



## **TOWARD ZERO CARBON:**

### **The Chicago Central Area DeCarbonization Plan**

Paysage des Toits et Architecture, Urbanisme

Paris, France

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# CARBON REDUCTION GOALS

## CHICAGO CLIMATE ACTION PLAN

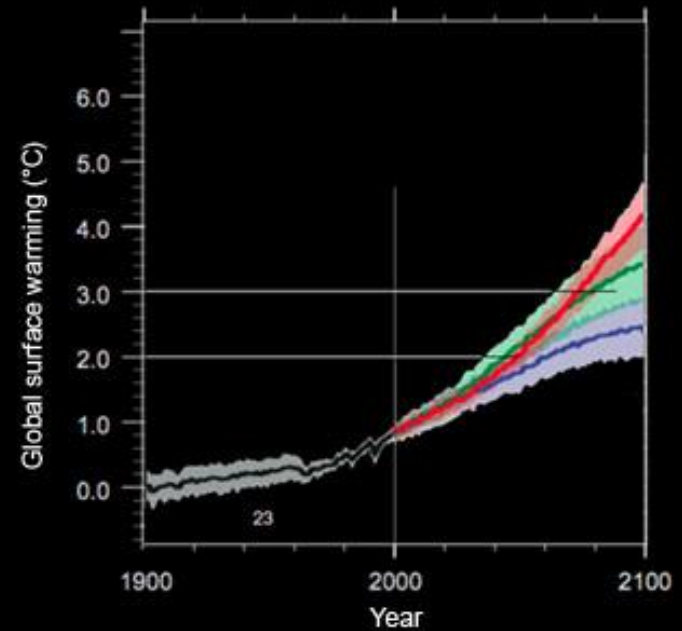
30% Reduction in commercial buildings by 2020



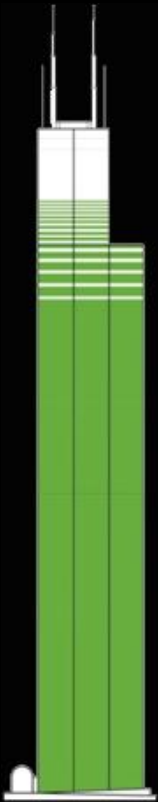
30% Reduction in commercial buildings by 2012



2030 Challenge and 2030 Commitment: New building standards reach carbon neutrality, 30% reduction by 2010, 100% reduction by 2030.



HOW CAN THE LESSONS OF  
WILLIS TOWER BE TAKEN  
TO AN URBAN SCALE?



# CATALYST FOR LARGER SCALE STUDY

Willis Tower has 1,500 miles of electrical cable, 25 miles of plumbing, and weighs a total of 222,500 tons Source: Willis Tower archives

Because of the high embodied energy in these materials, replacing the building with a new net-zero energy building isn't the greenest option

Modernization not only maintains the building's viability for the future – it is also the 'greenest solution'

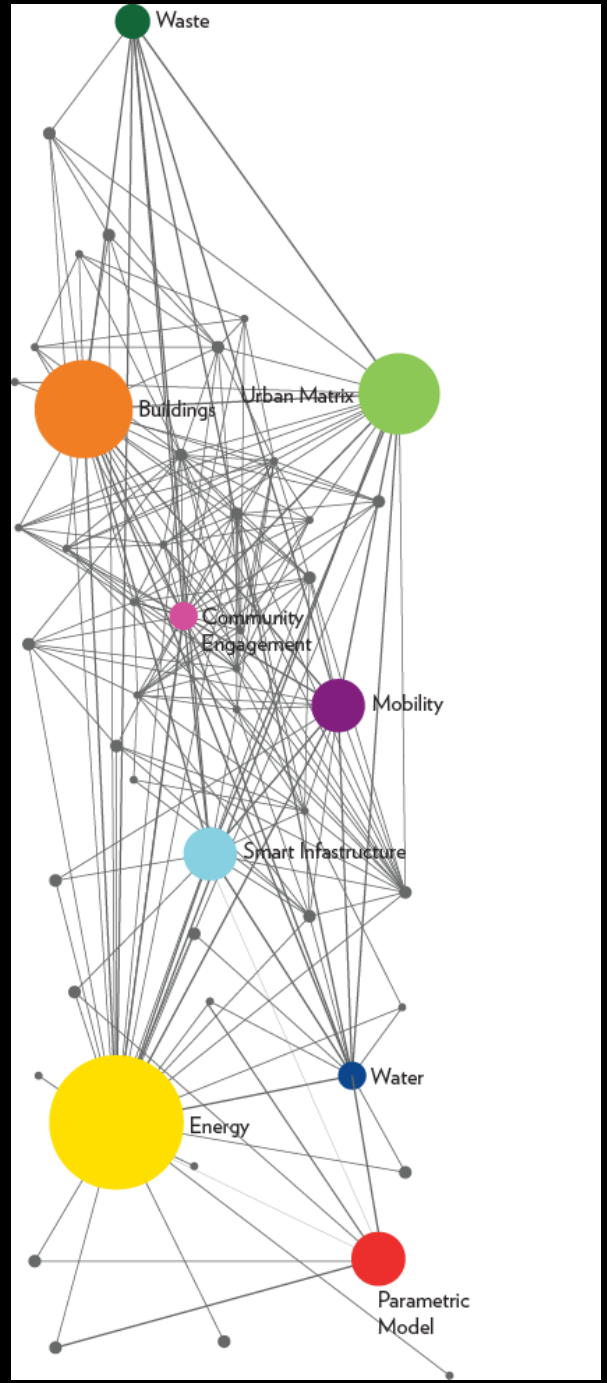
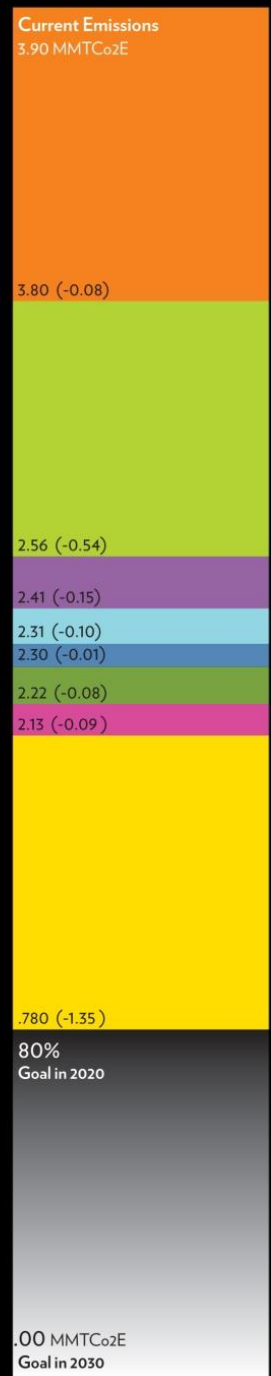


# CARBON EMISSIONS IN THE LOOP

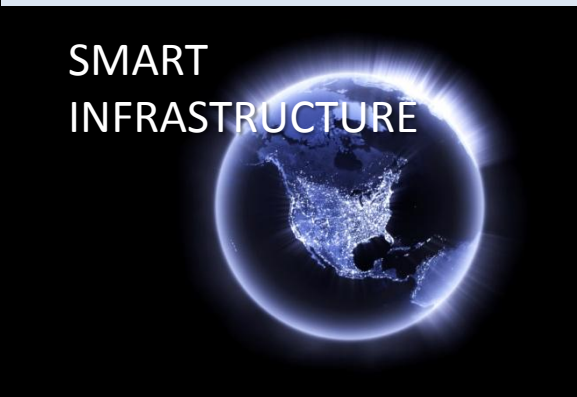
City: 39.0 MMTCO<sub>2</sub>E

Loop: 3.9 MMTCO<sub>2</sub>E

Loop: 1% of area, 10% of emissions



# DECARBONIZATION PLAN



# BUILDINGS



90 % of the square footage of buildings in the Chicago Loop was built before 1975. Much of this square footage has equipment and systems nearing the end of their life cycle. New buildings account for less than 1% of Chicago's building stock.





### Carbon Reduction



0 BtCO2

gas  
elecwater  
traf

### carbon

**2748.0**  
total BtCO2

**1855.00**  
elec BtCO2

**143.00**  
gas BtCO2

**80.00**  
water BtCO2

**670.00**  
traf BtCO2

### metrics

**180,000**  
total area Msqft

**100,000**  
population--

**10,000**  
cars

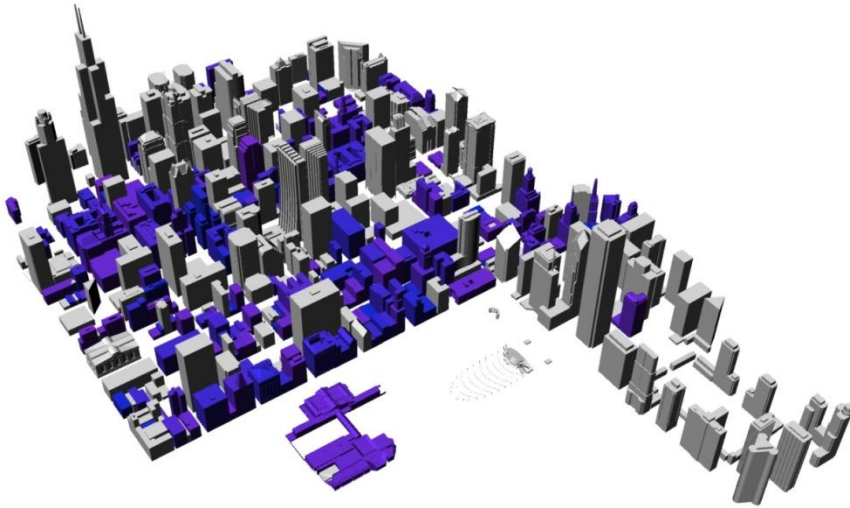
**0**

**Building Parameters**

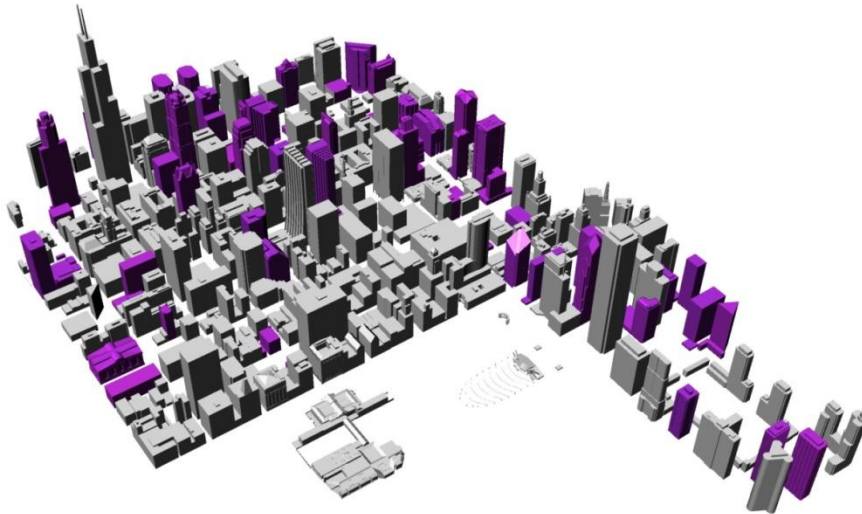
**City Parameters**



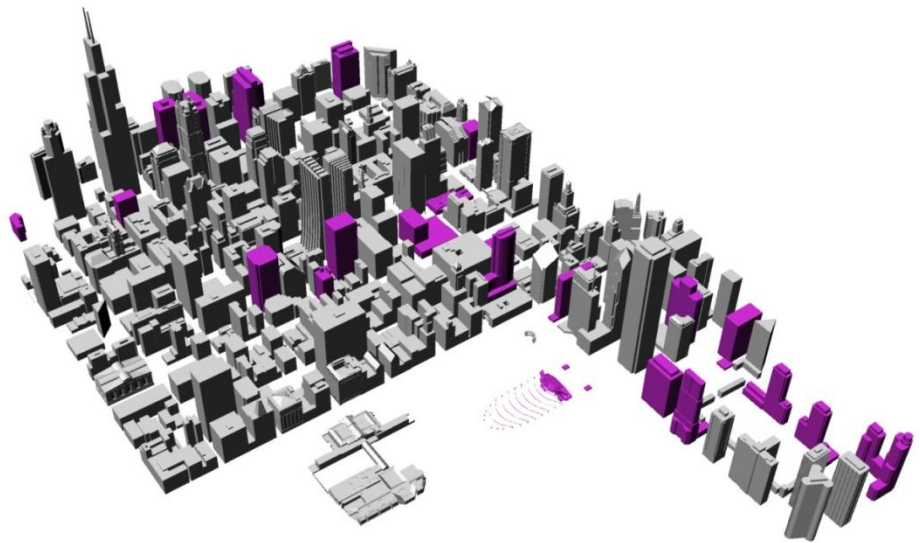
HERITAGE 1880-1945



MID-CENTURY 1945-1975



POST ENERGY CRISIS 1975-2000

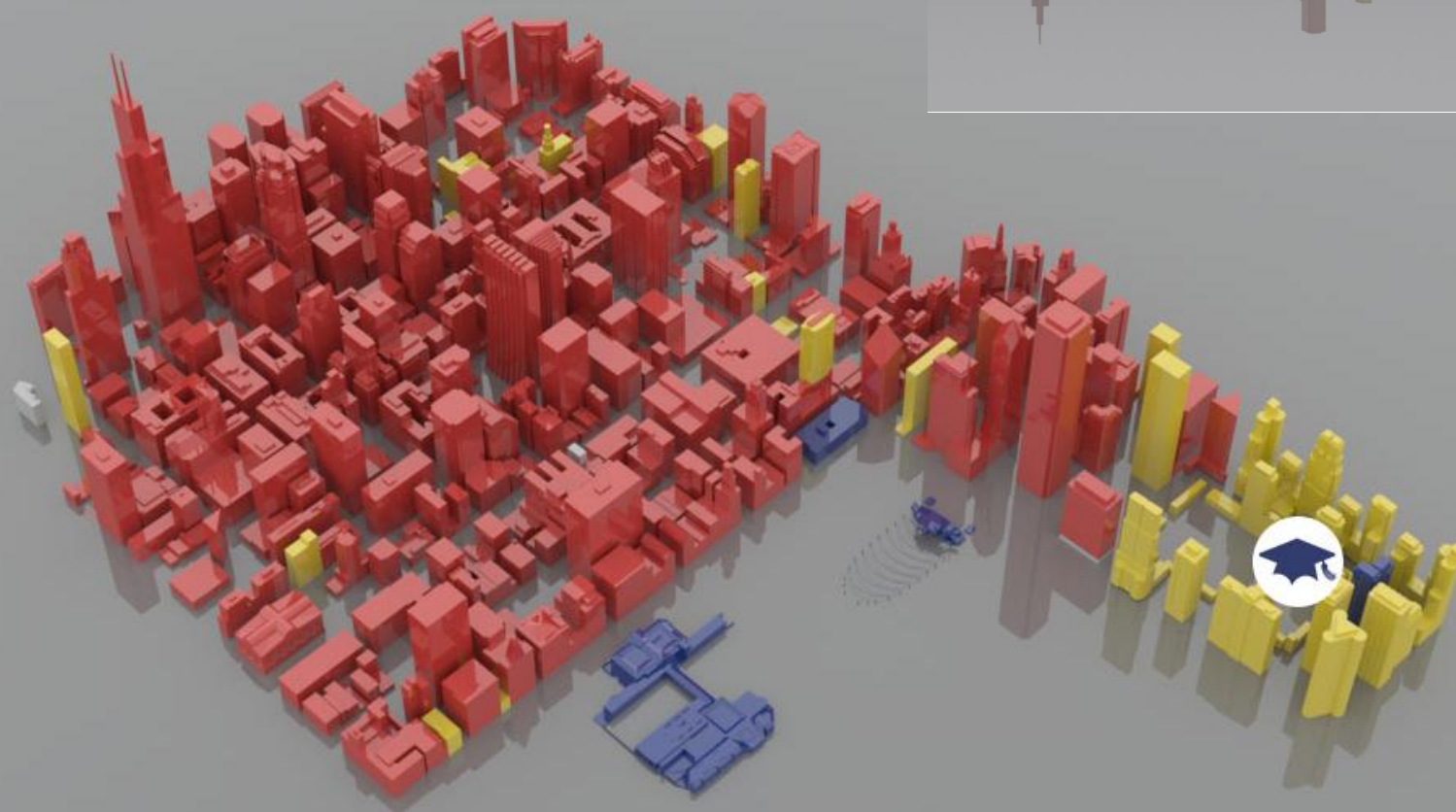


ENERGY CONSCIOUS 2000-

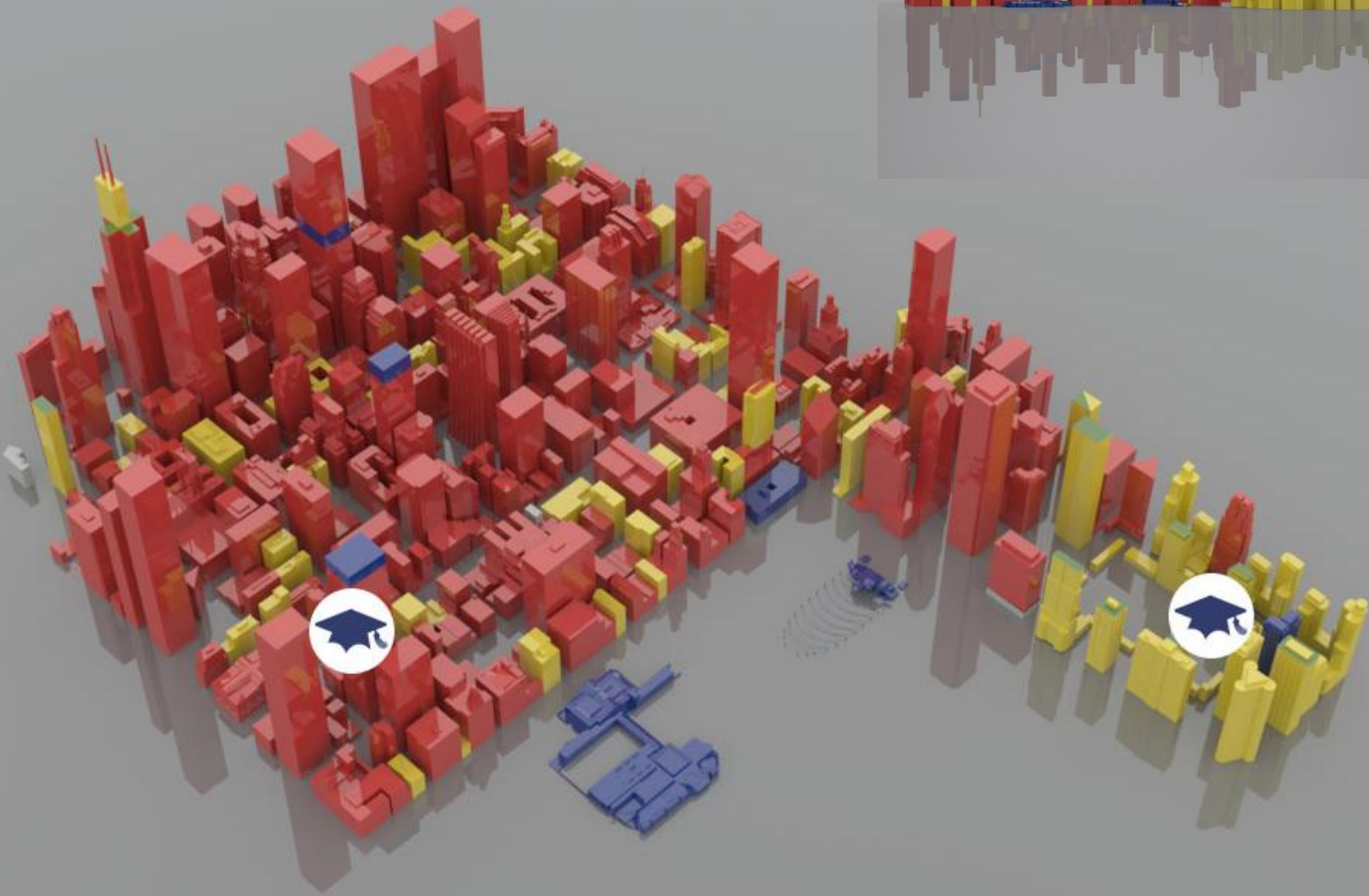
# URBAN MATRIX



Carbon Emissions:  
1 sq ft of Office= 4 sq ft of Residential

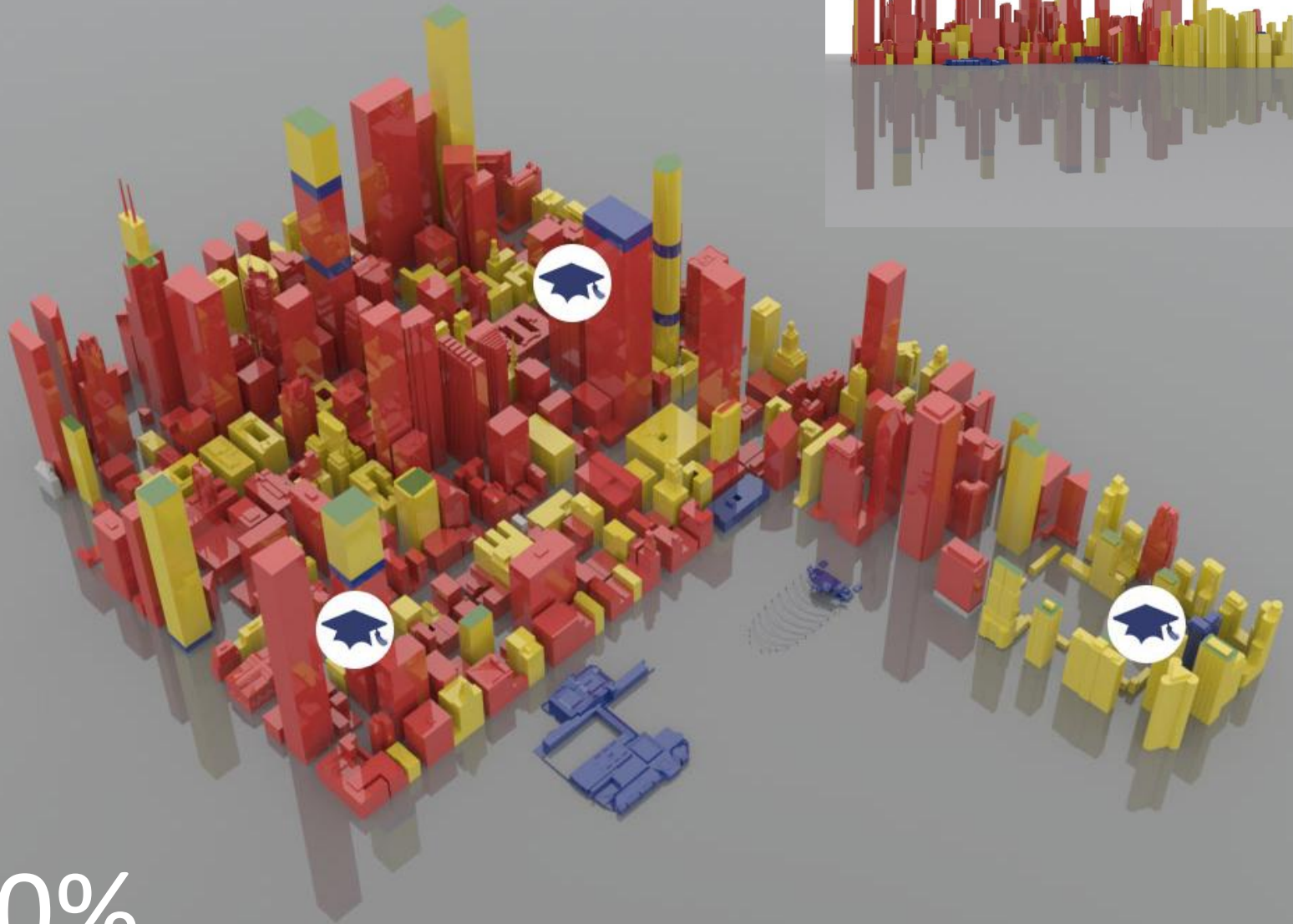


10%

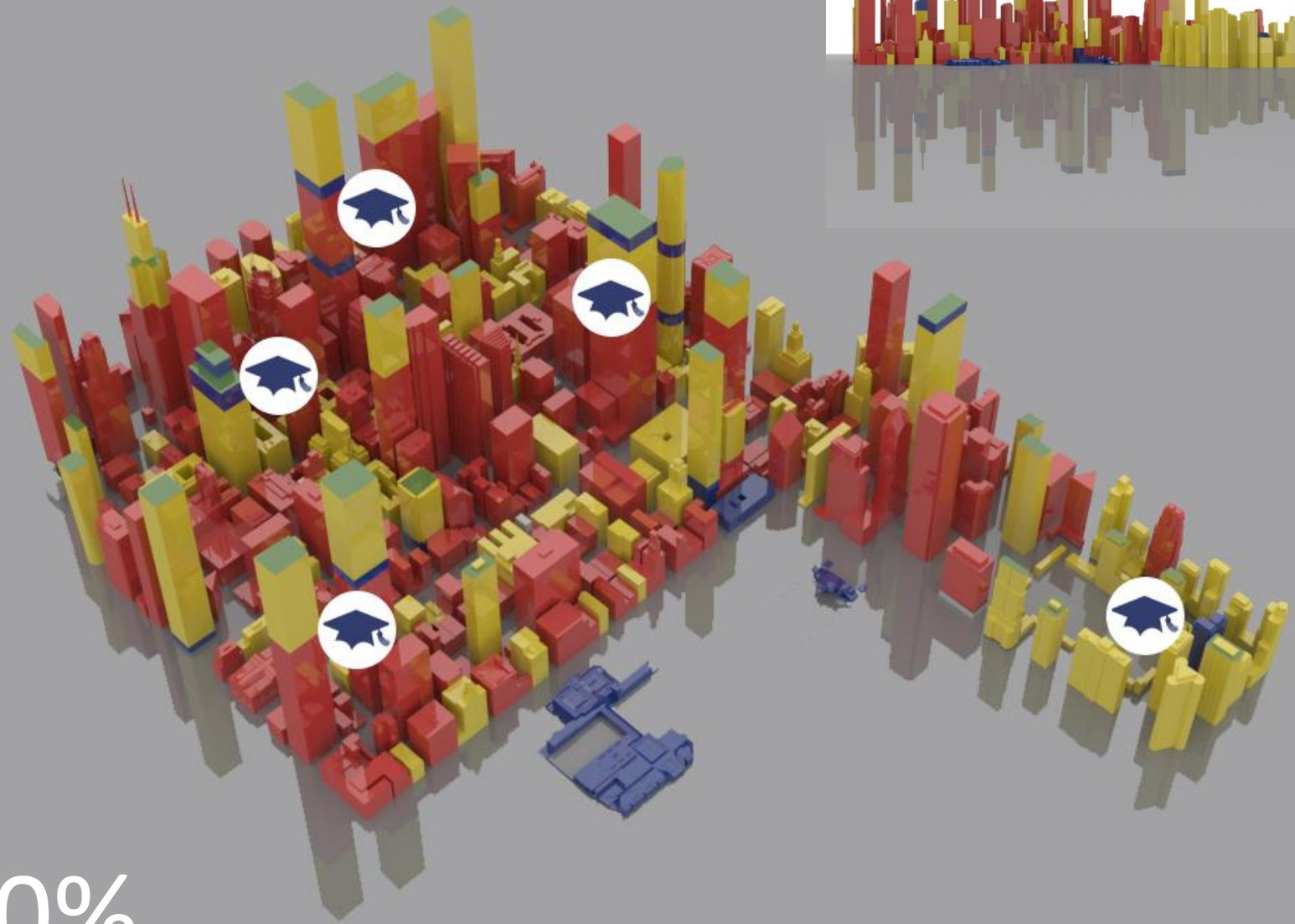


25%

40%

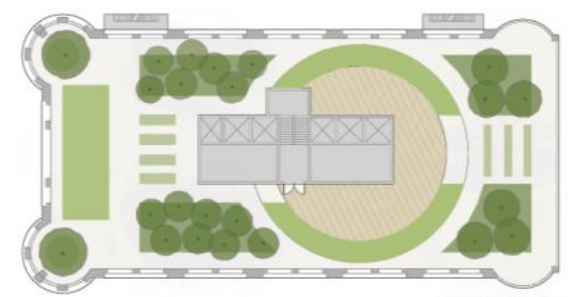


50%

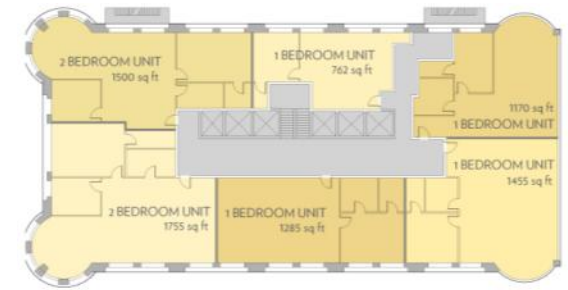


## POTENTIAL RE-USE

- Narrow Floor Plates
- Operable Windows
- Class "C"
- High Vacancy



ROOF TERRACE

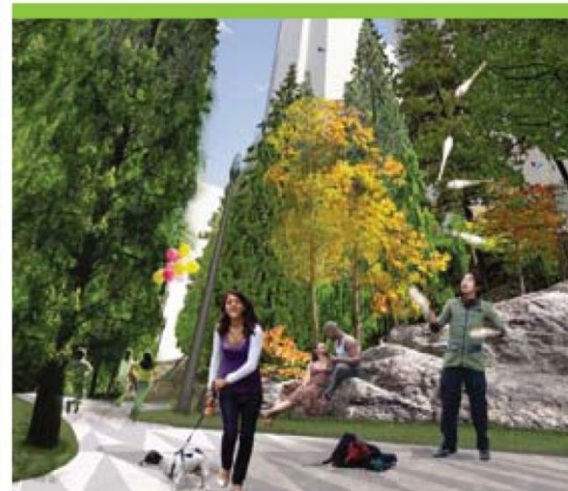
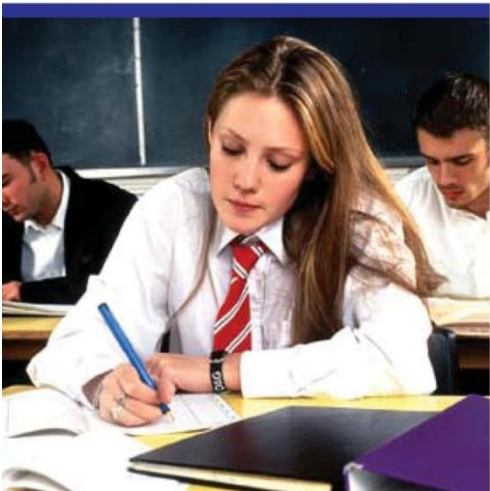
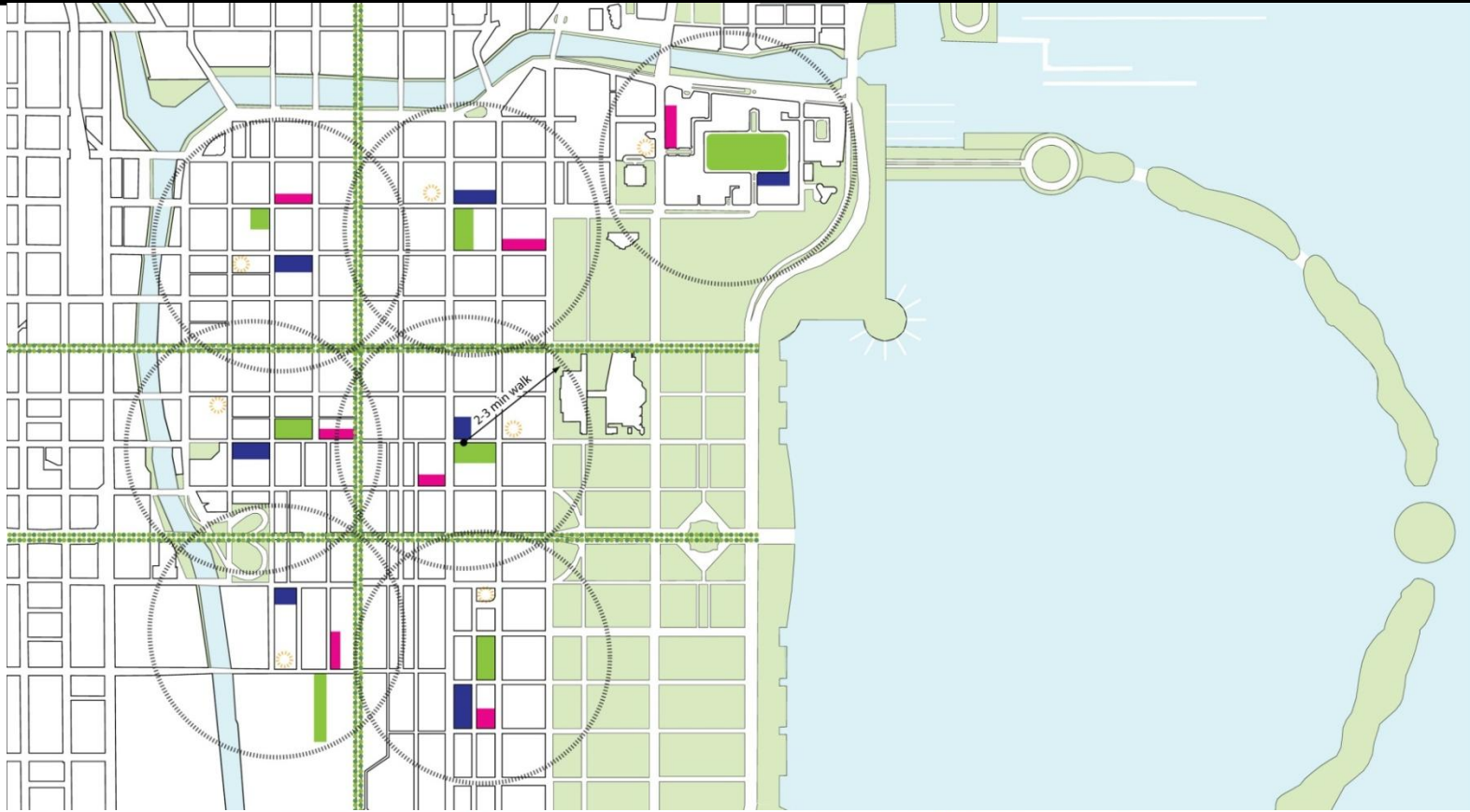


TYPICAL RESIDENTIAL FLOOR PLAN





# CITY WITHIN A CITY



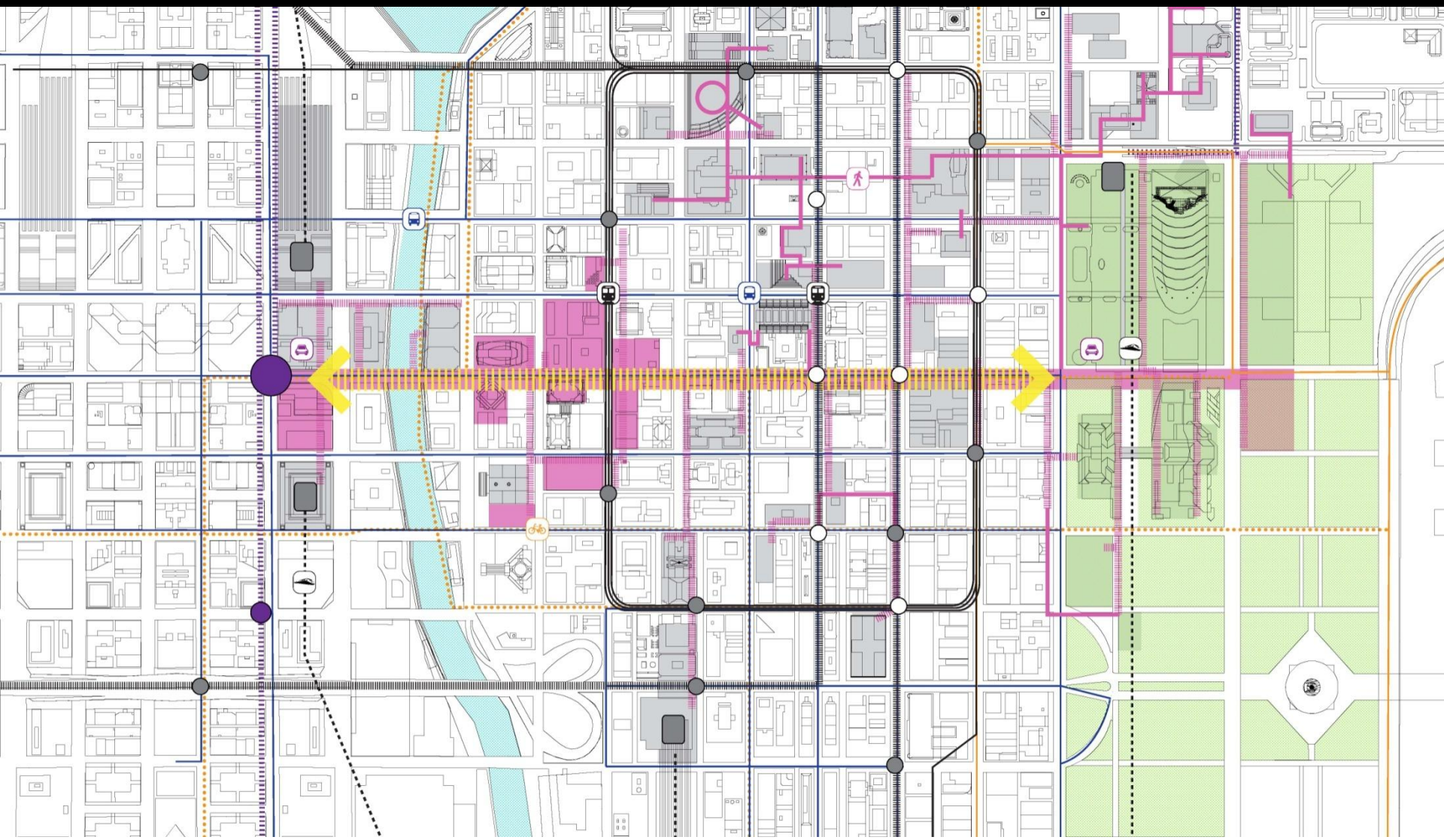
# DALEY ENVIRONMENTAL SCHOOL



# MOBILITY

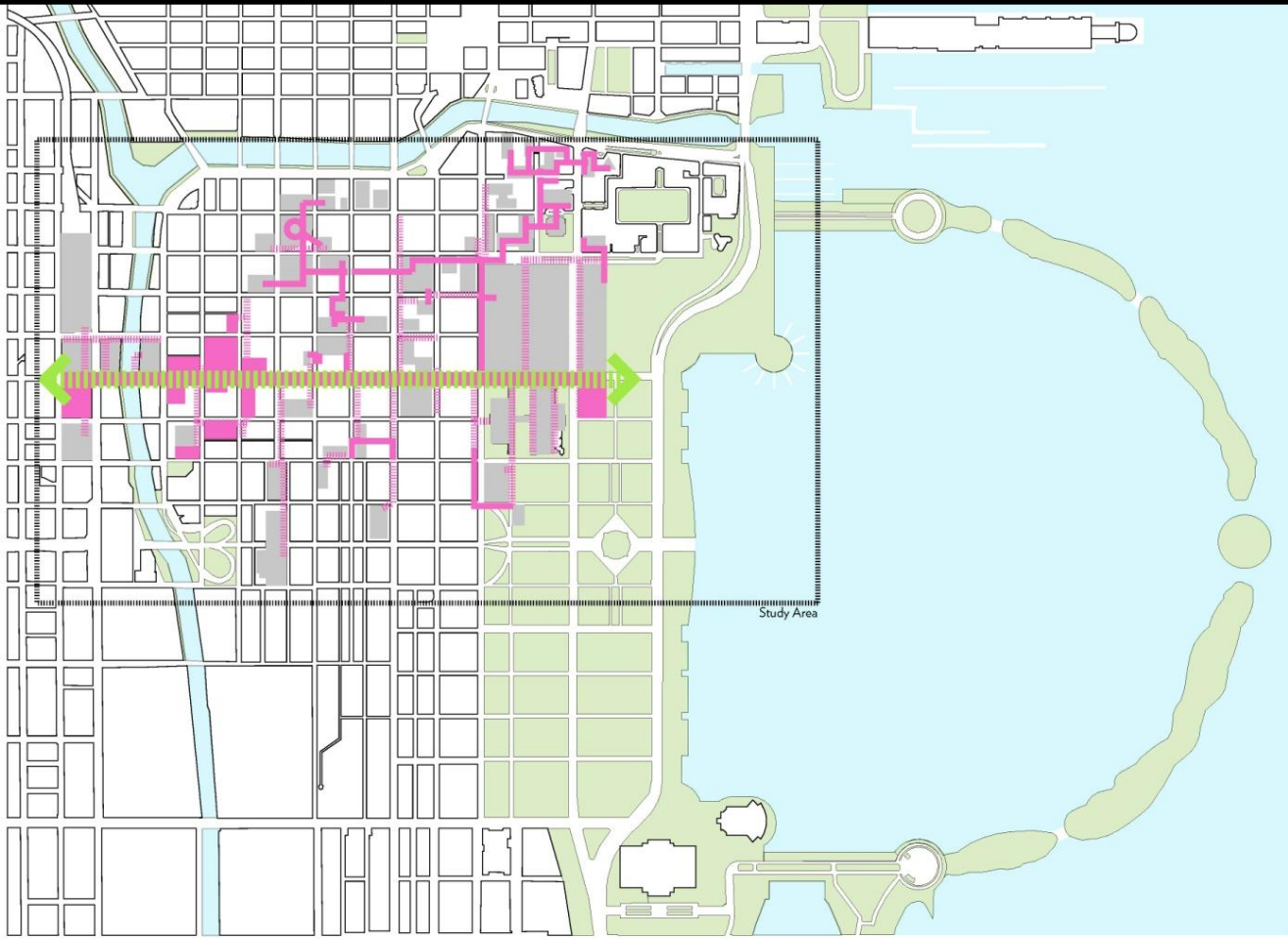


# MOBILITY NETWORK



- |  |                         |  |                   |  |                              |  |                       |
|--|-------------------------|--|-------------------|--|------------------------------|--|-----------------------|
|  | CTA Line (Above Ground) |  | Existing Station  |  | Existing Amenity Below Grade |  | Existing Bicycle Path |
|  | CTA Line (Underground)  |  | New Stop          |  | Proposed Amenity Below Grade |  | Proposed Bicycle Path |
|  | CTA Bus Line            |  | Existing CTA Stop |  | Existing Underground Link    |  |                       |
|  | RTA Line                |  | Improved CTA Stop |  | Proposed Underground Link    |  |                       |

# UNDERGROUND PEDWAY



- Existing Underground Amenities
- Proposed Underground Amenities
- Existing Underground Link
- Proposed Underground Link
- Monroe St Underground Intermodal Corridor



# INTER-MODAL GREEN AXIS



# INTER-MODAL GREEN AXIS



# INTER-MODAL ELECTRIC BUS LINE BELOW GRADE





# MONROE INTER-MODAL GREEN AXIS: ABOVE GRADE



# MONROE INTER-MODAL GREEN AXIS: NIGHT TIME ABOVE GRADE

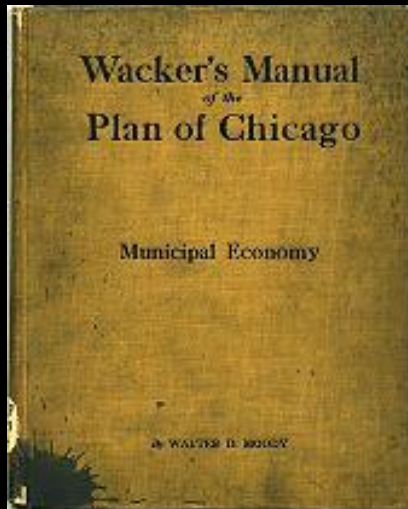


# COMMUNITY ENGAGEMENT



# COMMUNITY ENGAGEMENT

- CREATE A BRAND IDENTITY
- DEVELOP "GREEN TEAM" WITH DIVERSE MEMBERSHIP
- CREATE OUTREACH MEDIA CAMPAIGN
- MULTI-LINGUAL MARKETING MATERIALS
- CREATE BASIC AWARENESS- HEALTH AND WELL-BEING



PILOT CITY: CHICAGO, ILLINOIS

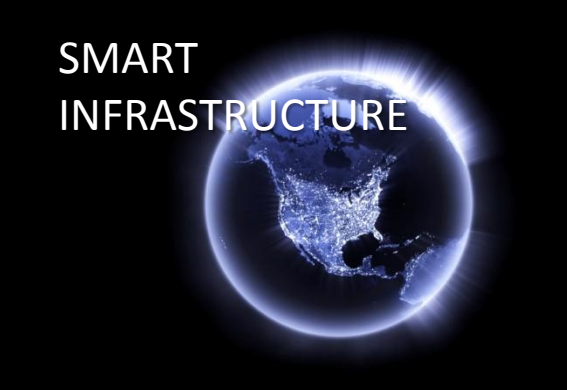
# CITY HALL ROOF VEGETABLE GARDEN DEMONSTRATION PROJECT

- Add to the existing roof garden with vegetables and herbs
- Use the vegetables for local soup kitchens
- Sell vegetables at local markets
- Honey production from rooftop beehives



# NOW WHAT?

- There is over 100 pilot projects in the study
- Financing plays a major role in moving forward
- Phasing strategy
- Getting the right team on board from civic and private sector





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