The site is located between Houston and Katy in the Harris County along I-10 in the Energy Corridor District. This area is surrounded by two large reservoirs that allow easy access to nature. The land use is very diverse with suburban housing, healthcare facilities, schools, hotels, shopping centers, restaurants, and business opportunities. Within the Energy Corridor District our site is centered by the intersection of Dairy Ashford Road and St. Mary’s Ln. The diversity of the District is reflected within our site, it contains a large number of residential and business units, and neighbors Stratford High School and a large residential community.

This site is very rich in diversity, has easy access to I-10 and within a walking distance to residential areas. However the lack of connectivity between, buildings, parks, and residential units, no buffers or signage along I-10 or Dairy Ashford Road for pedestrian safety, lack of attractive vegetation, and prone to flooding gives this site a lot of potential for improvement.

With the proposed design we aim to improve pedestrian safety, environmental responsibility, sense of identity, visual quality, and circulation. The design adds sidewalks and buffers to all the streets for pedestrian and bike safety, incorporates a stormwater management network throughout the site to prevent flooding, promotes a sense of identity through design uniformity, connects existing bike trails to the site for a cohesive network, and improves aesthetic value with vegetation and site furniture.
In order to create a successful design, we had to look at who lives in the Energy Corridor District. The majority of people in the district are white. The ratio of men to women is equally divided. We compared the ages of people living in the ECD to Houston and found that the majority of the ECD consists of adults ages 25-52. This makes up half of the district, compared to the 42% in Houston. From there, elderly adults are the next majority, although there is a large deficit between the two groups. The smallest group in the ECD are teenagers and college students. This shows that the majority are young professionals living and working within the district. This not only leads to a demand for more gathering spaces and destinations, but also ways to access these places. With the district encouraging alternative modes of transportation, diverse modes of accessibility are also crucial, as it gives more options to the residents instead of constantly relying on cars. This will not only benefit the young professionals, but everyone within the district.
SITE ANALYSIS / LAND USE
SITE ANALYSIS/LAND BREAKDOWN

- Green Space: 41%
- Streets: 37%
- Buildings: 16%
- Parking: 6%
3 different types of clay soil exist on our site, which do not allow for much water infiltration due to the urban compact conditions.
SITE ANALYSIS / BUILDING BREAKDOWN

Building Types

Commercial
- 40.05 acres

Religious
- 16.74 acres

Residential
- 27.19 acres

Retail
- 2.58 acres

Hotel
- 1.32 acres

Green Space

Building Height

[Diagram showing the breakdown of building types and their respective areas]
The public transportation network in the site is very good, there are too many bus stops in the same area. Distributing the extra bus stops elsewhere would be a great solution.

The bike lane network does not cross our site at all, we do have two bike lanes which go through N. Dairy Ashford Rd. which is north of the site and Memorial Dr. which is south of the site. Connecting these two bike networks through the site would be a very positive impact not just for the site but for the entire Energy Corridor District.
The existing street hierarchy consists of I-10 and Diary Ashford Rd. as Primary, St. Ma y’s Ln. as Secondary, Threadneedle St. and Barryknoll Ln. as Minor, and the street surrounded by the London Town homes we labeled as Local Street. This hierarchy was composed based on how much traffic and pedestrian activity is currently.

As for the existing sidewalk network, there are a large number of sidewalks in the site but they are broken and uneven. In some areas there is no buffer between the sidewalk and the street while in others there is, some areas have sidewalks on both sides while others do not. A more cohesive and connected sidewalk network will greatly improve the aesthetics of the place while making it safer for pedestrians.
CASE STUDIES

Portland, Oregon
extended curb

Legible London
wayfinding

Barcelona, Spain
bike lanes

KlydeWarren Park
placemaking
///LOW IMPACT DEVELOPMENT

Permeable paving reduces run off by slowing it down and helps filter water as it infiltrates into the ground.

Curb extensions not only act as a physical buffer between the pedestrian and vehicular traffic, but also holds water and filters it through natural processes.

Green parking design slows down water run off and cleans the water as it filters through.

**Permeable Surface Materials**
- Porous asphalt/concrete
- Open grid pavers
- Gravel paving
- Grass concrete paving
- Turf pavers
///SWOT ANALYSIS

**S**
**STRENGTHS**
- Generous 40’ wide two-way streets on majority of site
- Easy access to and from site via I-10
- Residential areas within walking distance to diverse land uses
- An abundance of parking
- Bus stop within walking distance

**W**
**WEAKNESSES**
- Connectivity between buildings, parks, residential
- Little to no attractions / landmarks
- Lacking sense of place and identity
- No buffers or signage along I-10 for pedestrian safety
- No safe signage or crosswalks along Dairy Ashford Road
- Lack of attractive vegetation

**O**
**OPPORTUNITIES**
- Pockets of green space for parks
- Large green space at Dairy Ashford and St. Marys Lane
- Food places within walking distance
- High demand for district to become more walkable / bikeable
- Potential attractive destination at Turkey Creek

**T**
**THREATS**
- Construction being built just feet away from the street on the northeast corner of St. Marys Lane
- Noise pollution from I-10 and Dairy Ashford Road
- A portion of the site is along the flood plain
- Underground parking not allowed due to flood plain
///GOALS AND OBJECTIVES

- Increase and improve crosswalks and sidewalks
- Add buffers between streets and sidewalks
- Implement bike lanes with buffers
- Connect existing bike trails to the site
- Introduce more bus routes within the site
- Introduce wayfinding system
- Create a stormwater management network
- Install porous pavement and rain gardens
- Remediate Turkey Creek bank erosion
- Implement a cohesive design theme
- Increase aesthetic value of the site
- Create a sense of place within the site
- Promote identity of the site
SPACIAL PROGRAMING

- Business/Mixed Use
  - Office and retail space
  - Plaza
  - Restaurants

- Streetscaping
  - Buffer b/w streets and sidewalks
  - Bike lanes
  - Widen sidewalks

- Walking/Biking Trail
  - Workout Stations
  - Viewing Deck

- Public Spaces
  - Plazas
  - Seating areas

- Open Space
  - Walking/biking trail
  - Open lawn space
  - Amphitheater
The proposed sidewalk network map shows that every street has a sidewalk in order to keep a cohesive look, it also labels the shared and stand alone sidewalks.

The street hierarchy network map illustrates the proposed street, St. Mary’s South Ln. which would connect to St. Mary’s Ln. and Tully St. right outside of the site.
The proposed sidewalk network map shows that every street has a sidewalk in order to keep a cohesive look, it also labels the shared and stand alone sidewalks.

The street hierarchy network map illustrates the proposed street, St. Mary’s South Ln. which would connect to St. Mary’s Ln. and Tully St. right outside of the site.
1. Proposed Business Hub and Plaza
2. Proposed Parking Garage #1
3. Proposed Parking Garage #2
4. Turkey Creek Park
5. Energy Corridor District Office
6. Threadneedle St. & St Mary’s Ln. Intersection
7. Proposed Pedestrian Friendly Streetscape
8. St. Mary’s Ln. & N. Dairy Ashford Rd. Intersection
9. ECD Park
10. St. Mary’s Ln. Extension
11. Proposed Public Open Space #1
12. Proposed Renovated Bus Stop
13. Proposed Public Open Space #2
///PROPOSED BUILDING
///PROPOSED BUILDING PLAZA
ECD PARK
///MULTI-USE OPEN SPACE/RENOVATED BUS STOP
///PROPOSED INTERSECTION
PROPOSED INTERSECTION NIGHT
///SECONDARY STREET

6’ sidewalk  5’ bike lane  4’ rain garden  24’ two way street

4’ rain garden  5’ bike lane  6’ sidewalk
UNDERPASS
The Energy Corridor District is located off of I-10 on the west side of Houston, TX. The primary goal of the project is to promote the businesses located along St. Mary’s Ln. and Threadneedle St., while also pushing towards sustainable and healthy practices for the users and area. The way that this will be implemented is by implementing place-making measures and developing streetscape guidelines that will enhance the safety and quality of life of the Energy Corridor District. Enhancing the site would be beneficial to all who use this neighborhood. The lack of pedestrian safety keeps it from being a sustainable, walkable area. The area has a fair amount of residents and businessmen and women who would benefit from being able to have places to enjoy themselves without going too far. The district is already improving its transit networks to make it easier and more environmentally friendly for those who work throughout the EDC. While there were some negatives that hinder the site of its possibilities, the pros definitely give the district an advantage. The proximity to a variety of places, give it the opportunity to be a place that will enhance the image of the Energy Corridor District. Our goals include building a vibrant community, enhance environmental quality, improve safety conditions and promote a diverse transit network. With new conceptual design implementations, this neighborhood of the Energy Corridor District will enhance the goals that the district wants to achieve. The ECD should promote that they are a sustainable district who wants to improve the quality of life for its property owners, businesses, residents, employees and visitors.
I. Introduction

II. Site Location

III. Site Analysis
   Existing Conditions
   SWOT Analysis

IV. Design Program
   Project Goals
   Design Program
   LID Program

V. Design
   Turkey Creek Revitalization
   I-10 Underpass
   Street Classification
   New Hotel & Park Development
TEXAS HARRIS COUNTY ENERGY CORRIDOR DISTRICT ST. MARY’S NEIGHBORHOOD

Site Location
Site Analysis
Existing Landuse
Existing Bus Routes
Design Context

- Located along I-10 with proximity to offsite attractions
- Potential active space to work with
- Potential space for LID implications
- Public transportation route
- Great street network

STRENGTHS

ADJACENT TO I-10
POTENTIAL SPACE
PUBLIC TRANSPORTATION
ACTIVE STREET SYSTEM
Design Context

- Minimal to no public green space
- Lack of pedestrian safety
- Lack of communal areas
- Lack of street and green space connectivity
- Lack of adequate signage
- Absence in wayfinding

MISSING SIDEWALKS
MINIMAL GATHERING SPACE
LOW CONNECTIVITY
INADEQUATE SIGNAGE
Design Context

- Active engaging community
- Complete Streets
- Space for LID practices
- Aesthetic quality improvements
- Urban plaza development
- Green space for active or open areas
Design Context

- Intense traffic along Dairy Ashford
- Minimal crosswalks increase safety risks
- Noise pollution from I-10
- No bike lanes
- Thin Sidewalks

Threats: Creek Edge, Minimal Crosswalks, Little Lighting, Small Sidewalk Buffer
Design Program
Case Studies

Beck Park
Dallas, Texas
MESA Design Group

The Creative Corridor
Little Rock, Arkansas
Marlon Blackwell Architect

Dockside Green
Victoria, British Columbia, Canada
Busby Perkins + Will (BPW) and PWL Landscape Architects

Dutch Kills Green
Long Island City, Queens, New York
WRT Margie Ruddick Landscape (MRL)

Renaissance Park
Chattanooga, Tennessee
Hargreaves Associates
Build Vibrant Community
Promote Diverse Transit Network
Enhance Environmental Quality
Improve Safety Conditions

Design Goals

Wayfinding
Integrate Infrastructure
Complete Streets
Bike Share
CROSSWALKS
Lighting
Improve Bus Stops
Pervious Pavement
Bioswales/Rain Gardens
Increase Tree Cover
Pocket Parks
Public Destinations
Design
Master Plan

- Turkey Creek Trail
- Turkey Creek
- Proposed Parking Garage
- Proposed Office Buildings
- Plaza
- Mixed-Use Building
- Proposed Parking Garage
- Residential
- Proposed Hotel and Retail Space
- Hotel Tree Plaza
- ECD Bike Share
- Dog Park
- Retention Pond
- Pavilion
- Open Recreational Space
- Soccer Field
Proposed Bus Route
I-10 Underpass

Day View

Night View
Street Class Map
Street Class II

Class 2

10' Sidewalk  5' Bike Lane  12' 1 Lane Street  6' Median  12' 1 Lane Street  5' Bike Lane  10' Sidewalk

60' Section
Street Class III

Class 3

10' Sidewalk 5' Bike Lane 24' 2 Lane Street 5' Bike Lane 10' Sidewalk

54' Section
Street Class III

Class 4

6' Sidewalk

24' 2 Lane Street

6' Sidewalk

36' Section
Office Plaza
Bike Share Program
Dog Park
**Grey to Green**

**EXISTING CONDITIONS**
- Gray Space: 81.0%
- Green Space: 19.0%
- 108.7 acres: 25.5 acres

**PROPOSED CONDITIONS**
- Gray Space: 68.2%
- Green Space: 31.8%
- 91.5 acres: 42.7 acres
<table>
<thead>
<tr>
<th>Presenters</th>
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<tr>
<td>Taylor Herrmann</td>
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<tr>
<td>Logan Kidwill</td>
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<td>Blaine Mikulik</td>
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<td>Michelle McCreary</td>
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<td>Kim Spaulding</td>
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**ENERGY CORRIDOR DISTRICT NEIGHBORHOOD REDEVELOPMENT**

**Presented by**

**MARCH 6TH, 2016**

**EXPLORE • DESIGN • INITIATIVE**
The Energy Corridor District is a continually growing and re-developing community. Sustainable development and a healthy living environment is a highly promoted objective of this area. The aim of The Energy Corridor District is to attract property owners, business, residents, employees and visitors through the use of sustainable development as an aesthetic quality in every way. The students of TAMU have been entrusted with the task of designing a comprehensive master plan for the area along St. Mary’s Ln. and Threadneedle St. as well as the neighborhood.

This comprehensive revitalization of the area will consist of new place making techniques, addition of safety measures such as bike lanes and better walking conditions and more effective circulation throughout the entire area. Another area of focus for us was in enhancing the relationship between the businesses and neighborhood areas so that the district was seemingly part of the same comprehensive plan. The identity of this area will be more apparent throughout the community as a whole because of the system-oriented design approach that was taken.

Although there are multiple areas of concentration here, the end result will be for the character as a whole of The Energy Corridor District to be recognized as a sustainable, livable and attractive community.
OUTLINE

SITE CONTEXT

SITE ANALYSIS
HYDROLOGY
CIRCULATION
LAND USE

SYSTEM ORIENTED RESEARCH

SWOT ANALYSIS

CASE STUDIES
SOLAR ENERGY SPHERE
TRAFFIC CALMING TECHNIQUES
JOHNNY STEEL DOG PARK
NOMA UNDERPASS

GOALS
1. CREATE VIBRANT DESTINATIONS
2. ENHANCE CURRENT SITE CONDITIONS
3. IMPROVE CONNECTIVITY & WALKABILITY
4. INCREASE PROPERTY VALUE

MASTER PLAN

PERSPECTIVES

STREETSCAPE DESIGN

DESIGN ASSESMENT
HYDROLOGY
CIRCULATION
VEHICULAR CIRCULATION
EXISTING LAND USE
TOTAL BUILDING SQUARE FEET

Total Building Square Feet
- Commercial Use: 501,393 sq ft
- Office Use: 1,447,443 sq ft
- Multi-Family Housing: 149,196 sq ft
- Single Family Housing: 701,896 sq ft
- Public Facilities: 26,513 sq ft
- Total: 2,826,441 sq ft

Total Parking Square Feet: 1,101,989 sq ft
COMMERCIAL USE

- Holiday Inn Express
  68,000 sq ft
- Ashford East
  113,288 sq ft
- Brook's Prime
  3,473 sq ft
- Courtyard Marriott
  136,560 sq ft

- 1201 N. Dairy Ashford Rd
  58,001 sq ft
- Rising Canoe
  13,453 sq ft
- Mid-South Bank
  50,733 sq ft
- Sasic
  6,870 sq ft
- Eastgate
  84,000 sq ft

- Shopping Strip
  29,430 sq ft

Commercial Use
501,393 sq ft
# SWOT Analysis

## Strengths
1. Landmark: Site of ECD HQ
2. Natural Features
   - Tree canopy
   - Stream/creek access
   - Potential open space access
3. Accessibility to and from the district adjacent land use

## Weaknesses
1. Pedestrian circulation
2. Vehicular circulation
3. Lack of land use diversity
4. Hazardous walking conditions
5. Outdated property conditions

## Opportunities
1. Enhance current successful design elements with creative & cohesive solutions (place-making)
2. Proximity to natural features
3. Increase accessibility through walkable design elements
4. Diverse land use opportunities

## Threats
1. Cooperation of property owners
2. Future traffic demands
3. Within flood plane
4. Civic policy
SWOT ANALYSIS MAP

- OPEN SPACE
- NATURAL FEATURES
- ENGAGING UNDERPASS CONNECTION
- WALKABLE STREETS
- ECD HEADQUARTERS
- DOG PARK
- RUNNING TRAIL & OPEN PARK AREA

STRENGTHS & OPPORTUNITIES
Developing high density walkable communities that have access to green space connected by pedestrian friendly transportation options can meet the housing markets demand and increase property value.
CASE STUDY 1: SOLAR ENERGY SPHERE

- Stand alone energy generator
- Takes shape of the sphere to better track and harvest sun’s energy via micro tracker during all hours of the day
- Has hybrid collector to convert daily electricity and thermal energy at same time
- Captures light energy no matter the weather conditions
- Affordable and sustainable: (largest one costs around $9,700 USD)

Being a symbol of energy, this would be the solution to the lack of prominent landmark for The Energy Corridor. Can be installed virtually anywhere on the site or at multiple points of energy and provide for neighboring business.
CASE STUDY 2: TRAFFIC CALMING TECHNIQUES

Use forces of acceleration to discourage speeding. Examples include speed humps, speed bumps, speed lumps, speed tables, speed cushions and textured pavements.

Force drivers to reduce speeds by impeding straight-through movements. Examples include traffic circles, roundabouts, and chicanes or serpentine streets.

Elicits a psychological sense of enclosure to discourage speed. Examples include center island narrowing, chokers and curb extensions.

“... traffic calming involves changes in street alignment, installation of barriers, and other physical measures to reduce traffic speeds and cut-through volumes in the interest of street safety, livability, and other public purposes.”

- The Institute of Transportation Engineers (ITE) & the Federal Highway Administration (FHWA), 1999
CASE STUDY 3: JOHNNY STEEL DOG PARK

The location is 2929 Allen Pkwy, Houston, TX 77019. The site has similar geography of the Energy Corridor and an innovative design to draw people into it. Johnny Steele Dog Park has many design features that make it a premier park and allow it to rise above other contenders.
In the M Street tunnel, the inside rains with light – a fixed bright pointillist plane that turns a dark roof into a glowing field. The interior of this tunnel radiates with tiny curtains that shift as you move through them like a set of waterfalls that stop above you. Looking up into this environment shifts the expectation of a dark and damp tunnel ceiling into a place you want to be. The light varies over this field so that you see a still effect of waves.
DESIGN GOALS

1. Create a vibrant destination
DESIGN GOALS

1. Create a vibrant destination
2. Enhance current site conditions
DESIGN GOALS

① Create a vibrant destination  
② Enhance current site conditions  
③ Enhance connectivity & walkability
DESIGN GOALS

1. Create a vibrant destination
2. Enhance current site conditions
3. Enhance connectivity & walkability
4. Increase property value
1. Create a vibrant destination
2. Enhance current site conditions
3. Enhance connectivity & walkability
4. Increase property value
POCKET PARK PREVIEW

- Company Name on Fountain
- Berm in Pocket Park
- Plaza & Seating Planters
- Park Running Area & Open Space
- Park Pond & Gazebo
- Company Pocket Park
DAIRY ASHFORD & ST. MARY’S INTERSECTION
NEXUS PLAZA & APARTMENTS
### Type I.
- Two or three lanes
- Main thoroughfares
- Little pedestrian traffic
- Ex. Dairy Ashford & HWY I-10

### Type II.
- Generally two lane
- Connect major & local streets
- Medium amount of pedestrian traffic
- Ex. Threadneedle & St. Mary's

### Type III.
- Generally two or one lane
- Includes cul-de-sacs
- Type with most pedestrian & bicycle traffic
- Ex. eastern section of St. Mary's
LOCATION

EXISTING

PROPOSED

24' ROADWAY
2' BUFFER
5' BIKE LANE
3' BIOSWALE
5' SIDEWALK

~54'
PROPOSED LAND USE
DESIGN ASSESSMENT: ECONOMIC ANALYSIS

PRE-DESIGN

- MULTI-FAMILY (30%)
- SINGLE FAMILY (70%)

EST. TOTAL RESIDENTIAL SQ. FOOTAGE: 430,534
MULTI-FAMILY UNITS: 162
EST. SINGLE FAMILY UNITS: 162-172

EDI DESIGN

- MULTI-FAMILY (100%)
- SINGLE FAMILY (0%)

TOTAL RESIDENTIAL SQ. FOOTAGE: 560,739
POSSIBLE MULTI-FAMILY UNITS: 639

*BASED ON ANALYSIS OF AVG. SQ. FT. OF MULTI-FAMILY UNITS: 877

INCREASE IN TOTAL SQ. FOOTAGE: 22.23%

RESIDENTIAL SURFACE AREA

- PRE-DESIGN
- EDI DESIGN

PERCENTAGE (%)

IMPERVIOUS:
- (75%)
- (33%)

PERVIOUS:
- (67%)
- (25%)

POTENTIAL PROFIT ANALYSIS
OF MULTI-FAMILY LAND USE

TOTAL SQ. FT: 560,739
AVG. SQ. FT: 877
POTENTIAL UNITS: 639
PRICE ($/MO.): $956
OCCUPANCY: 90%

POTENTIAL ANNUAL RETURN: $6,597,547.20

*BASED ON MULTI-FAMILY MARKET ANALYSIS AVERAGES
ANNUAL PRECIPITATION: (approx.) 52.69 in.

AVERAGE MONTHLY PRECIPITATION, HOUSTON AND U.S. (2013)

MONTHLY PRECIPITATION (in)

MONTH

JAN
FEB
MAR
APR
MAY
JUN
JUL
AUG
SEPT
OCT
NOV
DEC

HOUSTON
U.S.

DESIGN ASSESSMENT: STORMWATER ANALYSIS
**DESIGN ASSESSMENT: STORMWATER ANALYSIS**

**SURFACE PERVIOUSNESS COMPARISON**

- **PRE-DESIGN**
- **EDI DESIGN**

**PERCENTAGE (%)**

- 10
- 20
- 30
- 40
- 50
- 60
- 70
- 80
- 90
- 100

**IMPERVIOUS**

**PERVIOUS**

**DESIGN PERFORMANCE**

- REDUCES IMPERVIOUS SURFACE AND INCREASES PERVIOUS SURFACE BY 32%
- RUNOFF REDUCTION RATE: 7%
- ANNUAL RUNOFF REDUCTION: 924,801,523.1 gal/yr

**IMPERVIOUS PERVIOUS**

**EDI DESIGN**

**PRE-DESIGN**

**SURFACE PERVIOUSNESS COMPARISON**

**PEAK DISCHARGE RATE FOR STORM EVENTS**

- **PEAK DISCHARGE RATE (CFS)**
  - 100
  - 200
  - 300
  - 400
  - 500
  - 600
  - 700
  - 800
  - 900
  - 1000

- **10-YEAR**
- **25-YEAR**
- **100-YEAR**

**BASED ON ANALYSIS AND WATER TREATMENT COST OF $9/gal (CNT 2010)**

**ANNUAL RUNOFF REDUCTION**: 924,801,523.1 gal/yr
REFERENCES

Goal One:
http://www.sasaki.com/blog/view/659/

Goal Two:

Goal Three:
http://www.rrmdesign.com/projects/streetscapesandplazas

Goal Four:

Seating area:
https://www.google.com/search?q=plaza+seating+areas&rlz=1C5CHFA_enUS691&espv=2&biw=1053&bih=490&site=webhp&source=lnms&tbm=isch&sa=X&ved=0ahUKEwinYoUb7MAhXisYKHaJ0CBEQ_AUIBig-B#imgrc=8XaReYI1Dhd9mZM%3A

Running area in park:
https://www.google.com/search?q=running+area+in+park&rlz=1C5CHFA_enUS691&espv=2&biw=1300&bih=577&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi_5dbb77MAhVY62MKHaOWDDMQ_AUIBig-B#imgrc=a5qIf16y6BV44M%3A

Park pond and gazebo:
https://www.google.com/search?q=park+pond+and+gazebo&rlz=1C5CHFA_enUS691&espv=2&biw=1300&bih=577&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjFscSd777MAhU0omMKHc-KAooQ_AUIBig-B#imgrc=mbphqwUtThuyJM%3A

Company pocket park:
https://www.google.com/search?q=pocket+parks&rlz=1C5CHFA_enUS691&espv=2&biw=1300&bih=577&source=lnms&tbm=isch&sa=X&ved=0ahUKEwjFscSd777MAhU0omMKHc-KAooQ_AUIBig-B#imgrc=6xZ3svSW71NIM%3A

Seating berm:
https://www.google.com/search?q=concrete+seater+in+berm&rlz=1C5CHFA_enUS691&espv=2&biw=1300&bih=577&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiDrtW4777MAhU51WMKg2nOCGgQ_AUIBig-B#tbm=isch&q=terraced+seating+berm&imgrc=5ixX-fslM4zUCM%3A

Waterfall sign:
https://www.google.com/search?q=waterwall&rlz=1C5CHFA_enUS691&espv=2&biw=1300&bih=577&source=lnms&tbm=isch&sa=X&ved=0ahUKEwi4whvW777MAhUT1mMKHv-CscQ_AUIBig-C#imgrc=3gdPWrAvEN1QrM%3A

Underpass image:
https://www.google.com/search?q=underpass&rlz=1C5CHFA_enUS691&espv=2&biw=1300&bih=577&site=webhp&source=lnms&tbm=isch&sa=X&ved=0ahUKEwiXSP-o777MAhU62MKHTfHdgBQ_AUIByg-C#imgrc=3GlH4jkKthw2PM%3A
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<td><strong>Results</strong></td>
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As The Energy Corridor District continues to grow, sustainable development is a primary goal. Our task was to design a neighborhood plan that promoted businesses and place-making while incorporating sustainability. With four main goals, create destinations, promote sustainability, enhance connectivity, and increase safety, a design was created that would benefit The Energy Corridor District for many years to come.

These goals were accomplished through the proposal of two complete street styles to be implemented on Dairy Ashford and St. Mary’s ln. Two mixed-use buildings will bring more office space while encouraging the continual growth of retail in the area. Parking garages with green roofs and facades will provide ample parking while promoting sustainability. The addition of a fitness center and small plazas encourage users to spend more time outside.
Orientation

The Energy Corridor District located in Houston, TX is a 1700 acre business, residential and multi-use commercial site. The Energy Corridor District is located along Interstate 90, from S. Fry Road to North Kirkwood Road, and along Eldridge Parkway to Westheimer Road. Currently, there are more than 300 multi-national, national and local companies within the Energy Corridor, employing over 84,000 people. The focus area of this project is located in the St. Mary’s neighborhood.
Regional Analysis
Accessibility

When analyzing the site we started at a regional level in order to get a better understanding of the surroundings. In regards to transportation and circulation, we created a half mile, mile, and mile and a half buffer and examined the important features that landed in each zone. Knowing the proximity of these places could help us decide what may be beneficial additions to the area. We also analyzed the time it would take to travel within these zones by public transit, cycling, and a personal vehicle.

We felt it was important to know the distances to various parks, bodies of water, fire stations, retail stores, hospitals, and the interstate to aide us in the design process for our specific site within The Energy Corridor District.
Regional Analysis

Transit

While examining the accessibility to surrounding destinations was important, it was also necessary to take a closer look at the transit buffer. While the metro and bus systems are extensive throughout The Energy Corridor District, the routes do not extend into the site.

Not only did we examine the bus routes, we also examined the bike routes. Similar to the metro and bus routes, there were no bike routes that extended into the site. This is problematic for employees and residents within the site if they have a desire to bike.

Lastly, we analyzed the sidewalks. While they were more extensive than the other components, most of them were in poor condition, and not wide enough to accommodate many people.
Regional Analysis
Flood Zone

One of the most important factors to analyze was the flood zone. We started at the regional level in order to have a better understanding of where the flood plan was in regards to the site.

While some of the flood zone is to the south of The Energy Corridor District, a large portion goes through the south-west corner of the site. This is due to a small creek that passes directly through The Energy Corridor District.

This is an important factor that needs to be considered when beginning the design process as the new design should include implementations that can help maintain and control the water if the site was ever to flood.
Regional Analysis
Biotic Factors

In addition to the flood zone, there were other biotic factors that needed to be considered. These included the temperature and average rainfall. Examining these factors are crucial to knowing what vegetation would thrive in the area when beginning to design the planting scheme. The hottest times of the year are during the months of June, July, and August, while Houston receives the most average rainfall during the months of May, June, and November.


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Although the sun and shade analysis can be applied to a regional context, we chose to examine it on the site level. We created an analysis to show where the shade would hit specific spots throughout our site in order to plan and design most effectively. We wanted to make sure the destination spots took full advantage of the shade so users would still be comfortable in during the hot summer months. Similarly, we needed to make sure the vegetation fit each area in accordance to the amount of sun they received throughout the day.
The flood zone was examined in three different portions, the floodway, 100-year zone, and 500-year zone. The area most effected in the site was the portion closest to Turkey Creek. The residential and offices nearby were in both the 100 and 500 year zones. As previously mentioned, these zones needed to be taken into consideration throughout the design process in order to utilize the land most efficiently and minimize the damage done in case of a large flood.

Another important factor in the analysis was the soil types throughout the site. Not only is this information necessary for the growth of vegetation, but also for any structures that might be built in the proposed design. After examination, it was clear that the majority of the area had a high percentage of clay. This means that the water will not drain as efficiently as other soil types, and it could have a tendency to shift and swell based off the amount of rain received.

While beginning to analyze the circulation throughout the site, we realized quickly that there was hardly any public transportation directly in our site. There is only one bus route that enters the site, and only covers a small loop with 5 stops. Furthermore, there are no designated bike lanes in the site boundary. This means that residents and employees do not have a safe option if they have the desire to use a bicycle as their mode of transportation. Lastly, while there are sidewalks, most of them are in poor condition and not wide enough for multiple people.
In regards to the various surface types it was important to compare the pervious versus impervious. While there was a fair amount of green space, there was also large amounts of impervious pavement. The majority of these spaces had the potential to be turned into permeable paving that could be used to increase sustainability in and around the site.

The landuse was diverse but the majority was either residential or office space. We made sure to note this while beginning to design the site, as we wanted to make sure to accommodate for both types of users. There were also spaces such as the religious and industrial uses that we knew we could not change and would have to design around.

Considering that a majority of the space was office, residential, and commercial we knew it was critical to make note of the amount of parking versus the number of buildings. When designing and planning we wanted to ensure there would be enough accessible parking to accommodate all types of users, while also incorporating sustainability.
**Site Analysis**

**STRENGTHS**
- Proximity to IH-10
- Accessibility
- Wide streets
- Location

**WEAKNESS**
- Street infrastructure
- Lack of green space
- Heavy traffic use
- Connection

**OPPORTUNITIES**
- Streetscape
- Access to green space
- Stormwater Management

**THREATS**
- Safety
- Flood zone
- Not environmentally friendly
The strengths throughout the site were extremely important to consider in order to obtain maximal benefits. Some of these were the proximity to Interstate 10, and the location within The Energy Corridor District. Both of these gave the site great potential to become a destination. Likewise, we wanted to capitalize on the opportunities presented from these strengths such as stormwater management and enhance the current streetscape.

The weaknesses and threats were both aspects that could both be improved through utilizing the strengths and opportunities. By focusing on creating complete streets and destinations the street infrastructure and lack of connectivity will be improve. Similarly, the safety will be increased through complete streets and by implementing various sustainable designs the flood zone could be controlled more effectively and the environment will also improve.
CASE STUDY

COMMUNITY ACTIVITIES

KLYDE WARREN PARK
DALLAS, TX

Recognized as one of the best parks in the United States, Klyde Warren Park provides usable green space in downtown Dallas. With a series of outdoor spaces and multifunctional facilities, the park is continuously changing and adapting to the desire of the users. With excellent night lighting, this park creates not only an escape from downtown during the day, but also serves as a gathering space in the evening.

Klyde Warren = 5 ac
ECD Site: 205 ac
Case Study

Place Making

Hughes’ Landing
Woodlands, TX

Hughes’ landing offers an exceptional example of place making in regards to design. The restaurant row immediately creates a destination for residents and tourist alike. Pedestrian friendly throughout the entirety of the site, Hughes’ landing is successful at encouraging people to stay and enjoy the space instead of using it as a pass through. The surrounding mixed-use centers creates diverse activities and cultural variety unique to the area.

Hughes Landing = 66 ac
ECD Site: 205 ac
**StreetScape**

SW 12th Ave.
Portland, OR

12th Avenue creates a great example of successful streetscape. Through its application of Low Impact Development (LID), this street’s system maximizes capture, treatment, and infiltration of stormwater runoff. Not only does it treat stormwater, and therefore improved the surrounding water quality, it has improved the aesthetics and functionality. Through the new design the sidewalks have been improved, making the area more walkable, and added vegetation down the entirety of the street.

SW 12th Ave. = 0.92 ac.

ECD Site: 205 ac
LOW IMPACT DEVELOPMENT

MUeller COMMUNITY
Austin, TX

The newly constructed Mueller Community is a model district for urban development. Consisting mainly of multi and single family residential units it also includes hotels, parks, and commercial and office space. The goals of this newly designed community were to create a positive revenue stream, increase community diversity, and integrate sustainability all while successfully meshing with the existing surrounding neighborhoods.

Mueller Community = 711 ac.
ECD Site: 205 ac.
Design Program

The four overall goals this project encompasses are to create destinations, increase sustainability, enhance connectivity, and improve safety. In order to accomplish these goals we have four specific design objectives that correspond with each goal.

In order to create destinations within our site we focused on nearby food vendors, increasing parks and open space, an addition of a fitness center, and the close proximity to various retail stores.

Low impact development (LID) facilities were implemented to increase site sustainability, specifically green roofs, bioswales, and rain gardens, all of which are water treatment facilities.

Connectivity was enhanced through additional bus routes and bike shares. Plaza spaces and trails were proposed in order to give users small connection points between various buildings within the site.

Lastly, in order to improve the overall safety of the site within The Energy Corridor District, healthcare facilities were determined and complete streets were proposed. These complete streets include wide sidewalks and medians in order to give the users ample space from the passing cars. Additional night lighting throughout the plazas and streets will also add another safety feature, while clearly marked crosswalks will ensure all users have a means to safely cross the streets.
**Destinations**

The implementation of various retail and restaurant locations will create a vibrant atmosphere within The Energy Corridor District. We envision an area that creates a welcoming environment to draw visitors in, and promote the success of local businesses.

**Sustainability**

One of the most important changes proposed to the Energy Corridor District is the implementation of Low Impact Development systems. These various mechanisms assist in the infiltration of water to correct pooling and flooding, while also adding aesthetic value.
**SAFETY**

One of the most important aspects of creating a successful site is ensuring the safety of the users. The addition of multiple crosswalks and throughout the St. Mary’s neighborhood will improve pedestrian circulation while various light posts will create a safe atmosphere for all visitors at night. The implementation of complete streets will manage traffic while providing faster access to healthcare facilities in the area.

**CONNECTIVITY**

The addition of bike shares and additional bus stops throughout The Energy Corridor District improve mobility and circulation through the site, while implementing trail systems promote a healthier lifestyle. Plaza spaces will bring visitors together to enjoy the space rather than using it as a transition area.
Throughout the design process we highlighted areas of focus throughout the entire site in order to help organize which areas would be the most important in determining project phasing. Areas highlighted were large open spaces that could be used as an LID facility, empty, unused spaces that could act as a gathering space or plaza, and lots that could be completely transformed to generate new destinations. Main streets were highlighted to get a grasp on where the main flow of traffic was and if they passed our areas of interest.
Our final master plan included complete streets, new mixed-use buildings, additional parking garages with green roofs and green facades, and multiple destinations such as a fitness center, small plaza, and outdoor recreational courts. Bioswales and raingardens were implemented to manage stormwater, and a riparian buffer was proposed to help revitalize Turkey Creek.
Overall, most of the additional green space was added via the new green roofs and facades on the proposed buildings. A few smaller spaces were added for plazas and some parking was changed to pervious paving.

Two additional types of landuse were added through our design, including repurposed land and mixed-use buildings. The mixed-use not only increased living space, but office space as well, giving The Energy Corridor District room to expand.
The majority of the buildings that were proposed through our design were mixed use centers that included office space and living. Furthermore, available parking was changed from impervious paving to pervious when possible.

Connectivity was a weakness that we really wanted to focus on in the new design. In order to accomplish this we brought bike routes into our site. This allows residents to easily maneuver this portion of the Corridor District. Additional sidewalks were added through the complete streets which include night lighting so the site can be active at night.
Two different styles of complete streets were proposed on North Dairy Ashford Road and St. Mary’s Lane. Considering Dairy Ashford is much busier, the streetscape was designed for more traffic such as bicycles and more pedestrians. St. Mary’s Ln. was designed as a more leisure road with raingardens and benches.
The first phase of streetscaping is down St. Mary’s Lane and includes a variety of features that not only improve the safety of the pedestrians or cyclists, but almost implement sustainable rain gardens that can infiltrate and treat the storm-water runoff collected by the road. The road also includes benches built into the side of the rain gardens giving the users a place to sit and relax on days with good weather. Lastly the whole street has ground lighting to aide in improving the safety.
The second streetscaping phase is proposed down North Dairy Ashford Road. Considering this road is more of a pass through the sidewalks are wider to accommodate more foot traffic. Bike lanes are protected by a rain garden that, like the previous streetscape design, can infiltrate and treat stormwater that may run off from Dairy Ashford during heavy rain. The road is divided by a median that doubles as a natural water feature. Filled with small rocks at the bottom, the median will collect and filter water during rains.
The Energy Plaza, where most of the design is focused, includes multiple destination features, most notably, the new mixed-use centers. These include office spaces, retail, and additional living space. A fitness center with outdoor recreational courts have been proposed for the nearby residents, and a riparian buffer has been implemented to improve the quality of Turkey Creek.
The Energy Plaza acts the main destination for visitors and residents in this area of The Energy Corridor District. With two newly designed mixed-use centers, there is ample office and retail space. Additionally, in order to accommodate for this space, two car garages have been added and are attached to the back of the buildings in order to making parking as easy as possible. Roundabouts circle the garages to give people a safe place to pick up and drop off users if they take a taxi or Uber. A water feature passes directly through the two buildings and acts as a second destination for users. The feature reflects the buildings while also adding natural sound to the surrounding environment. Tables and seating have been places around the feature in order to encourage people to spend time outside during their off hours. In the distance, the bridge that goes over the riparian buffer can be seen. This also encourages people to walk around and get out of the office during breaks or lunch hours. Overall, this space was designed to encourage workers to utilize the time they have to go outside.
Towards the back of the Energy Plaza is a bridge and trail that crosses over the riparian buffer. After observing Turkey Creek we decided to implement a sustainable feature that would not only be aesthetically pleasing, but aide in the revitalization and protection of the creek. The buffer adds a minimum distance that people can get to the creek itself, and as the plants grow, this distance will as well. Furthermore, as the buffer becomes established, the various layers will continue to improve the stormwater runoff filtration system. The more plants the buffer consists of, the more thorough the filtration of water will become. However, we did not want to cut off the residents and users access to the creek completely. The bridge allows the people to still be apart of the creek, without physical interaction. It also provides access to the large open space on the other side that can be utilized for various outdoor activities or for simply walking around and enjoying the weather.
Due to the extensive amount of building and impermeable paving, green roofs and green facades were added in order to include additional green space. One roof is extensive and was proposed for the sole purpose of increasing sustainability. The second roof is intensive and can be used as a rooftop garden.
The intensive green roof provides an extra green space within the site that is more unique than most. On top of the parking garage, this roof garden gives people a chance to get outside in a more secluded setting. Offering great views of The Energy Corridor District, the roof has planters and seating to encourage use. Intensive roofs are great additions for increasing sustainability throughout a site. With the ability to withstand the weight of trees, the air quality can be significantly improved. In a large city such as Houston, the addition of these trees are very important. Not only do they improve air quality, they also have the ability to lower the urban island heat effect by cooling the air in the surrounding atmosphere naturally.
Reflection Plaza

A small space towards the right end of our site was a great place for a destination plaza. At the corner of Dariy Ashford and St. Mary’s Ln., this newly design plaza takes advantage of this busy intersection. With many people biking or walking by, the Reflection Plaza gives users a chance to take a break and enjoy what the plaza has to offer.
The Reflection Plaza offers a relaxing space for residents and visitors at the corner of Dairy Ashford and St. Mary’s Ln. The large trees offer ample shade, while the open space leaves spaces with full sunlight. Located at such a busy intersection, the plaza is a great natural gathering space. The space includes multiple benches for seating, and small water features that add another element to the area.
By far one of the busiest intersections within the site, the corner of Dairy Ashford and St. Mary’s Ln. was a major focus throughout the project. In order to make the area more safe, large crosswalks were added to each road. On Dairy Ashford they go through the new median in order to create a landing in case the pedestrians do not have enough time to cross the whole street.
As seen below, two new land uses were added after the design implementation, mixed-use and repurposed. Both of these bring in a chance for modern and sustainable design. While it may appear that the office space was significantly reduced, it in fact was simply moved into the new mixed-use buildings, while the addition of repurposed land and buildings encourage sustainability.
As seen below, two new land uses were added after the design implementation, mixed-use and repurposed. Both of these bring in a chance for modern and sustainable design. While it may appear that the office space was significantly reduced, it in fact was simply moved into the new mixed-use buildings, while the addition of repurposed land and buildings encourage sustainability.

**Stormwater Discharge**

The results of the new sustainable design were successful when comparing the current versus proposed stormwater discharge measurements. After the addition of pervious pavement the discharge of impervious over a 10 year period decreased by almost 400 CFS and almost 500 CFS for a span of 100 years. As a result, the discharge for pervious surfaces increased by approximately 70 CFS and 100 CFS. Over a long period of time these small sustainable additions to the site will greatly improve the water quality in the surrounding area.

**Results**

<table>
<thead>
<tr>
<th>Current</th>
<th>Proposed</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Year</strong></td>
<td><strong>Impervious</strong></td>
</tr>
<tr>
<td>10</td>
<td>1040.66 CFS</td>
</tr>
<tr>
<td>100</td>
<td>1456.92 CFS</td>
</tr>
</tbody>
</table>
THANKS & GIG ‘EM
threadneedle neighborhood
the energy corridor district
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site context

threadneedle neighborhood
the energy corridor district

katy
nottingham country
barker reservoir
geroge bush park
keliwood park
addicks reservoir
cullen park
memorial
briarforest
sitting on 2,500 acres bordering interstate-10 to the north and south, Houston's Energy Corridor District is often considered as one of the premier employment centers in the United States. With 10 major employers in the oil and gas industry along with 300+ national, multi-national, and local companies, the Energy Corridor District currently serves over 95,000 employees with 800,000 potential employees within a short 30 minute commute.
the energy corridor district
premier employers

1. amec foster wheeler
2. bp america
3. citgo petroleum company
4. conocophillips
5. j. ray mcdermott
6. mcdermott international
7. petroleum international
8. sbm offshore
9. shell oil company
10. worley parsons
commute analysis: automobile
commute analysis: public transit
site analysis
threadneedle neighborhood
abiotic analysis

average yearly rainfall
(2003 - 2014), Houston & national

floodplain vulnerability

average monthly rainfall
2013, Houston & national

drainage patterns
spring shade analysis

summer shade analysis

fall shade analysis

winter shade analysis
biotic analysis

soil analysis

130 acres of urbanized land near downtown Houston

1: 73 acres of Aris-Urban Land Complex
- 55% Fine-Sandy to Clayey Loam
- 45% Urban Development
- Poor Drainage and High Runoff

2: 54 Acres of Clodine-Urban Land Complex
- 55% Silty Loam Soils
- 45% Urban Development
- Poor Drainage and Low Runoff

3: 3 Acres of Aldine-Urban Land Complex
- 50% Fine Sandy Loam Topsoils
- 50% Urban Development
- Poor Drainage and High Runoff
anthropogenic analysis

existing land use

pervious / impervious

6% streets
16% buildings
37% parking
41% green space

legend
- office
- commercial
- retail
- vacant
- hotel/motel
- religious
- multi-family
- condo/townhome
- green space

legend
- pedestrian circulation
- bus stops

main intersections
- bus stops
- minor arterial
- major arterial

16.
opportunities

- structure of existing circulation hierarchy allows for easy adaptation and implementation of complete streets promoting pedestrian access and walkability...

- location within the energy corridor district provides potential for the creation and adaptation of both future and existing community corridors...

- large open areas along the site’s perimeter provide unique opportunities to integrate native and natural landscapes seamlessly into the project site...

- existing zoning structure along with circulation hierarchy creates natural points of destination within the project site...
constraints

- existing circulation hierarchy favors automobile traffic with little to no consideration of pedestrians, cyclists, and public transit...

- poor pedestrian connectivity causes fragmentation throughout existing community corridors within and adjacent to the project site discouraging general walkability...

- impervious surfaces dominate the landscape leaving small, fragmented areas suitable for environmentally focused design throughout the project site...

- lack of pedestrian friendly destinations along with outdated aesthetic standards creates little to no public interest in the project site...
**Case Study: Streetscape**

*Bagby Street Redevelopment, Houston TX*
- Design workshop
- Increased vegetation cover along streetscape by 165%
- Improved average lighting five times over
- Increased seating areas by 38%
- Provided sustainable design elements
- Developed walkable and bikeable “complete street”

**Case Study: Transit**

*Transit Revitalization Investment District, Philadelphia*
- Interface Studio, LLC
- Elevated the role of transportation in achieving Philadelphia’s sustainability goals
- Discouraged driving by promoting transit use and enhancing pedestrian-oriented infrastructure
- Re-purposed outdated infrastructure for new uses
- Created new and enhanced connections between the stations and local destinations
- Developed a phased approach to physically rebuilding the fabric around each station

**Case Study: Low Impact**

*Geos Net-Zero Energy Neighborhood*
- David Khan Studio
- Aimed to develop solutions for underutilized land
- Intensified development along an established north-south transit corridor in order to reduce sprawl
- Created checkerboard pattern house: single family mixed with percolation parks & rain gardens
- Implemented parks serving as neighborhood green spaces and stormwater management systems
- Integrated nature and agriculture into the fabric of everyday life

**Case Study: Placemaking**

*Waterway Square, The Woodlands*
- Sasaki
- Created a walkable downtown area
- Designed to be responsive to growth in the market
- Created an inviting landscape setting
- Created real estate value within and surrounding the development
- Evolved to support higher densities and more residential uses
develop complete streets
“strive to serve the needs of pedestrians, cyclists, and motorists alike...”

enhance community corridors
“create human scale connections within the community as it relates to the energy corridor district...”

promote environmental design
“develop sustainable living and working environments of the highest quality...”

create vibrant destinations
“create a sense of place providing a platform to work, live, and invest in the energy corridor district...”
user analysis

user group: office users
- duration of use
- usage of public space
- points of interest

user group: residents
- duration of use
- usage of public space
- points of interest

user group: commuters
- duration of use
- usage of public space
- points of interest

user group: visitors
- duration of use
- usage of public space
- points of interest
1. multi-purpose detention pond
2. mixed-use (retail, office, parking)
3. transportation hub & garage
4. townhomes
5. community park
6. mixed-use (residential & retail)
7. office
8. intersection application
9. retail & community park
10. hotel
proposed land use

legend
- office
- retail
- hotel/motel
- religious
- multi-family
- condo / townhome
- green space

pervious / impervious
- 6% streets
- 16% buildings
- 37% parking
- 41% green space
proposed circulation
**type one application**

| sidewalk | bike path | bed | type one streets | bioswale | type one streets | bed | bike path | sidewalk |
type two application
type three application
intersection application
design impact

proposed sustainable / low impact design can save up to $145,609.64 in water use annually, as well as meet a multitude of functions.

24,269,166.67 gallons harvested annually
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INTRODUCTION.

A LOOK INTO EXISTING CONDITIONS OF THE ENERGY CORRIDOR.
HISTORY OF THE ENERGY CORRIDOR DISTRICT

The Energy Corridor Founding
- Major Employers looked at relocating to a suburban campus environments near new housing for additional employees.
- Two energy companies, Shell Oil Company and Conoco (now ConocoPhillips), led the way by constructing state-of-the-art campus facilities on Interstate 10 at Dairy-Ashford and Eldridge Parkway, respectively.
- Other oil and gas companies quickly followed suit, including Amoco (now BP America) and Exxon Chemicals USA, as well as a number of energy industry service companies such as M.W. Kellogg, Diamond Offshore and Atwood Oceanics.

Establishment of The Energy Corridor District
- The Texas state government established the Energy Corridor District (also known as Harris County Improvement District #4) as a municipal management district at the request of the area's commercial property owners.

New Statistics
- BP America is the largest employer in The Energy Corridor District.
- ConocoPhillips is the fourth largest employer in the district.
- Citgo is the 14th largest employer in The Energy Corridor.
- Shell Oil Company's Woodcreek facility is the third largest employer in The Energy Corridor.
- ExxonMobil has chemical industry operations and is the 10th largest employer.
- The Kendall Neighborhood Library on Eldridge Parkway opened a new facility, replacing a smaller building on Memorial Drive.
- The U.S. Census Bureau's data indicated that 66% of the employees at The Energy Corridor live within a group of zip codes referred to the district as the “Commute Zone.”

New Achievements
- The Energy Corridor District is the third largest employment center in the region with more than 78,000 employees and consisting of more than 300 international, national and local companies.

New Transportation
- The Metropolitan Transit Authority of Harris County, Texas (METRO) provides public transportation to the area.
- The line, which began service on January 25, 2010, transports people who work and/or live in the corridor to area businesses and restaurants.

Present
- Interested in updating the area.
- Interested in improving safety and walk-ability.
- Enhancing a sense of place.
Texas Harris County The Energy Corridor District Threadneedle Neighborhood

**Climate**
- Temperate; Sub-Tropical

**Rain Fall**
- Yearly Average: 45.28 inches

**Temperature**
- Average High: 78°F
- Average Low: 59°F
- Average Temp: 69°F

**Wind Direction**
- Nov-Feb: North
- Mar-Jun, Aug, Oct: Southeast
- July: South
- Sept: East

**Average Weather in The Energy Corridor**
- Sunset
- Sunrise
- Winter Solstice
- Summer Solstice
- Midday
This image looks at the population of residents of The Energy Corridor.

- The population is a majority of adults: Age 19-64.
- Over 80% of the residents have a college degree.
- Almost 80% of the commuters coming into work in The Energy Corridor drive alone.

(The Energy Corridor district land use & demographics 2015 inventory and database ads market research)
SITE LEVEL ANALYSIS

FLOOD PLAIN

Turley Creek  Floodway  100-Year Floodplain  500-Year Floodplain

0            50                          150 Feet

I-10

Dairy Ashford
SITE LEVEL ANALYSIS

SOIL TYPE

Soil Group C
Soil Group D
Soil Group B/D
Water

Hydrologic Soil Group Map
* Note: Most of these soil types are clayey soils that poorly infiltrate and drain, increasing runoff.
- In the site there is only one protected intersection.
- Most intersections are dangerous to cross as a pedestrian due to lack of crosswalks.
- The intersection of St. Mary’s and Dairyashford is the busiest throughout the site.
- In the site there is only one protected intersection.

- Most intersections are dangerous to cross as a pedestrian due to lack of crosswalks.

- The intersection of St. Mary's and Dairyashford is the busiest through the site.
Currently there is a single loop bus route going through the site.

This bus route does not connect to I-10 or the Park-n-Ride.

Stops are no more than a quarter of a mile apart and the bus stops for 15 minutes at each.
Almost half of the land use is commercial.

The majority of green space is currently owned privately.

The residential area backs straight into the commercial buildings.

There is very limited mixed-use buildings.

Only 3% of the site is undeveloped making it harder for future planning.
SITE LEVEL ANALYSIS

BUILDING FOOTPRINT

OFFICE 50.54% 1,630,035 sq.ft.

OTHER 6.06% 195,470 sq.ft.

MEDICAL 5.73% 184,786 sq.ft.

Hotel 7.01% 226,016 sq.ft.

Religious 0.85% 27,373 sq.ft.

Food 0.97% 31,157 sq.ft.

Parking

Housing 28.85% 930,604 sq.ft.
VISUAL QUALITY ASSESSMENT.

Excellent: What makes these locations “excellent” in the visual quality assessment is the lush plant palette, and the open, tranquil green space.

Average: These locations are considered “average” because their appearance is as to be expected. The visual quality of these spaces can be easily improved upon with minor changes.

Needs Improvement: The locations considered of “poor” visual quality are areas that have the potential to be great identity-making areas. With some design, these locations have the potential to be vastly improved upon.
S.W.O.T. Analysis.

**Strengths**
- Numerous employees in vicinity
- Nearby recreational facilities
- Many restaurant and entertainment opportunities
- Proximity to green spaces
- Lots of trees
- Clean streets and areas

**Weaknesses**
- Lack of roadway safety facilities (i.e., stop lights, crosswalks, bike lanes)
- Unattractive building facades
- Lack of walkway facilities such as benches & trash cans
- Somewhat isolated from other parts of the district
- Disconnected streets and sidewalks
- Large impervious areas

**Opportunities**
- Add and enhance green space
- Enhance aesthetic quality
- Make the area more attractive
- Provide a sense of place
- Boost district’s identity
- Improve safety for all users
- Better connect public transportation
- Availability of funding

**Threats**
- District boundaries may or may not expand
- Amount of parking needed for amount of space available
- Public opinions
- Lies within floodplain
- Noise pollution from IH10
S.W.O.T. ANALYSIS.

**STRENGTHS**

- Numerous employees in vicinity
- Nearby recreational facilities
- Many restaurant and entertainment opportunities
- Proximity to green spaces
- Lots of trees
- Clean streets and areas
S.W.O.T. ANALYSIS.

WEAKNESSES

- Lack of roadway safety facilities (I.E. Stop lights, crosswalks, bike lanes)
- Unattractive building facades
- Lack of walkway facilities such as benches & trash cans
- Somewhat isolated from other parts of the district
- Disconnected streets and sidewalks
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S.W.O.T. ANALYSIS.

OPPORTUNITIES

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S.W.O.T. ANALYSIS.

THREATS
- District boundaries may or may not expand
- Amount of parking needed for amount of space available
- Public opinions
- Lies within floodplain
- Noise pollution from IH10
CASE STUDIES.
IN CONNECTIVITY, PLACE-MAKING, SUSTAINABILITY, & SOCIALABILITY
SALT LAKE CITY
200 WEST AND 300 SOUTH BIKE LANE'S DOWNTOWN

LOCATION: Salt Lake City
SIZE: 2.75 miles of bike lanes
DESIGNER: Unknown
COMPLETION DATE: October 2015

The design for protected bike lanes in downtown Salt Lake City was created to encourage and allow for alternative transportation and pedestrian use. Bike lanes have been introduced before, but have only been separate from vehicular traffic with only a white line. In a downtown transportation master plan adopted in 2008, Salt Lake City devised a plan for the intersection and streets of 200 West St. and 300 South St. to construct its first ever protected bike lanes. In this plan, the bike lanes are about 8’ wide an are separated by 4” of concrete barriers. At the intersection, there are four pedestrian island and a bicycle round-about. The lanes along both streets also include pedestrian pathways and angled parking.

http://www.moorerubleyudell.com/projects/port-angeles-stormwater-improvement-project/

STORMWATER IMPROVEMENT PROJECT
DESIGNS FOR INTERSECTIONS ON 4TH, 5TH, 6TH, & 7TH STREETS

LOCATION: Port Angeles, Washington
SIZE: Typical Size 2-Way Intersection
DESIGNER: Unknown
COMPLETION DATE: November 2014

The Fourth St. Stormwater Improvement Project was designed to control localized flooding and improve water quality. This will be done with multiple different rain garden designs, each to be implemented on many different street intersections. These designs leave options to connect to plazas, or just to be left as the corners of the streets. Each rain garden will include three different zones, with wetland covers in the middle and moving outward to less flood tolerant plants outwards.

These designs can be basis for the multiple intersections found in The Energy Corridor. With the multitude of different designs, it should not be hard to find one that fits each corner to adapt them to connect to newly designed plazas.

https://santa-monica.civicplus.com/2394/santa-monica-civic-center-parking-structure#}

SIP ADMINISTRATIVE CENTER
CREATING A STRONG IDENTITY FOR A CIVIC CAMPUS

LOCATION: Suzhou, Jiangsu, China
SIZE: 70 Acres
DESIGNER: SWA Group
COMPLETION DATE: 2005

Located on the banks of Jingji Lake, the Suzhou Indus Trail Park Administrative Center serves as the workplace for many government departments. SWA’s goal was to create a strong identity for the civic campus as well as integrate traditional culture and modern aesthetics. The program includes a plaza with fountains, a central green space, and a canal. Water is crucial aspect of the design. Using natural materials, the landscape makes connections to the city’s past, while at the same time aesthetically and functionally enhancing the future.

The natural materials, use of water, and relaxing grassy spaces are all elements that can easily be implemented near other commercial businesses to create a community identity and a stress-free work environment.

http://www.swagroup.com/project/sip-administrative-center.html

SANTA MONICA CIVIC CENTER
A LEADERSHIP IN ENERGY & ENVIRONMENTAL DESIGN PARKING GARAGE

LOCATION: Santa Monica, California
SIZE: 300,000 sq. ft.
DESIGNER: Moore Ruble Architects & Planner
COMPLETION DATE: 2012

The parking structure effectively provides not only 882 parking spaces (accommodated in six levels above grade and two below grade) but also a wide variety of amenities to the community, including a cafe on the main plaza terrace. High recycled materials where used and Photovoltaic panels on the roof which provide shade and a significant portion of total energy needs. Ribbed concrete panels are set in a shifting, rhythmic pattern on the facades, capturing a rich play of shadows while screening the presence of parked cars. A series of bays made of colored channel glass bring a lively, ever-changing quality by day and then again at night when illuminated.

This parking structure is very inspirational not only because of the aesthetic facade, but also all of the green infrastructure that is embodies and mixed use.

**BURBANK WATER AND POWER**  
**PLACEMAKING IN A SUSTAINABLE FASHION**

**LOCATION:** Burbank, California  
**SIZE:** 10 Acres  
**DESIGNER:** AHBE Landscape Architects  
**COMPLETION DATE:** 2012

Through the iteration of many sustainable landscape technologies, AHBE married industry and environment in a striking way. The "green street" features five water filtration technologies, with the eventual goal of becoming a zero-runoff site. Green roofs reduce the heat island effect, filter stormwater, and insulate using recycled materials and native plants. The courtyard features an industrial structure of a reclaimed electrical substation. This is the ultimate juxtaposition between industry and nature. The street, roof, courtyard, and plaza all serve as an entry water filtration system.

Many of these techniques can be introduced into The Energy Corridor as all of these features will create a sustainable, unique community to draw recognition and applause from all over the world.


**THE CREATIVE CORRIDOR**  
**A MAIN STREET REDEVELOPMENT FOR LITTLE ROCK**

**LOCATION:** Little Rock, Arkansas  
**SIZE:** 891,000 sq. ft.  
**DESIGNER:** Marlon Blackwell Architects  
**COMPLETION DATE:** 2012

The Creative Corridor spans over a 4-blocks area in endangered historical downtown Little Rock. This project aimed to create gateways into the area, a center plaza, and a pedestrian promenade to connects these spaces. The connection will include complete streets, which are those that accommodate drivers, pedestrians, and bicyclist. Found along these streets will be many forms of low impact development streetscaping that will include bioswales, rain gardens, tree mounds, and permeable walkways.

Many of these techniques can be introduced into The Energy Corridor because they too are looking for many of the same qualities. The LID streetscaping can be incorporated into the corridor, as well as the different types of plazas that are at the entrances and center.


**CITY CENTRE HOUSTON**  
**A MIXED USE DEVELOPMENT**

**LOCATION:** Houston, Texas  
**SIZE:** 47 Acres  
**DESIGNER:** The Office of James Burnett  
**COMPLETION DATE:** 2009

City Centre is a mixed-use development where public space and streetscapes integrate the many offerings - offices, residences, hotels, restaurants, retail, conference, fitness, cinema and structured parking - into a cohesive whole. The heart of City Centre is the public plaza enclosed by a hotel, restaurant and retail buildings, and by an office building. An intimate event lawn, water and fire features, and outdoor seating for ground-level restaurants make it ideal for a variety of programmed and spontaneous outdoor activities.

This mixed-use development can be used as inspiration because it demonstrates many of the ideas and ammenities that we would like to incorpate into our design. It's a good example of a design that is successfully carried out and made a cohesive whole.

https://www.theofficeofjamesburnett.com/2013/CityCentreStormwaterImprovements.html

**CROSS CREEK RANCH**  
**PLANNED COMMUNITY CHARACTERIZED BY NATURAL SETTING**

**LOCATION:** Fulshear, Texas  
**SIZE:** 960 Acres  
**DESIGNER:** SWA Group  
**COMPLETION DATE:** 2013

Restored pasture land creates a sustainable and ecological community. An existing waterway was expanded to create water systems that naturally filter wastewater for reuse in irrigation throughout the community. SWA re-forested the barren land to reestablish wildlife habitat, water quality, and preserve the natural environment all while promoting economic and community growth. 65% of the open space is naturalized with no-mow prairies and continuous habitats provide wildlife corridors.

Methods employed here can also be incorporated mere miles away in The Energy Corridor to create a sustainable, recreation-al landscape to renew and foster wildlife growth in the Houston area.

http://www.swagroup.com/project/cross-creek-ranch.html
DESIGN SOLUTION.

DESIGNING FOR CONNECTIVITY, PLACE-MAKING, SUSTAINABILITY & SOCIABILITY.
Design Goals & Objectives:

Connectivity:
- Improve connectivity between nodes
- Improve street safety for all users
- Promote mixed-use environment

Sustainability:
- Consider environmental conservation
- Apply Low Impact Development facilities
- Minimize auto dependency
- Preserve biodiversity

Sociability:
- Design attractive landscape nodes
- Create a sense of place
- Provide clear sources of way-finding
- Provide facilities for every user and need
- Facilitate the group and the individual
- Welcome visitors
- Create outdoors spaces for year-round use
This design introduced mixed-used designs.

- Undeveloped space would be turned into green space.
- Throughout the design the residential area was not touched.
PROPOSED BUILDING FOOTPRINT.

**OFFICE**
- 1,630,035 sq.ft. 50.54%
- 1,954,087 sq.ft. 49.80%

**RESIDENTIAL**
- 930,604 sq.ft. 2.68%
- 930,604 sq.ft. 23.72%

**MIXED-USE**
- 0% 19.80%
  - 776,896 sq.ft. 19.80%

**HOTEL**
- 226,016 sq.ft. 7.01%
- 76,353 sq.ft. 19.50%

**OTHER COMMERCIAL**
- 195,470 sq.ft. 6.06%
- 128,521 sq.ft. 3.28%

**DOCTOR/MEDICAL**
- 184,786 sq.ft. 5.73%
- 9,648 sq.ft. 0.19%

**FOOD**
- 1,157 sq.ft. 0.97%
- 20,175 sq.ft. 0.51%

**RELIGIOUS**
- 27,373 sq.ft. 0.85%
- 27,373 sq.ft. 0.70%

**KEY**
- Current
- Purposed
The current sidewalks were widened to increase pedestrian safety.

- Sidewalks were added to streets without.

- A boardwalk was also added to the natural area in the northwest corner.
- All streets have at least one bike lane.
- St. Mary’s and Dairyashford will have a bike lane on both sides of the street.
- Adding bike lanes on all streets will help make the site more accessible.
- These bike lanes will connect to The Energy Corridor District’s Master Plan.
- The extension of Stillmeadow Dr. will increase the connectivity of the site.

- A new road was added to the north to connect the transportation hub to I-10.
With the addition of the transportation hub it is like having an extension of the Park-N-Ride in the site.

The new bus routes go all the way through the site making them more usable.
SECONDARY STREET: THREADNEEDLE & BARRYKNOLL

CONNECTOR STREETS
- Proposed intersection at St. Mary's & Dairy Ashford will include:
  - Street Lights
  - Protected Bike Lanes
  - Wide Pedestrian Walkways
- The median & street trees provide the benefit of traffic calming.
BUILDING SIGNS.

DAY VIEW

NIGHT VIEW
STREET SIGNS.

DAY VIEW

N. Dairy Ashford Drive

St. Mary’s Lane

Transportation Hub

NIGHT VIEW

St. Mary’s Lane

Transportation Hub

N. Dairy Ashford Drive
LOW IMPACT DEVELOPMENT FACILITIES.

STREETSCAPE

Catchment Median: Median running down the center of the street with passive tree irrigation to attenuate stormwater through streetscape greening; for primary use along Dairy Ashford

Bioswale: Stormwater runoff conveyance system that provides alternative to storm sewers; to be used adjacent to sidewalks where appropriate

Tree Grates: Protect street trees, enhance aesthetic quality & allow infiltration of stormwater runoff; to be used along sidewalks wide enough to accommodate the grates

Porous Pavement: Allow movement of stormwater through surface to reduce runoff, trap pollutants & filter from the water; for use on sidewalks & streets

STORMWATER MANAGEMENT

Bioretention: Convey & filter contaminants & sediments from stormwater runoff through organic materials; for use within parks/plazas

Detention: Slowly drain & filter stormwater runoff to attenuate flooding; used in Riverway Park

Recycling: Recycle water onsite for irrigation, water features, etc; use where appropriate

BUILDINGS

Green Infrastructure: Green space around building provides aesthetic & cleansing qualities; use adjacent to mixed-use development

Rainwater Cistern: Capture and recycle stormwater; add on to strategically selected buildings

Green Roof/Wall: Divert waste, manage stormwater, reduce urban heat island effect, improve air quality, add amenity space; retrofit on existing buildings & built new buildings to suit
- The natural planting area of the Riverway Park gives employees a great place to get away from the daily work grind.

- With about a half mile loop of trail users have the opportunity to go walking during lunch or after a long day to destress and live a healthier life style.

- The Riverway Park trails occupy what was once undeveloped land and beautify the area surrounding the existing detention pond.
- The Riverway Plaza is the transition space that connects the natural area of Riverway Park and the urban spaces of The Energy Corridor District.

- There is plenty of seating throughout the plaza, including open benches to secluded pods.

- This plaza is a great location for meeting with friends, having lunch with co-workers, or just relaxing after a busy day.
The view from The Energy Corridor District office will be a simple mix of nature and man made structure.

- The water feature will give a nice calming sound as people pass through the space.
- The large trees and berm makes this location an excellent area to have a picnic-like lunch.
TRANSPORTATION PLAZA.

- Located near the transportation hub and bus stops, the transportation plaza welcomes commuters to the heart of The Energy Corridor District.

- Not only does this plaza accommodate commuters, but also provides a space for employees and local residents to wind down and hang out.

- The many layers of area make it a great place to sit and people watch.
- The Transportation Hub will act as an extension to the Addick’s Park-n-Ride located further down I-10.
- The Transportation Hub will provide the opportunities for a bike-share service, car-share service, and plenty of visitor parking.
- Skybridges will connect the Transportation Hub to new mixed-use and office buildings, making for a safer pedestrian crossing.
• Retail, office spaces, and apartments will all be offered in the mixed-use facilities.

• The mixed-use plaza combines the public and private activities of retail visitors and residents.

• This plaza incorporates many different low impact development techniques to make it a more sustainable hang out.
THE ENERGY PLAZA.

- Previously an old storage facility, the Energy Plaza has transformed the site into a vibrant multi-use plaza.

- With food truck accessibility this plaza will bring a variety of choices for employees spending their lunch break here.

- At night this plaza has the potential to become the "It" place to be.
- Shady lawns create a unique experience for employees and visitors.
- The reflection water feature creates a tranquility in the space making for a relaxing place to rest and play.
- A network of walkways throughout the site give the users option for their path around the feature.
- Due to the proximity of the local residents and children's hospital many amenities geared toward children were added; these include:
  - Fun rolling hills
  - Colorful pavement patterns
  - Bubbling splash pads
- This space also provides a direct connections from the residential area to the offices in the area.
DESIGN IMPACT.

MEASURING THE IMPACTS OF CONNECTIVITY, PLACE-MAKING, SUSTAINABILITY & SOCIABILITY.
GOAL ORIENTED IMPACT.
CONNECTIVITY IMPACT.

**NEW TRAIL**
- 0.67 Miles

**IMPROVED SIDEWALKS**
- 3.99 Miles

**BIKE LANE**
- 3.23 Miles

**CONNECTOR STREET**
- 0.43 Miles

- Bike Lanes & Trails: 3.23 Miles
- Improved Sidewalks: 3.99 Miles
- New Trail: 0.67 Miles
- Connector Street: 0.43 Miles

Diagram showing:
- Sidewalks
- Bike Lanes & Trails
- Connecting Roads
- Existing Streets
SUSTAINABILITY IMPACT.

- **Trail**: 0.67 Miles
- **Streetscaping**: 2.01 miles
- **Public Space**: 597,457 sq.ft.
SOCIABILITY IMPACT.

TRAIL
0.67 Miles

PLAZA SPACE
477,042 sq.ft.

PARK SPACE
120,415 sq.ft.
PLACE-MAKING IMPACT.

PUBLIC SPACE
597,457 sq.ft.

Connectivity
sustainability
sociability

Overall impact Place - making
THANKS & GIG’EM.