

## North End Smart District

This architectural topic research studio used North End Smart District in Charlotte as the testing ground for understanding the potential role(s) of 1) green infrastructure and buildings, 2) smart growth strategies, and 3) form-based urban design practices in sustainable urban development. To achieve this goal, 11 graduate students in the M.Arch program followed the Geodesign workflow and engaged in site mapping (including the use of GIS), diagramming and data analysis, precedent research, master-planning and visioning processes, as well as urban open space design processes.

North End Smart District has been defined by 15 studies between 1993 and 2016 that identified the area as a future hotspot for development, attracting new economic activities, particularly centered on technology and innovation sectors. The area is made up of eight neighborhoods north of Uptown Charlotte and mixed with several light-industrial establishments across the area, most of which have ceased operation and been left untouched. The general condition of the existing residential neighborhoods is below average and has shown signs of underinvestment.

The challenges for the students include: 1) build strong relationships and preserve the community's identity; 2) create partnerships; 3) increase equitable community engagement; 4) use data analytics, innovation and lessons learned to inform institutional practices; 5) introduce sustainable development principles.

## Project Structure

For these architecture students who at the time were not familiar with general urban planning principles and the Geodesign methodology, the class was structured around the so-called three bottom-lines of sustainability: Environment, Economy, Equality, and tasked to create three sets of future development scenarios with each being focused only on one of these three areas respectively. The class initially followed the first three models of the Geodesign workflow and generated a set of 10 evaluation maps on the 10 system innovations that were originally identified by IGC. The class found this a useful way to connect the in-class learning exercises to the overall goals of IGC. Though it may not be ideal for comparison purposes planned at IGC, these simplified thematically-focused scenarios have appeared to be an effective teaching tool for architecture students to step into the planning field.

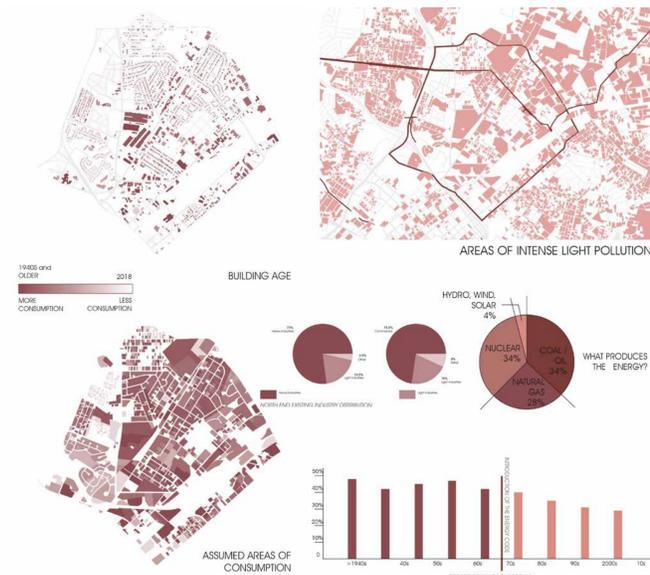


## Assumptions

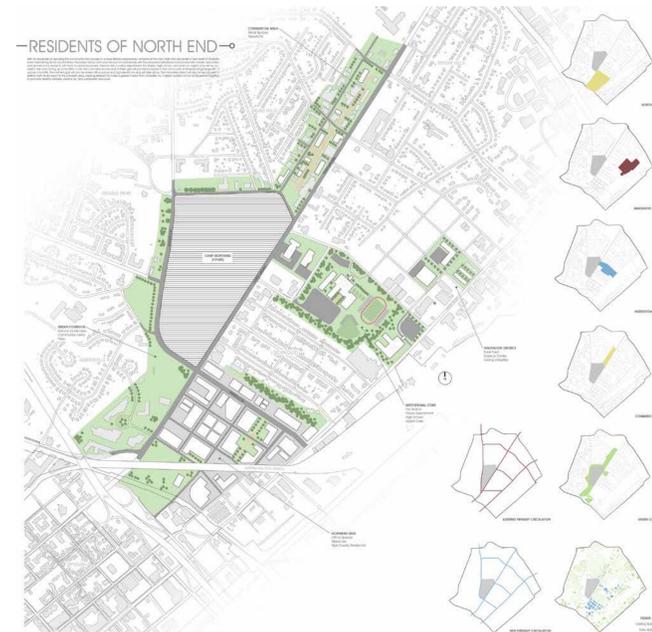
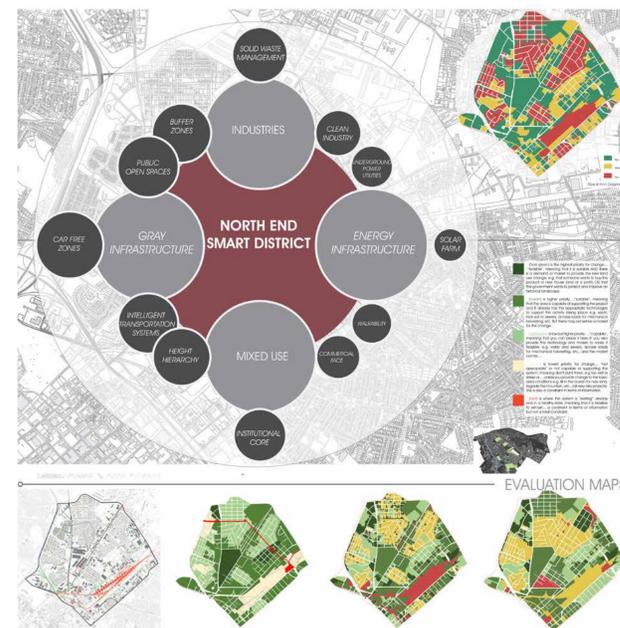
This class project was conducted based on the following assumptions:  
The recently-completed light-rail extension project south of the site is expected to attract residential development projects near the two stations located at the southern edge of North End Smart District. The Charlotte metropolitan area will continue to see a constant growth in both population and jobs in the next 30 years. Uptown Charlotte will continue to experience a rapid expansion in mixed-use development and face pressure to improve its infrastructure and amenities to meet the needs of younger urban dwellers, who are looking for higher quality of life in dense urban areas. The future proposed zoning regulations will be friendlier towards mixed-use development with higher density housing projects, high-quality urban amenities such as public open space and pedestrian network requirements.

## System Innovations

For the purpose of class teaching/learning, this studio project incorporated all 10 system innovations that were identified by IGC. In addition to these 10 systems, the class also included Historical Context as one additional factor to reflect the inferences of the 8 existing residential neighborhoods upon the future development of the area.



With the introduction of the energy code in the mid-70s, construction has been held to a stricter use of energy consumption.



## Economy-Centric Scenario

A smart Industrial city has the ability to drive the economic growth of a region. Smart technologies have a big impact on the city and its people. It improves the overall quality of life and attracts investments and business opportunities. It addresses the woes of urbanization, in order to augment the growth of an economy and spur its development.

### Energy Infrastructure

Any physical and environmental impact related to a city's production, storage, distribution, and consumption of energy is that city's energy infrastructure.

### Gray Infrastructure

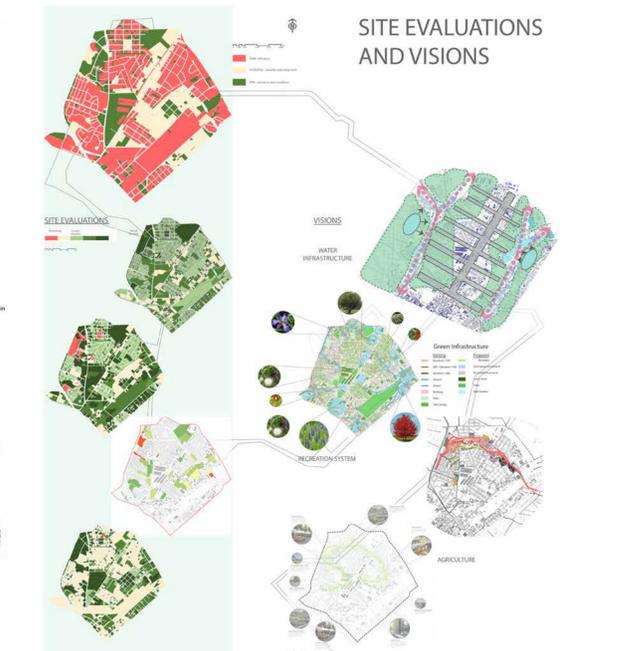
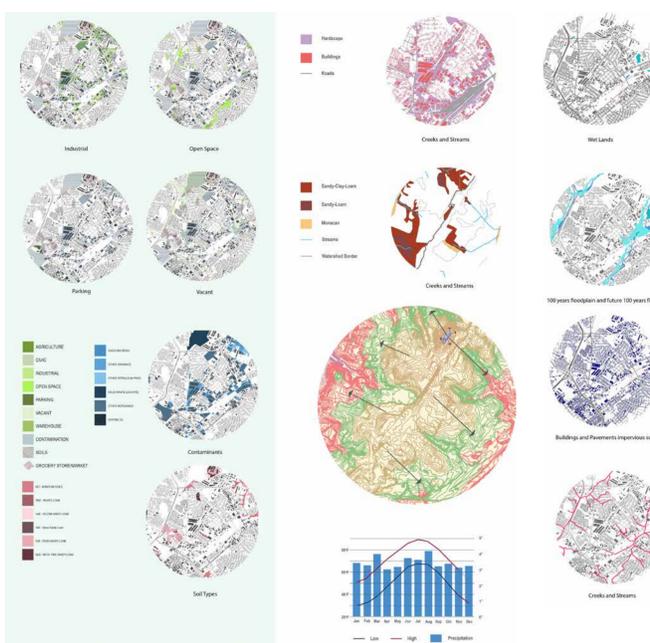
Gray infrastructure, in this context, is every means of transportation, both public and private. This consists of vehicular and pedestrian networks.

### Industry

It is defined as the aggregate of manufacturing or technically productive enterprises in a particular field, often named after its principal product. Manufacturing; Processing; Distribution commerce; Mining.

### Mixed Use (High Density Housing and Commerce)

Mixed-use development is a type of urban development that blends residential, commercial, cultural, institutional, or entertainment uses, where those functions are physically and functionally integrated, and that provide pedestrian connections.



## Environment-Centric Scenario

This scenario is aiming to preserve as much natural vegetation as possible and provide optimum open/park space for the district, while also helping the NESD develop into a vibrant, prosperous, and smart community. It also hopes to better manage stormwater in the district by utilizing the site's natural topography and landscape and implementing low-impact design strategies.

### Green Infrastructure

As more green spaces are turning into developments, stormwater runoff is becoming a major problem. Green infrastructure handles this issue by reducing and treating the runoff at the source.

### Water Infrastructure

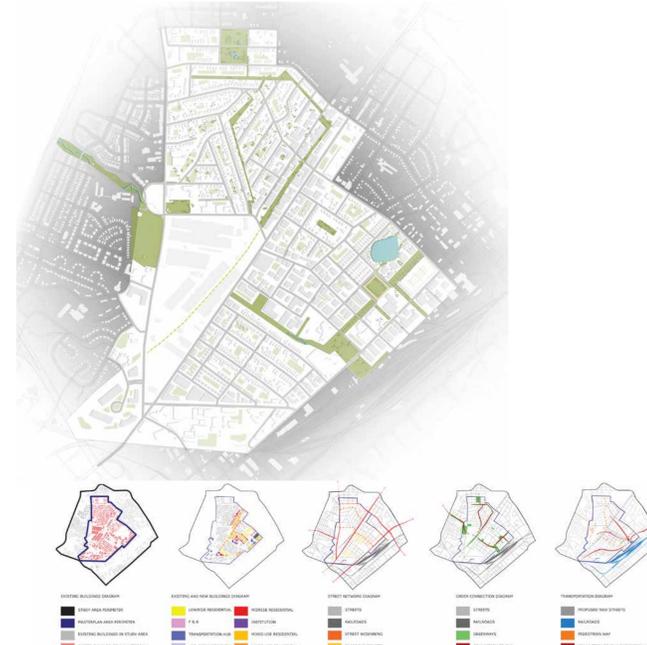
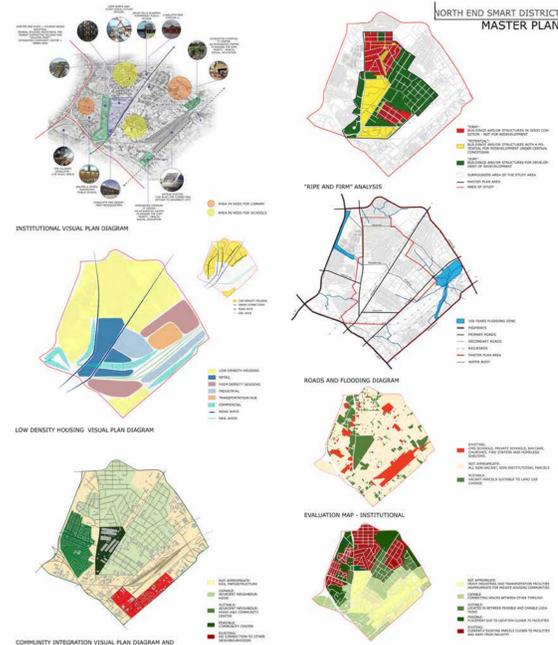
Water infrastructure, such as dams and levees, provide important benefits to society, they can fragment and alter aquatic ecosystems.

### Agriculture

Urban farming is a solution for this problem bringing produce closer to the consumer and using more efficient farming processes such as aeroponics and aquaponics. These processes use significantly less water to produce an equal crop yield. Implementing a zero waste system within an urban farm can help limit energy use.

### Open Spaces for Recreation

Parks and recreation area are one of the most important spaces in cities. A cultural center connects people to each other. A big outdoor space can collect most of the requirements of people who live there, such as central park in Manhattan.



## Social Equality-Centric Scenario

The main intention of the design is to amalgamate the site into the fabric of uptown Charlotte. Considering the buildings and their functions on the site, the main focus was to merge the homeless shelter with the city fabric. The design has three major goals: 1) Propose the project as a Gateway project because of the site location; 2) Include Homeless Shelters into the city's fabric; Create safe streets which would build up great public spaces.

### Low Density Housing

This term describes a type of housing that if dominant in an area, would result in a low average housing density. Low density housing can look like a large detached home on a very large residential block mostly hosting single families.

### Historical Context

Each neighborhood within the North End Smart District contains a thriving community fighting to keep their identity. Genesis Park; Park at Oaklawn; Greenville; Brightwalk; Druid Hills; Lockwood; Optimist Park; Graham Heights.

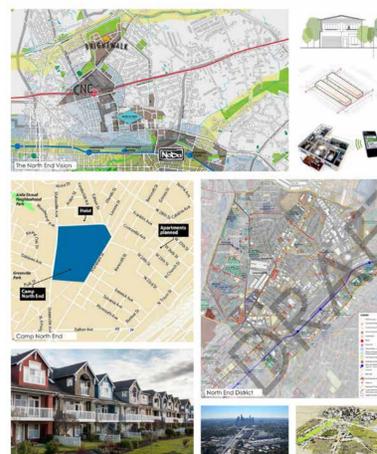
### Institutions

Institutions are a society or organization having a particular object or common factor, especially a scientific, educational, or social one, such schools, public service offices, local law enforcement offices, health care providers, religious organizations, etc.

### Housing Lower Density

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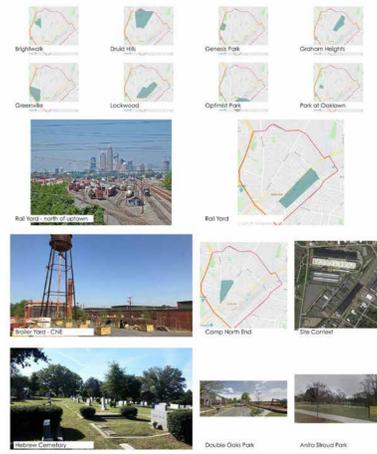
A few ideas to improve this in Low Density Housing are: An L shaped plan to reduce garage space for car parking; Use of smart lighting and ventilation fixtures to help reduce energy usage and save out on money; Managing the waste such that it is recycled, reused or reduced to use within the housing district for other building purposes.



### Historical Context

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The rail yard sits between North Davidson St. and Brevard St., north of uptown Charlotte which opened in 1984. Camp North End: 74 acre site in the middle of the 8 neighborhoods; First warehouse built in 1924 by Henry Ford; Sold to the U.S. Military in 1941; U.S. Military outfitted 5 more warehouses; Total 1.8 million sq. ft. of warehouse space; Bought by Eckerd's in 1967; Used as Eckerd's shipping and distribution center until 2016;



### Energy Infrastructure

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Given the on-going depletion of non-renewable energy sources, it is more ecologically conscience to use solar panels or wind turbines to generate energy. Renewable sources of energy not only have minor environmental implications, but they are also fueled from inexhaustible sources like sun light, air, or tidal movements. Underground utility lines are also preferred in modern development since they also have little impact on the environment.



### Green Infrastructure

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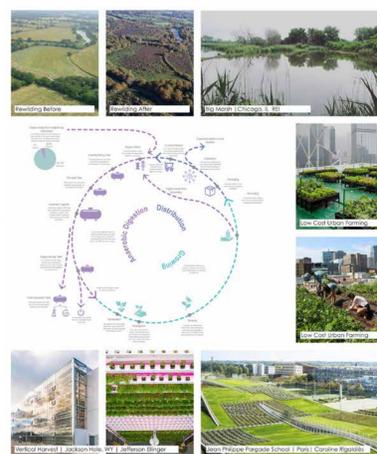
Low-Impact Design Strategies:  
 Downspout Disconnection  
 Rainwater Harvesting  
 Rain Gardens  
 Planter Boxes  
 Bioswales  
 Permeable Pavements  
 Green Streets and Alleys  
 Green Parking  
 Green Roofs  
 Urban Tree Canopy



### Agriculture

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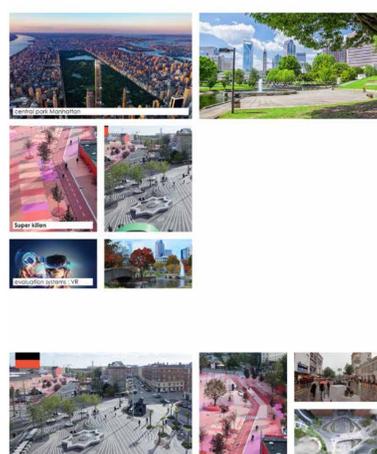
Rewilding allows nature to correct itself and rebuilds its ecosystem to what it was before it was farmland or urban development. The point is to take over farmed land and make it fertile again. The idea of introducing smaller ecosystems into an urban environment can have positive impacts on human health. This process could produce fertile land from what may currently be polluted in the urban context.



### Flexible : Recreation

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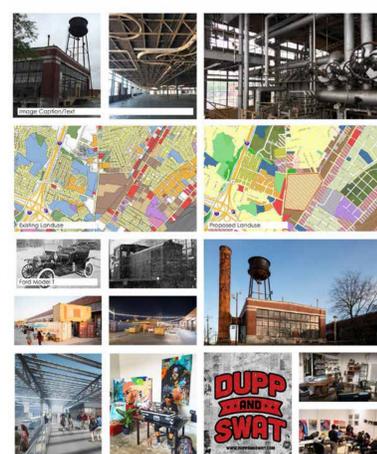
Instagamic place: for making somewhere more attractive by creating an instagamic space, a famous place for taking photos.  
 Walkable path: one of the main parts of parks is walkway path, bicycle path and walkway path, creating walkway path for walking make a space for socializing.



### Industry

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By 2020, Charlotte Center City will be the central hub of an Applied Innovation Corridor, beginning in South End, extending through Uptown and North End: the 5.6-square-mile hip, artsy new sector north of Uptown. It provides unparalleled connectivity for moving goods and people. Investments have catalyzed the area and have begun to transform the identity of North End into a dynamic residential and business address.



### Gray Infrastructure

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System Design: Capacity: System to support the increase in the population over the course of time (Up to 2050). Cost Efficiency: Transportation to be affordable for the majority of the users. Environmental Friendly-ness: The system to be environmental friendly, in order to minimize the side-effects such as air pollution, sound pollution, etc. Speed: System to be fast with the minimum grid-lock, traffic jams, and delays.



### Mixed Use (High Density Housing and Commerce)

Definition

High density housing, this term describes any development outcome that results in more homes on a property.



### Institutional

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A major focus of Charlotte-Mecklenburg School's new plan will be breaking the link between poverty and academic achievement to close gaps and reach educational equity in our community.



### Water Infrastructure

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Water quality buffers: In order to reduce hazards during the extreme storm events, the increased vegetation buffers can be utilized to mitigate the aforementioned effects.



## Architecture Topical Studio, Fall 2018



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