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Case Study:

Embedding INVEST in Contracting for the Corpus Christi Harbor Bridge

Corpus Christi, Texas

Lead Agency: Texas Department of Transportation (TxDOT)
INVEST Modules: Project Development (PD) and Operations and Maintenance (OM)
Link: http://ccharborbridgeproject.com/

The Texas Department of Transportation (TxDOT) used INVEST during the procurement process for the Harbor Bridge Project in Corpus Christi. TxDOT's request for proposals (RFP) required that bidders describe how their proposal would meet a "Platinum" rating on the INVEST PD module and a "Silver" rating on the INVEST OM module. The sustainability score, along with price and other factors, was part of the total score for selecting among the four bidders. This provided a strong incentive for bidders to achieve high sustainability at low cost. The winning bidder committed to a range of sustainability practices that will bring tangible benefits to the community.

> *"Using INVEST went beyond the rating. Sustainability became engrained in the project design. INVEST spurred our developers to look at different ways of doing things. The costs were small and some of the sustainability practices brought cost savings."* – Frank Holzmann, TxDOT

About the Project

The Harbor Bridge Replacement Project includes the construction of a new, cable-stayed bridge over the Port of Corpus Christi Ship Channel. The design includes a main span of 1655 feet, which when completed, will be the longest cable-stayed bridge span in the United States. The purpose of the project is to address structural deficiencies and navigational restrictions of the current bridge, and improve safety, connectivity, and level of service in the area. The new bridge will allow larger ships to deliver their cargo to the Port of Corpus Christi, serving as an economic catalyst for the region and the State of Texas. The scope of the comprehensive agreement includes the design, construction, finance, and 25-year maintenance of the project. The inclusion of maintenance in the contracting mechanism provides an incentive for the contractor to minimize life cycle costs, an important aspect of sustainability.

Getting Started

The Transportation Commission, which oversees TxDOT's work, made clear that they wanted sustainability to be a key part of the bridge replacement project. When the original bridge was built in the 1950s, it was a catalyst for growth for the City of Corpus Christi and the coastal bend region. The Commission saw the bridge replacement as an opportunity to enhance the social, economic, and environmental aspects of the community.

Rendering of the future bridge. (Courtesy of TxDOT)

In conversation with the FHWA Texas Division office, TxDOT expressed an interest in learning more about INVEST and how it could be used on the project. As such, in July 2014 the FHWA Texas Division hosted a one-day workshop on INVEST at the TxDOT Corpus Christi District. Approximately fifteen participants attended this event, representing private consultants, the City of Corpus Christi, TxDOT, and the Corpus Christi Metropolitan Planning Organization (MPO). TxDOT found it particularly helpful that an Ohio DOT project manager served as one of the instructors at the workshop and shared Ohio DOT's experience using INVEST on the Cleveland Innerbelt Bridge replacement. This brought hands-on lessons from using the tool to improve the sustainability of a major bridge project through the procurement process and the project development phase.

The next month, TxDOT brought together an INVEST working group of TxDOT staff and pre-scored the Harbor Bridge Replacement project in order to see what level of INVEST rating could be achievable. The group assessed how many points they thought the project could earn on each INVEST criterion. They determined that a "Platinum" level was achievable on the PD INVEST module and a "Silver" rating was achievable on the OM module. The table below provides examples from the pre-scoring workshop.

Harbor Bridge Project Examples from Pre-scoring Workshop

INVEST Criterion	Points Available	Scoring Notes	Achievable Score
PD-02 Lifecycle Cost Analyses	1 to 3	Can get at least 1 point for Life Cycle Cost Analysis (LCCA) of bridges. An additional point for LCCA of storm-water is achievable.	2
PD-07 Habitat Restoration	1 to 3	Can get 1 point for efforts to minimize wetland impacts (adding cross-culverts as part of permit). An additional 2 points are achievable through implementation of a "restoration plan."	3
PD-13 Freight Mobility	1 to 7	Can get 2 points for overpass clearance improvements for shipping. An additional 4 points are achievable by implementation of a no-idling policy and signage and provision of new dedicated truck delivery parking area.	4
PD-23 Reduced Energy & Emissions in Pavement Materials	3	Can get 3 points. TxDOT uses warm mix asphalt.	3

Using the Procurement Process to Spur Sustainability

Over the next three months, TxDOT worked on the RFP and updated the technical provisions for consistency with INVEST criteria. The RFP included the follow requirements on sustainability and INVEST:

- Describe the proposer's approach and commitment to sustainable design, construction, operational, and maintenance practices;
- Describe how a "Platinum" rating will be achieved for the INVEST Project Development module;
- Describe how a minimum of a "Silver" rating will be achieved for the INVEST Operations and Maintenance module;
- Describe how the following sustainability categories will be addressed: Energy Efficiency; Community and Environmental Justice; Green Building; Waste Reduction and Recycling; Green Project Administration; Materials and Resources; Construction Practices; Education; and Demonstration of Energy Efficiency;
- Include a sustainability manager on the team to track progress towards sustainability commitments.

To score each of the four bidders, TxDOT used a best value scoring system under which price accounted for 80 percent of the score and technical plan accounted for 20 percent. The price includes design, construction, and 25 years of maintenance. The technical score is based upon:

- Aesthetic requirements,
- Technical solutions,
- Project management plan,
- Quality management plan,
- Maintenance management plan, and
- Sustainability plan (including INVEST rating).

Best Value Scoring	
Price:	80 points
Technical:	20 points
Total:	100 points

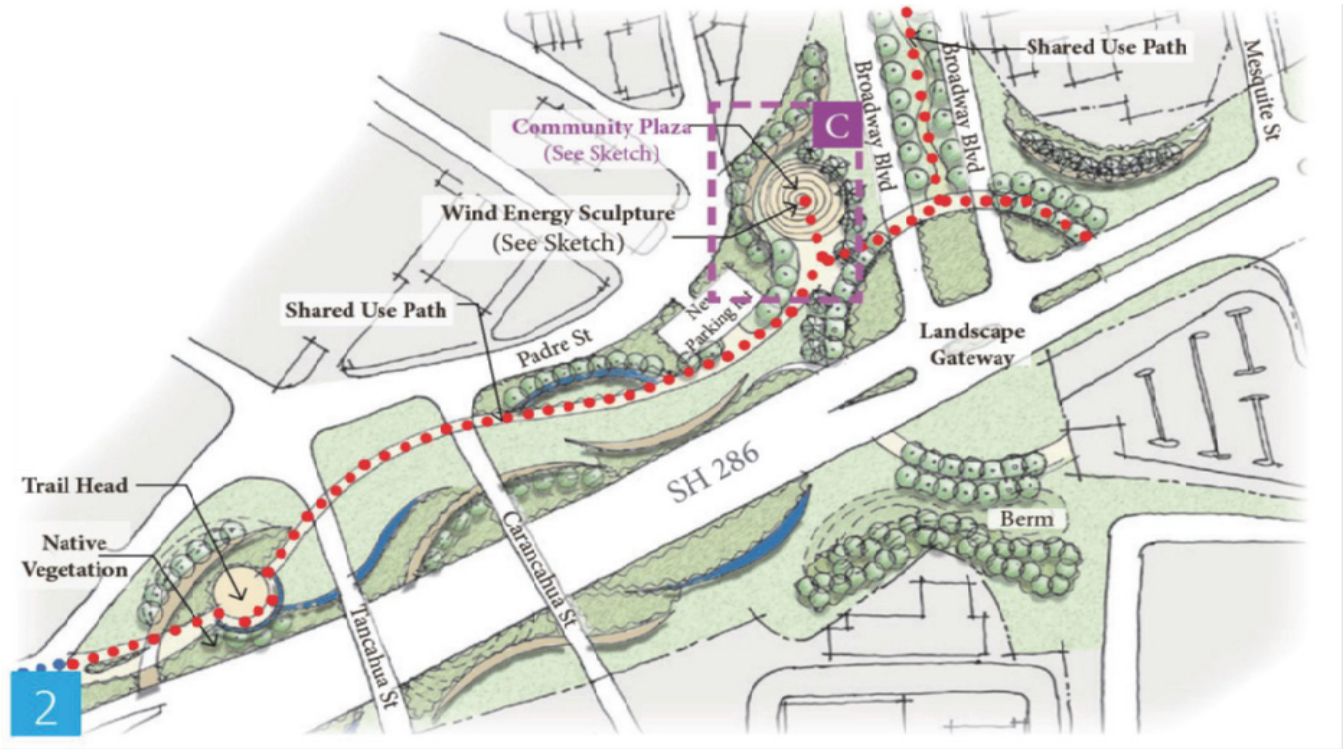
The team of Flatiron/Dragados received the highest score and was given a conditional award in April 2015. Their bid was $845 million for the base scope design and construction price and $128 million for the 25 year operations and maintenance price. Flatiron/Dragados committed to achieving "Platinum" INVEST rankings for Project Development and Operations and Maintenance. These commitments will be incorporated into the final contract. TxDOT and the contractor will monitor commitments included in the sustainability plan during construction and also score the Harbor Bridge project post development to ensure that the commitments to INVEST "Platinum" are met.

Elements in the Sustainability Plan

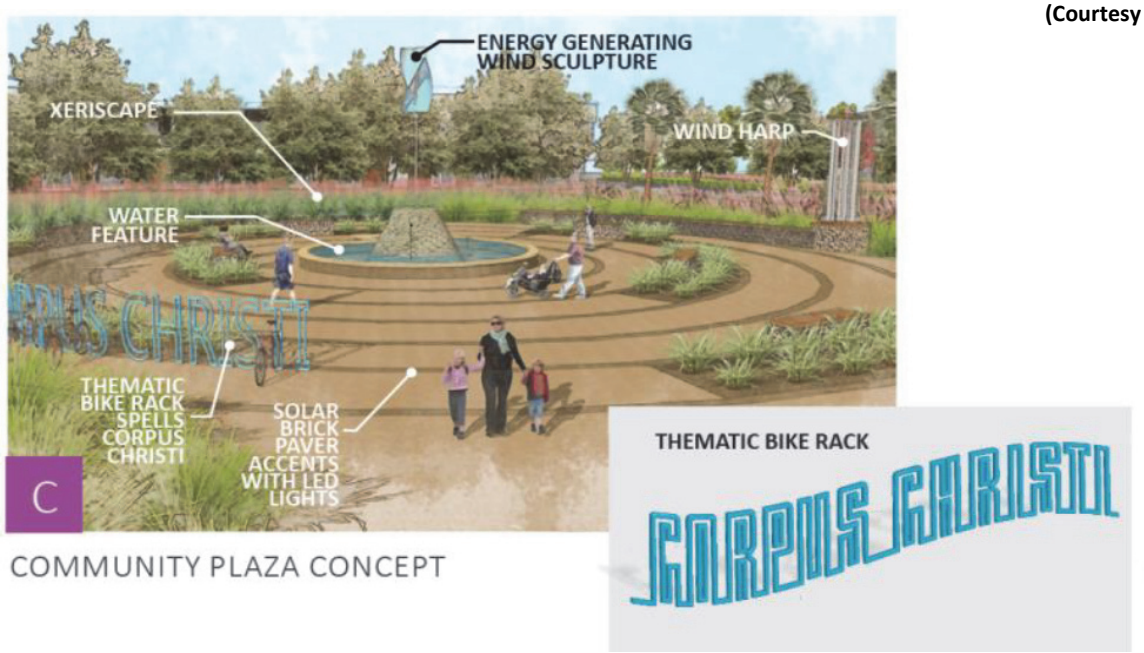
The winning bidder's sustainability plan includes a number of impressive sustainability practices listed below. The INVEST criterion to which each relates is in parenthesis.

- Energy Efficiency (PD-17)
    - All lighting fixtures are LED
    - Solar powered path lighting with solar brick pavers and solar markers on shared use path
    - Energy-generating wind sculpture
- Community plaza and belvedere to overlook ocean (PD-03)
- Native vegetation in landscaping and xeriscaping (PD-18)
- High strength, low permeability concrete mix, which provides protection from the harsh marine environment of salt water spray and warm air (PD-22)
- Waste reduction and recycling (PD-19, PD-20)
    - Benches at belvedere and landscaped areas made from recycled materials
    - Re-use of sign structures on new alignment
    - Re-use of concrete from interchange bridges as crushed stone in landscape

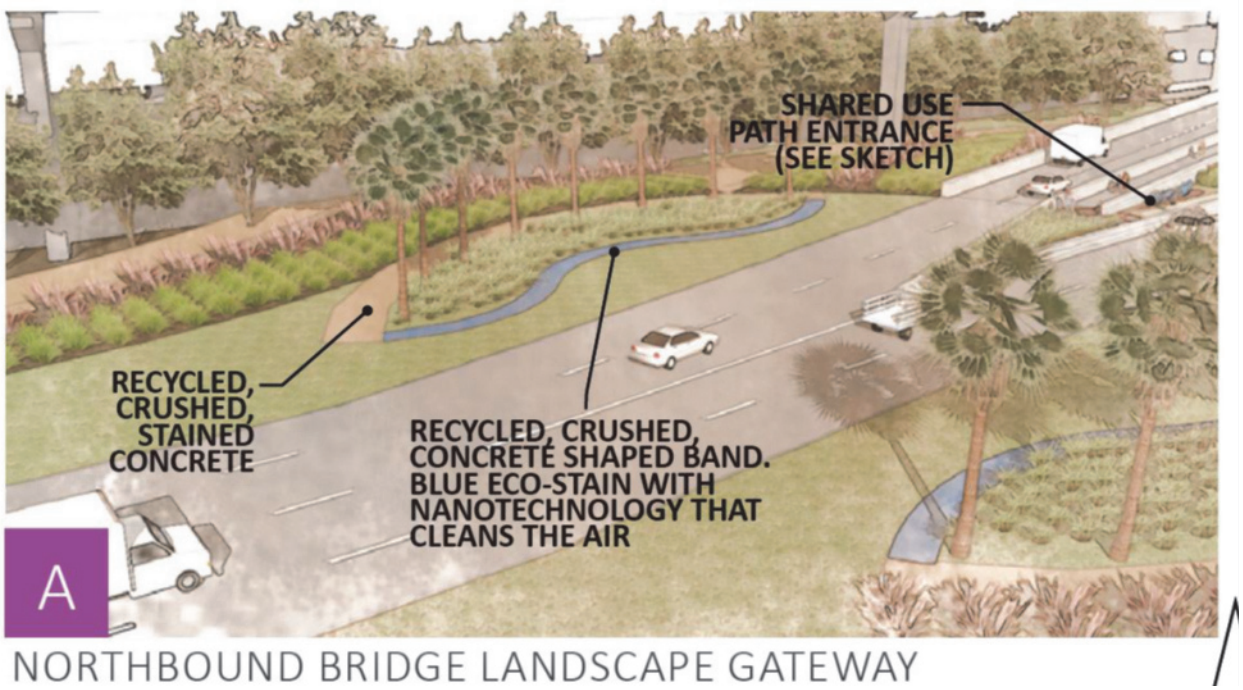
- Train construction personnel about project's sustainability initiatives (PD-25)
- Utilize temporary and permanent best management practices (BMPs) to treat stormwater prior to discharging to ocean (PD-08)
- Minimize and mitigate impacts to minority and low-income communities. Provide temporary bus service for community when construction impedes access (PD-03)
- Minimize air quality degradation during construction, including dust emission and odor control plan (PD-26)
- Shared use path (PD-10, PD-11)



Map of proposed landscaping and connectivity features.
(Courtesy of TxDOT)



Rendering of proposed community plaza.
(Courtesy of TxDOT)



Rendering of Northbound Bridge Landscape Gateway.
(Courtesy of TxDOT)

Key Outcomes of Using INVEST:

- Sustainability became engrained in the project design. Numerous sustainability practices are included and will be contractually obligated and tracked.
- Embedding INVEST in the procurement process provided an incentive for the bidders to achieve high sustainability outcomes at low cost.
- The inclusion of maintenance in the contracting mechanism provides an incentive for the contractor to minimize life cycle costs, an important aspect of sustainability.
- The costs of sustainability improvements were small and some of the sustainability practices brought cost savings.
- The practices brought demonstrable social, economic, and environmental benefits to a community that had previously felt negative impacts from the old bridge.
- The peer exchange between Ohio DOT and TxDOT proved valuable and may be a model moving forward for other agencies.
- TxDOT is considering using INVEST for additional sustainable infrastructure improvements in the future as part of major multi-million dollar planning and construction efforts throughout the state.