

Project

Page

- Reconstruction of Oregon Avenue NW; Washington DC, USA **2**
- San Diego International Airport Terminal 2 Parking Plaza, USA **12**
- Lacombe Main Street Program, Alberta, Canada. **23**
- Salt Lake City Water Reclamation Facility, Utah, USA **34**
- Gordie Howe International Bridge, Ontario, Canada – Michigan, USA **42**
- Ship Canal Water Quality Project (SCWQP), Washington, USA **50**
- Southport Levee Improvement, California, USA. **54**

International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	Reconstruction of Oregon Avenue NW; Washington DC		
Country:	United States	Sector:	Transportation Infrastructure
Dates of the project:	2012 to Present	Stage of the project:	Under Construction

Description of the project:

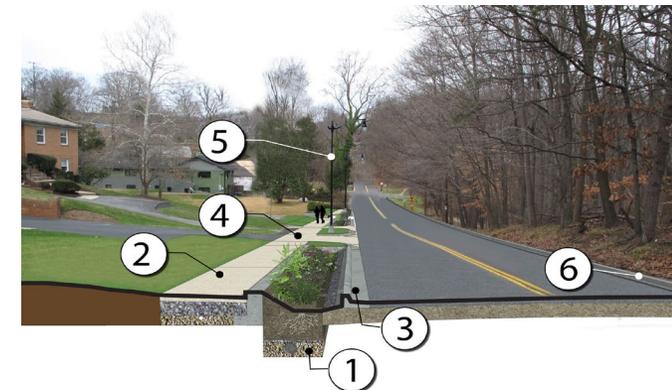
Oregon Avenue, between Military Road to Western Avenue, is a 1.75-mile urban collector roadway adjacent to Rock Creek Park. This rustic parkland/woodland setting in the midst of an urban area makes Oregon Avenue a unique roadway creating a pleasant experience for commuters and a valuable asset for the community. However, the Oregon Avenue Environmental Assessment, completed in 2012, identified many existing conditions that pose significant transportation deficiencies: deteriorating pavements; substandard roadway geometry; inconsistent roadway width; inadequate stormwater drainage; deficient structures, lighting, and transit facilities; poor sight distance; and a lack of pedestrian facilities.

The District Department of Transportation tasked Volkert, Inc. to develop a design that reconstructs the roadway as a comprehensive effort resolving transportation, community, and natural system issues as part of one design project. The design process followed a Context Sensitive Solutions approach that uses sensitive materials and practices, and either preserves or enhances the landscape by incorporating aesthetic treatments that are in context with the surroundings, such as the a new bridge over Pinehurst Run, retaining walls, a new sidewalk along the west side of the roadway, and stormwater and reforestation plantings.

These efforts were rewarded by the Institute of Sustainable Infrastructure with an Envision Silver Award in 2018.



Before and After: 1. Bioretention Cell, 2. Sidewalk, 3. Curb and Gutter, 4. Driveway, 5. Lighting, 6. Curb and Gutter.



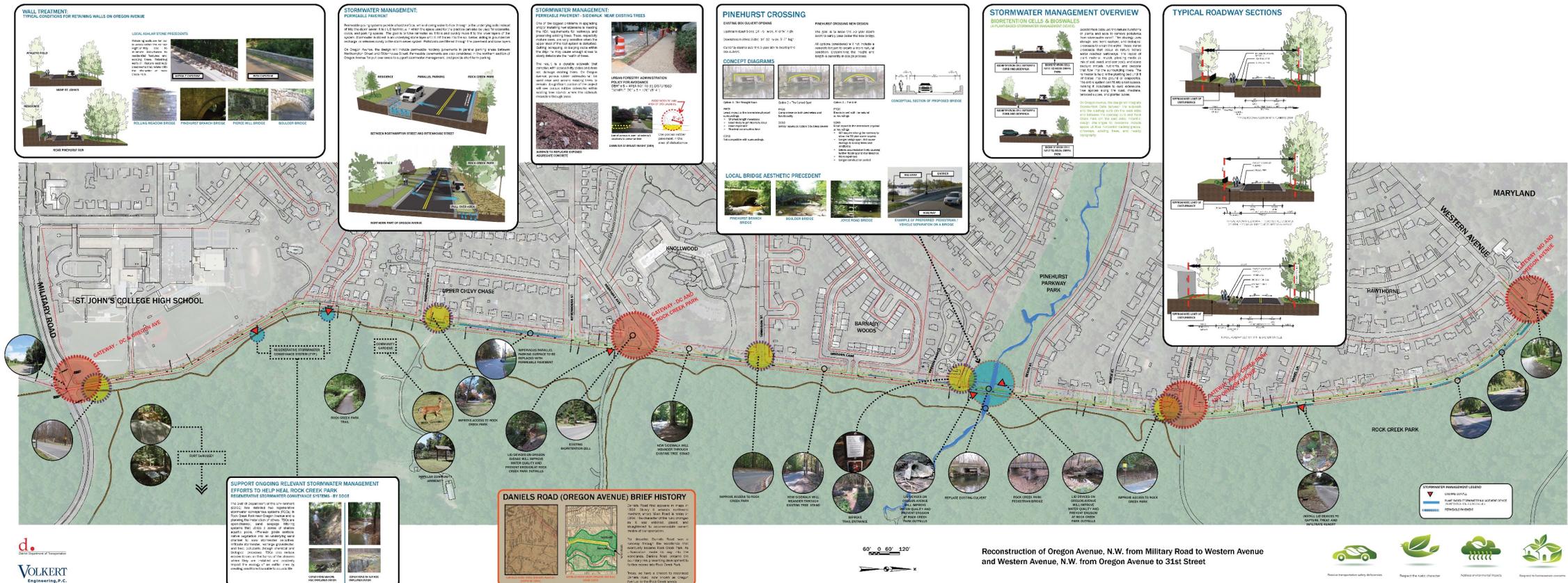
International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	Reconstruction of Oregon Avenue NW; Washington DC		
Country:	United States	Sector:	Transportation Infrastructure
Dates of the project:	2012 to Present	Stage of the project:	Under Construction





Defining overall project goals by involving stakeholders (People-First Outcome 5)

In order to make significant changes to the corridor, the District Department of Transportation (DDOT) completed an Impact Final Environmental Assessment (EA) which defined various social and environmental goals for the project:

- Create a safe facility for all users of the roadway
- Effectively manage stormwater runoff
- Avoid/minimize use of parkland by staying within the DDOT right-of-way to the extent possible
- Preserve and protect environmental resources – both man-made and natural – and retain the current context of the corridor
- Provide improved access to Rock Creek Park
- Utilize environmentally sensitive materials and practices
- Provide a new bridge over Pinehurst Run allowing for the fifty-year storm to pass safely while limiting disturbance to the surrounding parkland. The previous bridge would frequently overtop causing flooding and damage to infrastructure and the parkland.

The public outreach process conducted during the EA raised community concerns regarding changes to the character of the corridor and identified support for the following issues:

- Involving the entire community in the planning phase
- Maintaining the existing street footprint and road curves that mitigate speeding
- Keeping the natural topography and geometry of the street
- Having natural looking surface walking trails on pedestrian areas
- Leaving mature trees in place
- Keep similar kind of lighting
- Rehabilitating the road to avoid hill cutting and retaining walls
- Linking trails so street widening is not necessary
- Addressing stormwater concerns with a targeted plan
- Maintaining the integrity of Rock Creek Park
- Planning that implements measures for street maintenance in the future



Walkthroughs with concerned residents helped foster environmental awareness and advocacy for sustainable stormwater management processes



The Design Phase addressed all the issue mentioned above through a collaborative process including the use of an interactive project website, face to face meetings with stakeholders, site walks, public meetings, and coordination with other agencies. Besides meeting with residents, the team engaged with the following stakeholders who also had related projects in the planning phases, were recently constructed, or are currently underway.

- National Park Service (NPS)
- Department of Environment and Energy (DOEE)
- St. John's College High School – Collaborate in placing the new sidewalk on a permanent easement, rather than disturbing the appearance of Rock Creek Park
- DC Water – Coordination with Oregon Avenue Water and Sanitary Sewer Replacement Project. Construction of the roadway project is phased into three segments to minimize disruption for residents and commuters
- International Dark Sky Association (IDA) – Initiative to improve neighborhood lighting along sidewalks, roadways, and alleys throughout the District of Columbia
- Commission of Fine Arts (CFA)

Rock Creek Park is a large urban park that bisects the Northwest quadrant of Washington DC. Part of the huge park is located on the entire east side of Oregon Avenue for a 1.75-mile stretch. The park was created by an Act of Congress in 1890 and is administered by the National Park Service. The 1,754-acre parkland connects multiple cultural institutions in the Northwest quadrant of DC. The network of trails and roadways provides access and connectivity for leisure and for commuting. The park presents valuable qualitative experiences for visitors and residents and has a significant impact in attracting a well-educated workforce to the area. Properties adjacent to the park or within its vicinity consistently increase or maintain their value partly because of the proximity to the park. Businesses and educational institutions promote their proximity to the park as an added value to gain client's interests. Commuters often choose to use the park's roadway system because of its scenic values. The environmental, social, and cultural benefits the park offers are unmeasurable, thus improvements to Oregon Avenue had to be compatible with the preservation of the Rock Creek Park character.



People-First Outcome 3: Improve economic effectiveness and sustainability

The design process included an extensive stakeholder engagement process that led to coordination, collaboration, and buy-in from internal stakeholder in charge of design approvals and regulatory permits; as well as external stakeholder interested civic groups, elected officials, and the public at-large. Future infrastructure projects will benefit from the design process and outcomes achieved for the Reconstruction of Oregon Avenue including innovative solutions such as:

- Collecting close to the 1" storm for the entire 1.75-mile project area with green infrastructure, exceeding expectations of simply following the Maximum Extend Practical (MEP) process. This effort helps resolve erosion problems at the seven outfalls within Rock Creek Park and water quality of its tributaries.
- Replacing High Pressure Sodium lighting with LED lighting for the entire corridor – achieving close to 60% energy conservation. In response to the community's concerns of the DDOT standard 4000k (white) light, DDOT installed demonstration projects along the corridor to test several alternative fixtures. Through this process, a LED fixture with less than 3000k (amber) light was selected. DDOT is now considering LED lights less than 3000k as standard lights in residential streets.
- Provide a safe, attractive, and convenient alternative to vehicular transportation. The new sidewalk will finally allow residents to safely walk to surrounding destinations, visit neighbors, or simply go out for a stroll. Convincing a population that grew up in a car dominated society to accept a pedestrian facility in lieu of roadway asphalt is a challenge. The team used an intense stakeholder engagement process to show that a pedestrian facility could fit in with the surrounding context. We also had to educate people to explain that this was necessary to meet current civil rights and would also be beneficial to society in general.



Public meetings provided physical to-scale mockup for people to understand the required dimensions for sidewalks and the diverse abilities of user groups.

International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

People-First Outcome 5: Fully involve all stakeholders in the projects

The Reconstruction of Oregon Avenue required an Environmental Assessment process that presented multiple alternatives from making No Recommendations to one with an extreme scenario of transforming the corridor to more roadway surface and severe disturbance to the community. Resistance from the community was inevitable. The corridor's character is dominated by Rock Creek Park which provides a scenic natural landscape in an urban area. Fear of a high-speed roadway to accommodate high traffic volumes were justified due to historical examples of traditional transportation project from the past.

DDOT and Volkert's emphasis on developing a design following a Context Sensitive Design was critical in the public engagement process. The Design Team developed a project specific website providing standard information for the community to be aware of past meetings, future expectations, and the project's goals. However, the website also provided people the opportunity to participate in polls to rank their highest concerns about the potential changes to the corridor. Design enhancement considered – such as street lighting options and restoration tree plantings – are also clearly explained and depicted on the website and then further polls were offered to solicit public input and maintain open lines of communication. The continuous public feedback through the website helped prepare the presentation material for the public meetings, and as a result the meetings became more productive because the presentation could focus on relevant issues revealed through the website's feedback. Another important part of the public outreach effort was educating stakeholders about levels of involvement and realistic expectations during various phases of the project. An entire section of the website explains engineering standards, requirements, and responsibilities in laymen's terms to help educate the public of the technical challenges and required infrastructure improvements. Complete transparency in decision making and process was welcomed by the public who previously felt unheard.

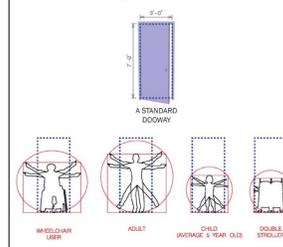
PURPOSE OF A SIDEWALK

Sidewalk users move closer than vehicular counterparts, and therefore are more aware of their surroundings. For this reason, sidewalk users also require more from their environment. Successful sidewalks provide more than movement from point A to point B, they respond to the surroundings and enrich one's connection to the community.

Listed below are some benefits of including sidewalks:

- Accessibility
- Beauty
- Connection to Nature
- Connectivity
- Encounters
- Freedom of Movement
- Healthy Living
- Healthy Environment
- Leisure
- Mass Transit Connections
- Neighborhood Participation
- Opportunities for Art
- Pedestrian Safety
- Reduce Use of Cars
- Sense of Place
- Socialization
- Traffic Calming
- Vehicular Safety

COMPARISON WITH A COMMON, KNOWN DIMENSION



TAKE PART IN TODAY'S SIDEWALK EXERCISE!

Four sidewalk scenarios are laid out to better understand the experience of a 3', 4', 5', and 6' sidewalk.

Please pretend to be one of the users listed below and pass through the four sidewalk options. Try as many options as possible and avoid conflicts with other sidewalk users.

TYPICAL USER GROUPS



Using string and measuring tools, we laid out a sidewalk path in front of Chatsworth / Unicorn Lane



Shown above is a sequence of four pictures showing a five foot sidewalk measuring post existing trees. Porous rubber sidewalk material will help preserve trees and provide an ADA compliant surface.

	Cost	Durability	DDOT Standard?	Present in Rock Creek Park?	Present in the Surrounding Area?	Received Public Support?	Selected Material
STRUCTURES / RETAINING WALLS							
Dry Laid Stone Masonry	\$\$	●●●	No	Yes	Yes	NA	
Mortared Stone Masonry	\$\$\$	●●●	No	Yes	Yes	NA	
Stone Veneer	\$\$\$	●●●	Yes	Yes	Yes	Yes	X
Brick Veneer	\$\$\$	●●●	Yes	Yes	Yes	No	
Flat Face Concrete	\$	●●●	Yes	No	Yes	NA	
Concrete with Formliner Rustication	\$	●●●	Yes	No	No	No	
SIDEWALKS							
Asphalt	\$	●●●	No	Yes	Yes	Yes	
Brick	\$\$\$	●●●	Yes	No	Yes	No	
Concrete	\$\$	●●●	Yes	No	Yes	No	
Stonedust	\$	●●●	No	Yes	Yes	Yes	
Exposed Aggregate Concrete	\$\$	●●●	Yes	Yes	Yes	Yes	X
Porous Rubber Sidewalk (near trees)	\$\$\$	●●●	Yes	No	Yes	Yes	X
ROADWAY PARKING SURFACE							
Pervious Poured in Place Concrete	\$\$	●●●	Yes	No	Yes	No	
Pervious Asphalt	\$	●●●	Yes	No	Yes	No	
Pervious Concrete Unit Pavers	\$\$\$	●●●	Yes	No	Yes	mixed	X (to be determined)
Concrete Blocks with Turf	\$\$	●●●	No	Yes	Yes	Yes	
Concrete Blocks with Gravel	\$\$	●●●	No	No	No	No	
Precast Concrete Panels	\$\$\$	●●●	No	No	Yes	Yes	X (to be determined)

Transparency in design direction and educating stakeholder on the need for improvements was critical in achieving support for the project.

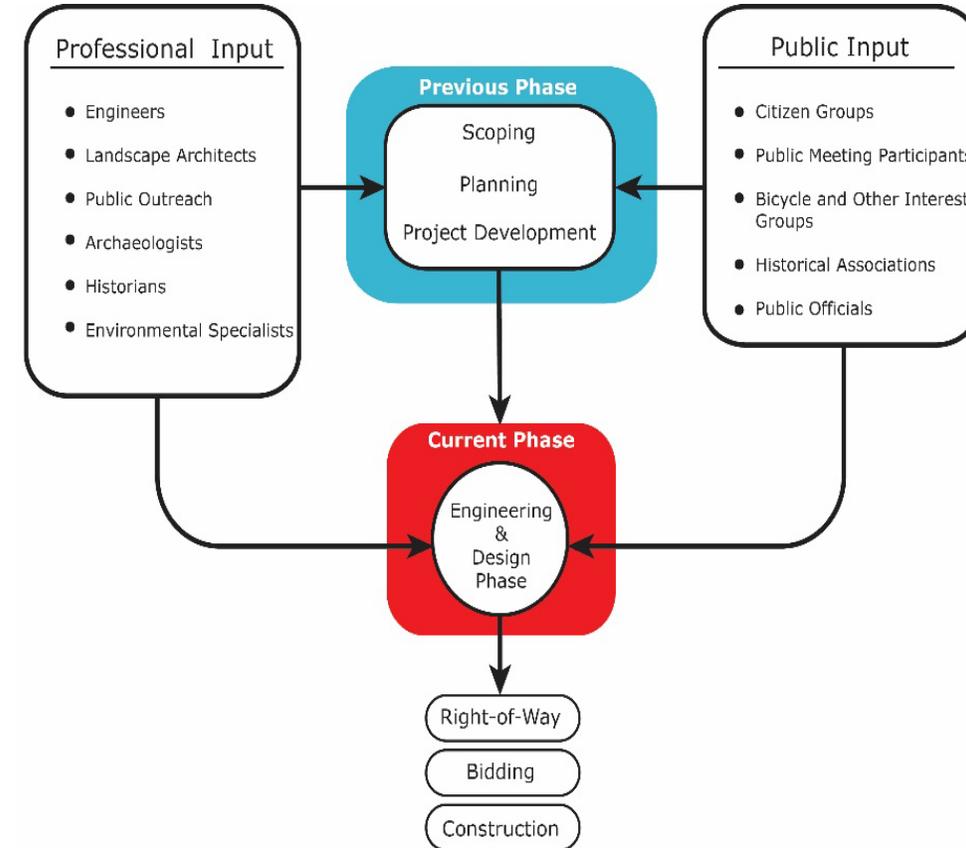


People-First Outcome 5, continued: Fully involve all stakeholders in the projects

The development of the construction documents for the Reconstruction of Oregon Avenue was a total team effort among various design disciplines and impacted stakeholders such as DC Water, Pepco, National Park Service, Washington Gas, the Department of Energy and Environment, and St. John's College High School, The District State Historic Preservation Office, and the Commission of Fine Arts. DDOT, the design team, and the impacted stakeholders recognized the importance to working together as a team to achieve a high level of service and sustainability performance.

A significant multi-phased public outreach effort was critical in gaining the public's confidence and to better gain information from stakeholders to develop a holistic design. By patiently and persistently sharing information about every aspect of the design, residents were able to constructively engage with the design process. This included explaining the engineering necessities, clarify the District's requirements, and demonstrating design issues and technical challenges to overcome. This proved to be a well-received part of the public outreach strategy because it made the public aware of the challenges the team had to resolve, the schedules they had to meet, and the type of information that is beneficial during each phase for the design process.

Completing the construction documents was possible thanks to the coordination and collaboration of a committed team of professionals who provided their expertise at the appropriate times throughout the course of the project.



The diagram, showing the flow of information sharing used to complete the design, was shared with the entire team to raise awareness that information from multiple sources is critical to completing a Context Sensitive Solutions design.



Multiple infrastructure projects were underway during the design period for Oregon Avenue. Most notably was the design to upgrade and relocate water service and sewer lines along much of the corridor by DCWater. DDOT coordinated extensively with DCWater to relocate water service lines serving the communities along Oregon Avenue. To minimize disruption the work to upgrade the water line is completed during the reconstruction of Oregon Avenue. The team worked with DCWater to design the system and itemize the work separately from the roadway work. Coordination also included scheduling the construction of the roadway work to not interfere with DCWater's Oregon Avenue and Bingham Drive, NW Sewer Rehabilitation Project.

DDOT engaged with St. John's College High School and National Park Service to avoid impacting the visual quality of Rock Creek Park, a National Park Service property north of Military Road. A long retaining wall facing the Western Ridge Trail of the park would have been necessary if the roadway and the sidewalk were located within the Right-of-Way as shown in the Environmental Assessment. The team reached out to the school for the necessary land to install the required infrastructure improvements and preserve the scenic views that define the character of the corridor and the park itself. In return DDOT agreed to add another traffic lane from the school's parking lot entrance to the intersection of Military Road. This would also include the reconfiguration of the intersection and new traffic signals which would improve the waiting time for commuters on Oregon Avenue. Long waiting periods throughout the day were common concerns expressed at public meetings and in the project website. This is an improvement which will not only help the school, but the community at large.

Uncontrolled stormwater runoff has created erosion problems throughout the corridor. This problem is especially bad at the seven existing outfalls, which all impact tributaries or ravines in Rock Creek Park. The design process had to go through the new Stormwater Regulations adopted by DOEE in 2013. These regulations required any project built in the Right-of-Way (ROW) to follow the requirements and meet the stormwater retention to the Maximum Extent Practical – the MEP process. Oregon Avenue was the first large scale infrastructure project to follow this process, and DDOT made a commitment to not only follow the MEP process, but reach the 1.2" / 24-hour storm event typically required for private development. The team's stormwater management design implemented green infrastructure practices throughout the corridor able to treat the 0.9" / 24-hour storm.

In addition, the project also addresses other infrastructure issues such as the undergrounding of the secondary electrical line as a part with Pepco's DC PLUG. The District of Columbia Power Line Undergrounding (DC PLUG) initiative is a partnership between the District and Pepco to improve the reliability and resiliency of the District of Columbia electric system by placing select systems underground.



People-First Outcome 2: Enhance resilience and responsibility towards environmental sustainability

The entire roadway design followed a Context Sensitive Design approach which included roadway reconstruction that follows the current natural terrain, provides connectivity to local attractions, introduces bicycle and pedestrian facilities throughout the corridor, and preserves the existing character of Rock Creek Park and the cultural resources of the corridor itself. This led to the following betterments for the project:

- A new bridge that allows for the fifty-year storm to pass safely while limiting disturbance to the surrounding parkland. Previous bridge would frequently overtop causing flooding and damage to infrastructure and the parkland.
- Roadway runoff is captured in bioretention facilities. This helps in improving the water quality of nearby stream and reduces erosion around outfalls.
- Large tree stand clusters along the 1.75-mile corridor are preserved to preserve the natural character and wildlife habitats. A tree reforestation initiative, specific to this project, is introduced to gain support from the community and enhance the tree canopy over the roadway.
- Rock Creek Park is more accessible to the community. The new sidewalk and crosswalks on Oregon Avenue, and the improved entrances to the park create an inviting experience that is safe and comfortable.



District Department of Transportation

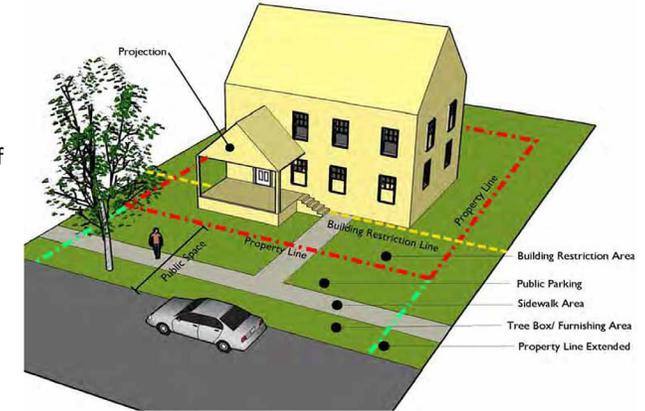
Wayne Wilson
Project Manager



Oliver Boehm, RLA, ENV-SP
Lead Designer

In selecting trees, five simple rules apply:

1. Trees will be installed on the private property side within the public parking area, within 10 feet of the sidewalk.
2. As with all vegetation within the public parking area, maintenance responsibility is that of the abutting property owner.
3. Trees must be from the plant list provided in the enclosed Selection Card.
4. Residents must commit to watering their trees on a regular basis.
5. Trees will be located in areas not in conflict with utilities or stormwater management devices.



A reforestation initiative, specific to the project, plants native species to Rock Creek in an area behind the sidewalk that is still within the public right of way. In Washington DC, the Right-of-Way boundary is often set back far away from the sidewalk (shown as a red line) and part of the private front yard is located within public space. By offering to plant large canopy tree in front of resident's houses, the project will enhance the character of the entire corridor, gain community support, and support Rock Creek conservation efforts.

International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Description of the project:

- San Diego International Airport's (SAN) Terminal 2 Parking Plaza (T2PP) is more than just a parking garage, it's a cutting-edge 11 acre, three-story Plaza with approximately 3,000 parking stalls that delivers a wide range of heightened environmental, social, and economic benefits to the Airport San Diego County Regional Airport Authority (the Authority or Airport Authority) and the community.
- The \$127.8M structure opened in May 2018 as a result of a holistic approach to build a project that contributes to environmental sustainability, fiscal sustainability, and stakeholder engagement.
- Was awarded the Institute for Sustainable Infrastructure's Envision Gold certification for incorporating sustainable best practices into its design, construction, and operations. The project scored highest in the rating system's Leadership category, with points received for providing effective leadership and commitment, fostering collaboration and teamwork, providing stakeholder involvement, and improving infrastructure integration. In 2016, the San Diego International Airport was the first airport in the world to receive an Envision certification for an infrastructure project.
- Was solely funded by Authority funds but was a design bid project that enabled private companies to accomplish a large capital project and provide economic stimulus to San Diego.



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Compliance with UNECE People-first PPP criteria:

- Building the Terminal 2 Parking Plaza focused on improving quality of life for our community and delivering the Airport's mission of planning for and providing air transportation services to the region with safe, effective facilities that exceed our customer expectations.
- The project implemented environmental sustainability, fiscal sustainability, and stakeholder engagement.
- The project's construction created local jobs and delivered a sustainable infrastructure piece that showcases innovative new ways to build a parking plaza.
- Our partnership with our construction contractors helped expand small businesses presence at the airport, increased our operational capacity with a new facility, and enhanced our customer service.
- SAN is a signatory of the Airports Sustainability Declaration which aligns with the United Nations sustainable development goals and calls for the development, implementation, and expansion of sustainability and resilience of airports and our surrounding community.



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Outcome 1: Increase access to essential services and lessen social inequality and injustice

- During the construction of the project, Swinerton Builders, a private construction company, worked with more than 50 other contractors and subcontractors to build the structure along with 180 local companies and 150 small vendors and designers.
- The Authority is committed to the growth of the San Diego region and ensures that local, small, historically underutilized, service-disabled veteran and emerging businesses have every opportunity to do business at the airport.



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Outcome 2: Enhance resilience and responsibility towards environmental sustainability

- The Terminal 2 Parking Plaza features an advanced parking guidance technology to reduce unnecessary vehicle circulation and idling, extensive natural lighting, energy-saving lighting controls and 1,700 LED light fixtures, as well as an overlook deck with environmental educational signage.
- The Parking Plaza offers paired trash and recycling receptacles to passengers and employees.
- 16 parking stalls for electric vehicle charging and 145 'EV-ready' parking stalls debuted with the opening of the project. These electric vehicle charging stations, and the entire facility, are tied into SAN's 12kV energy loop system enabling them to be completely powered by renewable energy from our 5.5 MW of onsite solar power.
- More than 200 parking spots in the facility are designated for low-emitting, fuel efficient, and carpool/vanpool vehicles.
- The innovative stormwater capture and reuse system collects up to 100,000 gallons of rainwater and reuses it as cooling tower makeup water. Instead of becoming stormwater runoff, potentially impacting San Diego Bay, the rain that falls on the facility saves almost 2 million gallons of potable water annually from being used in SAN's central utility plant to condition air in the terminals.



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Outcome 2: Enhance resilience and responsibility towards environmental sustainability

- Designed in accordance with multiple sustainability metrics and was the first airport in the U.S. to be Gold certified under the Parksmart green parking program, and the first airport in the world to receive a the Institute for Sustainable Infrastructure's Envision Gold certification for an infrastructure project.
- The facility helps to reduce greenhouse gas emissions by reducing the need for vehicle circling and idling. Guided parking assistance technology points users in the direction of open spaces. Pay-on-foot, pay-by-cell, and Automated Vehicle Identification payment systems also reduce or eliminate idling in the egress parking lanes.
- The facility's efficient, LED motion-sensor lighting reduces electricity usage.
- An option for users to purchase carbon offsets through the reservation system allows users to balance out the environmental impact of their travels through an Authority-owned carbon offset program called The Good Traveler.
- The Terminal 2 Parking Plaza increases parking capacity in front of the terminals by nearly 1,700 spaces, maximizes safety, and reduces sightline obstructions while improving vehicle circulation.
- The Parking Plaza has received the Industrial Environmental Association's Environmental Excellence Award for Regional Leadership in Sustainable Design and Operation, the United States Green Business Council San Diego Chapter's Net Energy Citation Award, Collaboration of Design + Art's CODAaward for artwork design, and the American Institute of Architects award for Sustainable Design.



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Outcome 3: Improve economic effectiveness and sustainability

- Parking is one of the Airport Authority's largest sources of non-airline revenue and therefore a crucial element to the Airport's finances.
- The project was finished ahead of time and under budget, ensuring financial goals were achieved through the addition of parking spaces.
- The design of the facility ensures operational efficiency now and into the future as vehicle movement and congestion-prevention were considered high priority.
- The Parking Plaza was built with flat plates so if in the future there is a better and higher use for this facility other than parking, it can easily be repurposed—reducing future costs should the time come.
- The construction promoted local, decent, and sustainable employment to more than 1,900 construction workers. The Airport Authority, along with the project's main contractor, Swinerton Builders, intentionally decided to work with local and small businesses.
 - \$32 million to small businesses and \$59 million to local businesses, which contributed to the economic development of San Diego County.



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Outcome 4: Promote replicability and the development of further projects

- The successful deployment of the structure and its stormwater capture and reuse system gave the Authority assurance that this type of technology works, is worthwhile, and can be done at other locations on the airport campus.
- The project has been shared with other North American airports at Airports Council International-North America conferences, highlighted in aviation industry publications, and showcased at various presentations with the hopes that similar projects can be implemented elsewhere.



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals

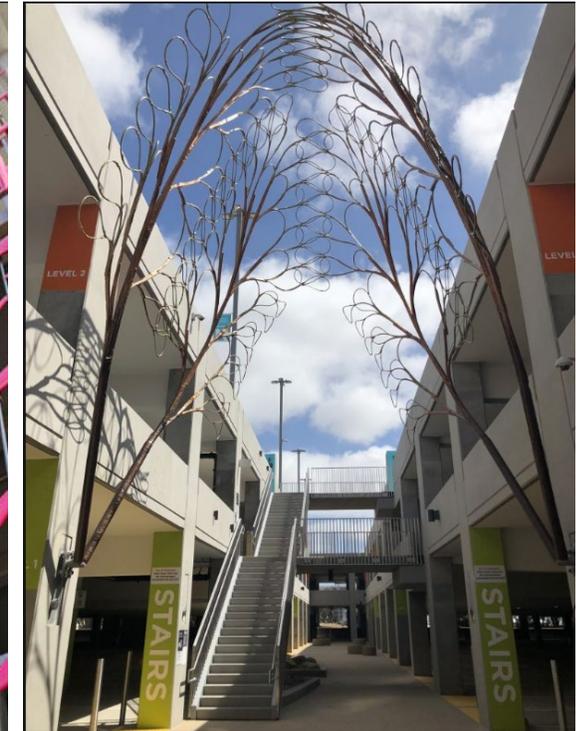


THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Outcome 5: Fully involve all stakeholders in the projects

- The Airport Authority worked closely with employees, potential and chosen contractors, airport tenants, and the public to consult on the selections, design, and impact of the project.
 - In depth workshops, awareness events, peer review sessions and department meetings
- Integration with special groups such as the California Coastal Commission, California Environmental Quality Act (CEQA), and National Environmental Policy Act (NEPA).
- The Airport Authority's Arts Program was a unique stakeholder that worked closely on to two site-specific art installations for the project.
 - *Formation*, by artist Mark Reigelman, consists of three screens made up of 638 cast resin airplanes that represent the past, present, and future of aviation in San Diego.
 - *Boulevard*, by Ball-Nogues Studio, includes bundled fiberglass branch-like rods that are distributed across all light wells.
 - Contribute to the facility's aesthetically pleasing design.



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	San Diego International Airport Terminal 2 Parking Plaza		
Country:	United States	Sector:	Regional Government
Dates of the project:	September 2016-May 2018	Stage of the project:	Operate, Maintain

Outcome 5: Fully involve all stakeholders in the projects

- During the development of the project definition document, the Authority was very involved and dedicated significant amounts of time to ensuring all parties understood the qualifications for the Envision and Parksmart certifications.
- Once the project was awarded to a design team, Authority staff and contractors collaborated with them to familiarize them with the Envision and Parksmart processes.
 - A “charrette” with the design team was conducted to go over Envision’s value, how it compares to LEED, what Airport projects it applied to, and the Parking Plaza’s application process.
- Design team meetings occurred every two months with relevant stakeholders to request documentation and provide updates on the Envision process.
- Parksmart certification processes and check-ins were also coordinated.



environmental@san.org
sustain.san.org
619-400-2782



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals

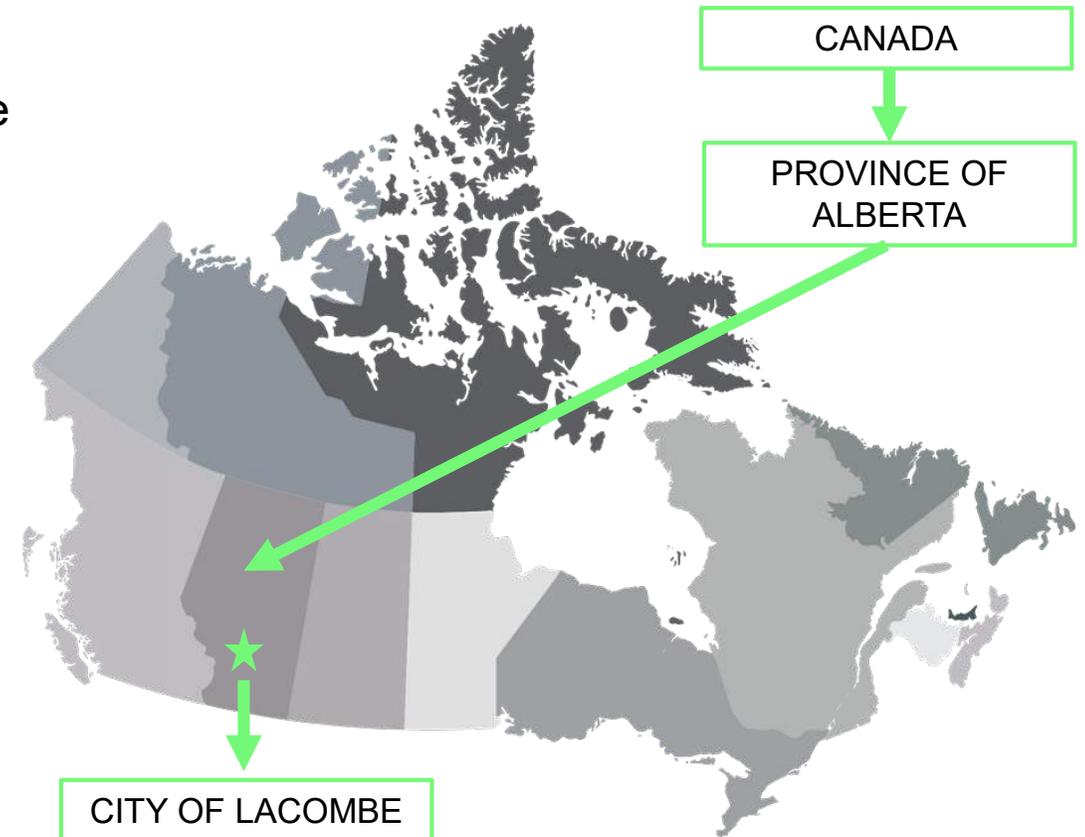


THE GLOBAL GOALS
For Sustainable Development

Project:	Lacombe Main Street Program		
Country:	Canada	Sector:	Infrastructure – Transportation, Water
Dates of the project:	2015 - 2018	Stage of the project:	Planning, Design, Build – Complete Operate & Maintain – Ongoing

Description of the project:

- The Lacombe Main Street Program took place through the heart of Lacombe's historic city center.
- City of Lacombe has a population of nearly 14,000.
- Known as the Mural Capital of Alberta, the city center is home to over 40 murals which tell the story of Lacombe's history and six designated historic sites.
- Infrastructure over 50 years old needed critical repairs.
- Required the Main Street through Lacombe be closed during construction.





Lacombe Main Street Program

Description of the Project:

- USD\$5 Million Revitalization
- Full sanitary sewer and road replacement.
- Critical water main and franchise utility improvements.
- New greenspaces at three of five intersections and enhancement of old growth locations.
- Commissioned Kinetic Tree Sculpture.
- Enhanced pedestrian wayfinding and safety including application of barrier free design practices.
- Increased parking with no additional land required.
- Protected areas for future infrastructure expansion without need to close the road.



Lacombe in 1908.

First 110 Years



Lacombe in 2018.

Need Resilience
for Next 110 Years

Lacombe Main Street Program

Compliance with UNECE People-first PPP criteria:



Photo: Kinetic Tree Sculpture by William Johnson of Edmonton, AB, CAN.

VERIFIED SUSTAINABILITY & INNOVATION

- The Lacombe Main Street Program completed comprehensive independent third-party verification under the Envision Sustainable Infrastructure Framework.
 - Recognized with the Envision Silver Award for applying verified sustainable infrastructure practices.
 - Recognized with the Innovation Credit for Leadership under Envision for developing a Collaborative Design Model that integrates stakeholders at every stage of the planning, design, and construction process.
 - Since 2013, 84 projects across the world have completed Envision Verification with a combined value of USD\$22.5 Billion.
 - Lacombe Main Street Program is the fifth project to complete verification in Canada and first in the Province of Alberta.

Lacombe Main Street Program

Compliance with UNECE People-first PPP criteria:



VERIFIED SUSTAINABILITY & INNOVATION

- Envision provides valuable insights on how project teams can achieve higher levels of sustainability by addressing a full range of environmental, social, and economic impacts during the design, construction, and operation phases of the project.
- Envision applies to a broad section of industries: energy, water, waste, transportation, landscape, agriculture, development, and information.
- Project teams can address 64 credits in five major categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate & Resilience.
- The Lacombe Main Street Program received the highest level of achievement possible for seven Envision credits.



Lacombe Main Street Program

Outcome 1: Increase access to essential services and lessen social inequality and injustice.

- Implemented barrier free design practices so individuals with mobility concerns can access all key services (education, fire protection, medical, family support, dental) and businesses located in the project area.
- Provided enhanced pedestrian crossings through concrete bulb-outs, Rectangular Rapid Flashing Beacons (RRFBs), textured curb ramps, and channelization of crossing locations.
- Developed branded wayfinding signs to direct individuals to key public services, businesses, and historic sites.
- Enhanced access and egress from the City's Fire Station to reduce response times for emergency services .





Lacombe Main Street Program

Outcome 2: Enhance resilience and responsibility towards environmental sustainability

Adopt a broad definition of sustainability – environmental, social, economic – to provide long-term resilience.

- Added greenspace and trees at three of five intersections while enhancing old growth locations.
- Provided enhanced landscaping with local species that bloom in both winter and summer.
- Design team integrated eight relevant master planning documents into the design.
- Developed a City-wide sanitary sewer model to ensure long-term capacity for a growing community.
- Protected key areas for future expansion of road corridor without disruption to the community.
- Critical communications infrastructure that provides services for half of the City was replaced.
- Gas servicing was relocated to alleys for safer and easier maintenance.
- Over 75% of material used during this project (by cost) can be recycled and re-used at the end of its service life.





Lacombe Main Street Program

Outcome 3: Improve economic effectiveness and sustainability



LACOMBE EXPRESS

-8°



Grant Creasey/Mayor of Lacombe

MAYOR'S COLUMN: Lacombe downtown revitalization key to sustainability

'Together they improved public safety and helped stimulate private investment in the local economy'

Photo Source: <https://www.lacombeexpress.com/opinion/mayors-column-lacombe-downtown-revitalization-key-to-sustainability/>

- City created a Downtown Storefront Enhancement Program to fund improvements to local businesses while the roadway was closed for construction.
- Every dollar invested in local main street programs over the last ten years, generates between \$16 to \$33 in new investment in the community*.
- Small businesses owners said they have experienced a “buy-local sentiment” that has helped them compete with large retailers.
- Shoppers more interested in buying goods made closer to their community.

*Source: National Main Street Center - Canada

Lacombe Main Street Program

Outcome 4: Promote replicability and the development of further projects

- Communities across the Province of Alberta are experiencing a need to improve their City Centers as the region was first developed 130 years ago and the infrastructure at the core of these communities is in need of replacement.

In only one year since completing the Main Street Program:

- Stantec (Engineer) and Pidherney's (Contractor) have continued their partnership to revitalize a portion of the City Center in the City of Red Deer (pop. 103,000).
- Communities in Alberta are reaching out to Stantec (Engineer) to advise or implement the Collaborative Design Model to their City Center Revitalization (Town of Crossfield, Town of Coaldale).
- The Lacombe Main Street Program proves that any municipality, regardless of size or budget, can adopt the Collaborative Design Model as a template for use on future projects to enhance the socio-economic well being of any community.





Lacombe Main Street Program

Outcome 5: Fully involve all stakeholders in the projects

Project Team Developed a Four-Part Collaborative Design Model:

3. Partnership Based Procurement Process

- Team developed a unique qualifications based selection process that was combined with unit price bidding to identify a construction contractor.
- Contractor (Pidherney's) joined the project team during design and provided input on the constructability, staging, traffic accommodation and cost savings impacts of the design.

4. Holistic Approach to Construction Communications

- Developed a two-way multi-platform communications channel between the project team and the impacted stakeholders.
- Platforms included social media, email, radio announcements, conventional print advertisements, in person business liaison during construction, and through YouTube.

Recognized under the Envision Framework with the Innovation Credit for Leadership for exceeding the requirements of credit "LD1.3 Provide for Stakeholder Involvement".



International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	Salt Lake City Water Reclamation Facility		
Country:	U.S.A.	Sector:	Wastewater Management
Dates of the project:	July 2018 – December 2024	Stage of the project:	Design/Build

Description of the project:

The Salt Lake City Department of Public Utilities (SLCDPU) owns and operates water, sewer, stormwater, and street lighting utilities for Salt Lake City, Utah. SLCDPU collects sewage from Salt Lake City, including residential and industrial sources. All sewage is treated to permit levels by the Salt Lake City Water Reclamation Facility (SLCWRF) located at 1365 West 2300 North, Salt Lake City, Utah, before discharge. The New SLCWRF is needed to replace aging infrastructure and comply with new regulations enacted in 2016 by the Utah Department of Environmental Quality, Division of Water Quality. The new regulation lowers the phosphorus discharge limits for the SLCWRF to limit the nutrient load entering receiving bodies of water. The new treatment plant must be operational by January 1, 2025 to comply with these regulatory requirements. The New SLCWRF (48 MGD) will replace the current plant at the existing site and is the largest public works projects in Salt Lake City history. With full focus on resilience, the state-of-the-art facility is being designed to handle the demands of population growth, potential hazards, and stricter government regulations over the next 50 years. Project website available at: makeitpureslc.com

Compliance with UNECE People-first PPP criteria:

The New SLCWRF complies all 5 of the recommended UNECE People-first PPP criteria. The project is located in an economically depressed residential area and the goal is to create an asset for this community by nearly eliminating odor related to the WRF and adding amenities for the community, such as a community meeting space, education center, wetlands, and new connected trail. The New SLCWRF has set high sustainability and resiliency standards with a target of Envision Platinum certification and LEED Gold for the Administration Building.



Outcome 1: Increase access to essential services and lessen social inequality and injustice

- The New SLCWRF will provide wastewater treatment for the entirety of Salt Lake City, independent of social or economic standing. The high costs of constructing the New SLCWRF required an increase in sewer rates for multiple years. The SLCDPU recognizes that an increase in rates can be very difficult for the economically vulnerable. In order to help alleviate this potential additional strain on this vulnerable portion of the population, sewer rates are and will be increased based on a tiered usage basis. The Salt Lake City Department of Public Utilities offers a few programs for economically vulnerable customers.
 - *Salt Lake County Tax Abatement Program* - Customers who qualify for the Salt Lake County tax abatement program are eligible for a reduction in their water, garbage and storm water charges.
 - *Water Assist* - For some, even affordable water seems out of reach financially. For that reason, Public Utilities, in partnership with the Salvation Army, Intermountain Division offers Water Assist to Salt Lake City customers. To apply for assistance, a customer must qualify at 150% of poverty level and/or have a family member who meets one or more of the following criteria: Be 60 years or older; Be disabled; or, Have a verifiable medical emergency.
 - *Equal Pay* - Customers can request that their water bills be evened out over a period of time, a program called Equal Pay. To be eligible, customers need to have one year's worth of billing history and have a zero balance on their account.
- The New SLCWRF is located in the northern part of the SLC in a historically underserved area of the City. The Administration Building and rehabilitated wetlands of the New SLCWRF are being designed to be open to the public to provide a meeting space, educational opportunities, and access to the wetlands for observation of wildlife and connection to existing trails.



Outcome 1: Increase access to essential services and lessen social inequality and injustice (Continued)

- Historically, wastewater treatment plant staff has been predominately male, and existing restrooms and locker room areas reflect this with a higher number of stalls, showers and lockers in the men's restrooms and locker rooms and no lactation facilities located onsite. In an effort to accommodate a more gender-diverse staff, unisex bathrooms and locker rooms are being provided in the Administration and Operations and Maintenance Buildings. Additionally, a lactation room (or Mother's Room) is also being provided in both buildings. These new facilities are intended to convey an atmosphere of equality and exclusivity in all aspects of the work.



Outcome 2: Enhance resilience and responsibility towards environmental sustainability

- The New SLCWRF will remove both phosphorus and nitrogen from treated wastewater to help protect the Great Salt Lake from harmful algal blooms and other negative impacts of potential eutrophication. The additional nitrogen reductions are not required by regulations.
- The following sustainability targets have been set for the New SLCWRF: reduce net embodied carbon from primary materials by 30%; reduce greenhouse gas emissions by 25%; use at least 25% recycled materials; divert at least 75% of operational waste; during construction at least 50% of waste materials are recycled, reused, and/or salvaged; operational energy is reduced at least 30%; meet 50% of energy needs (electricity and fuel) from renewable sources; make a direct and significant net-positive improvement to the watershed; reduce potable water use by at least 75%; no potable water consumption during construction except for human consumption and hygiene; and commissioning and monitoring water and energy use.
- The SLCDPU partnered with the University of Utah to perform a downscaling of global climate projection models to apply the model to the design of the New SLCWRF. The project team is in the process of creating a Hazard Resilience Plan for the New SLCWRF that includes seismic planning and design, flood planning and design, security, and the integration of the SCADA system with a computerized maintenance management system.
- The project site is within an area mapped by Salt Lake County as having “High” liquefaction potential. Because the New SLCWRF has a Risk Category III assignment, facilities for the New SLCWRF need to achieve among the highest possible ratings for seismic performance. For each building at the New SLCWRF, the targets for seismic performance are:
 - Safety – zero fatalities, injuries and blocking of exit paths unlikely.
 - Damage – Repair costs likely less than 5 percent of the building replacement cost.
 - Recovery – The expected performance will be likely to result in people being able to quickly re-enter and resume use of the building, from immediately to a few days, excluding external factors.



Outcome 3: Improve economic effectiveness and sustainability

- Sustainable Return on Investment analyses (sROI) have been used to assess the economic, social, and environmental costs and benefits of all major design decisions. Monetizing the triple bottom line allowed a direct comparison with the financial costs and benefits in a common metric and eliminated the subjectivity and bias that can be introduced using qualitative methods. sROI enabled assessment of highly valued economic, social and environmental outcomes that are typically not quantified. Similar to a benefit-cost analyses, sROI addresses whether an entity is better off by performing a certain action (investment strategies being considered) versus “business as usual”. The economic, social, and environmental values are then vetted through a workshop. The results support selection of the most beneficial alternative to meet objectives and goals, considering all project constraints.
- Aeration blowers at water reclamation facilities generally use 50% of the total power consumed at the plant, therefore, energy efficiency measures were focused on minimizing oxygen consumption to reduce energy use. By using a sophisticated operational method that uses anaerobic and anoxic zones to perform biological treatment of the water without adding additional air, tied with modern instrumentation and operational feedback loops that optimize the amount of air added to the process to achieve just the required amount of treatment, results in significant energy savings when compared to traditional methods. Similarly, providing a gravity flow based plant where the water is lifted once and flows by gravity through each treatment process results in fewer pumped systems, reducing energy consumption, required maintenance, and capital costs (material usage). Features were incorporated into the design to improve operational efficiency. In total the energy saved by implanting these features is over 3,500,000 kWh per year. These features include:
 1. The use of advanced wastewater computer modeling to accurately estimate oxygen requirements under varying flows and loads
 2. Incorporation of anoxic zones in the biological process to recover and reuse oxygen
 3. Blowers sized to cover full range of load conditions preventing over aeration
 4. Use of ammonia probes and effluent analyzers to provide real time monitoring of effluent quality
 5. Fully automated control system integrating analyzers and blowers to minimize energy consumption
 6. Use of variable frequency drives to match pump speeds with diurnal flow variations and reduce power demand at pump start-up



Outcome 4: Promote replicability and the development of further projects

- The New SLCWRF is a pilot project for Salt Lake City using the Envision sustainability framework. This project will set a precedent for other City infrastructure projects by obtaining Platinum certification. The Envision framework may be used to set up policies, guidelines, and standards to facilitate sustainable and resilient future projects.
- The project includes training programs for local skill development. Diversified monthly training is provided to the operations staff in connection with the New SLCWRF. A demonstration facility of the New WRF will be constructed a minimum of two years prior to completion of the full-scale facility. The purpose of the demonstration facility is to train the operational staff (current and future) on the correct operation of the biological nutrient removal process critical to the successful operation of the new facility. Training is provided to operators on each of the new systems and processes on a schedule that allows SLCDPU to take over operation of new facilities as early as is practicable during the commissioning phase. Additionally, the contractor provides onsite training to their crews related to safety, personal health, and construction means and methods as needed for the project.



Outcome 5: Fully involve all stakeholders in the projects

- Salt Lake City Department of Public Utilities (SLCDPU) is implementing a robust public engagement effort to ensure this project reflects community needs and goals. The project provides an opportunity to build a wastewater campus that includes outreach space and educational components for the public to access. Stakeholders were directly involved in the design of the Project through activities including: public open houses, community briefings and presentations, working groups (Great Salt Lake, sustainability, educators, and youth), informational materials and mailings, Project website, and community care line. Public outreach has included a public engagement plan, stakeholder interviews, a design charrette, City Council tour, Rose Park Community Festival, online public comments, and informational materials (e.g., fact sheet, mailers, website).
- The communication goals and objectives with the public have been and are:
 1. Communicate proactively and develop collaborative relationships with stakeholders to:
 - Ensure a positive political, community and environmental climate to support the project, SLCDPU and Salt lake City in the present and the future.
 - Increase awareness and understanding of the project to gain support an help ensure that it is completed on time and on budget.
 - Demonstrate that the project team, SLCDPU and Salt Lake City are trustworthy and responsible with public resources.
 2. Provide opportunities to solicit meaningful, appropriate and actionable stakeholder input to help shape the project.
 3. Mitigate construction and operational impacts with stakeholders.
 4. Clearly establish that the SLCDPU staff are professional, responsive and caring, and are committed to the community and the environment.
- A design charrette and several public houses were held for the project team to engage with the community on decisions that will affect the residents. Key stakeholders participated in these events, including the general public. The project team keeps a running log of public feedback and the status of implementing the feedback into the design. Collaboration with area residents, schools, the community council, the operators that will run the facility, and City leadership have been and will continue to have an active role in the development of the project.

International PPP Centre of Excellence

People First PPPs for the United Nations Sustainable Development Goals



THE GLOBAL GOALS
For Sustainable Development

Project:	Gordie Howe International Bridge		
Country:	Canada-United States	Sector:	Transportation
Dates of the project:	2018-2024 -construction	Stage of the project:	Design/Build

Description of the project:

The Gordie Howe International Bridge, which spans the Detroit River and connects Windsor, Ontario, Canada and Detroit, Michigan, United States, is currently under construction and scheduled to open in 2024. The project is a once-in-a-generation undertaking which will not only deliver much-needed transportation improvements for international travelers, it will also provide jobs and opportunities for growth to the Windsor-Detroit region and includes features that make this project truly distinctive. The project is being delivered through a public-private partnership (P3). Windsor-Detroit Bridge Authority (WDBA) is a Canadian Crown corporation responsible for overseeing construction and operations. Bridging North America (BNA) is WDBA's private-sector partner responsible for the project's design, construction, financing, operation and maintenance

There are four components to the project: the bridge, the Canadian Port of Entry (POE), the U.S. Port of Entry (POE), and the Michigan interchange. Once complete, the bridge will have the longest main span of any cable-stayed bridge in North America. The bridge is 2.5 km/1.5 miles in length, with 3 lanes each direction and no piers in the water. A dedicated multi-use path will accommodate pedestrians and cyclists. Once constructed, the Canadian POE will be the largest Canadian port along the Canada-U.S. border and the US POE will be one of the largest anywhere in North America. The Michigan Interchange activities include the primary connecting ramps to and from the US POE as well as the construction of four new road bridges, five new pedestrian bridges, and widened roads at key intersections.

Compliance with UNECE People-first PPP criteria:

The Gordie Howe International Bridge project project complies with all five of the suggested UNECE People-first PPP criteria and sets a precedence for sustainable infrastructure projects of this scale.



Outcome 1: Increase access to essential services and lessen social inequality and injustice

- A key project feature is the inclusion of a Community Benefits Plan to ensure that the communities located most directly adjacent to the project will be among its truest beneficiaries. The Gordie Howe International Bridge Community Benefits Plan reflects community priorities and includes a Workforce Development and Participation Strategy and a Neighborhood Infrastructure Strategy.
- To ensure that local residents and businesses on both sides of the border are informed of Project employment opportunities, the project team has partnered with workforce development, job training and temporary employment organizations to organize employment information sessions.
- The project team has partnered with educational institutions to implement co-operative/work placement programs, mentoring and job shadowing opportunities, focusing on women and minorities in the Windsor Region.
- The project team will maintain ongoing communication and engagement with Canadian Indigenous Peoples regarding workforce/employment opportunities, training and pre-apprenticeship/apprenticeship opportunities, as well as business and contracting opportunities during the design, construction and operations phases of the project. The project team will coordinate with existing programs to facilitate apprenticeship opportunities for Canadian Indigenous Peoples, including establishing a list of Canadian Indigenous Peoples who are apprentices or who are interested in becoming apprentices. The project team will implement co-operative/work placement programs, mentoring and job shadowing opportunities for Canadian Indigenous Peoples, with particular emphasis on women.
- Streetscape and trail network enhancements outlined in the Community Benefits Plan, include increased security lighting, trailheads, local street improvements, park improvements, trail connections, wayfinding and interpretive signage and custom bike racks. These features incentivize non-motorized transportation and reduce automobile dependence to support mobility and access for the most vulnerable users of the transportation network.



Outcome 1: Increase access to essential services and lessen social inequality and injustice (continued)

- The bicycle and pedestrian infrastructure, expanded trail network, and improved sidewalk infrastructure along adjacent local roads align with the City of Windsor's Official Plan, which calls for an improved pedestrian network to increase the diversity of transportation options across the border.
- According to the Climate Vulnerability in Detroit report, 24 per cent of Detroit households do not own a vehicle, which demonstrates streetscape improvements and increased connectivity between the trail and streetscape network in Detroit is critical to improve mobility and access for economically vulnerable populations. Five new pedestrian bridges will be constructed over I-75 in Detroit, compliant with Americans with Disabilities Act (ADA) standards, replacing the previous pedestrian bridges that were constructed prior to ADA regulations. The pedestrian bridges over I-75 improve local accessibility for non-motorized transport in the southwest Detroit community. Local road improvements outside of the US POE will be design and constructed according to "Complete Streets" principles with curb extensions to minimize pedestrian/cyclist crossing distance, pedestrian countdown signals, continuous, fully accessible sidewalks, deciduous shade trees between streets and sidewalks, and landscape enhancements.
- Once open, the Gordie Howe International Bridge multi-use path will be toll-free for pedestrians and cyclists further improving accessibility and use.
- One of the main purposes of the project is to enable access and mobility with a target to redirect freight trucks off local roads providing a new highway-to-highway connection. Redirecting freight traffic off local roads enables better access and mobility for all roadway users and less noise and safety concerns in the Detroit and Windsor communities, thus improving livability.



Outcome 2: Enhance resilience and responsibility towards environmental sustainability

- Construction materials with recycled and regional content (such as crushed concrete for aggregate) will be utilized as much as possible to reduce the project's carbon footprint.
- Canadian and U.S. POEs will be designed to be energy efficient and to maximize water reuse. Energy conservation measures include outside air volume control (based on air quality), condenser heat recovery, free air cooling, and free waterside cooling (when outside air temperatures permit).
- The project will achieve LEED v4 Silver rating for facilities and Envision Silver rating for bridge and Michigan Interchange. The following targets have been set for the project: 75% diversion of waste from landfills during operations, at least 5% of materials used are from reclaimed or recycled materials, at least 30% of materials are locally sourced, a minimum 32% reduction of energy demanded from non-renewable energy resources during operations, reduce water demand by at least 25% at the POEs, commissioning and monitoring water and energy to optimize use.
- Extreme heat and flooding are the primary hazards expected to be exacerbated by climate change. Extreme heat events are expected to stress the electric grid. To improve the project's resiliency, redundancy was incorporated into the electrical system to enhance the project's resilience from power disruptions regardless of whether they are caused by extreme heat events, flooding events, or other hazards, natural or human-caused.
- The landscape has been designed specifically with native, low-growth species that do not require irrigation. By eliminating the demand on the public water system, the project increases its resilience to drought. The stormwater management components of the project incorporate stormwater ponds to alleviate stormwater going into the public system and prevent water from going into the public waterway, mitigating the impacts of stormwater runoff from increased precipitation on the existing stormwater system.
- The current plans call for the bridge to be six lanes, three in each direction. However, the bridge has been designed to be expandable to up to eight lanes to account for future traffic volumes, demonstrating adaptive capacity.
- The target is to design for a minimum 125-year service life for non-replaceable components of the bridge and bridge approaches; 75 years for the Michigan Interchange; and 100 years for the structural components of the POEs.
- The project is maintaining biodiversity with the installation of a peregrine falcon box and new snake hibernacula near the Canadian POE.



Outcome 3: Improve economic effectiveness and sustainability

- Under the public-private partnership structure, the private sector assumes a major share of the risks in terms of financing and construction and ensuring effective performance of the infrastructure, from design and planning, to long-term maintenance. There are various performance targets during operations, with associated penalties for non-compliance.
- Economic opportunity project targets include supplying at least \$250 million of the Canadian design-build work to the local Canadian workforce and supplying contracts to Disadvantaged Business Enterprises (DBE) in Michigan to achieve a project goal of 2.15% of the cost to construct and engineer the Michigan Interchange and the portion of the bridge within Michigan.
- The project has a target of hiring and training at least 20% of the workforce from the local Detroit/Windsor area. As part of the Community Benefits Plan, a Regional Workforce and Development Participation Strategy has been prepared that focuses on the workforce, training, and pre-apprenticeships/apprenticeships.
- The project team has partnered with educational institutions to implement co-operative/work placement programs, mentoring and job shadowing opportunities, focusing on women and minorities.
- During operations, a tracking and verification program will be implemented as part of the exiting building commissioning process to record effectiveness, financial costs and benefits, and observed or estimated environmental and human health and comfort benefits for the direct energy-producing and energy-consuming systems for the U.S. and Canadian POEs.



Outcome 4: Promote replicability and the development of further projects

- The project team is working as a conduit between workforce development and training centers on both sides of the border, as well as unions and sub-contractors, to enhance communication and understanding between the parties; trainers will know more about requirements of various skilled and unskilled jobs; and unions and sub-contractors will learn more about availability of training programs in the communities.
- Local school districts, higher education institutions, skills training and job placement organizations, unions, and other related resources are being utilized to enhance opportunities for Windsor-Essex and Southwest Detroit residents, along with businesses in both regions, to participate in this project.
- The project team will continue to offer assistance or training to workforce and contractors in the Windsor-Essex region to help position them to successfully participate in work opportunities associated with the Project, including: engaging in training programs available in Ontario and Canada; engaging in English as a Second Language programs; providing information sessions for smaller contractors on the bidding process; and tendering lower-value contracts.
- The project team is engaging Detroit residents for job training, pre-apprenticeship/apprenticeship and employment opportunities and will maintain ongoing communication with the Detroit residents, communities, educational institutions, and labor regarding training, pre-apprenticeship/apprenticeship, and employment opportunities for Detroiters during design, construction, and operations.
- The project team is engaging with existing agencies and programs to enhance the likelihood of qualified Detroit residents obtaining employment as a result of the project during design, construction, and operations, including English as a Second Language programs, providing information sessions for smaller contractors on the bidding process and tendering lower-value contracts.



Outcome 5: Fully involve all stakeholders in the projects

- The project team has been engaging with the community since the project's Planning Needs/Feasibility Study (PN/F Study) was initiated in March 2002, during the environmental planning process, procurement process and is anticipated to continue throughout the design, construction and operations period.
- Over 300 public meetings, hearings, and workshops were held to facilitate public involvement during the preparation of the Environmental Assessment Report in accordance with the *Ontario Environmental Assessment Act* and the *Canadian Environmental Assessment Act* and the Environmental Impact Statement in accordance with the *National Environmental Policy Act* for the US side of the project.
- Ensuring that residents, business owners and governments of the region are engaged, kept informed and play a role in the planning and delivery of the Gordie Howe International Bridge project is not only a top priority for the project team, but a commitment made during the environmental study. Since 2015, hundreds of meetings have been held with the community to seek feedback and discuss questions, concerns and topics of interest. The community will continue to have consultation opportunities throughout the delivery of the project to ensure the host communities' needs, goals, and issues are addressed.
- Consultation feedback has helped inform the final design of the Gordie Howe International Bridge along with the implementation of construction mitigation plans to minimize construction impacts.
- To inform the development of the Community Benefits Plan, a two-phase consultation approach was undertaken between 2015 and 2019, with Ontario and Michigan residents, Indigenous Peoples, business owners and community and municipal leaders resulting in over 230 unique suggestions for community benefits and engagement of thousands of stakeholders. Activities that informed the Community Benefits Plan included public meetings, one-on-one meetings, focus groups, a public survey, social media and direct correspondence.
- Multiple consultations and meetings were held in both Canada and the US with representatives of workforce development and training organizations, higher education institutions, economic development groups, small business associations, municipalities, construction industry representatives, and others to introduce and get feedback on key initiatives of the draft Workforce Development and Participation strategy before finalization.



Project:	Ship Canal Water Quality Project (SCWQP)		
Country:	United States	Sector:	Stormwater/Wastewater
Dates of the project:	2015 - Present	Stage of the project:	Design and Construction

Description of the project:

Seattle Public Utilities and King County Wastewater Treatment Division are building an underground storage tunnel to significantly reduce the amount of polluted stormwater (from rain) and sewage that flows into the Lake Washington Ship Canal, Salmon Bay and Lake Union from our sewer system. The project will reduce combined sewer overflows from six basins in Seattle by 2025.

Compliance with UNECE People-first PPP criteria:

Beginning in the planning phase of the project, social impacts to the local community were considered as well as environmental and economic impacts. Compliance with Washington's State Environmental Policy Act (SEPA) includes goals to stimulate public health and welfare. Following the preparation of SEPA environmental documents, the project adopted the use of the Envision Sustainability Rating System that includes further considerations for community quality of life. These considerations resulted in documenting the project's development of local skills, mobility and access improvements, preservation of historic and cultural resources, and enhancing public space.



Please showcase how the project actually implement the People-first approach and focuses on one or more of the five following People-first outcomes. Use the guiding questions to provide some examples and justification.

Outcome 1: Increase access to essential services and lessen social inequality and injustice

The SCWQP incorporates the City of Seattle's Community Workforce Agreement (CWA) that requires contractors to follow social equity, workforce diversity, and development of local workers for construction careers. The CWA promotes and ensures access for women and people of color to meaningful work on City public works projects. Consultant contracts for the project actively support utilization of women- and minority-owned businesses (WMBEs, defined as at least 51% owned by women and/or minorities) by providing both prime and subcontractor opportunities. The goals of the City's CWA and WMBE programs align with Outcome 1.

Outcome 2: Enhance resilience and responsibility towards environmental sustainability

The SCWQP will result in major water quality benefits to Lake Union, the Lake Washington Ship Canal, Salmon Bay, and the Puget Sound by reducing the combined sewer overflows by approximately 88%. All new facilities are designed to meet local stormwater quality and quantity improvement standards. A tunnel solution was selected specifically to reduce construction-related impacts and is incorporating the Institute of Sustainable Infrastructure's Envision framework. The new system has been sized to incorporate uncertainty from climate change, making for a resilient system. The benefits of water quality will benefit wildlife habitat, recreational uses of surface waters, and tribal fishing activities in the area.



Outcome 3: Improve economic effectiveness and sustainability

Through a first-of-its-kind Joint Project Agreement between the City of Seattle and King County, the SCWQP provides a combined sewer overflow (CSO) solution for six separate basins in a single, shared storage tunnel – reducing management and oversight and other project delivery related costs. Operations and maintenance opportunities will result after project completion in the local project area. Also, mentioned in Outcome 1, the project incorporates CWA and WMBE requirements with the goals of improving social equity, workforce diversity, and development of local workers in both construction and consulting. Project-related community outreach also seeks to empower voices in the community that are most impacted.

Outcome 4: Promote replicability and the development of further projects

Many of the strategies used on the SCWQP have been used to implement across the owner's organization and many of the technical solutions on the project can be repeated and scaled to other combined sewer overflow projects. Many "firsts" have been achieved for Seattle, including a joint project agreement between two public owner agencies, a curved microtunnel to minimize shoreline impacts, use of ISI's Envision framework, and use of a shared web-based collaboration platform used across agencies sub-project, and consultant teams. Methods used and documentation generated from the project can be referenced and used again on other projects in the future.

Outcome 5: Fully involve all stakeholders in the projects

Project stakeholders have been involved during each stage of the project's development. Multiple opportunities to interact with the project team were provided during the pre-design phase, when social and environmental impacts were being assessed via open houses and scoping sessions. During design, community outreach was conducted to immediate neighbors through open houses, email updates, and one-one-meetings. At each point when the project's budget and utility ratepayers were impacted, a dedicated effort to communicate these changes to the local community was completed.



Project:	Southport Levee Improvement Project		
Country:	California, United States	Sector:	Water
Dates of the project:	Constructed 2017-18	Stage of the project:	Operate, Maintain etc.

Description of the project:

The Southport Levee Improvement Project improves a 5.6-mile segment of the West Sacramento levee system along the Sacramento River in the Central Valley of California. The Sacramento River is one of two major river systems that convey water from the Sierra Nevada Mountains through the Central Valley and into the San Francisco Bay. In the late 1800's, river sedimentation caused by hydraulic mining practices exacerbated seasonal river flooding. Levees along the Sacramento River were originally designed and constructed to channelize the river and, thereby, move sediment down stream. However, channelization creates high water conditions that are detrimental to a levee's structure along with negative environmental and river system impacts. The Project's design includes both fix in place solution measures and the construction of a new set back levee. The setback levee return 212 acres to the flood way which are being restored to riparian and oak savannah habitat.

Compliance with UNECE People-first PPP criteria:

The World's cities and populations naturally develop along waterways. Waterways provide water, food, transportation, recreation, and other resources. They are a foundation for human development. Overuse, overcrowding, exploitation, diversion, and climate change can have severe negative impacts to river systems and the people who depend on them. Flooding caused by sedimentation of the Sacramento River due to hydraulic gold mining ruined livelihoods and damaged land, assets, and commerce. Since the levee system's initial construction with available material, levee design and performance criteria have greatly improved. The Sacramento Levee Improvement Project was contemplated, designed, and constructed to contemporary performance requirements with the idea of creating the greatest public good with the least amount of private harm. Project implementation required a mindful balancing of flood risk reduction measures with the city's long-term development goals, ecological restoration objectives, and minimized impacts to effected property owners.



Please showcase how the project actually implement the People-first approach and focuses on one or more of the five following People-first outcomes. Use the guiding questions to provide some examples and justification.

Outcome 2: Enhance resilience and responsibility towards environmental sustainability

Completion of the Southport Levee Improvement Project setback levee significantly reduces flood hazards for the protected area, while reestablishing Sacramento River floodplain severed by the previous levee configuration. The floodplain restoration project has immense value, both in terms of the resources it will provide and as a learning opportunity for professionals involved in ecological restoration worldwide.

Flood Protection

The West Sacramento Area Flood Control Agency is currently implementing system-wide levee improvement projects to improve the flood resilience of West Sacramento. The system-scale project is called the West Sacramento Levee Improvement Program (WSLIP), and the Southport Levee Improvement Project discussed in this case study is one of the program's first completed projects. The program is the result of years of analysis and preparation, during which the Agency performed several formal evaluations of the city's entire levee system, with a focus on evaluating existing conditions and the levee design compared to newer engineering design guidelines and criteria.

Vulnerability and risks assessments show that flooding events will likely become more intense and unpredictable in West Sacramento in the future, putting increased stress on traditional levees. This flooding threatens more than 54,000 residents, 25,000 jobs and \$7 billion in infrastructure. The project's primary objective is to increase the Southport community's level of flood protection. The project is designed to meet a 200-year level of flood risk reduction in anticipation of increased sea levels, storm frequency and severity. This is a significant improvement over the previous 100-year level of flood risk protection. It has been estimated that a 100-year flood event would flood the entire Southport area with at least one foot of water within 24 hours, with the primary evacuation route inundated within four hours. Many of the potential consequences could result in changes in employment numbers and patterns, business and personal incomes, tax revenues, and regional economic activity. This increased flood protection created by the new levee enhances operating capacity for businesses and protects existing and planned housing in West Sacramento.



The project's design was evaluated within the larger context of the Sacramento River and other levee systems. Hydraulic impacts and changes that would occur as a result of the design were prohibited from negatively impacting other levee systems, i.e. no transfer of flood risk to other systems is allowed. Prohibiting risk transfer maintains the resiliency of the broader Sacramento River system levees. The Southport Levee Improvement Project and overall levee system will benefit from other flood risk reduction projects on the river that will lower maximum flows. Together, these projects will provide flood risk protection that is resilient against potential changes in weather patterns created by a changing climate.

In addition to changes in the levee, the project provides further flood protection as a result of its siting. The setback levee design removed approximately 200-300 acres of developable land adjacent to the levee, restoring the area to a natural floodplain. Future development of homes on this land was eliminated, which reduces impacts from flood risk and aligns with the goals of the State of California, the U.S. Federal Emergency Management Agency (FEMA), and the U.S. Army Corps of Engineers (USACE).

In addition to flood risk reduction, the project also was planned to provide recreational and ecosystem restoration elements compatible with the flood improvement actions. Five project alternatives were evaluated as they related to the three project objectives. The selected alternative provides the best option for achieving flood protection goals, while optimizing restoration opportunities to combat long-term climate change effects, and providing recreational opportunities.

Habitat Restoration

The project's Sustainability Design Objectives focused on ecosystem enhancement of the offset area and other remnant features, such as the degraded levee and existing channel margin of the Sacramento River, and were based on a series of multi-objective design criteria seeking to balance habitat enhancement and sustainability, flood control, site management, and recreation, including maintaining an open passage for water movement into and out of the floodplain, reducing the potential for fish stranding, providing continuous habitat corridors for wildlife movement, and identifying habitat enhancement and mitigation opportunities on both water and land sides of the levee.



The project leveraged a rare opportunity to restore 212 acres of habitat in a highly-urbanized area, with a net increase of 114 of habitat that did not exist before the project. The restoration includes new wetland habitat on the water side of the new levee to improve the lateral flow of a portion of the Sacramento River and expand much-needed protected habitat for local biodiversity. The setback levee restores part of the historical Sacramento River floodplain, as well as riparian and oak woodland habitats. The restored wetland habitat also reduces the risk of short-term flooding and erosion hazards, while achieving multiple ecological benefits.

Native fish will benefit from restored access and increased availability of seasonal floodplain habitat within the levee offset area. Net gains for native fish habitat and nursery have been achieved by breaching the remnant of the previous levee system to allow the offset area to seasonally inundate which also enhances riparian, wetland, and Shaded Riverine Aquatic Habitat. The levee offset area will periodically flood in a manner that supports salmonid migration by providing nursery and shelter from predation for juvenile fish. Because connectivity between the floodplain and river is essential, habitats are designed to maximize wide, continuous habitat corridors to facilitate wildlife movement.

A native plant palette was selected to maximize vegetation diversity and structure. To increase the likelihood of long-term planting success, the habitat restoration included a one-year backwater interim condition in the offset areas, creating a more sheltered environment due to lower water velocities, allowing restoration plantings to establish during the fall, winter, and spring in the year following construction without exposure to through-flows from the Sacramento River.

Ecological benefits, including habitat quantity and quality, translate to enhanced quality of life for residents through improved environmental health, public space, local character, quality of views.



Outcome 3: Improve economic effectiveness and sustainability

Recreation

The regained floodplain provides high quality riparian and savannah habitat and refuge for wildlife, while offering significant opportunities for people to connect with the natural environment and enjoy outdoor recreation.

Project elements align with other current and future recreational uses in the community, including interpretive trails (pedestrian and cycling), marina access, viewing platforms and interpretive signage. The project team worked closely with the City to align project elements with recreational enhancements planned as part of the City's recreation program and tie project development to community goals to support expanding safe recreational access along the river.

A public road previously located atop the levee was relocated to the land side of the new setback levee. To promote mobility and recreation, new bicycle paths were included with the road relocation and a recreational path was added on the top of the new levee. Other potential recreational uses in the area include trails for bikes, hiking, and horses; new fishing areas and water access; children's play area; fitness trail; and boat ramp/beach access area. These recreation opportunities result in a cumulative beneficial impact on the community.

The project also has served as a catalyst for other open space efforts in the vicinity, including the acquisition of land for public access to the area and restoration of an adjacent lake. Demonstrable investment has been seen through actions like grant funding received from the California State Parks Habitat Conservation Fund Grant Program for the Southport Levee Trailhead Project. The \$460,000 grant will fund half of the costs to construct a formal trailhead adjacent to the new Southport Levee Trail. Proposed improvements include parking, landscaping, an informational kiosk, shade features, an ADA ramp to the crown of the levee and other amenities to support trail use. Development of the trailhead fits directly into the City's plan to extend trails into the project area and is a clear example of how the project is stimulating additional public space improvements. These upgrades provide an attractive, safe and economical community attraction for residents and visitors.



Outcome 3: Improve economic effectiveness and sustainability

Extended Useful Life

The project was designed with the future in mind. With the primary project purpose focused on a 200-year level of flood protection, the levee improvements are anticipated to serve the Southport community for many years to come, even in the face of increased flood severity and unpredictability. To accomplish this, the project team made a broad range of design decisions that add to the project's durability and resilience. Decisions around the project's configuration, design, materials, vegetation, public vehicle access, and operations and maintenance access all help extend the project's useful life.

Bank erosion is a growing concern as flooding events are anticipated to become more severe and unpredictable in the future. A key design feature, bank protection was used to compare and select the best design alternative. Setting back the levee and reestablishing a waterside river bank supports slope stability. The hydraulic roughness created by the offset area attenuates erosive and scouring forces created by high water thereby protecting the levee prism. The remnant levee also acts as a buffer against wind and wave erosion.

Vehicular access to the levee has been limited by relocating the road that previous sat atop the levee. The removal of vehicle traffic reduces vibration and loads on the levee, improving durability. The setback levee design includes an operation and maintenance corridor to ensure ease of access for these activities, supporting the project's long-term performance. These protections extend the life of the levee, while reducing maintenance and capital refurbishment. These measures also are anticipated to result in less construction activity and therefore a reduction in associated greenhouse gas emissions.



Outcome 4: Promote replicability and the development of further projects

Replicability

The Southport Levee Improvement Project provides a learning opportunity and example for project approach, levee design opportunities, habitat restoration, and recreational improvements; individually or collectively. Where sufficient land is available adjacent to levee systems, setback levees could be considered, with related remnant levees and the potential for floodplain creation and/or habitat restoration. Where levee improvements are of a fix-in-place nature with limited restoration opportunities, design teams could consider other ways to design access for fishing and recreational opportunities to provide additional project benefits, while reducing erosion and other forms of levee degradation. Individual elements of the project could be used, such as selecting native vegetation or creating habitat where it didn't previously exist.

The project provides a model for holistic planning and design that illustrates how to improve the existing community condition beyond the scope of the project. This approach begins with ensuring a project's vision is community-focused and reflects local needs and goals; includes a robust stakeholder engagement process; and looks to balance the interests of affected communities when meeting project goals by delivering the greatest public benefit with the least private harm. This type of thoughtful planning and design can be applied to many projects to produce multi-benefit infrastructure that is resilient to climate change while providing additional community improvements.

Results spur Recognition

The Envision Sustainable Infrastructure Framework was used to evaluate the sustainability and resiliency of the Southport Levee Improvement Project. As a testament to the project's careful planning and implementation, the multi-benefit flood risk reduction and ecosystem restoration project received the Envision® Platinum verification from the Institute for Sustainable Infrastructure (ISI) in February 2020.

The Envision sustainable infrastructure framework assesses project sustainability across five categories: Quality of Life, Leadership, Resource Allocation, Natural World, and Climate and Resilience. These key areas contribute to positive social, economic, and environmental impacts on a community during the planning, design, and construction of infrastructure projects.