

# Chicago Central Area DeCarbonization Plan

Chicago, Illinois

ADRIAN SMITH + GORDON GILL  
ARCHITECTURE

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The Chicago Central Area DeCarbonization Plan aims not only to reduce the environmental impact and carbon emissions of the downtown but to improve the overall quality of life of the city's urban environment.

SERVICES  
Architecture  
Urban Design

There are many ways to reduce carbon emissions, and numerous cities have made commitments to reduce carbon and other greenhouse gases. Some plans focus on energy production, some on transportation and others dwell on solid waste and recycling. While this study examines all of the carbon sources characteristic of the urban condition, the goal here is not simply to reach a reduction number that is calculated from an applied set of assumptions.

The Chicago Central Area DeCarbonization Plan is a beginning process for maintaining the economic and cultural vitality of the urban core, from an energy and carbon perspective. The continued viability of cities and urban living is a core principle in the long-term idea that population growth can continue without its negative impact to the environment becoming detrimental to the planet in the form of global warming.

It is therefore critical that our cities are not only decarbonized, but also continue to develop as great places where people can live happy, healthy lifestyles with a minimized environmental footprint. The DeCarbonization Plan proposes a variety of methods for reducing carbon including aggressive upgrade of the existing building stock and urban fabric.

There are, on the surface, simpler ways to reduce carbon which should first be discussed. A wind farm or large scale photovoltaic array can power hundreds of buildings. A single nuclear plant can power an entire region. Why, then, is there a need for a decarbonization plan for the city? If it were a simple matter of replacing greenhouse gas emitting fossil plants with renewable energy resources, urban decarbonization would not be necessary. However, if no urban decarbonization happened and the energy issues were simply solved by the creation of more power plants, many opportunities for the improvement of the urban environment and of social issues would be lost, and cities like Chicago might be allowed to decay over time.

These social issues, which can be solved by decarbonization, include all the complexities of carbon production that are bound up in the city. For example, an aging building stock currently consumes much more energy than is necessary, and needs to be upgraded not only for its emissions but for its future economic viability. Commuters currently drive from the suburbs to the city on infrastructure that is costly to maintain, and over-crowded. Stormwater currently pours off of hard surfaces into the water treatment system where it could be recovered, and unshaded surfaces in the city allows high temperatures to occur in a localized area. The Chicago Central Area DeCarbonization Plan seeks to go beyond the technological fix and advance Chicago's global leadership position not only as a green city but also as a continuing model of architectural and urban innovation.



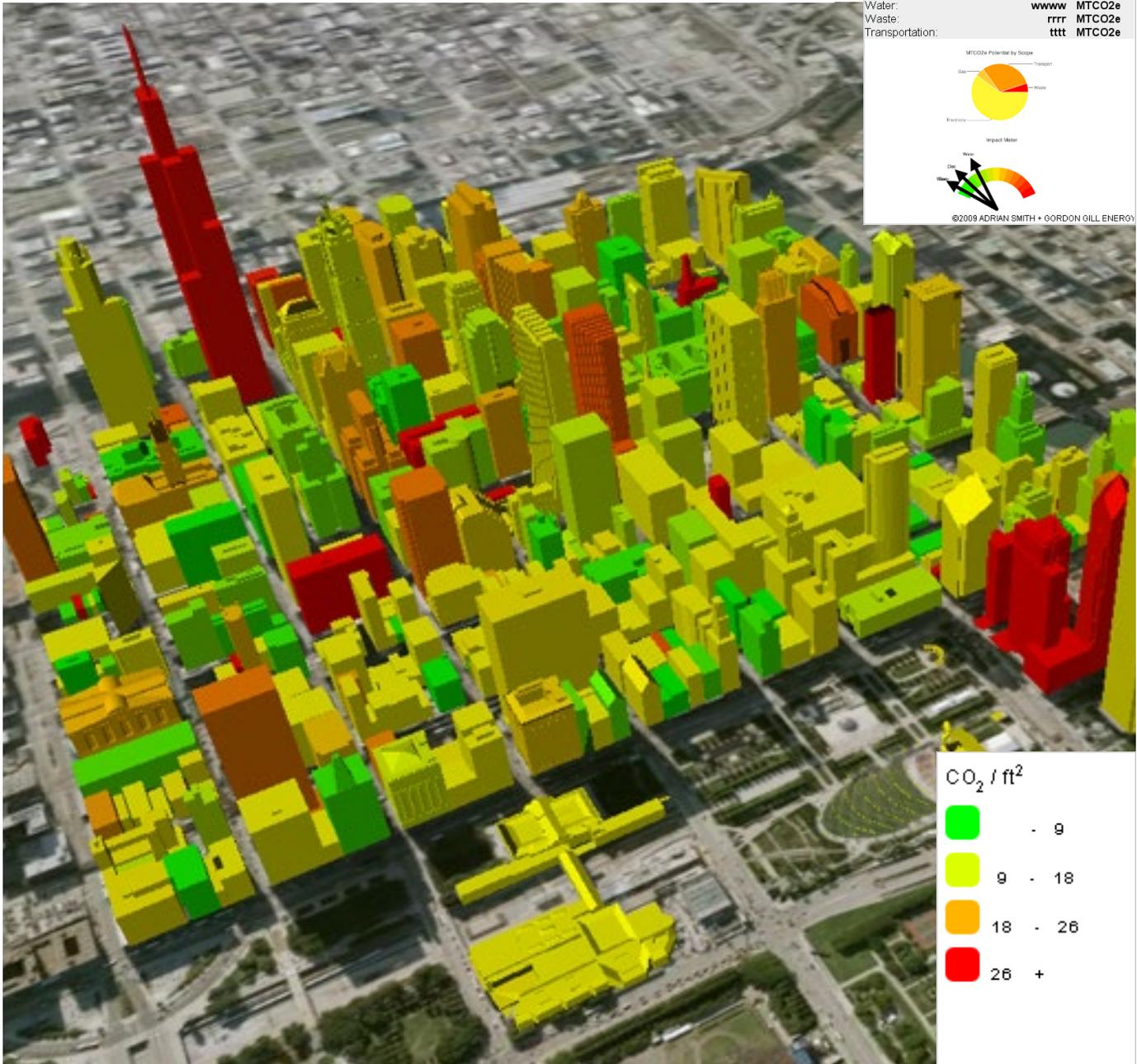
**Building 123**  
123 W. Wacker Dr.  
Gross Area (sf): 1,300,000

Residential:	35,189	MTCO2e
Electricity:	6,179	MTCO2e
Natural Gas:	cccc	MTCO2e
Purchased Chilled Water:	wwww	MTCO2e
Water:	rrrr	MTCO2e
Waste:	tttt	MTCO2e
Transportation:		

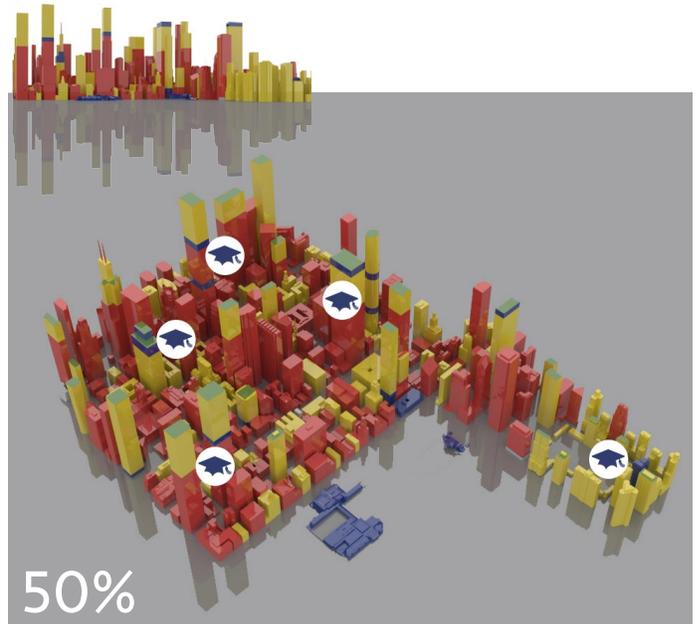
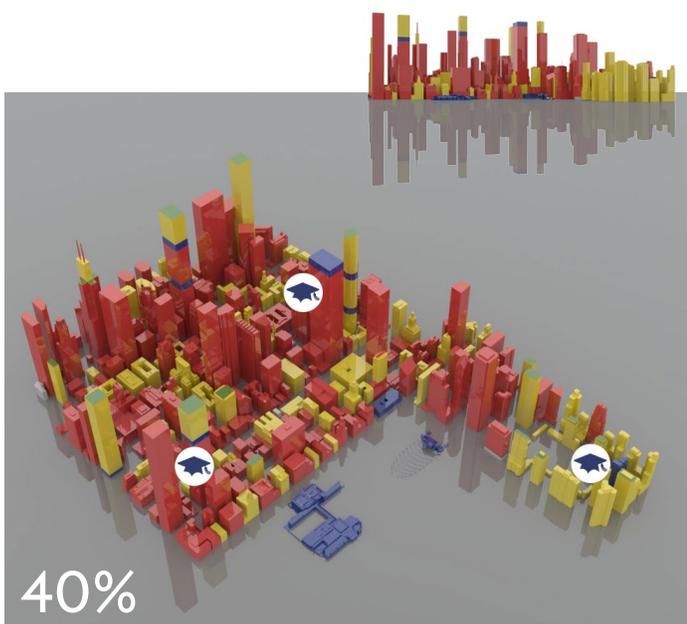
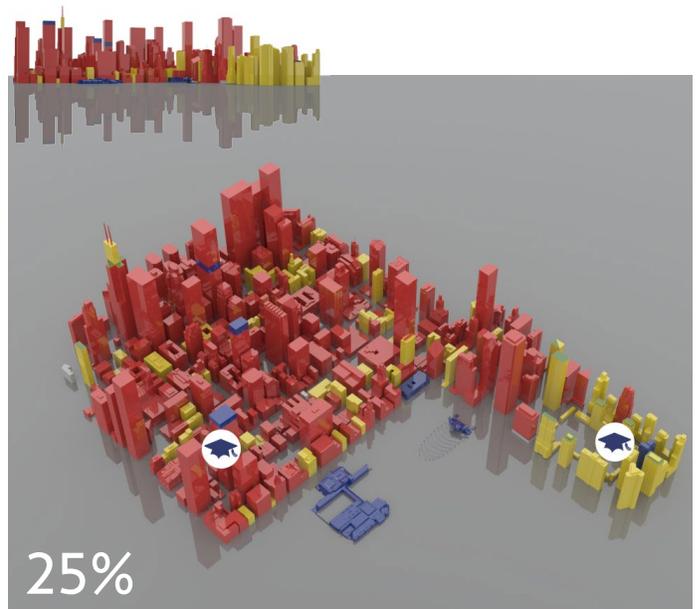
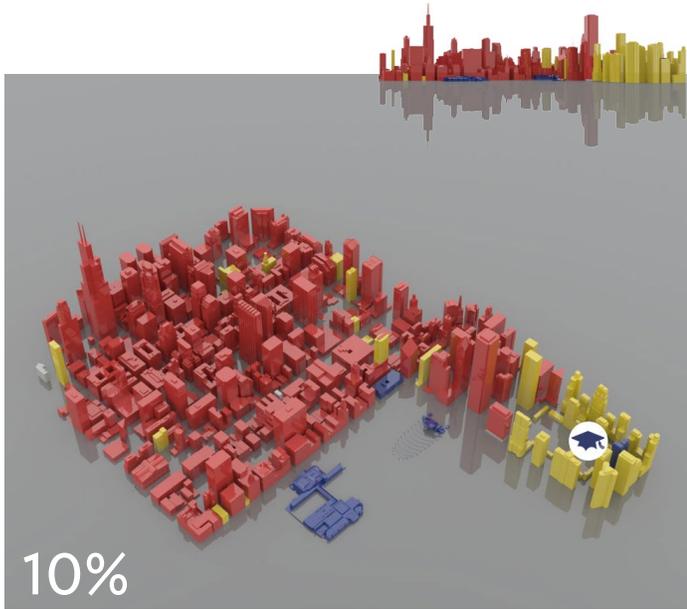
MTCO2e Potential by Scope

Impact Matrix

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The Data Model is a tool that AS+GG is developing to be able to visualize building energy consumption and emissions at a citywide scale. It was developed with the intention of monitoring and communicating all aspects of city buildings that relate to their carbon impact, current and future. This serves a number of purposes: a method of analysis to inform energy oriented planning decisions including cost data, an advertising platform for companies making efficiency upgrades to their buildings, an educational tool, and a forum to raise awareness about the carbon impact of the built environment and the effectiveness and cost of strategies in place to improve this.

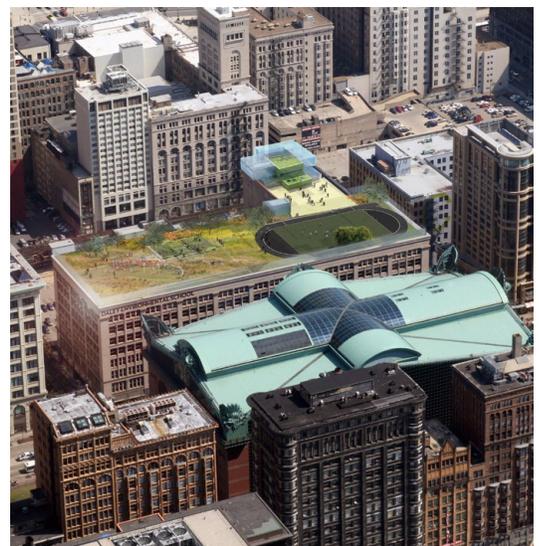


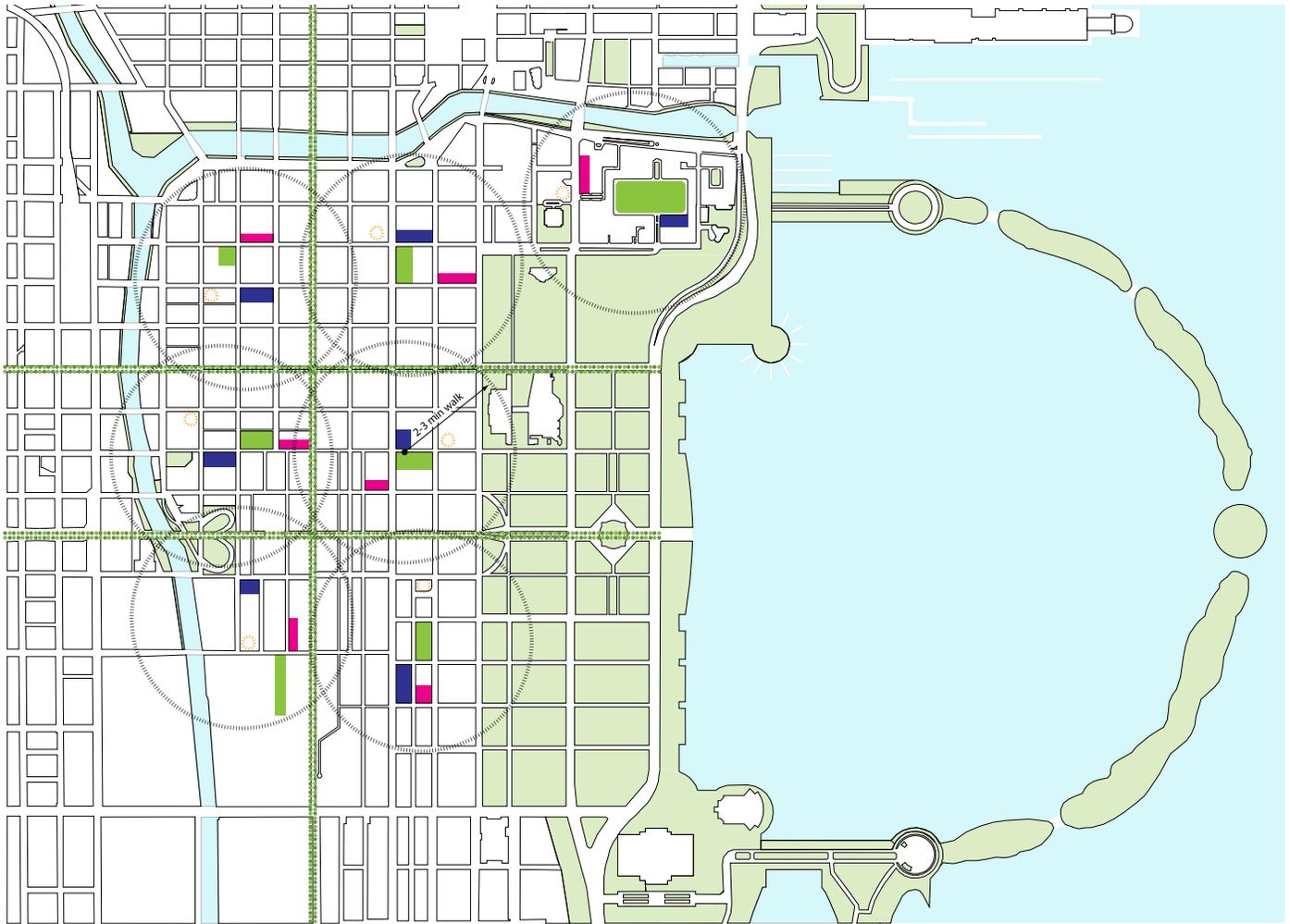
The current occupancy breakdown in the study area is approximately 90% commercial and 10% residential. This amount of residential area, in addition to the amenities necessary to support that population, such as schools and grocers, falls short of the area that would be needed for even half of the daytime work population.

If the occupancy ratio in the Loop intensified to 50%/50% commercial/residential the mix would result in one of the world's most efficient and sustainable live-work communities, creating a new paradigm for cities across the globe.

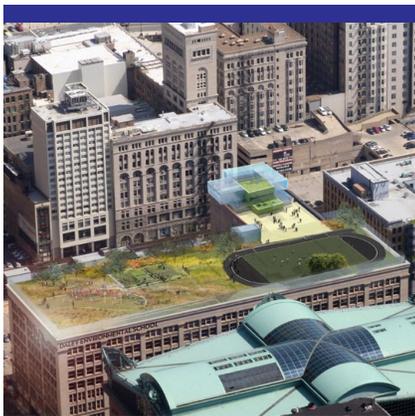
A superior education system is vital to the evolution and success of the mixed use city. These facilities must be state of the art with advanced programs and a diverse curriculum. Issues in sustainability such as ecology, genomics, biodiversity, and agro-forestry should be introduced to students early in their development. With a diverse student body and holistic approach to early development, institutions like the Daley Environmental School will become the archetype for the Chicago Public Schools.

Burnham's Plan of Chicago was introduced in 1909. The plan developed as a reaction to the effects industrialization of the modern world were having on the quality of the city's inhabitants. Plan commissioner Wacker developed a textbook which taught the major aspects of the Plan to a generation of Chicago schoolchildren. The vision of "The Green City" manual follows in that honorable tradition as a primer of Chicago's vision for a carbon-free future, and should be taught as part of the curriculum at Chicago public schools.





SCHOOLS + DAYCARE CENTERS



DALEY ENVIRONMENTAL SCHOOL

AMENITIES + SERVICES



INTER-MODAL GREENAXIS

URBAN GREEN SPACE



CHICAGO ECO-BRIDGE

The increase in residential real estate in downtown Chicago would lower the area's overall carbon footprint by creating a dense, mixed-use community. Adding significant residential space increases the area's need for amenities that the Loop currently lacks to support residential life: K-12 schools, daycare systems and grocery stores. The creation of a vibrant urban community relies on the quality of amenities, and the incorporation of these important amenities is a critical step in the Loop's transformation into Chicago's next premier neighborhood for families.



In response to the analysis of the existing transportation options and proposed items in the Chicago Central Area Plan, a series of design strategies evolved as a means to integrate them into a coherent, functional and thriving urban system. A multi-level East-West Intermodal Axis would be created along Monroe Street. An electric bus route below grade will transport commuters across the Loop. This link will also connect to the upgraded underground pedway system with improved retail and amenities. At grade, Monroe would narrow to two lanes to allow for a more pedestrian and bike friendly experience. The Monroe Street corridor has the potential to be a convenient link for transit and pedestrians, and for retail to thrive. Its central location in the Loop will make it a hub for commuters.



There are currently breaks in the pedway system that can be connected to make one continuous below-grade system. Below grade Monroe East-West Intermodal provides a covered space during inclement weather. This space can be programmed to incorporate amenities and services such as schools, shopping, gyms, entertainment, bicycle station, library, spas, grocery stores and restaurants. Considering the extreme Chicago weather conditions, there is potential for building owners to capitalize on their connection to a thriving pedway system that will encourage potential retail and services to serve increased inhabitants of the Loop.

A connection to the proposed East-West Monroe link could aid in optimizing this pedway system. There are locations where the below grade portion erodes and connects with above grade streetscape. This occurs at open plaza areas such as Chase Plaza. There are also interconnections up and down to the shuttle bus stops.

The green axis is the main spine that links a series of smaller green plazas that support the inhabitants during the day and evening hours. The green connections would improve transportation, livability, reduce heat island effect, reduce storm water treatment requirements, increase air quality and improve amenities.





The proposed Chicago Eco-Bridge would complete the last major recommendation of the 1909 Burnham Plan of Chicago in a thoroughly modern way that celebrates the city's future as well as its past. The two-mile bridge, a breakwater in the Monroe Harbor, celebrates Chicago's position as the greenest city in the United States.

The bridge creates a grand new civic space providing educational and recreational opportunities and unparalleled views of the skyline from a central observation tower. This new outdoor space encourages environment stewardship within its patrons by incorporating a Great Lakes Learning Center, Marina Habitat Observatory and other outdoor amenities that celebrate the environment.

