MCKINLEY MILLS FOR THE NEW MILLENNIUM

Reinventing Chicago's Pershing Road

Prepared by the University of Chicago team
for C40 Students Reinventing Cities
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INTRODUCTION

The following plan for Pershing Road does not attempt to merely recreate the storied industrial past of this site. Rather, we seek to reinvent industry and free Pershing Road's future from former industries' exploitative pasts. Our plan, McKinley Mills for the New Millennium, combines sustainable industry with community benefits to ensure this neighborhood career hub can survive and adapt to changing climatic conditions for years to come.

The overarching goal of the site is to create a self-contained, sustainable live-work hub with planet and people-minded benefits. Former industrial spaces at [insert addresses] will feature a mix of businesses that advance sustainability goals, from solar panel repair and manufacturing to clothes upcycling. Buildings that once housed warehouses or manufacturing will be converted into live-work spaces, minimizing commute time and transit-related fossil fuel expenditures. Green space will unite the area around a central plaza, mirroring the rich environmental benefits of the neighboring McKinley Park while still providing unique biomes and convenient meeting spaces for workers and residents. Wider, more pedestrian-accessible sidewalks, narrower, realigned roads, and street-level storefronts transform inhospitable streets into havens attractive to Chicagoans feet or miles away. Roof space is maximized for energy production, heat reduction, urban gardening, and recreation, combining rooftop walking paths with solar green roof design. Undergirding these community benefits is a rich tapestry of sustainable infrastructure and design: embedded and ballasted photovoltaic arrays, constructed wetlands, indigenous species parks, rain and greywater collection, single-stream recycling. We want to design a green community that does not sacrifice the existing community's wants, needs, and hopes for their home. McKinley Mills for the New Millennium is a plan that balances the wealth of nature with the innovation, career potential, and urban amenities that draw thousands to Chicago each year.

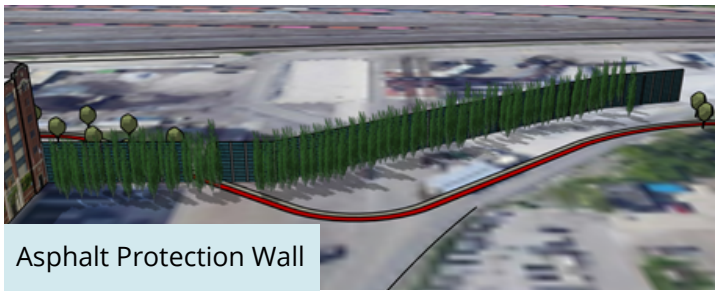
While this plan is manifold and even eclectic, we incorporated the ten princIples of sustainable design into a single district unparalleled in Chicago. The designs described here will bolster the idea of a 15-minute city, a corner of Chicago in which most commonly used locations and services are contained within the 15-minute walking radius of three-quarters of a mile. We plan to use sustainable industry as the magnet attracting residents and visitors to our site, while the combination of affordable housing and green amenities will assure people can live on site without personal sacrifice. The middle-class nature of the jobs created will mirror the surrounding neighborhood and mitigate the negative effects of gentrification that often accompany job campuses and new housing developments.

The end result is a community fine-tuned for both current residents and the future planet we want. We invite you to explore McKinley Mills for the New Millennium and imagine Pershing Road's potential fully realized.

DESIGN SOLUTIONS

NATURE-BASED SOLUTIONS

The park areas we propose for the area consist of 4 main elements. The first is the **main plaza** which includes green space, a water feature, space for urban farming, space for a farmers market, and some other attractions like a playground and a climbing wall. Additionally, there is a **walking and biking trail** that connects the entire area to its surroundings. This trail also leads up to the rooftops, which are covered in a variety of plants to create a **nature boardwalk** experience with a view of downtown Chicago. Lastly, we propose a **glass wall with fronting trees** to protect the site from the pollution made by the asphalt plant.



Asphalt Protection Wall

Overview

Close-up

Trail

Rooftop Trail

Main Plaza

COMMERCIAL SPACES

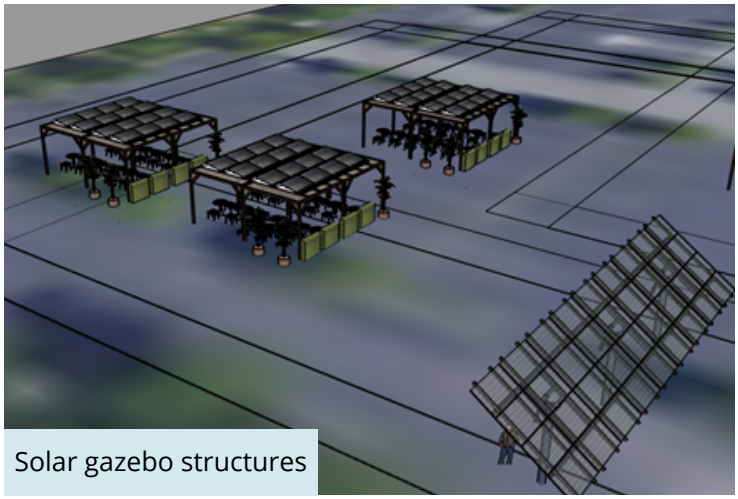
Currently, the buildings create something of an impenetrable wall along Pershing Rd, making it unpleasant and uninteresting for pedestrians to walk along the south side of the street. As Gehl et al. note, "For public space and buildings to be treated as a whole, the ground floor facades must have a special and welcoming design" (2006, 29). Our redevelopment plans call for the Pershing Rd-facing first floor spaces in the three large, city-owned buildings as well as 1919 W Pershing Rd to be **converted to commercial units.**

These spaces will have widths in increments of roughly 18', and depending on the distribution of space sizes, we will add as many as **48 commercial spaces** across the four buildings. We will preserve existing windows and add doors for direct street access. These alterations will make the building much more transparent, interactive, and welcoming to passersby. This is part of a **larger sidewalk redesign**, which also includes widening of the sidewalk, the addition of benches and tables, the addition of stormwater planters, and the installation of permeable pavers underneath the boardwalk area and between planters. These alterations will make the site more engaging and exciting to the public and draw foot traffic to the south side of Pershing Road.

CLOSE TO HOME

The overall goal of the "Close to Home" objective is to ensure that the project site plays host to resources that benefit the residents of McKinley Park and the city at large. Under the McKinley Park for the New Millenium plan, we achieve these goals by turning the underutilized ex-industrial site into a **mixed-use development hosting retail, educational, and manufacturing centers.** Under our plan, the three city-owned buildings on Pershing Road, spanning three blocks on their own, will be activated for retail activity with several storefronts added onto the ground floor as well as a large **indoor market** on the ground floor of one of the buildings.

We will also incentivize **solar panel construction and maintenance companies** to buy into the upper floors of the two Easternmost of these buildings in order to bring industrial jobs back to the neighborhood. Finally, we will convert the old Central Manufacturing District Clock Tower into a **museum commemorating the history of manufacturing and the environment** in the city, the progress that has been made, and the progress that still needs to be made to achieve a sustainable future.



Solar gazebo structures

Solar green roofs

Indoor Market

Solar panel factory

RENEWABLE ENERGY

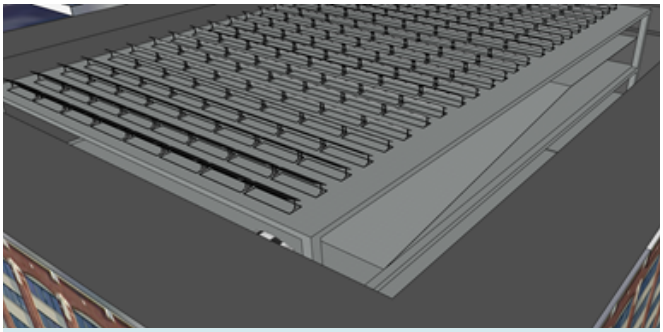
No sustainable community should exist without a definitive source of energy generation. Our site will integrate solar energy in three distinct ways: solar green roofs, a social access solar garden, and free-standing solar arrays in converted parking lots. This trifold plan **integrates distinct community benefits with the energy generation** needed to ensure carbon neutrality for, at minimum, operational energy costs. **Solar green roofs** will be placed on two of the three state-owned building roofs, leveraging both the extensive roof space and the positive synergism between photovoltaic cells and urban heat island-reducing greenery. **Freestanding arrays** will abut the buildings and the constructed wetland to supplement rooftop solar energy generation for both electric and heating purposes. A **social access solar garden** will integrate solar energy generation into the public amenities of green space through photovoltaic arrays embedded in the roofs of shade structures such as gazebos or bike rack protectors. These solar structures primarily aim to **offset energy usage** within this site, but they will also form the backbone of a **community solar initiative** that will connect the community to solar development.

MIXED-USE DEVELOPMENT

Another aspect of our overall design concept is a **low and middle-income mixed-use development** that contains roughly **300 apartment units along with over 300 jobs**. In order to be as sustainable as possible, we want to emphasize the reduction of vehicle transportation by the strategic use of public transportation along with creating a self-sustaining community asset where many commercial and residential activities can take place within the district. Not only will this save travel time for the residents but also increase the convenience for the surrounding neighborhood. The McKinley Park neighborhood currently has 14% unemployment, and Chicago is experiencing decreasing population, so just adding more housing units would not prove useful for the district. Instead, we want our district to **attract people to stay in the area** and draw new people in, **without increasing gentrification.** Local employment quotas and reserved housing can ensure that the gentrification impact is not felt on existing McKinley Park residents. The infrastructure of the district will need to change to be a viable live/work community and will include strategic and efficient parking systems, recreational opportunities that promote active and healthy lifestyles, and light industry that has an emphasis on sustainability practices such as hydroponic agriculture.

Light-welled building with green roofs

Multi-purpose green space



Wrapped residential with interior parking garage

CLEAN CONSTRUCTION

Our plan makes the most of the historic buildings at the project site, preparing them for **diverse uses with minimal changes to their original form.** Very little material will be removed from the buildings, but some older stretches of sidewalk and some brick where doors will be placed will need to be removed. The debris from this process can be used as landfill in other areas of the site for landscaping features.

We will also retrofit the buildings in line with the **Passive House principles**, aimed to fortify the building envelope and reduce thermal bridging through increased insulation and window sealing. These modifications will make heating the building significantly more efficient throughout the cold Chicago Winters. In addition, **light wells** dug into the roof of the large city-owned buildings in the site will fill the residences and manufacturing spaces within them with natural light throughout the day. The **lifespan of these roofs will also be extended by the addition of green roofs**, which reduce the harm done by ultraviolet radiation and cold winds.

STREET REDESIGN

When the Central Manufacturing District was first constructed, its planners realized the early need for an effective intermodal transit network. Railroads brought resources to the site, workers could walk mere minutes to homes in McKinley Park, and a modern road network would move trucks and people to and from the site. In the past half-century, this understanding of multi-modal site connectivity fell off in favor of wide boulevards connecting trucks and suburban commuters to far-flung expressways. In returning the district to its **granular transit focus reminiscent of the 15-minute city**, this section proposes a number of improvements for transitioning the site to offer dynamic transit options.

Central to community building is the reconstruction of Pershing Road. While already repainted to reflect a reasonable two-lane traffic pattern, for the street to be an inviting space safe for local pedestrians **the road needs to be physically narrowed**. To accomplish this, the redundant side street north of the complex will be eliminated and **Pershing will be realigned** to occupy much of this space. Widened sidewalks, pedestrian islands, attractive planters, and new crossing signals will help to slow traffic and boost walkability. New parallel spots will continue to recognize vehicular needs, while **dedicated bus turnoffs and a large bike path in front of the complex** will support alternative transit solutions. Within the complex, wide pedestrian avenues and rail-trail conversions in the rear will continue these principles of people-centered mobility. Lastly, a new complex entrance from the western spur of Damen Ave and the creation of better crossing signals and barrier-separated bike lanes will extend the road improvements along the remainder of Pershing Road.

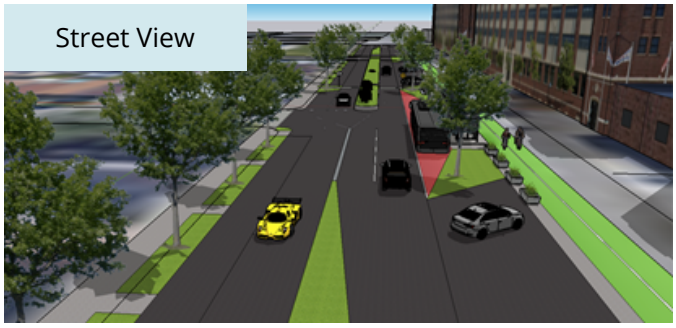
GREEN ECONOMY

In addition to green industry, green retail can thrive in the indoor market and additional ground-floor commercial spaces along Pershing. The market itself can provide **incentives for green vendors**, like prime locations or rent reductions for vendors who serve locally sourced products. The new retail opportunities on the whole benefit **green consumption patterns** by enabling nearby residents to do a lot of their shopping locally. The Museum of Industry and the Environment in the old clock tower will also serve the move towards a green economy as an educational resource, displaying to the community the benefits of green industry and the many harmful effects of industry as it has stood in the site project and around the world to date.

Before and After

View from Above

Street View



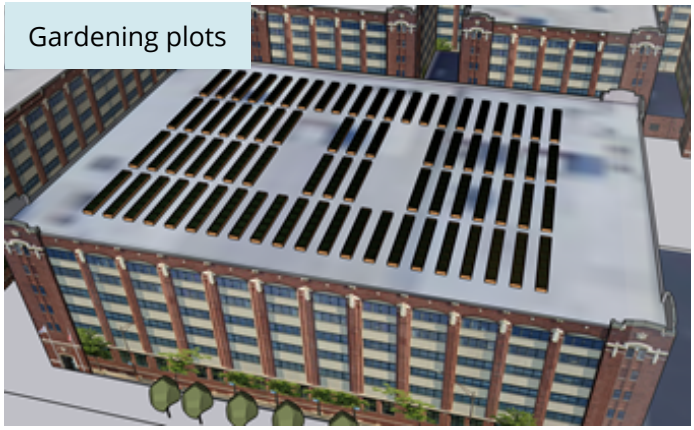
Our plan provides opportunities for both green industry and green retail to thrive throughout the project site. We situate sustainable industry at the heart of our plan through our dedication of large areas of **manufacturing space for solar panel construction, repair, and installation companies as well as other green manufacturers.** These companies will bring **middle-class jobs in light and medium industry** to the predominantly middle-class community already in the McKinley Park area.

COMMUNITY INCLUSIVITY

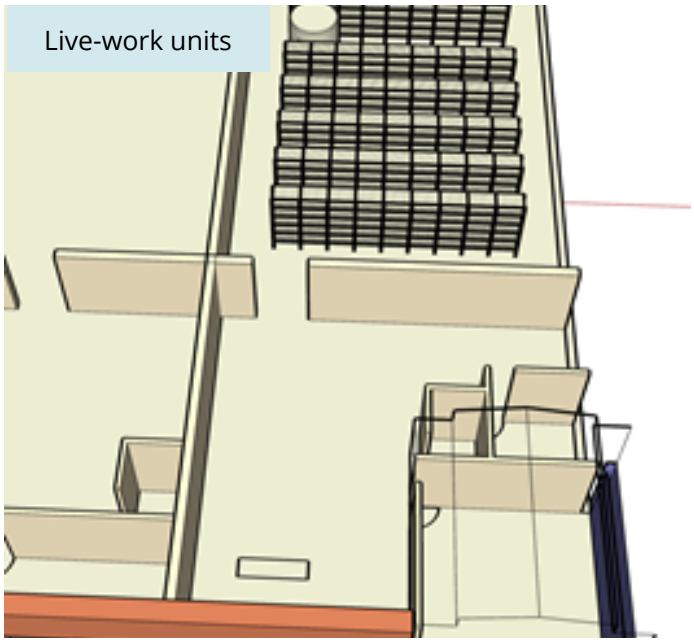
The designs on this part of the model address several different project themes. The main focus here was creating **diverse housing options and inclusive spaces.** The three large buildings will be converted to **mixed-use buildings**, and, in order to create sufficient lighting throughout each unit, we gave room for thirty feet of depth from the windows. One shortcoming of the lightwells is that lower floors on the interior of the wells will only see a few hours of direct light each day. In the smaller industrial buildings, we created an example of **possible work-live units.**

The model shows an **indoor farming system,** but each room can be outfitted with a variety of different light manufacturing systems. On top of the U-haul storage building, we drew up some **basic designs for gardening plots**. And in the large parking lot near the asphalt plant, we designed a **pleasant wildflower meadow with woven pathways and benches**, which the community can work together on to construct.

Gardening plots



Live-work units



McKinley Mills Monarch Meadow

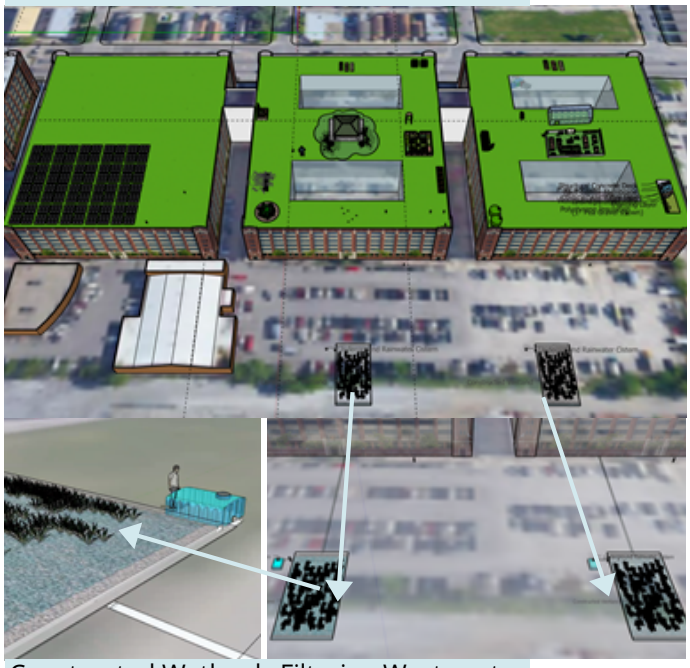
Example Wildflower Meadow

RESOURCE MANAGEMENT

It is essential that water and solid waste move from linear consumption to circular conservation and incentivize resource efficiency. This proposal aims to achieve this on three fronts:

1) Stormwater management through green infrastructure
Conventional gray stormwater infrastructure (i.e., sewers, wastewater treatment plants, underground storage systems, etc.) addresses the symptoms of stormwater runoff while green stormwater infrastructure tackles the root problem, which is the imperviousness caused by land development. This proposal focuses on green roofs, rain cisterns, and permeable pavers:
➔ Two 15,000-gallon concrete rain cisterns underground next to the constructed wetlands
➔ A re-envisioned solar green rooftop space for the three city-owned buildings that will:
1) produce energy and serve as a semi-intensive green roof,
2) showcase sustainability practices via different gardening activities and workshops,
3) enable food production for the residents of these buildings.
➔ Permeable pavers on the sidewalks along the Pershing Road commercial strip

Green Roof with Constructed Wetlands

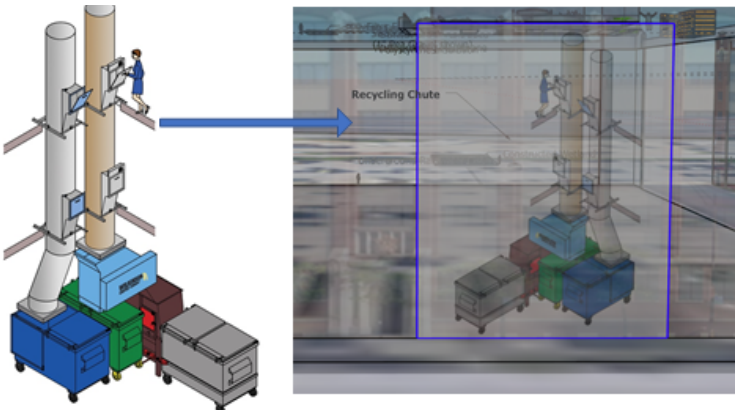


Constructed Wetlands Filtering Wastewater and Rain Cisterns

2) The reuse of nonpotable water through on-site wastewater treatment
Managing water usage more sustainably is crucial to address the impacts of water shortage and droughts. It is possible to reduce freshwater demand by 36–75% by equipping neighborhoods to use nonpotable water (Farr 2018, 294). Thus, treatment and reuse of nonpotable/gray water coming from sinks, showers, baths, washing machines, dishwashers, etc. are essential. Located behind the three city-owned buildings will be two constructed wetlands that can each filter 2000 gallons of wastewater every day. The treated wastewater can then be used for garden drip irrigation and toilet flushing. Besides, captured rainwater from roofs and permeable pavers stored in rain cisterns can be reused to flush toilets and irrigate gardens without necessarily being treated in the wetlands.

3) On-site recycling practices in high-rise residential and commercial buildings
High-rise buildings in Chicago have long employed trash chutes to enable occupants to toss their waste on each floor. This project proposes the redesign of the single chute into a three-compartment chute (i.e., landfill trash, commingled recyclables, and organic waste) for a zero-waste design.

Chute System for Landfill trash, commingled recyclables, and organic waste



ENVIRONMENTAL BENEFITS

GREEN SPACES

Trees in an urban setting store around 51.7 and up to 178 metric tons of carbon per hectare. Thus, 1) the trees found on the main plaza, 2) tree canopies along the edges of the main road, and 3) the vegetative buffer around the asphalt plant can make a **significant difference in terms of carbon sequestration**. Besides, asphalt plants produce toxic air pollutants that are harmful to human health. Building a protective wall including a dense area of trees will help **filter air pollutants.** Also, green plantings and the wildflower meadow will not only help store carbon with its approximately 106,000 square feet of carbon-sequestering plants (appendix A), but even help **regulate and improve the quality of water**.

CLEAN ENERGY & SUSTAINABLE INDUSTRIES

Our solar green roofs will generate **820,577 to 893,094 kWh per year** cumulatively. Our free-standing solar panels and cells embedded in the social access solar gardens will generate an additional **163,858 to 178,338 kWh per year.** If this energy were produced with conventional fossil fuels as opposed to solar, 1,264,014 to 2,127,114 additional lbs of CO_2 would be emitted into the atmosphere. This translates to a **632 to 1063 standard ton carbon savings** with solar energy (Appendix C). 5 By collocating sustainable industries that produce materials with energy generation hubs, our plan also **drastically reduces the embodied emissions of solar panels** represented by transportation and production.

RESOURCE MANAGEMENT

Green stormwater infrastructure overall preserves rainwater as a resource, maintains the natural water cycle, decreases water loss in the region, reduces flooding, and decreases dependence on potable water for irrigation. Green roofs will act as insulators, reducing the energy needed to cool and heat a building and indirectly lowering CO_2 emissions. The three large green roofs' yearly average carbon sequestration will be an average of 7,568 pounds of carbon (appendix A) Furthermore, the raised garden beds on some rooftops will provide fresh food to local residents and restaurants, reducing the environmental costs of transportation.

Permeable pavement along the sidewalks and permeable concrete will absorb rainwater and mitigate combined sewer overflows and the harmful ecological effects of urban runoff. This is especially needed in McKinley Park, since "...one-inch rain events typically yield 10 million gallons of runoff per block in McKinley Park, with the most affected areas being industrial districts." Also, permeable systems can provide significant water quality benefits including "reductions in thermal impacts and loading of sediments, chloride loads, heavy metals, and hydrocarbons."

Constructed wetlands will treat non potable/gray water so that it can be reused for toilet flushing and irrigation, which will significantly decrease dependence on potable water. Organic matter, nitrogen, phosphorus, metals, and other contaminants in the wastewater will become food for microorganisms and plants. The wetlands will use less energy to process waste than traditional municipal systems, while creating valuable habitats for a variety of flora and fauna.

A three-compartment chute system for landfill trash, commingled recyclables, and organic waste in residential and commercial developments will conserve energy, reduce air and water pollution, mitigate greenhouse gases, and conserve natural resources.

CLEAN CONSTRUCTION & PEOPLE-CENTERED MOBILITY:

In 2017, 11% of global emissions came from embodied carbon used in building materials 6. Our project **minimizes use of new building materials** by avoiding constructing any new large structures. Work-live units will enable residents not to have to commute to work. The buildings with the dugout lightwells will allow for the maximum amount of light possible to penetrate each unit and **reduce the need for electric lighting.** The addition of ground-floor commercial spaces will aid in **making McKinley Park a 15-minute neighborhood** (Appendix D) where residents do not need to drive elsewhere to meet their daily needs. Whether it's ditching cars in favor of buses or just reaching the site on-foot or via a bike, the street improvements will **reduce the demand for driving cars to McKinley Mills and reduce greenhouse gas emissions**. Also, there will be less energy produced in the transportation of goods and services as the district will provide resources locally. **Food produced through hydroponic agriculture** will be consumed locally and distributed to Southside communities instead of being imported from greater distances.

COMMUNITY BENEFITS

GREENSPACES

Transforming the empty, concrete rooftops into arrays of green roofs maximizes the amount of open space to socialize, garden and engage in various workshops, activities, or workouts. The pathway that bridges the six smaller manufacturing buildings will mark the site as something truly unique, not just in Chicago, but in the entire United States. The trail is a great way to incentivize people living in the complex and surrounding communities to explore the interesting landscapes that reflect the diverse Lake Michigan biomes. The main plaza will also have a lot of opportunities for community bonding. People can sit on the central lawn together and socialize, work together on urban farming, talk to people working at the farmers market stands, etc. The constructed wetland areas, increased park space, and green roofs will not only decrease the carbon footprints of residents but will provide multiple health benefits to the community. Through the increase of vegetation, the air surrounding the site will become cooler and cleaner resulting in benefits like reduced asthma and other respiratory diseases, heat-related illnesses, and a significant reduction in building heat and AC costs. These areas will also foster a community identity that is centered around Illinois' native vegetation and a collaborative, green community mindset.

COMMERCIAL SPACE

The addition of up to 48 commercial spaces will bring new, publicly accessible amenities including a hardware store, a grocery store, a daycare, a community health clinic, and restaurants which will ultimately create an entirely new and productive area for the surrounding community to identify with and engage with. In fact, there is not a hardware store for almost a mile around the project site. The new commercial space activates a part of the neighborhood that currently sees very little foot traffic strengthening connections to the neighborhoods southwest and the southeast of the site and providing loads of new jobs. The museum of the environment and industry in the clock tower is also an additional educational gem in the crown of the area. Buildings housing large, robust work-live spaces and public workspaces will increase residential opportunities to work from home as well as the potential for collaboration on business start-ups or other projects without restrictions like lack of electrical, plumbing, or internet infrastructure that hinders potential

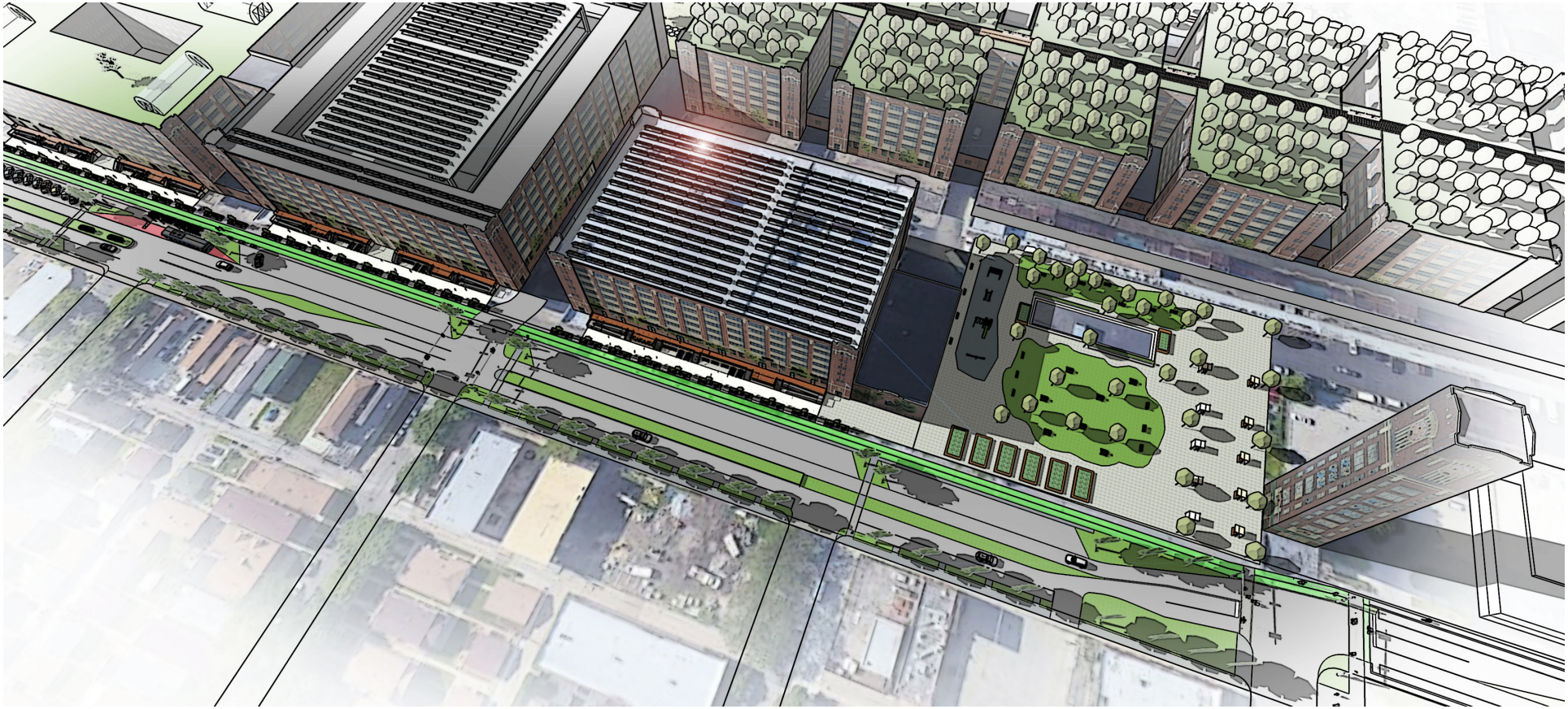
STREET IMPROVEMENTS

Street improvements along the site involve creating a pedestrian-focused avenue. Increasing the number of crosswalks, the potential for outdoor restaurant seating, greenery, and decreasing the width of the road will greatly benefit local businesses as well as all of the nearby residents. The thinner roads will slow down traffic to the point where drivers will have to be very cognizant of pedestrian crossings, and cars trying to park or pull out, while the trees that border the road will create an optical flow that pushes drivers to be more aware of their speed. The road improvements will better connect local communities with each other, increase accessibility to the parks and reduce traffic ultimately decreasing noise pollution emissions creating a safer and cleaner environment.

ENERGY

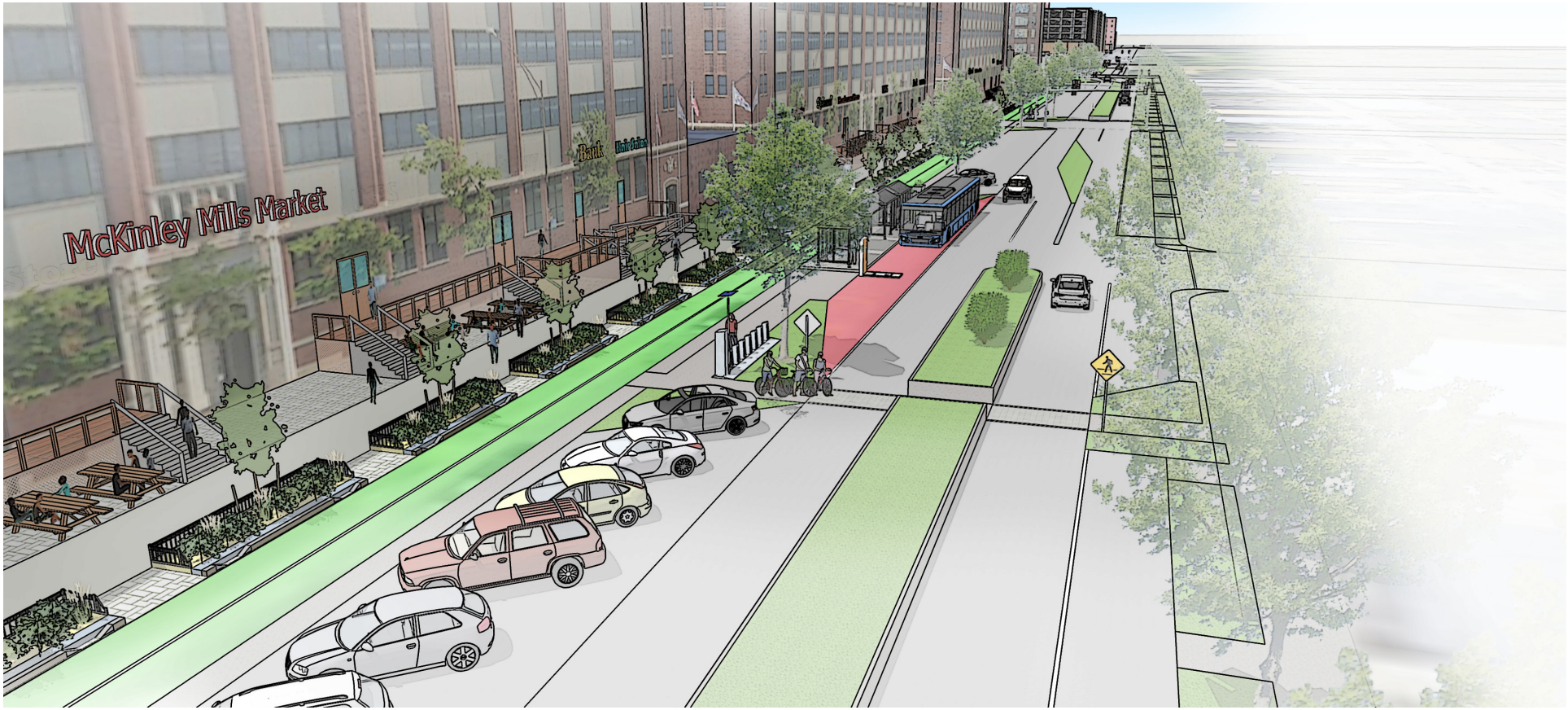
Community energy creates both cost and emissions savings by allowing subscribers to offset the fossil-fuel-generated energy that dominates ComEd's grid with clean, locally developed energy. Although community energy is in its infancy in Chicago, Citizens Utility Board estimates those who subscribe to community energy models will save upwards of $2,000 off their utility bills.

Project Overview



Urban Plaza

Commercial Corner



Complete Street

MCKINLEY MILLS FOR THE NEW MILLENNIUM: IMPLEMENTATION PLAN

PROJECT TIMELINE

A five-year completion timeline is reasonable for a development of this size, but with so many moving parts, the development lends itself nicely to phased implementation. First, the street and sidewalk will be modified to allow for greater connectivity with the district. The section of the road bordering McKinley Park requires only minor adjustments, while the realignment in front of the complex requires some additional planning, but both sections can be altered without majorly disrupting traffic flows. At the same time, sidewalk widening and the addition of stormwater planters will occur.

Since the buildings will be mixed-use, one building can be completed at a time while still providing a comprehensive live/work environment. Thus, building modification and restoration should begin as early as possible. Cutting the lightwells and reinforcing the structure will be followed by retrofits of the first two floors. In each building, revenue generating features should be the first to be implemented so they can start producing the return on investment needed to finance the project. Once there is sufficient space for residents the next step should be creating the parking building. As residents move in, the rooftop gardens and hangout spaces should be developed. Parks and plazas ought to come last since McKinley Park already offers a beautiful public space right across the street. The solar green roof project should be started as soon as light wells are cut, which should take approximately a year to complete. Because the installation is a net community and environmental good, solar green roofs can and should precede the introduction of sustainable businesses. The construction of wetlands and rain cisterns should take perhaps a couple of months.

The indoor market would consist of a central seating area and, at first, maybe only a few vendors around that area. As time progresses, more vendors can be drawn into the market to share in the prosperity of the market and grow it even further. Similarly, the addition of ground floor retail along Pershing Rd can be postponed or completed in phases if it is unfeasible to fill all the spaces in a short timeframe. Public spaces should be relatively quick to develop, allowing for later start dates. The wildflower meadow and roof plantings can be completed in 1-2 months, and the elevated trail on the roof could likely be completed in under a month. The average time to construct a park is 12-18 months, which is a reasonable estimate for construction time for the main plaza. The glass wall will probably take 2-5 months to be constructed but should be started immediately to block pollution from the asphalt plant.

While the process could be accelerated with funding from the Future Energy Jobs Act repurposed as subsidies for businesses who relocate to this industrial hub, it will likely take several years before the site has realized its economic and sustainability potential. Thus, manufacturing spaces can be redeveloped slowly.

COMPLIANCE WITH URBAN PLANNING RULES

We will propose to the City of Chicago that the entire site be rezoned as a planned development (PD,) thus making compliance with zoning regulations significantly easier. Since we have taken great care to ensure that the “project serves and integrates with surrounding neighborhood,” it is very realistic to assume that this rezoning proposal will be accepted (2nd City Zoning). The City is very interested in the redevelopment of this high-profile site, and our proposal connects with and benefits the community in numerous ways. Under the PD designation, the various uses making up the site will all be allowed: commercial storefronts and stalls, residential units, industrial spaces, and green spaces.

A few interventions will require compliance with non-zoning related planning rules. In maintaining city and IDOT traffic standards and recognizing the property’s current manufacturing zoning, lanes have been designed to meet the prescribed width for semi-trucks. These same standards were applied when designing the Damen Ave site entrance, which may see commercial traffic in need of wide intersections. Additionally, the state’s plumbing code currently prohibits greywater and rainwater reuse systems. Property owners will have to apply for an exemption from the Illinois Department of Public Health to use greywater and rainwater to flush toilets (Chicago, IL Collaborative Water Petal Implementation Guide 2018).

TECHNICAL CHALLENGES

Each part of the redevelopment will come with its own technical challenges, some more difficult than others. On the ground floors of the old industrial buildings we will need to construct divisions between and within store fronts, as well as make accommodations for specific store needs like refrigeration or other large appliances. We will also need to set up the buildings for wireless internet access, to make them more appealing to tenants and patrons. Cutting lightwells into the buildings to ensure adequate sunlight for each unit will be a difficult engineering problem, but the intervention will maximize usable space and will be designed within current building structural constraints to minimize additional costs. Safety considerations will be critical for contractors as well as for future tenants and patrons; the buildings in the manufacturing district are old and potentially contain pollutants. Environmental considerations need to be addressed heavily and safety systems need to be installed (e.g., sprinklers, fire stairwells).

Realigning Pershing Road will require careful planning. The creation of a wide median and new eastbound lanes should be the most difficult part of the road realignment, as workers will be operating on an island amongst active traffic. Also, for all road changes within this plan, extensive work may need to be done to reroute utilities and add sprinkler lines for any planters adjacent to the road. The addition of ground floor commercial spaces is challenging since the ground floors of these buildings sit about 4’6” above grade. Adding stairs leading up to each individual storefront fails to account for accessibility, so elevated boardwalks running along the face of each building with ADA-compliant ramps and staircases will be constructed.

Numerous miscellaneous challenges will crop up during construction. The glass wall will be an engineering challenge, needing to be durable and able to withstand wind. Managing water as it flows off the roof requires disconnecting downspouts and redirecting water to a green stormwater infrastructure installation. The buildings repurposed for residential and commercial uses must have enough space both in the building interior (for the segregated shafts) and on the receiving floor (to collect the segregated materials).

Besides physical engineering challenges, recruitment of existing businesses may prove difficult. The site will benefit from pre-existing businesses and structures such as the NLEI and Ailey Solar Electric. There must be economic incentives to create an unorthodox jobs campus at a site that has not hosted transformative industrial activity in decades.

KEY ACTORS AND ROLES

Such a large project will require the coordination of numerous actors. In the building retrofits, Architects will be responsible for determining the exact lightwell dimensions and figuring out how each unit will fit into the building. Engineers and environmental engineers will assess current structural conditions and stormwater management to propose plans for lightwell additions, façade alterations, and green infrastructure additions. Due to the historical nature of the buildings in the district, Preservation Chicago, the Chicago Historical Society, and other groups will be interested in the maintenance of the character of the buildings and would need to be consulted about the renovations. These groups might also be valuable assets to the museum we intend to create in the clock tower.

Developers will manage project finances and set up the infrastructure that enables other actors to successfully transition into their roles in the district, including the parking garage, buildings, and community amenities. In financing the project, solar panel companies and vendors for the markets and storefronts should be contacted early on in order to show developers that there is real interest in revitalizing the areas and that their investments could be returned to them over time through rent.

This site will consult the existing businesses and organizations in the area that have already broken into the sustainability “market.” Both located within our site, Ailey Solar Electric Inc and the National Latino Education Institute (NLEI) will hopefully play a huge role in expanding service and guiding development. NLEI is a crucial organizing entity for government funding; Illinois, under the Future Energy Jobs Act, allocates $4 million in each delivery year to the Multicultural Jobs Program, of which NLEI is a part.

The City of Chicago must approve, provide funding for, and conduct the road improvements. The CTA will need to expand bus service on route 39. The Chicago Park District will own and maintain parks and green spaces in the area, and an Advisory Council consisting of community volunteers will meet on a regular basis to support the effective functioning of their local park. Building managers, condo boards, maintenance staff, and residents must work together to ensure that internal building operations, such as the recycling program, are successful. All stakeholders described in the community engagement section of the appendix must be consulted throughout the development process. Beyond what is described in the appendix, we will need to collaborate with local business associations and the McKinley Park Development Council to collate their neighborhood plan developed in 2018 with our vision of a sustainable future.

BUDGET AND FUNDING MECHANISMS

Given the long history of underinvestment in Chicago's South Side, finding a viable path for financing this district revitalization master plan is essential to the project's success. Relying on public-private partnerships, McKinley Mills will be built through a combination of upfront public and private investments as well as various tax deferment and federal incentive schemes.

Critical to attracting interest in the manufacturing district is a wide array of upfront spending from the City of Chicago. In the drive to shift the area from underutilized industrial resources to a mixed-use community hub with decades of future growth, the city needs to help provide the basic infrastructure. This begins at the front with the overhaul of Pershing Road, site entrances, and supporting utilities like below-ground sewage lines and drainage systems. But where officials can truly help put the project on the map for future residents and commercial tenants - while also preserving public access – is in the construction of park amenities across the site. Connecting the western, occupied buildings in the district with the rest of the site would be a rail-trail conversion financed by the city and managed by the Parks Department. The same would be done for the conversion of the City's storage lot behind the eastern buildings to constructed wetlands. Finally, the real draw for public investment is the roof network. Implementing principles for green roofs as well as an above-ground park system with a trail running between the six buildings would unquestionably be the site's main draw and, using the aforementioned financing plan, would help draw private investment to the area.

Complementing these upfront public projects is a heavy amount of spending from private developers. Their focus would be targeted towards renovating existing structures to accommodate residential and commercial units at a cost of $50+ million. While this number may appear steep for the area, these are basic investments in features that generate direct revenue for landlords and match a similar level of spending on adjacent projects within the district. Private development can also be sectionalized to allow for natural growth alongside market trends. While redevelopment of the three large buildings bordering Pershing is seen as critical, full redevelopment of the rear six and the U-Haul building can wait for funds to become available after Phase 1.

Bridging the gap between public and private - while also allaying any remaining hesitancy from developers - is Tax Increment Financing (TIF). TIF money can help to support infrastructure improvements that would otherwise take too long for city approval or may not serve the most pressing public interest. Significantly, this funding could be used to partially back major capital improvements like the installation of fiberoptic cables and tax-generating market space in the vein of Reading Terminal. Other projects eligible for TIF money include internal pedestrian avenues, the plaza at the entrance to the site, and the rear wall obstructing the asphalt plant. While there has been some controversy attached to TIF in recent years, the fact this project is not a private megadevelopment, the power of TIF to speed up construction, and the work city officials have done to reform the program to serve neighborhoods like McKinley Park make it a reasonable financing option.

Lastly, there are several state and federal incentives that can help pay for this project. Federal renewable energy credits can return as much as 26% of the costs for solar instillations which would likely be added by ComEd. Additionally, community funding dolled out through the NPS's Community Assistance in Conservation and Outdoor Recreation grants could be used to cover some of the park space improvements. The totality of federal and state incentives likely only represents a few million of the project's roughly $150 million cost, but this approach is an additional step towards diversifying funding sources for the district.

Improvement	Cost	Financing Source
Structural Improvements to Historic Buildings	$30M	Private
Pershing Road Improvements, New Site Entrances	$25M	Public
Internal Parking Garages	$17.5M	Private, TIF money
Internal Utility Improvements (HVAC, electricity, etc)	$15M	Private
Rear Trail Construction	$12M	Public, Parks Department, TIF money
Green Roof	$11.2M	Public, Parks Department, TIF money, State Incentives
Market Construction	$10M	Private, TIF money
Rooftop Trail	$5M	NPS grants, Parks Department
Storefront Facade Improvements	$4M	Private
Wetlands	$4M	Parks Department, TIF money
Asphalt Plant Wall	$3M	TIF money, Fees on Tenants
Lightwells	$3M	Private
Fiberoptic Cable Construction	$3M	Private, TIF money
Plaza	$2M	Public, TIF money
Solar Roof	$1.26M	Private (ComEd), Federal Tax Incentives
Landscaping	$1M	Public, Fees on Tenants
Clock Tower Improvements	$1M	Public, Fees on Tenants
Sidewalk Improvements	$290K	Public, TIF money
Improved Rainwater Drainage	$100K	Public
Rain Cisterns	$100K	Private
Total	$145.45M	

Summary of budget for proposed policy interventions.

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APPENDICES

APPENDIX A: CALCULATING THREE CITY-OWNED GREEN ROOFS’ YEARLY AVERAGE CARBON SEQUESTRATION

A Michigan State University research report offers average carbon sequestration values provided by extensive green roofs’ aboveground biomass (Getter et al. 2009). The recommended range of grams of carbon sequestered per square meter from aboveground biomass is 162 g C/m2 to 168 g C/m2.

Converting to lbs C/SF from metric units, the range can be defined: 0.0332 lbs C/SF to 0.0344 lbs C/SF. Excluding the light well areas and assuming that the roof allocated to solar panels will be combined with a semi-intensive green roof system, the total green roof area will be approximately 20,800 square meters, which is 223,900 square feet.

Thus, an extensive green roof system provides an estimated carbon sequestration capacity as follows:
Lower Bound (using 0.0332 lbs C/SF) 0.0332 lbs C/SF * 223,900 SF = 7,433 lbs of carbon per year.
Upper Bound (using 0.0344 lbs C/SF) 0.0344 lbs C/SF * 223,900 SF = 7,702 lbs of carbon per year.

In this case, the 223,900 SF extensive green roof would sequester between about 7,433 and 7,702 pounds of carbon annually, or an average of 7,568 pounds of carbon per year. However, we are proposing a semi-intensive roof, characterized by more herbaceous plants, ground covers, grasses, and small shrubs than that of extensive roofs. This means that the semi-intensive green roof plants will have a larger carbon sequestration capacity than what is calculated here.

APPENDICES

Solar roof energy generation (kWh):
(820,577; 893,094)
Solar gardens/freestanding arrays energy generation (kWh):
(163,858; 178,338)
Roof CO_2 production if produced with fossil fuel sources (lbs):
(1,747,829.01; 1,902,290.22)
Solar roof CO_2 production (lbs):
(694,208.142; 755,557.524)
Solar gardens/freestanding arrays CO_2 production if produced with fossil fuels (lbs):
(349,017.54; 379,859.94)
Solar gardens/freestanding arrays CO_2 production (lbs):
(138,623.868; 150,873.948)
Total CO_2 difference between fossil fuel and solar energy generation (lbs):
(1,264,014.54; 2,127,113.856)

Meadow Ordering List for 2003, 9/6/02

Forbs for sun:		
Anaphalis margaritacea	Pearly everlasting	20
Anemone patens	Pasqueflower.	12
Asclepias tuberosa	Butterfly weed	32
Baptisia australis	Blue wild indigo	12 in gals.
Baptisia lactea	White wild indigo	6, in gals.
Callirhoe triangulata	Poppy mallow	12
Campanula americana	American bellflower	32
Castilleja coccinea	Indian Paintbrush	32
Chelone glabra	Turtlehead	12
Desmanthus illinoiensis	Sensitive plant	12
Dodecatheon jeffreyi	Sierra shooting star	32 if 2-yr. plants.. NG
Eryngium yuccafolium	Rattlesnake master	12
Eupatorium purpurea	Sweet Joe Pye Weed	9
Filipendula rubra	Queen of the Prairie	6 qts.
Geum triflorum	Prairie Smoke	32
Hypoxis hirsuta	Yellow star grass	32
Lespedeza capitata	Round-headed bush clover	32
Liatris aspera	Rough blazing star	64
Liatris pycnostachya	Prairie blazing star	32
Liatris spicata	Marsh blazing star	32
Lilium superbum	Turk's cap lily	12
Lithospermum canescens	Hoary puccoon	32
Lobelia syphilitica	Great blue lobelia	32
Lupinus perennis	Lupine perennis	32
Mimulus ringens	Square-st. monkey flower	32
Penstemon digitalis	Smooth penstemon	24
Penstemon grandiflora	Large-flowered beardtongue	32
Phlox bifida	Sand phlox	32
Phlox divaricata	Wild blue phlox	32
Phlox glaberrima	Smooth phlox	16
Phlox pilosa	Downy phlox	32
Ruellia humilis	Wild petunia	32
Salvia azurea	Blue sage	32
Silene virginica	Fire Pink	32
Sisyrinchium campestre	Prairie blue-eyed grass	32
Thalictrum dasycarpum	Purple meadow rue	32
Verbena stricta	Hoary vervain	32
Vernonia fasciculata	Ironweed	24
For shade:		
Arisaema triphyllum	Jack-in-the-pulpit	15
Aruncus dioicus	Goatsbeard	6
Camassia	Quamash (bulb)	60 blue, 40 white
Cimicifuga racemosa	Snakeroot	6
Houstonia caerulea	Quaker Ladies, Bluets	32
Iris cristata	Dwarf Crested iris	16
Mertensia virginica	Virginia bluebells	32

Credit: Chicago Park District inter-office correspondence documents

APPENDIX B: IDEAL COMBINATION OF WILDFLOWERS TO CREATE PRAIRIE ENVIRONMENT

APPENDIX C: ENERGY GENERATION CALCULATIONS (ABOVE)

A second calculation using another resource to calculate the solar roof energy generation: 2520 solar panels will cover the entire roof area. Each solar panel has approximately 250 W of nominal power; so, 4 solar panels have 1 kWp of nominal power. Therefore, 2520 / 4 = 630 kWp of nominal power. Based on the European Commission's PVGIS Interactive Tool 5, for May, for instance, the monthly PV energy output is 86,700 kWh. This represents a significant amount of energy production capacity, since in 2019, the monthly electricity consumption for a U.S. residential utility customer was an average of about 877 kWh 5. This means that in May, about 100 households can be provided electricity 100% through clean energy.

APPENDIX D: POPULATION SERVED BY DIFFERENT BUSINESSES

After putting a grocery store in the new retail store fronts, around 3872 people who were not previously within a 10-minute walk of a grocery store would then be within 10 minutes of a grocery store. Assuming half of those people were driving 1.5 miles round trip (the approximate distance from the underserved population to the Jewel Osco on Archer Avenue) to get groceries once a week, we would save about 61,000 kg of CO_2 emissions per year just by cutting out those trips.

	Facility	Additional Population Served
1	CPS 9-12	5477
2	Hardware	5477
3	Grocery	3872
4	Library	1578
5	CPS k-8	24
6	Daycare	24