is that it is quite different from the existing pavement coating that is used by BSS. The existing pavement coating is Slurry Seal, a rubberized coating that does not require any aftercare in terms of maintenance. It seals small cracks in the street against water infiltration and protects the pavement in terms of its structural

stability. BSS is looking at how this new coating will compare to this traditional coating. Will the cool-paving products be able to stand alone, or will they still need recurring maintenance? If it is the latter, it creates additional challenges for BSS.

There are still concerns in terms of this particular product, specifically with its thickness – two layers of 50-micron coating compared to the customary coating BSS uses, which is three-eighths of an inch. Spotts encourages other cities to try urban cooling strategies, as well as other manufacturers, creating a competition for sustainability — “We are seeing positive results. We’re seeing a 10-degree-Fahrenheit change. But we challenge other manufacturers to come forward [with similar products] and see if they can beat that.” ●

**Julia Edinger** is an Editorial Assistant for *American Infrastructure Magazine*. She may be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com)



# LA WATER STORAGE UNDERGROUND



*The Los Angeles Department of Water and Power brings water storage systems underground*

By Julia Edinger

In 2008, the Los Angeles Department of Water and Power (LADWP) started the design of the Headworks Reservoir, the largest underground reservoir in the Western U.S.

The need for this project emerged as a result of increasing water quality regulations from the Environmental Protection Agency, which addressed eliminating the use of open finished water reservoirs. The two existing reservoirs in the area were open reservoirs, so the LADWP team initiated work on the massive undertaking of the new reservoir.

The reservoir is a large and complex project, as the total storage capacity of it will be 110 million gallons. A project like this must be broken into stages to be accomplished efficiently.

"We have Headworks Reservoir East,

which is completed and partially buried," explained Susan Rowghani, Director of Water Engineering and Technical Services for LADWP. "We're under construction with the Headworks Reservoir West. So that's phases one and two. The third phase will be the construction of a flow control station... The fourth phase deals with the restoration of the site, which we anticipate having native plantings on top of the reservoir with passive recreation for people to walk on, because this particular site is right next to the LA River."

While the fourth phase is still in the conceptual phase, the team anticipates phases one through three will all be complete in 2021.

## **Los Angeles: A Need for Water**

In a place like Southern California, water



## PROJECT PROFILE: HEADWORKS RESERVOIR PROJECT



security is a common concern for the community. A reservoir of this scale is likely to have a huge community impact. This is one of the reasons that LADWP is carefully planning the fourth phase, which will have the most interaction from Los Angeles residents.

The environment was taken into account with efforts of increasing the project's sustainability. One example is the mutually beneficial use of dirt from a nearby business. This helped the business to save on dumping costs that they would have incurred, while helping LADWP as well.

"Not only was that an example of something mutually beneficial, neighbor-helping-neighbor, it's also an example of how we reduced our carbon footprint as well as cost by procuring dirt elsewhere," stated Ellen Cheng, Spokesperson for LADWP.

With open reservoirs, as opposed to these buried tanks, water can be lost through evaporation. A closed water storage system provides environmental benefits as it helps to use water more efficiently.

For a project that takes up such a large site of land, the benefits to the community will be huge. The capability of the region's water systems is increased by this development, also. Each reservoir takes a large amount of time, soil, and labor to construct, bury, and landscape. But the LADWP team is committed to ensuring that this space is still used. Ultimately, its proximity to Griffith Park and the Los Angeles River is expected to increase foot traffic and outdoor recreation.

The team went to great lengths involving themselves in conversations with various stakeholders and political entities prior to construction to reduce negative community impacts. With nearby cemeteries, parks, and even an equestrian facility, it was important to mitigate noise pollution during the evenings and to minimize traffic interruptions. Through the open dialogue, this was able to happen.

### Moving Forward

While the new reservoirs are approaching completion, the

▲ The Headworks Reservoir project increases the total water storage capacity to 110 million gallons.





*“It’s also an example of how we reduced our carbon footprint as well as cost by procuring dirt elsewhere.”*

*– Ellen Cheng, Spokesperson, LADWP*



Silverlake and Ivanhoe Reservoirs still serve a purpose to the community, allowing recreational use and enjoyment, according to Cheng.

From the location chosen for the project, to the in-house design, to the landscaping and final construction that remains, careful thought went into each element of this project. The new reservoirs are sure to provide greater water security to a region that urgently needs it.

LADWP is not slowing down on improving the water infrastructure of Southern California. Between several water quality projects and reviving aging pipe and pipeline systems, LADWP has many exciting projects in the works from the San Fernando Valley to the Owens Valley.

This project not only modernizes the water infrastructure systems of the community, but it also gives back to the community. The project’s final phase will provide a recreational green space that the community can enjoy while the infrastructure works diligently to store water underneath. ●

**Julia Edinger** is the Acting Editor for American Infrastructure Magazine. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com).

▲ The team anticipates that the first three phases of the project will be complete in 2021; the fourth phase involves the landscaping to make the site functional.

◀ The closed reservoirs help to conserve water as it prevents loss due to evaporation, which was occurring with the previous reservoir system.







# A New Chapter for Affordable Housing

The Gateway at Willowbrook by Withee Malcolm pairs affordable housing with a public library to create a community for growth



By Julia Edinger

**W**ithee Malcolm has a long history of providing a unique touch to its developments, not only offering differentiated design, but as their mission statement says, “design that makes a difference.” The Gateway at Willowbrook may be the most obvious example of such a project, providing sustainable, affordable housing to people in the greater Los Angeles area.

What makes The Gateway at Willowbrook especially unparalleled in that sense is that

it marks the first occasion of a partnership between Los Angeles County and the private sector in order to provide housing and a library to the community.

## Reviving Willowbrook

This project took place in Willowbrook, an unincorporated community neighboring Los Angeles that is undergoing a major transformation. When the Martin Luther King Jr. Hospital and the Charles R. Drew University of Medicine and Science faced problems in 2007, the hospital was closed,

◀ The Gateway at Willowbrook marks the first occasion of a partnership between Los Angeles County and the private sector.





the university withdrew its accreditation under duress, and the 30-year-old library was far past its prime.

The community faced a great challenge. Members of the community lost access to the hospital, and in its place, gained a significant amount of negative media attention. Fortunately, Willowbrook is a community of resilient people, and it was the investment of people that helped turn it around.

In 2015, a new hospital opened. By 2018, the university regained accreditation. The Willowbrook/Rosa Parks Metro Station

underwent a \$109-million upgrade, expanding on its capacity and creating growth opportunities in the community. Still, the greatest opportunities for growth arguably come from the heart of The Gateway at Willowbrook: The Willowbrook Library.

#### **Gateway to Growth**

This mixed-use project has created enormous opportunities for residents of the Willowbrook community. The project was completed in February of 2018 and is fully occupied, providing 100 units of affordable

housing, paired with a public library. The building encompasses a representation of two foundational aspects of socioeconomic growth: housing and literacy.

According to a report published by the Pew Research Center, 95 percent of Americans (ages 16 and older) agree that the resources public libraries make available to members of a community play a significant role in giving everyone the chance to succeed. The same report elaborated that two thirds of those surveyed stated that their public library closing would affect them and their





▲ The project is LEED for Homes Gold Certified, meaning its energy performance goes above and beyond current standards.

▼ This community is unique as it offers many opportunities for both physical and intellectual growth.



families. This became a reality for the people in Willowbrook, but a public-private partnership helped to renew this community.

“The Gateway at Willowbrook is the epitome of what high-quality and affordable development and services can and should look like,” explained Mark Ridley-Thomas, Los Angeles County Supervisor.

Literacy has long been known to correlate with economic mobility, and public libraries provide greater access to literacy for members of the community.

between Los Angeles County and the building team, which consisted of Withee Malcolm Architects and Thomas Safran & Associates Development.

The \$44 million project has been in progress since 2016, and now offers a number of features and services to residents. The building offers residences to low-income seniors, reserving 22 units for formerly-homeless individuals. The library, however, creates a gathering space for members of the community of all ages.

The gathering space offers community activities,

*“The Gateway at Willowbrook is the epitome of what high-quality and affordable development and services can and should look like”*

*- Mark Ridley-Thomas, Los Angeles County Supervisor*

This particular library will offer reading areas, a workforce center, family areas, public-access computers and more. With modern art installations, literacy programs, and endless access to information at the click of a button, the library emphasizes the community's culture. This mixed-use project opens a door — a gateway — for disadvantaged members of the community.

#### **More Than Housing**

The project was completed through a joint effort

job posting, community news, and boundless access to information.

“The biggest challenge was to create an inviting public access to the project, in terms of both vehicular and pedestrian, while maintaining the security and privacy of the seniors who reside in the building,” explained Dan Withee, Founding Partner of Withee Malcolm Architects.

According to the project team, the architect and developer worked together to find a solution that would incorporate public and private functions





▲ The development includes spaces that encourage social gatherings, such as this shared lounge for residents.

without disrupting the residents' sense of security. Having separate parking and entrances for the public and for residents allows for a peaceable solution to some of the challenges that may arise with mixed-use living.

The building was designed to be visible from the 105 freeway as well as from Wilmington Avenue, designed to be a gateway to the city.

Another feature of the project that helps to improve the community at large is its energy efficiency. In addition to reducing the project's carbon footprint in the community, this helps to keep the cost of utilities down.

"This project was LEED for Homes Gold Certified," stated Mauricio Munoz, Withee Malcolm's Project Manager. "Energy performance exceeds Title 24 by over 15 percent."

The community gathering space is adjacent to the private gathering space on the first

floor, allowing for socialization or solitude. The project's amenities include gardens, an outdoor lounge, fire pit, and barbecue area, in addition to laundry and fitness facilities.

Los Angeles has a growing challenge with the lack of affordable housing, but projects like this one may be able to offer solutions. It can be the difference between simply building homes and offering "design that makes a difference." Investing in fundamental infrastructure and the members of the community is critical to effecting change. **RED**

**Julia Edinger** is the Editor for *Builder and Developer Magazine*. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com).

## PROJECT INFO

**LOCATION:** Willowbrook, CA

**ARCHITECT:** Withee Malcolm Architects

**DEVELOPER:** Thomas Safran & Associates

**SIZE:** .97 Acres  
7,721 sf Library  
1,218 sf Community Room

**UNITS:** 105

**DENSITY:** 107.8 du/acre

**GREEN CERTIFICATION:** LEED





# *Willowsford: A Community as Strong as its Roots*

*This master plan in Loudoun County, Virginia is all about growth and connection:  
to nature, to agriculture, and to each other*

**By Julia Edinger**





▲The homesites at Willowsford range from less than ¼ of an acre to up to eight acres in size. Photo Courtesy of Maxine Schnitzer.

**D**efined as an agrihood, the master-planned community of Willowsford is blending the boundaries between community and agriculture.

In the middle of Loudoun County, Willowsford's 4,000 acres of Virginia countryside serve a greater purpose than simply housing; the landscape itself is a part of this community. Drawing on the natural scenic landscape, with its wood-covered hills and

agricultural fields, Willowsford, rather than being a shelter from nature, seeks to engage residents with it.

The community was started with the vision of "inspired living" as a foundation for what Willowsford would become. The community's roots are deeply integrated into its design. According to Stacey Kessinger, Vice President of Marketing for Willowsford, "The architectural guidelines for Willowsford were

thoughtfully created to capture the rich, varied character and charm of Loudoun County, and were based on three historical categories: Formal, Arts and Crafts, and Picturesque." Using this design framework allowed for a "diversified and scenic streetscape in harmony with the natural landscape of Willowsford and rooted in the area's heritage."

The homesites at Willowsford range from less than ¼ of an acre to up to eight acres in





▲ Combining luxury amenities with an emphasis on agriculture makes Willowsford unique.



▲ The Sycamore House is one of the two community centers within Willowsford that provide a space for interaction and gathering.

size. Carefully selected building materials enhance the designs. This was one of the biggest challenges for the developer of Willowsford: persuading builders to change their philosophy and strategy. With higher standards of design guidelines, it was necessary for builders to utilize new products and high levels of finishes. Ultimately, this was a successful strategy and a challenge that improved Willowsford in the long run. “The market responded in favor of what was being offered, and this changed the building standard for our market today,” said Kessinger.

So, what exactly is an agrihood, and why does it set Willowsford apart from other communities? An agrihood is a way of integrating the traits and practices of agriculture into a community for a farm-to-table experience. In 2011, Willowsford introduced these ideas of locally grown produce and agrihood living; the Willowsford Conservancy and Farm are the heart of it. Including trails and nature walks, educational programs, fresh produce for sale, and more, the Conservancy makes up 2,000 acres of





▲ Willowsford homes are designed with an emphasis on connections to nature through indoor-outdoor living spaces.

*“Willowsford is the only community in this region that can offer this powerful and authentic [agricultural] experience to its residents.”*

*—Stacey Kessinger, Vice President of Marketing, Willowsford*

agricultural space; the farm occupies 300 acres of that space.

“Residents are encouraged to engage with the farmers and learn where their produce comes from and how it is grown,” said Kessinger. “Willowsford is the only community in this region that can offer this powerful and authentic experience to its residents.”

In addition to the high standards for the landscape, the homes at Willowsford are held to rigorous architectural standards. This includes specific criteria like architectural-grade shingles for roofs, classically designed and style-specific porches, garage doors not being permitted to face the street, and a masonry requirement for exterior-projecting fireplaces, in addition to a ban on vinyl siding.

These guidelines ensure uniformity and high standards in all of the builds.

The amenities at Willowsford are nearly endless. Outdoorsy residents can fill their time exploring the 2,000 acres of open space of Virginia’s countryside, hiking the 40+ miles of trails, fishing and kayaking on Willow Lake, and visiting the Willowsford Farm and Farm Stand. The more athletic residents will have options from the disc golf course to the sledding hill. Families may find they enjoy the resort-style pools and children’s pool, the culinary classes, or the outdoor amphitheater. Social gatherings are best held in one of the two community centers: the Lodge and the Sycamore House. Of course, there are many additional programs and events planned to

create connections between neighbors of all ages.

The four villages, The Grange, The Grant, The Grove, and The Greens all offer their own unique traits to residents but, in any of these portions of Willowsford, active, healthy lifestyles are encouraged. Each village offers single-family detached properties, but there are many builders working in this community to add their own touch and their own level of energy-efficient features into the homes.

Each of the villages is unique in its own right. The Grant features Grant Family Campground and a small farm area. The Grange also has a farm area, in addition to a community garden, a recreation area, and a dog park. The Grove has several parks



## PROJECT INFORMATION

**PROJECT NAME:** Willowsford

**LOCATION:** Loudoun County, Virginia

**TYPE OF PRODUCT :** Single Family Detached

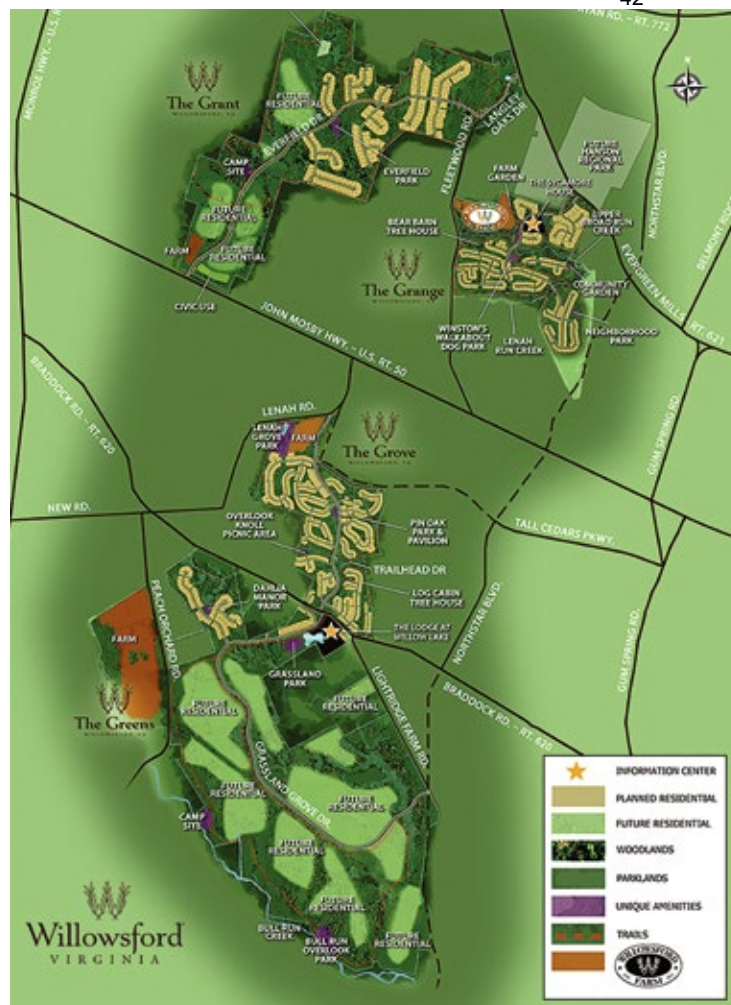
**# UNITS CURRENTLY BUILT:** Approximately 1,740 sales

**# UNITS AT BUILD OUT:** A little over 2,200+ once final build-out is complete

**# UNITS SOLD / OCCUPIED:** Approximately 1,565 settled homeowners to date

**BUILDER:** Over the years Willowsford has welcomed up to 11 builders, including NV Homes, K. Hovnanian Homes, Beazer Homes, Drees Homes, and Camberley Homes

**DEVELOPER:** Willowsford



and neighbors the Conservancy, as does The Greens. The Greens is also home to an archery range, as well as another campground in a wooded area. There are so many things and so many places to explore; the land at Willowsford will connect you – both to nature and to your neighbors.

The target buyer for a Willowsford home tends to be a move-up from the local markets: Loudoun and Fairfax. The Willowsford buyer is generally someone who is family oriented, career oriented, active, and healthy. The buyer is likely to be someone who appreciates the food and farm connection; they are likely to be passionate about sustainability and the environment.

The community is quickly approaching completion. It opened for sale in October 2011, less than 10 years ago. Willowsford expects to have full build out mid to third quarter next year, in 2020. At build out, Willowsford will have over 2,200 homes. Just over a year away from full build out, Willowsford already has about 1,565 settled homeowners.

The project will soon be coming to an end, but for residents of Willowsford, the

experience is just beginning. Families will come to learn about agriculture, practice healthy living, enjoy locally grown produce and artisan items, and understand the meaning of “inspired living.” **BD**

**Julia Edinger** is the Editorial Assistant for Builder and Developer Magazine. She may be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com).

*Photos Courtesy of Willowsford Community*



▲ The Lodge is a community center at Willowsford offering bocce courts, a pool complex, a recreation area, and mountain views.





# NEWLAND

## DEVELOPS A GREEN FUTURE

*Green Home Builder Magazine's Developer of the Year, Newland, builds on its reputation of delivering sustainable communities in 2019*



## Developer of the Year: Newland



▲ Newland, 2019's Developer of the Year, has worked on a number of sustainable communities in 2019, including Tehaleh, pictured here.

**By Julia Edinger**

Newland is closing another successful year as one of the nation's leading residential developers. Developing a number of groundbreaking communities, each with an emphasis on sustainability as an integral part of the design, Newland has continued its longstanding trajectory of creating inspired places. Taking into consideration the input of *Green Home Builder Magazine's* readers,

as well as the undeniable accomplishments of the company, the results were clear: Newland is *Green Home Builder Magazine's* Developer of the Year for 2019.

"We believe that sustainability is an evolving path, not a final destination," explained Ted Nelson, Chief Executive Officer for Newland. Nelson's view of what makes a Newland community so





*“I’m most proud of seeing families thrive well into the future. You know you’ve touched literally thousands of lives, and that we’ve made those lives better by building a more sustainable community.”*

*— Ted Nelson, CEO, Newland*

special is the way that it continues to grow after development has been completed. “Even after Newland has ceased operations, the communities continue to thrive and evolve, reflecting the fiscal and environmental sustainability principles that were instilled during the community’s envisioning. We create strategies that guide and propel more holistic planning and design that we use nationally and with our partners.”

#### **Newland’s National Sustainable Initiative**

The emphasis on sustainable design and development sets Newland communities

apart from the competition because of the comprehensive approach taken. Partnering with North America Sekisui House enabled Newland to develop yet another sustainable blueprint — this time, however, it would act as the framework to align Newland’s corporate values with the way they build communities.

“During the envisioning and planning stage of a community, Newland collaborates with a multi-disciplinary team — architects, town planners, market research specialists, local officials, internal team members, energy consultants, environmental engineers, biologist(s), brand agencies, and landscape

architects — to test ideas, research precedents, challenge regulatory hurdles, look at the broader context, and, ultimately, begin to craft the form and essence of the community,” Nelson explained. “We strive to maximize the benefit to future residents and the regional community.”

This comprehensive approach is intended to ensure the long-term growth opportunities of a newly developed community. According to Nelson, a community that provides continued value, offers services, and renews the landscapes that have been impacted by its development is a sustainable one.





► Creative designs throughout - from product offerings to land use - create a well-blended community, as seen here in Briar Chapel.

► A trademark of a Newland community is the emphasis on preserving and embracing natural spaces on the site.

► Newland's communities implement long-term sustainability efforts by educating consumers, as seen on these informational posts in Reed's Crossing.







▲ Thoughtful designs and a dedicated team allow Newland to create such distinct and enduring spaces.

Careful planning helps Newland to enforce these ideas in their work. Offering diverse designs throughout the community – from product offerings to land use – helps to create a well-blended community that will ultimately connect residents to each other as well as to their surrounding environment.

The key areas of focus for sustainability in community development for Newland are community, open space, water, energy, and connection.

“We believe that sustainability is an evolving path, not a final destination,” Nelson said.

### Developing Sustainable Communities Nationwide

Newland has successfully developed communities for widely varying markets across the country, and each takes a similar approach to conserve the land and culture of the region. Still, each community models sustainable development in a different way.

“Our sustainability mission and principles at Newland serve as a guide through the community creation process — from preserving acres of open space and planting native vegetation, to water conservation

strategies, and engaging the local community,” explained Bob McLeod, Newland’s Founder and Executive Chairman. “This is a key concern for the consumer and will continue to be integral in the future.”

Newland has been working on a number of impressive projects in 2019: Reed’s Crossing, Wendell Falls, Embrey Mill, Elyson, Riverlights, Tehaleh, and Estrella.

For example, the master-planned community of Briar Chapel in North Carolina, featured in *Builder and Developer* in July, was developed in a particularly unique way. Through a partnership with Chatham County at Southern Energy Management, Briar Chapel would include a green building standard for all homes. The National Green Building Standard Program guided the development in this community and ultimately led to over \$5.3 million in energy savings in the past decade.

Tehaleh, featured in the February issue of *Builder and Developer*, is a heavily wooded community in Washington that conserves water with its own wastewater treatment plant. Its development included repurposing soil and maximizing preservation, and the natural spaces enhance the community by encouraging

homeowners to spend time outdoors.

Reed’s Crossing, located in Hillsboro, Oregon, truly exemplifies the Newland vision of creating a flourishing community by providing affordable housing and outdoor STEAM classrooms, creating a community that fuels personal and economic growth.

Each community is unique but all are recognizable as Newland communities because of the enduring sense of place that they create through connection, preservation, and timeless appeal.

Newland has many accolades for the thoughtful design of these communities, but the lasting impact is the true source of pride. Said Nelson: “I’m most proud of seeing families thrive well into the future. You know you’ve touched literally thousands of lives, and that we’ve made those lives better by building a more sustainable community.”

To learn more, please visit [newlandco.com](https://newlandco.com). 🏡

*Julia Edinger is the Editor of Green Home Builder Magazine. She can be reached at [julia@builder.media](mailto:julia@builder.media).*



# Mitigation, Adaptation, and Resilience

**Builder.Media is proud to be a media partner of USGBC's 18th Annual Green Building Conference in Southern California**

By JULIA EDINGER



**E**ach year, green building and sustainability advocates come together in Southern California for USGBC's annual Municipal Green Building Conference & Expo (MGBCE). It is the largest gathering of industry leaders in the region, which addresses commercial and municipal building, residential building, transitioning to clean energy, and much more. USGBC's 18th Annual Municipal Green Building Conference & Expo provided climate change solutions for an era in which they are necessary.

## Key(note)s to Sustainability

Dr. Chuck Kutscher, PE, Fellow and Senior Research Associate at UC-Boulder, and Former Director of NREL Buildings and Thermal Sciences Center, made the opening keynote speech.

"The question here is, 'Is 2019 the year we make progress on climate change?'" Kutscher stated, speculating, "I'm optimistic."

In regards to the need for rapid and drastic change, Kutscher cited environmental extremes worldwide, from drought to flooding, while emphasizing the need to lower carbon emissions. Still, he is optimistic for a number of reasons: the number of candidates in the primaries running with climate change solutions as a part of their platform, the emergence of the green new deal resolution and the probability of similar proposals to come, and the growing movement of young people protesting and taking action.

A highlight of the day was having Christine Harada, President of i(x) investments, as a keynote speaker. Christine Harada formerly served as the Federal Chief Sustainability Officer for the Obama administration.

Harada made a strong argument for the need for "First Principles Thinking," a method of critically thinking about a problem. This strategy involves stripping the problem to its most fundamental

components and addressing those first, and then looking at the bigger picture to find solutions from there.

This method of critical thinking allows builders to first work through how any solutions will impact the design, and then ask broader questions about how it may affect the tenants, and even have more long-term impacts.

"You can make good money while doing good things," Harada stated in her speech. She acknowledged that this increased emphasis on sustainability, while necessary, may cause some discomfort throughout the transition. Harada encouraged embracing that discomfort as part of the evolving process.

Said Harada: "Our collective future depends on us exercising our innovation."

## Sustainability Sessions

The event included a host of experts who provided insight into the world of green building and clean energy. The topics varied widely, with the common denominator of sustainability. From the role of schools in green building, to strategies to implement in your own projects, to preparing for an unpredictable future, the sessions offered something for everyone in attendance.

Eric Corey Freed, RA, Sustainability Disruptor at Morrison Hershfield, was the afternoon's keynote speaker. He led a session titled "Building as a Conscious Act: Finding Opportunity in Health, Resiliency, and Community." The session provided an insightful and entertaining approach to the theme of the day.

"What I'm seeing is a world that desperately needs to be redesigned," said Freed, citing recent natural disasters, as well as projections for the near future.

Because those effects are now being witnessed firsthand, people are becoming more aware of the effects of climate change and the need for immediate action. Companies are facing legal repercussions for the adverse effects of their actions.

The solution involves drastic change, but according to Freed, it is a worthwhile investment. "What we now know is that fixing the problem is a lot cheaper than doing nothing."

He expressed the need for innovation in our solutions and our belief systems as a whole. He identified trees as a deployable technology for capturing and converting carbon. He also explained how cognitive biases can sometimes repress innovation. But conflicts can be opportunities for collaboration, as well, and Freed encourages industry leaders to create a plan for sustainability goals and stick to it.

"It's up to you to do this," he challenged attendees. "It's up to you to make a bold vision."

## Effecting Efficiency

MGBCE featured a number of exhibitors with sustainable solutions for professionals to use in the field, as well as resources for increased efficiency for the future. Between vertical planters for a new age of urban farming, resources for building to energy efficiency codes, and the latest in sustainable building materials, there were plenty of experts sharing their insights into green building.

The event was an opportunity to discuss every stage of sustainability, from policy to implementation in building. The green awards ceremony recognized leaders in LEED municipal building, municipal innovation, and policy.

While this environmental era that we are living in is far from normal, it is time to accept that it is the new abnormal. It is time to come together and share our strategies in combating these challenges for a sustainable and resilient future.

*Julia Edinger is the Editorial Assistant for Builder and Developer Magazine. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com)*



# Technology's Transformative Power

*In 2020, technology will transform infrastructure systems, making them more resilient and sustainable*

By Julia Edinger



**Julia Edinger** is the Editor for *American Infrastructure Magazine*. She can be reached at [julia@builder.media](mailto:julia@builder.media).

**T**he contributions of technology in the infrastructure industry have already proven to be transformative. Major shifts in the past year have occurred, not just in the way we talk about designing the infrastructure systems of tomorrow, but also in the way that we are building infrastructure systems today.

Since the emergence of the worldwide web, technology has advanced at an increasingly rapid pace. Technologies that were once no more than science fiction concepts can now be found in the average person's pocket or living room. Technology is rapidly changing the scope of what is possible. Such a dramatic shift is certain to shake things up in a major way, so let's break it down.

## Smart Sensor Technology

Sensor technology is especially transformative because it can benefit many different sectors within the world of infrastructure. From water, to transportation, to smart cities, sensor technology is one of the fundamental building blocks to upgrading our infrastructure systems for the modern world.

Last year, I had the opportunity to interview Lisa Beutler, Immediate Past-President of the American Water Resources Association and the Senior Principal overseeing Water at Stantec. According to Beutler, the sensor technologies provide real-time data that allow infrastructure professionals to model different variables, increasing efficiency with scheduling and prioritization. Drone technology can also help improve the accuracy of predictions.

While sensor technology plays a major role in the world of water management, it can also be used to monitor failures on a wide range of construction projects, like in the case of Michigan's Mackinac Bridge.

## Smarter Vehicles

One of the major changes we are seeing in terms of technology in the world of transportation is the way vehicles operate. With the exception of a few experimental projects, like solar roadways, the key shift is people driving electric vehicles — and someday, these electric vehicles may be driving themselves.

While electric vehicles are gaining ground in many countries, the US has been slow to pick up this trend. One reason may be the lack of EV charging stations, making long trips particularly unfeasible. Without proper EV infrastructure in place, the purchase of an electric car seems like an unreliable investment. However, there is high demand for smaller, less expensive electric vehicles. Hopefully the market will respond.

A certain type of vehicle that will need a complete overhaul of existing infrastructure systems also has the potential to increase

safety and convenience: the autonomous vehicle. Autonomous vehicles are already being tested on roads, but one concern is the way sensors may detect existing street markings that weren't designed for a driverless car.

There are already initiatives to improve vehicle efficiency. Some states have even implemented regulations and initiatives to help push the transition smoothly and quickly. Ohio, for example, has been testing new smart transportation technology on the 33 Smart Mobility Corridor, providing a foundation for future advancements in autonomous vehicle technology.

## Smarter Cities

The way we are designing cities and master-planned development projects is also shifting, as these new technologies reshape the planning period. To start, the infrastructure of a smart city goes far beyond the roads and bridges; it includes digital infrastructure: the sensors, artificial intelligence, smart technology in buildings and on traffic lights, and more.

Smart cities today mean something different than smart cities of the past, even 10 years ago. Now, artificial intelligence technology is much more readily available, and parts of our infrastructure networks are connected in ways we had not previously imagined possible.

A connected city has the potential to transform even the way that we define what infrastructure can be. Predictive weather technologies could set other systems in motion to mitigate the risks of storms. Smart technology can limit the use of lighting to the times when it is necessary. Drones can monitor traffic congestion and report on slowdowns.

**“A connected city has the potential to transform even the way that we define what infrastructure can be.”**

## The Technology of Nature

When thinking about technology, many think of computer-related technology, but technology encompasses the application of science to something to simplify a process or activity. In recent years, infrastructure professionals have realized that green infrastructure can unlock massive potential, from stormwater management to air quality.

It is time to look at the way we view technology, and the way we view infrastructure, with a new perspective. ●



# Sustainability in Infrastructure

*The natural environment offers opportunities for more sustainable systems in infrastructure*

By Julia Edinger



**Julia Edinger** is the Editor for *American Infrastructure Magazine*. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com)

**T**he world is changing at a rapid pace, and with it, the way that we define infrastructure. As technology advances, it is imperative that the systems Americans rely on advance, as well. From relying more heavily on clean energy sources to implementing predictive technology to make existing systems more resilient and efficient, it is a new era for infrastructure professionals.

## Resourcefulness in Renewables

The growing role of renewable energy as a fundamental part of the nation's infrastructure is undeniable. This year, the U.S. Energy Information Administration published a report predicting renewable energy, led by solar and wind, would be the fastest-growing electricity source this year and the next. While challenges still exist, this certainly seems to be the case.

A growing number of cities, counties, and states have made the commitment to transition to using 100 percent renewable energy before the year 2050. Of those, there are a number of cities that have fully transitioned to 100 percent renewable energy already — from Burlington, VT to Georgetown, TX.

With these monumental standards as a goal, the work can begin. With all of the work that has yet to be done to help facilitate the national transition, there must also be people willing and able to do the work. Jobs in renewable energy are booming. According to a Bloomberg analysis of the US Bureau of Labor Statistics' biennial employment projections, jobs in solar panel installation and wind turbine technical work are expected to grow at double the rate of any other occupations.

More leaders in the energy industry nationwide are seeking to utilize renewables, and the rate at which it is increasing is only expected to grow. While some uses of renewables are added features of a project, more and more projects are being dedicated specifically to advancing renewable energy capacity, such as creating wind and solar farms. These projects have the ability to revitalize a brownfield site in a way that gives back to the community it occupies.

As the world evolves, America must evolve with it; that evolution is powered by energy. Renewable energy provides a sustainable solution to make the nation's infrastructure more resilient and secure.

## Advanced Technology Advances Infrastructure

Technology continuously shapes the way people interact with the world around them, from shopping, to research, to infrastructure. Technology is constantly delivering new developments and making things possible that could only be imagined in the past.

With the technology that exists today, professionals can mon-

itor infrastructure remotely with things like sensor technology, drones, and data capture. These technologies can improve the efficiency of a wide variety of systems. Whether it is ensuring the pipeline is not carrying more water than necessary or preparing for a system failure before it occurs, there is a wide range of benefits to this type of data.

This information allows infrastructure professionals to better analyze the way they prioritize infrastructure projects, and they help reduce waste — both in cost and impact. Ultimately, the more information project leaders have access too, the more effectively they can make decisions.

Some of the new technology being implemented in cities across the country does not appear to be technology as one may traditionally imagine it. It is not necessarily a web-based app, but instead, could look like a simple garden bed to the untrained eye. Green infrastructure is a widely discussed topic in stormwater solutions as the extreme storms resulting from climate change continue to occur more frequently.

"Green infrastructure coupled with grey infrastructure is going to be helping and be a big part of the solution," explained Tom Kunitz, President of the Water Environment Federation. "But green infrastructure is not just a pile of grass. It's a living technology, and it needs to be properly designed, constructed, and maintained."

There are many environmental benefits to adding green infrastructure. It can be done on a small scale to combat new construc-

**As technology advances, it is imperative that the systems Americans rely on advance, as well.**

tion or to mitigate risks in a flood zone. Some cities, though, are implementing citywide green stormwater infrastructure programs in order to be more resilient. One such example is Philadelphia, which has implemented Green City, Clean Waters, resulting in economic and environmental benefits.

"This program keeps billions of gallons of runoff and combined sewer overflows out of our waterways over the course of a year, all by investing in sewer infrastructure and making our neighborhoods greener," stated Philadelphia Mayor Jim Kenney.

Between solar panels, drones, and rain gardens, the technology of the future is going to look and function differently than that of the past. Still, it all comes back to environment — impact, preservation, and protection. Industry leaders should take note of the technology nature provides. The environment is offering resources for the infrastructure of the future; take them. ●



# Taking the Nation by Storm

*"If you can't go through an obstacle, go around it. Water does." – Margaret Atwood*

By Julia Edinger



**Julia Edinger** is an Assistant Editor for *American Infrastructure* magazine. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com)

Recent months have brought a whirlwind of water struggles across the nation, but each challenge seems as unique as its region. Between storms and their subsequent flooding in the Midwest, hurricane recovery efforts taking place in the South and Southeast, and an affront of wildfires on the drought-ridden brush of the West, it seems that water needs are at the forefront of infrastructure conversations, and rightfully so.

While the recent natural disasters certainly signify the increasing effects of climate change, there are existing struggles with the state of water infrastructure that stem from longstanding funding shortfalls.

It is important to acknowledge that a lot of the infrastructure systems in America — specifically those in rural, low-income, and disadvantaged areas — are aging out of their utility. Because recent decades have seen an increase in both population size and severe weather, without seeing significant improvement or investment in advancing these systems to be capable of providing for present-day needs, the nation's water stability is lacking.

The most famous example, but far from an isolated incident, is the city of Flint, Michigan. The residents of this city fell victim to cost-cutting measures of elected officials of the state who wanted to save money by switching water sources. The plan was not carefully regulated, nor was adequate testing done, and many residents were poisoned with lead. After years without a solution, the city was forced to declare a state of emergency. Several additional years would pass before a plan was set in motion to solve the problem. The city will have to do extensive checks to verify that every pipe is safe and secure. While the headlines have begun addressing Flint's problem as a solved one, many Flint residents would disagree.

Lisa Beutler, President of the American Water Resources Association, addressed the prominence of this problem across rural America in an interview with *American Infrastructure Magazine*.

"There are a lot of small, rural communities throughout the country without access to good, safe water," explained Beutler. "We've got to figure out how to get people on adequate systems and connected in ways that meet all the necessary health requirements."

However, there are also many exciting new technologies that are allowing water infrastructure professionals to address these challenges in an entirely new way. The transfer of real-time data allows decisions to be made more efficiently in order to preserve and enhance our water systems based on their actual usage and weather predictions.

These new uses of technology in the infrastructure industry are likely to have a ripple effect, leading to an enhancement of the

water-savings and water-efficiency features in existing systems. Ultimately, more efficient water systems will allow for less waste, more savings, and a cleaner environment.

Still, weather predictions cannot be made without a plan for climate, which is defined as the patterns of weather over a long period of time. In the past, many have viewed these effects as a threat isolated to coastal regions, but now many people living in the Midwest are seeing these effects washing up to their front doors.

Extreme flooding has caused three billion dollars in damage to homes, land, and infrastructure, according to reports of state officials. Missouri Governor, Mike Parson, declared a state of emergency for immediate aid. Members of the Oglala Sioux tribe were stranded due to a flood crisis. The past few months have required assistance from government officials, military officials, and government agencies like the Federal Emergency Management Agency. Families in communities across this region are fighting to keep their heads above water — no pun intended.

"Failure in these matters could lead to far more catastrophic consequences than just time wasted in a commute that is longer than necessary," former Massachusetts Governor, Bill Weld, stated in his column on page 32, in regards to the urgency of investing in water infrastructure. Across the aisle, Minnesota Senator, Amy Klobuchar, has proposed a trillion-dollar infrastructure plan.

Fortunately, infrastructure investment is a bipartisan goal. It is

**It is important to acknowledge that a lot of the infrastructure systems in America — specifically those in rural, low-income, and disadvantaged areas — are aging out of their utility.**

a goal that will likely be at the forefront of the platforms of the 2020 presidential candidates as debate season begins. There have already been great strides with the Green New Deal resolution; expect many of the 2020 candidates to propose a similar comprehensive reform policy that addresses shortfalls in infrastructure, energy, and climate resilience.

Precipitation comes in many forms, and each poses unique threats to an aging infrastructure system. Those threats can be prepared for by implementing disaster-resilient infrastructure and sustainable funding solutions for continued investment. If the nation's treatment systems are being used to their full potential, more precipitation can be stored, treated, and redistributed.

Water security is a right; it is time for investment. ●



# Revitalized Foundation for Greatness

*The State of the Union address called for greatness; that must include a plan for infrastructure*

By Julia Edinger



**Julia Edinger** is the Assistant Editor for *American Infrastructure* magazine. She may be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com).

We are only a few months into the new year, but the road to revitalized infrastructure seems paved with potholes and legislative obstacles. Still, there are many exciting advancements that can be expected in the near future, achieved through bipartisan compromise.

It is expected that upcoming infrastructure projects will be placing an added emphasis on new technology integration. It is also likely that, within the coming months, we will see multiple plans proposed to help the nation ensure its sustainability in alignment with international climate goals and standards.

During the State of the Union (SOTU) address, the president called for both parties to unite to rebuild America's crumbling infrastructure.

A \$1.5 trillion infrastructure plan was proposed in February 2018, and although it was delayed, it is likely that a divided congress will try to push forward a similar plan – primarily including transportation infrastructure revitalization – this year.

However, the overarching theme of the SOTU address was the message of greatness. America should be striving for greatness: striving not just to improve infrastructure, but to be a leader in infrastructure and clean energy.

Congressman and Chairman of the House Transportation and

priority military construction, and endanger communities. Kaptur emphasized, "We cannot allow the President to steal funds from the Army Corps of Engineers intended for urgently-needed civil works projects."

Congress has other plans for infrastructure, taking strides to put forth a comprehensive bill to combat climate change. Senator Edward J. Markey and Representative Alexandria Ocasio-Cortez introduced a Green New Deal resolution in February, which would create millions of jobs, address climate change, and stimulate the economy.

The plan is likely to be adjusted and improved as it moves through the legislative process, but senators are already voicing their support. Republicans are likely to support a plan like this based on job growth in the renewable energy sector and the stimulation to the economy, so there are opportunities for bipartisan support moving forward.

While there has already been much divide on this resolution, it is critical to find the unity that was called for in the SOTU address. If Congress can come together on a complex plan like this, there will be massive improvements to the nation's aging infrastructure, economic productivity, and ultimately, the transition to a cleaner, more secure energy system.

Congress members have not yet come to an agreement on this particular issue. However, there is still immense support for an infrastructure plan from both sides of the aisle.

Society is always moving forward at a rapid pace, and there are many new

**"Any serious infrastructure proposal must provide sustainable, long-term federal funding so we can make these necessary investments, create millions of living-wage American jobs, increase economic growth, and decrease congestion and emissions." – Congressman Peter DeFazio**

Infrastructure Committee, Peter DeFazio, shared his concern over the depleting Highway Trust Fund.

"Any serious infrastructure proposal must provide sustainable, long-term federal funding so we can make these necessary investments, create millions of living-wage American jobs, increase economic growth, and decrease congestion and emissions," said DeFazio.

However, while funding is absolutely crucial, the recent government shutdown and the declaration of a national emergency over funding for a wall have left many officials questioning the prioritization of these needs over long overdue infrastructure projects.

Congresswoman Marcy Kaptur, Chair of the House Appropriations Subcommittee on Energy and Water Development, stated that declaring a national emergency over a wall would hurt the readiness of military troops, delay high-

technologies becoming available that are likely to transform the infrastructure industry. Between drones and augmented reality providing increased photography and visibility opportunities, the emergence of autonomous vehicles, and the endless possibilities that 3D printing enables, one can only speculate what the infrastructure industry will look like five years from now.

In the next year, there will likely be many more advancements in technology and legislation that will help move this nation to become more sustainable and more efficient than it is in its current state. However, we need strong leadership and a carefully designed plan that encompasses more of America's infrastructure than roads and bridges.

Through revolutionary clean energy plans, an emphasis on job creation in the renewable sector, and a sustainable funding plan for revitalizing the aging foundations of this country, the state of infrastructure could soon be better than it has ever been before. ●



# Plans for Infrastructure in 2019

*With new leadership and a shift in attitudes, much-needed change may be in store for infrastructure*

By Julia Edinger



**Julia Edinger** is the Editorial Assistant for *American Infrastructure Magazine*. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com)

It is likely no surprise to many of our readers that America's infrastructure needs substantial improvement, and soon. Most of the necessary improvements are long overdue and heavily underfunded. We need major change in 2019 to bring America's infrastructure grade up from its current D+ rating from the American Society of Civil Engineers. However, there have also been some major changes in America's leadership, as well as in the mindset of voters, which could lead to the improvements we need.

For the average American, aging infrastructure can make something as simple as driving to work an inconvenience, or even a safety hazard. This is one reason that the state of transportation is often the first concern for individuals — and voters — when thinking of necessary infrastructure improvements.

Revitalization of transportation infrastructure is a bipartisan issue; in fact, it is one of the key platforms of politicians on both sides of the aisle. According to the Brookings Institution, most candidates on both sides of the aisle are speaking about the importance of transportation infrastructure. Democratic candidates, however, were found to be more likely to focus, additionally, on water and energy issues. With the common ground of supporting infrastructure improvements, ideally, politicians will be able to move forward on these issues and make tangible progress.

The difference is in the details, but it is not a cause for divide. Republicans are looking to make improvements in our infrastructure that are drastic and immediate; Democrats are looking to make improvements that are sustainable and carefully planned. Conversations must take place in order to find a way to improve infrastructure in the near future without having a dramatic, negative consequence on the environment. This is an opportune time for voters and policy makers on both sides of the aisle to come together for change.

We cannot talk about our infrastructure's future without mentioning the impending effects of climate change. Rising sea levels and temperatures threaten our infrastructure. It is necessary that our infrastructure improvements be enacted in a way that is sustainable against these threats. Although, unfortunately, enforcing that improvements are made with climate change in mind may mean delays in long-overdue progress, it is critical to recognize these delays as a necessity.

With cities all over the east coast still looking for a stormwater management solution from tropical storms, California facing the consequences of the wildfires, and Alaska's earthquake doing

significant damage to the state's infrastructure, it is apparent why we need strict and thorough regulations when it comes to building new infrastructure. It is also clear that the environment should be viewed as a factor in the designing and building of infrastructure projects in a more comprehensive way than it has been in the past.

Many elected officials have used infrastructure revitalization as a key platform in their campaigns. Still, it often feels that it is just being used as a campaign tool, and the lack of significant progress is discouraging for those who are truly working to improve our infrastructure's state.

Still, the outlook is positive. The 2018 election brought many new people into office, such as Janet Mills, Maine's newest elected governor, who has already released a detailed economic plan that seeks to improve the nation's infrastructure, especially in terms of transportation and the environment. Other prominent leaders have also proven their commitment to infrastructure revitalization, such as Representative Peter DeFazio who proposed a plan that involves \$500 billion in funding through bonds and fuel tax revenue. The hope is that the House could approve legislation for infrastructure revitalization in the first half of 2019.

Big conversations are likely to take place this year, and hopefully policymakers can put aside their differences to come together

**Conversations must take place in order to find a way to improve infrastructure in the near future without having a dramatic, negative consequence on the environment. This is an opportune time for voters and policy makers on both sides of the aisle to come together for change.**

on these issues. Voters are hopeful that in 2019 they will be able to see the change they were promised — including the \$1.5 trillion infrastructure plan promised during the 2016 presidential campaign.

In addition to revitalizing the existing infrastructure, it is important to start making the change to renewable energy. While the initial costs of such a conversion do seem high, it would create jobs, improve the environment, and drastically improve our economy long-term.

As 2019 begins, the outlook is positive that we will see some tangible plans and funding for infrastructure revitalization. However, in order for this to happen, we need to come together on a concrete plan that includes shifting environmental needs with comprehensive and tangible funding to accompany it. ●



# Wellness Within: A Healthier Built Environment

Wellness Within Your Walls provides a blueprint for designing a home with wellness as the focal point

By JULIA EDINGER

**W**ellness is defined as “the state of being in good health, especially as an actively pursued goal.”

By this definition, wellness is something that should be continually aspired to, constantly increasing the standard for what qualifies as being well.

Jillian Pritchard Cooke, founder of Wellness Within Your Walls, became an expert on eco-friendly design with her groundbreaking work on EcoManor, the first LEED Gold-certified home in the U.S., as the head of her interior design firm, DES-SYN. It was this journey in design, and the subsequent cancer diagnosis thought to have been caused by environmental factors that resulted from it, which led her to analyze the standard by which we deem homes acceptable. This led to the creation of *Wellness Within Your Walls* (WWYW).

Cooke began to examine and understand the contaminants found in building products, materials, and furnishings – including paints, stains, sealants, engineered wood, and textiles

– and other often overlooked features of a home’s interior environment. According to the Environmental Protection Agency, the average American spends 93 percent of their lifetime inside of buildings. Of these buildings, the home is often the only place that one can customize; should that home not be the healthiest place to spend a majority of your life?

The WWYW Healthy Living System has helped homes to be healthier through a 10-step approach towards wellness, focusing on the following: clean air, clean water, natural light, chemical control, physical wellness, conscious consumption, mental wellness, spiritual wellness, food science, and behavioral strategies. Builders use WWYW’s three categories (Natural, Sustainable, and Responsible) to implement the Healthy Living System in the design and specification of products and materials to adhere to this approach.

“For every step the building industry has taken as it relates to efficiencies, we’ve been shadowing with the conversation of contami-

nants,” Cooke explained.

Increased energy efficiency is vital, but it cannot stand on its own without a focus on how this is affecting occupants of the homes being built. Tight Box Syndrome, for example, can occur as a result of designing extremely efficient homes. It is necessary to include a proper ventilation system and healthy materials, which is a key focus for the WWYW team.

The results have been studied by WWYW through a number of case study homes that Cooke’s team has been working on across the country. Unsurprisingly, the building challenges vary based on region, but Cooke has found that it often requires educating homeowners on their behaviors as much as it does educating builders on the materials they should use. WWYW has commenced a Pilot Home Program, implementing WWYW’s standards and Healthy Living System.

## Castle Homes: Nashville, TN Pilot Home

Mid-Tennessee is going through a building boom right now, but sustainability regulations still remain lenient. Those who have lived in this region may remember the tradition of sitting around a standard wood-burning fireplace as a family. However, harmful contaminants in wood-burning fireplaces may pose a dilemma for a wellness-focused builder.

“Rather than omitting this committed builder from the Wellness Within Your Walls program, we made the decision to educate the builder and design team and architect on how to responsibly handle working fireplaces,” Cooke stated of her solution.

Working with the team and using open dialogue can increase the number of detection devices installed around the fireplace. The dialogue can also inform the homeowner of the importance of using the fireplace in moderation or omitting it completely, if the homeowner suffers from lung irritation.

This was an interesting contrast to the previous case study and pilot home in California, where wood-burning fireplaces are much less common. Still, rather than telling builders that



▲ WWYW provides a guiding blueprint for a healthier and more holistic home.



*“For every step the building industry has taken as it relates to efficiencies, we’ve been shadowing with the conversation of contaminants.”*

*— Jillian Pritchard Cooke*



wellness and wood-burning fireplaces cannot coexist, she considered alternative solutions.

“With our pilot program, we are letting in some of these question marks,” she explained. “We believe if we start on the pilot program by having a responsible dialogue, it will open up more opportunity for technology to detect unwanted combustible gases.”

These decisions help to further the wellness conversation, as well as the conscious decisions of individuals. Doing everything possible to reduce toxins, and then carefully managing something like a wood-burning fireplace with detection and moderation can help achieve a balance between tradition and wellness.

#### **ABC Green Home 4.0: Crestline, CA Case Study and Pilot Home**

The latest ABC Green Home project is being built in the San Bernardino Mountains just south of Lake Arrowhead. The high altitude challenged the creativity of the team, as the

area’s temperatures can fluctuate dramatically.

Having received an Award of Merit from the Pacific Coast Builders Conference’s Gold Nugget® Awards in the category of “Best Innovative Energy Design,” there is no question that this home is efficient. One thing that sets it apart from the other merit honorees is the intrinsic focus on wellness throughout the design and build of the home, which facilitated it receiving a second Award of Merit for “Innovative Housing Design.”

Builder.Media and WWYW worked throughout the planning process of the ABC Green Home 4.0 to ensure the incorporation of the Healthy Living System. Implementing this 10-step approach ensured that the best practices in green building would be paired with the best practices in holistic design.

#### **Lessons Learned**

WWYW’s case study homes are in a number of locations, from California to Florida — even

England. As WWYW gains traction worldwide, region will not be the only factor that changes between projects. Whether it is adjusting to a region’s culture, behaviors, and attitudes; or whether it is the elevation, climate, and temperature, having a guideline can help ensure the health of the build.

Builders and homeowners alike are inquiring about their home’s health through tools like the Hayward™ Score. Bill Hayward of Hayward Lumber is working on the next WWYW pilot home for his family in Pebble Beach, California.

The WWYW program provides a design guideline for the building industry with wellness at the heart of it. This is the way that we make the built environment healthier — no matter where you are building. **BDM**

**Julia Edinger** is an Assistant Editor for *Builder and Developer Magazine*. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com).



▲ A wood-burning fireplace and a healthy home can coexist with a guiding program like WWYW to educate builders and buyers alike.



# Building Wellness in the Home

The industry's increasing focus on wellness is leading to healthier home environments

By JULIA EDINGER

**T**he green building industry is evolving rapidly. Following closely behind, the building industry as a whole is advancing to include the green building movement. It seems that, each day, leaders are producing more innovative solutions for the built environment.

## An Evolving Standard

While individual states are still leading the charge on energy codes for building efficiently, the nation is following these trends – albeit, at a slower rate.

California, for example, has been a pioneer of environmentally conscious energy regulations, continually expanding and improving. Title 24 building regulations are updated each year to further the transition towards a net zero future, in which buildings generate as much energy as – or

from the built environment in the near future.

## Designing for the Environment

One of the most important elements of wellness is having clean air to breathe. Designs with seamless transitions between indoor and outdoor living spaces help to build this connection. These spaces are being added to homes of varying styles as they have many benefits. In addition to the high demand for this type of layout, and the improvement of air quality due to natural air, these spaces can be sustainable, too.

“The environmental benefits we see include less saltwater runoff, less erosion, and an outdoor living space that can help reduce the cost of heating and electricity within a home,” states Peter Rotelle, President of Rotell(e) Development Company and Studio(e).


Thoughtful design can allow for these added

A home's wellness depends on the builder creating properly ventilated spaces with maximized natural light and clean air. It also depends on the education of the homebuyer or occupant who will need to consciously think about how things like cooking appliances could negatively affect their home's health – and in turn, their own health.

“We've spent the past 20 years focusing on creating these really energy-efficient homes, and now we're spending 90 percent of our time in these buildings,” explained Jennifer Berthelot, President and CEO of A SustainAble Production. She has been involved in the wellness movement since the first version of the WELL building standard's creation, and has witnessed the shift to more efficient buildings' effect on the wellness movement. “They're airtight and energy-efficient, but they're also full of toxins that are not healthy for us...I think people are realizing that buildings can be used as preventative care.”

Leaders of this movement have been implementing solutions to educate homebuilders and homebuyers alike on the benefits of having a healthy home. Sometimes this involves behavioral changes, so education is critical to improvement.

Wellness is likely to be a topic of conversation among building experts and industry leaders as the building regulations and energy goals in other states follow those that have been enacted in California. It is important that with these increasingly efficient homes, builders are able to ensure the health inside of the homes.

Educate buyers and builders on the importance of these factors and the savings that will follow. Give them the information on the risks of ingesting contaminants in an unhealthy home. Inform designers and architects that a tighter envelope requires stronger ventilation. Education is the key to wellness. 

**While the codes guide builders and developers to implement energy-saving features, initiatives implemented by green building advocates help to further those standards.**

more energy than – they use.

“The most visual change to new homes will be that new single-family and low-rise residential buildings (three stories or less) will require a solar photovoltaic system,” explained J. Andrew McAllister, Lead Commissioner for Energy Efficiency at the California Energy Commission.

While the codes guide builders and developers to implement energy-saving features, initiatives implemented by green building advocates help to further those standards. For example, the United States Green Building Council's Los Angeles division has launched the Net Zero Accelerator program. This program helps with the existing divide between the ambitious net zero building goals and current technologies available.

With ever-evolving green building standards, industry leaders can reasonably expect this trend to spread across the national market in only a matter of time. Homebuyers can expect to see solar panels, savings, and a smaller carbon footprint

environmental benefits of outdoor living spaces. It also protects a home's indoor spaces from Tight Box Syndrome, in which an extremely efficient home with a tight building envelope suffers from lack of proper ventilation. A balance must be found.

“A critical idea to remember when creating an indoor-outdoor living space is that even though we want the space to flow into or out of one another, we need to make sure that these two spaces still have clear boundaries,” explains Jessie Kim, a third generation Feng Shui consultant. “Make sure you can close the doors and the curtains when appropriate to keep the energy inside your home.”

## Holistic Wellness Approach

High energy efficiency is no longer a feature for a niche market, but rather, it is quickly becoming the standard by which all builders and developers will construct homes. The emerging trend today is the focus on wellness as an important aspect of the home.



**Julia Edinger** is the Assistant Editor for *Green Home Builder Magazine*. She can be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com).



# Resolutions to Build Green in 2019

Industry leaders see “la vie en rose” as building efforts become more green

By JULIA EDINGER

A new year always signals a time to reflect on progress and plans for the future. It is the season of New Year’s resolutions and, as an industry, it is more important than ever that builders resolve to go green this year.

Startling, evidence-backed research has surfaced in the past year that informs of the encroaching dangers of climate change. In October, a report released by the UN Intergovernmental Panel on Climate Change stressed the urgency of taking action to combat climate change. The report emphasizes that, without major and immediate changes, the disastrous climate consequences will be irreversible.

While many human behaviors influence climate change, the built environment is

Title 24. This year, the California Energy Commission will develop the update for its Energy Commission’s 2030 Energy Efficiency Action Plan. According to Commissioner Andrew McAllister, “This plan will be the state’s primary road map for energy efficiency for the coming decade.” It is likely, and would be in the nation’s benefit, if a similar set of federally mandated standards is implemented in the near future.

This year’s updated energy-efficiency standards for California builders mandate solar photovoltaic systems for new homes, and new thermal envelope, ventilation, and lighting standards. Builders in California have successfully incorporated these building standards into their design strategies despite initial challenges with the transition.

**It is likely, and would be in the nation’s benefit, if a similar set of federally mandated [energy efficiency] standards is implemented in the near future.**

inevitably one of the largest factors. From infrastructure to skyscrapers, it is clear that these things shape the state of the environment. According to Stacy Sinclair of USGBC, buildings presently account for around 40 percent of energy consumption in the United States. However, change is on its way.

In November 2018, builders gathered in Chicago for the internationally renowned Greenbuild conference. This November, builders will gather again in Atlanta. At conferences like this, builders can learn strategies from experts in the industry for building sustainable homes. Through extensive dialogue and debate, new solutions will be reached, setting the stage for new approaches to be effected.

This year is slated to be transformative for the industry. California is taking large strides to increase green building efforts through

Other states are recognizing the importance of these changes. A number of states have considered legislation requiring new buildings to be solar-ready. Some places mandate energy-efficiency features or provide incentives to encourage them. However, California is the first state to require solar panels for all new homes, which is a big turning point for the industry. Many experts anticipate that these standards will progressively transition to being the norm.


According to Dan Rendler, Director of Customer Programs and Assistance for SoCalGas, “Public policy can encourage people to reduce their personal carbon footprint, but preserving choice, providing options, and minimizing disruption to people’s daily lives are all important strategies to inspire rapid consumer adoption.” This important distinction emphasizes that a carbon footprint reduction is possible, but that it should be executed in a

way that does not excessively impose on the consumer’s individual freedoms.

Smart home technology is one of the ways builders can allow residents to maintain their choice while increasing their home’s energy efficiency. It is through deliberate design choices like this that builders who have not yet begun the transition to green building can do so without imposing on homebuyers. Smart home technology provides options for users that can improve their daily lives; it simultaneously reduces negative consequences to the environment.

According to a study published in the journal Nature Communications, immediate fossil fuel phase-out could limit warming to keep it under 1.5°C, while waiting until 2030 cuts those odds in half, from 66 percent to 33 percent. The evidence is straightforward; the consequences of not making a transition to sustainability will be manifested through floods, drought, heat waves, and poverty. Attempts to combat these rising temperatures, however, could have a drastically more significant, positive effect on climate than many industry leaders may have initially believed.

With great research comes great responsibility. In light of the knowledge that has surfaced in the last year, builders have an obligation to their buyers – and to society – to build in a way that does not threaten the state of the environment. Through careful design, integration of new technologies, and new building standard policies that move towards net-zero buildings, a greener future is possible

in 2019. Resolve to make it happen. 



**Julia Edinger** is the Editorial Assistant of Green Home Builder Magazine. She may be reached at [julia@penpubinc.com](mailto:julia@penpubinc.com)