RED ARC pedestrian and bicycle bridge

existing circulation

existing building function

travel time before & after

suspenders

bridge railing

bridge structure

concept diagram
This project will connect Grisby Square with the Addicks Park-N-Ride system across I-10 in The Energy Corridor of Houston, Texas. The design utilizes native, water wise plants to reduce the need for supplemental irrigation. Low energy efficient lighting will also be implemented to allow the bridge to be self-sustaining with the use of solar power energy. To accomplish such a self-sustaining bridge, we focused on four main goals:

• Sustainability
• Connectivity
• Place-Making
• Safety

• The highest percentage of residents in the is area 5pm that would use the bridge are those who are working or going to school.
• Right now most people drive alone, with the addition of the bridge the percent of bikers would increase.
• The shade analysis helped determine locations for solar panels, that would offset the energy cost of the bridge. Safety

INVESTIGATION

PROPOSED BICYCLE CIRCULATION

SHADE ANALYSIS

PROJECTION

ACTUALIZATION

2. STAIRS TO BRIDGE

3. WATERFALL PLAZA

4. PARK N' RIDE RAMP ENTRANCE

The Waterfall Plaza is intended to be a destination. This space offers room for visitors to meet and interact. The stairs serve an alternate way to access the bridge, as well as a space with plenty of shaded seating. The ramp is the main entrance for the north end of the bridge, and acts as an extension to the bike trails in the area. Additionally the ramp facilitates ADA accessibility across the interstate.

Once on top of the bridge there is plenty of room for walking, biking, and passive activity.

A'-A' VIEW ON TOP OF THE BRIDGE
The Energy Corridor District consists of over 2,000 acres that extend along both sides of Interstate 10 in West Houston. It is considered one of the nation’s premier employment centers containing the headquarters and regional offices of prominent international energy companies, energy services firms, and many other significant organizations. The District is distinguished by its exceptional location within the Houston metropolitan area, a large and growing critical mass of existing office workers and residents, and adjacency to some of the region’s great natural assets.

**SITE ANALYSIS**

The Energy Corridor features significant assets internally, however, internal and external accessibility is challenged. Especially for pedestrians and cyclists. Barriers include I-10, which is a large urban road and carries more than 200,000 vehicles daily.

**Volution:** noun | vo·lu·tion | volushan
1. a single turn of a spiral or coil.

**Volution:** adjective | vo·lu·tion·al | volushenal
2. Moving in a circular way combined with lateral motion.

**PEDESTRIAN EXPERIENCE**

Rigged supports anchored by structural cables create a sense of lateral movement and multiple angles compressing movement visually.

Textured concrete accents by interactive lighting invoke a sense of safety while enhancing visual experience.

**COMPUTER EXPERIENCE**

Structural cables and bicycle brooked subtly referencing the circular interest and impact as a pedestrian corridor.

DUAL MITRED SUPPORT SYSTEMS CREATE A SENSE OF LATERAL MOVEMENT AND THREE-DIMENSIONAL MOTION, OFFERING UNIQUE AND VARYING INTERPRETATIONS DEPENDING ON THE PERSPECTIVE OF THE VIEWER.

**Volution Pedestrian Bridge**

"The scale, walkability, and authentic character of this district will continue to serve residents and employees of the Energy Corridor as the area undergoes rapid redevelopment and growth..."

**VOLUTION PEDESTRIAN BRIDGE**

"One of the most significant challenges facing development in The Energy Corridor north of I-10 is the physical division created by the highway. Currently, the nearest opportunity for pedestrians and bicycles to traverse I-10 exists along Route 6, requiring at least a half mile of circuitous travel with multiple road crossings before reaching the transit center site from the south of I-10. This distance and route will inhibit achieving the critical mass of pedestrians necessary to create and sustain a vibrant mixed use and entertainment hub at the transit center."

"One solution is the construction of an iconic pedestrian and bicycle bridge spanning I-10, connecting the new developments in the north to the existing office and residential environment in the south. Pedestrian and bicycle bridges are bold statements for communities with similar infrastructure hurdles. In addition to expanding the reach of the districts they serve, these bridges offer and encourage alternative means of mobility for residents and workers previously limited to passenger car travel and transit options. The bridge can also serve as a significant architectural and engineering gesture, which in time can contribute to The Energy Corridor’s overall cohesive branding and messaging."
Bridging the Future

Currently, the closest connection to cross IH-10 is along State Highway 6. This leads to a difficult and less safe way of traveling for pedestrians and bicyclists, discouraging them to traverse the divide of the north and south sides of the Energy Corridor District.

The aim of this design is to create a safe passage over IH-10 for pedestrians and bicyclists while at the same time giving an iconic look to the district. It also aims to encourage walking and biking instead of driving to get across the highway. It also takes into consideration Sasaki’s proposed Master Plan for the Addicks Park’n’Ride/Grisby Square area in order to create unity.

Safety  Connectivity  Sense of Place

There are three main goals that this design aimed to achieve:

- Provide safe pedestrian and bicycle access across IH-10
- Connect the district at the Addicks Park’n’Ride and Grisby Square
- Create an unforgettable and iconic bridge that becomes a symbol of the Energy Corridor District

Both ends of the bridge branch out into two kinds of access. One way to access the bridge is by a series of stairs. The other access is by ramp, making it easy for bicyclists.

The 60’ width makes it possible for pedestrians and bicyclists to share the bridge comfortably. The Addicks end of the bridge is designed to connect to a proposed parking garage based off Sasaki’s Master Plan.

Two areas of the bridge that jut out across the highway have seating. Users can either sit under the shade structure or around the circular planter.

Within the circular planters are Urban Trees, artificial trees that filter and clean the air of carbon dioxide (designed inspired by Influx Studio). Not only do they create focal points during the day, but also at night, lighting up in different colors.
TRACING YOUR PATH
PEDESTRIAN AND BICYCLE BRIDGE DESIGN
Hua Yan
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The bridge has two parts separately, could be mainly used for pedestrians and bikers. The linkage between the two parts improve flexibility on choosing direction, and reinforce the structure with wires as well.

Longest Bridge Span: 600’
Shortest Bridge Span: 525’
Height of Peak point: 50’
Width of Bridge: 12’
Material: Steel Structure

Orientated all directions

Individual Walker Pattern
Two Walkers Pattern
Group Walkers Pattern

Pedestrian Tracing Pavement
The experimental model was created with Rhino-grasshopper and remote control device, which simulate the situation when users are walking on the bright. The more walkers get together, the more colorful the pavement could be.

Bicycle Tracing Pavement
The model provides a function of tracing the moving path of bikes, and gives instantaneous velocity and curvature at certain points on the moving path.