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# Net-Zero Energy Infrastructure for Detroit's Future Public Realm

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In 2010, the design team modestly claimed that we could make Southwest Detroit the first 'net zero energy' community in Michigan, meaning they could gain the entirety of their electrical, thermal and transportation energy needs from renewable sources. We were awarded one of five national grants in the Ford College Community Challenge to partner with Southwest Detroit through the Southwest Detroit Development Collaborative, and spent the next two years proving it could be achieved! Working with a diverse faculty team from the College of Architecture and Design and College of Engineering, students played an important role as Research Assistants/Designers on the project.

For the project, the design team:

- Established an overall goal to create the Detroit region's first 'net zero energy' community - meaning that SWD will produce more energy (through alternative sources) than it consumes.
- Leveraged the community's assets and current "green" community initiatives, planning and design in support of the overall goal.
- Embraced a holistic and systemic approach to the design project, and defined five (5) elements [Density, Urban Mobility, Alternative Energy, Public Realm and Green Economy] which define a Sustainable Community.

We worked in Southwest Detroit, a 12,450 acre, 19.45 square mile neighborhood located

on the Detroit River, the international border with Canada and at the junction of major highway and rail infrastructure. Southwest Detroit is characterized by new immigration and population growth, a cogent cultural heritage, large employment centers, rich "blue, green and gray" infrastructure and cultural and historic sites. Southwest Detroit enjoys a vibrant commercial base and is served by highly skilled advocacy and longstanding, effective community-based development organizations, 25 of which recently organized under the umbrella organization of the Southwest Detroit Development Collaborative [SDDC].

The design team made recommendations on how existing community initiatives can use vacancy, alternative energy solutions, density, natural systems and community empowerment to create a sustainable community. The design team also focused on leveraging and enhancing the neighborhood's assets and blue, green, gray and white infrastructure networks to inform the future urban form of the neighborhood.

After meeting with the community and local contributors we designated 3 primary 'HUBS'. These HUBS were influenced by our previous research on density in Southwest, our LEED ND analysis, and our observation of the concerns and interests within the community. The design team called this new geography "Energy/Density Hubs" and identified four: Michigan Central Station+vicinity (leveraging a convergence of density and infrastructure); Woodmere/Springdale neighborhood

(leveraging community development initiatives), the Detroit Intermodal Freight Terminal [DIFT]/Bow Tie area (leveraging the significant transportation investment in the neighborhood) and the Condon Neighborhood-Livernois/Tireman area (leveraging concentrations of vacant land and diverse partnerships).

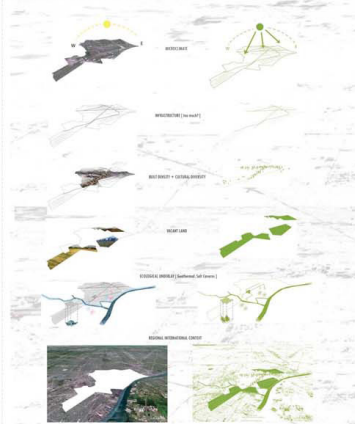
# NET ZERO ENERGY INFRASTRUCTURE FOR DETROIT'S FUTURE PUBLIC REALM

URBAN EVOLUTION, CREATING DETROIT'S FIRST NET ZERO ENERGY COMMUNITY

In 2016, the design team modestly claimed that we could make Southwest Detroit a net zero energy community, meaning they could gain the entirety of their electrical, thermal and transportation energy needs from renewable sources. We were awarded one of five national grants in the Ford College Community Challenge to partner with Southwest Detroit through the Southwest Detroit Development Collaborative, and spent the next two years proving it could be achieved. Working with a diverse faculty team from the CoAD and CoE, students played an important role as Research Assistants/Designers on the project.

## ASSETS

For the grant project, the design team made recommendations on how existing community initiatives can use vacancy, alternative energy solutions, density, natural systems and community empowerment to create a sustainable community. The design team also focused on leveraging and enhancing the neighborhood's assets and blue, green, gray and white infrastructure networks to inform the future urban form of the neighborhood.



**Area of Interest**  
After meeting with the community and reviewing the design team's primary assets, the design team identified a 1.2-mile square area in Southwest Detroit (100-105 streets) and an observation of the context and interests within the community.



For the grant project, the design team embraced a holistic and systemic approach to the design project, and defined five 21 elements which define a Sustainable Community.

**Density:** Invest in density to support existing populations, and, as the result of a collective, criteria driven dialogue increase built and population density at points of geographic convergence.

**Urban Mobility:** develop an all modes approach to moving people and goods in a carbon neutral manner. Place emphasis on, and invest in, the pedestrian environment, mass transit, bicycle and EV fleets.

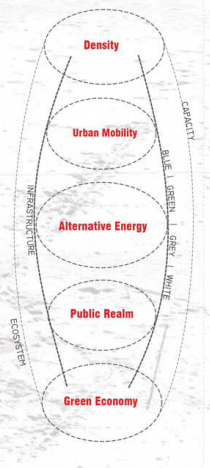
**Alternative Energy:** recommend a hybrid approach based on renewable resources, including solar, geothermal, hydro current and storage solutions that leverage local assets, and leads by neighborhood self-sufficiency.

**Public Realm:** cultivating a new urban ecosystem for the new geography of the city, focusing not only physical improvements to the public ROW, but also plantings and ground plane improvements that enhance environmental quality and create spaces for expanding community and social equity.

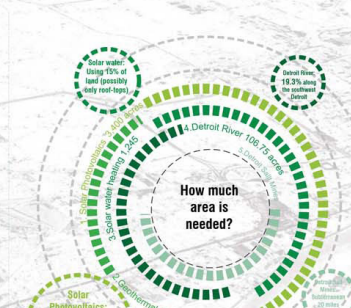
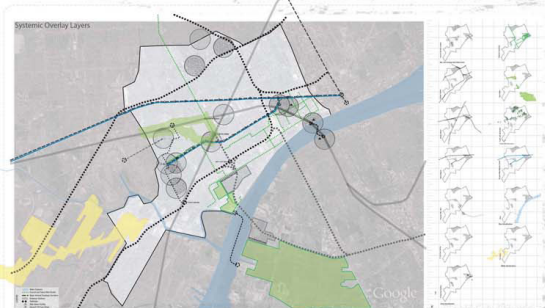
**Green Economy:** a focus on leveraging significant investment in regional and international infrastructure to create opportunities for economic development, including training, job creation, making and conversion of extant industrial and commercial assets.

For the project, the design team:  
 • Established an overall goal to create the Detroit region's first net zero energy community - meaning that SWD will produce more energy (through alternative sources) than it consumes.  
 • Leveraged the community's assets and current "green" community initiatives, planning and design in support of the overall goal.  
 • Embraced a holistic and systemic approach to the design project and defined five 21 elements which define a Sustainable Community.

The context of the authors' design research is Detroit, Michigan, USA. Specifically, we have walked in Southwest Detroit, a 12,650 acre, 19.45 square mile neighborhood located on the Detroit River, the international border with Canada and at the junction of major highway and rail infrastructure. Southwest Detroit is characterized by high immigration and population growth, a vibrant cultural heritage, large employment centers (both "blue" green and gray) infrastructure land-cultural and historic sites. Southwest Detroit enjoys a vibrant commercial base and is served by highly skilled advocacy and longstanding, effective community-based development organizations, 25 of which, recently organized under the umbrella organization of the Southwest Detroit Development Collaborative (SDDC).



## CONVERGENCE



For the grant project, the design team utilized the digital interface to map data and conduct analysis to identify the geography of the neighborhood where we will develop urban design proposals.  
 • Called this new geography "Energy Density Hubs" and have identified four so far: Michigan Central Station vicinity (leveraging a convergence of density and infrastructure); Woodruff/Springdale neighborhood (leveraging community development initiatives); the Detroit Intermodal Freight Terminal (DTFT) area (leveraging the significant transportation investment in the neighborhood) and the Condon Neighborhood (leveraging vacant land and diverse partnerships).

## VISION

