buffalo food path

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Arch546_Masters Project
Spring 2010 . Prof. Felsen

page_**info topic**

introduction

studio : 1,000,000,000

"Make big plans; aim high in hope and work, remembering that a logical diagram once recorded will never die."
Daniel H. Burnham, 1907.

"I like thinking big. I always have. To me it's very simple: if you're going to be thinking anyway, you might as well think big."
Donald Trump, 1987.

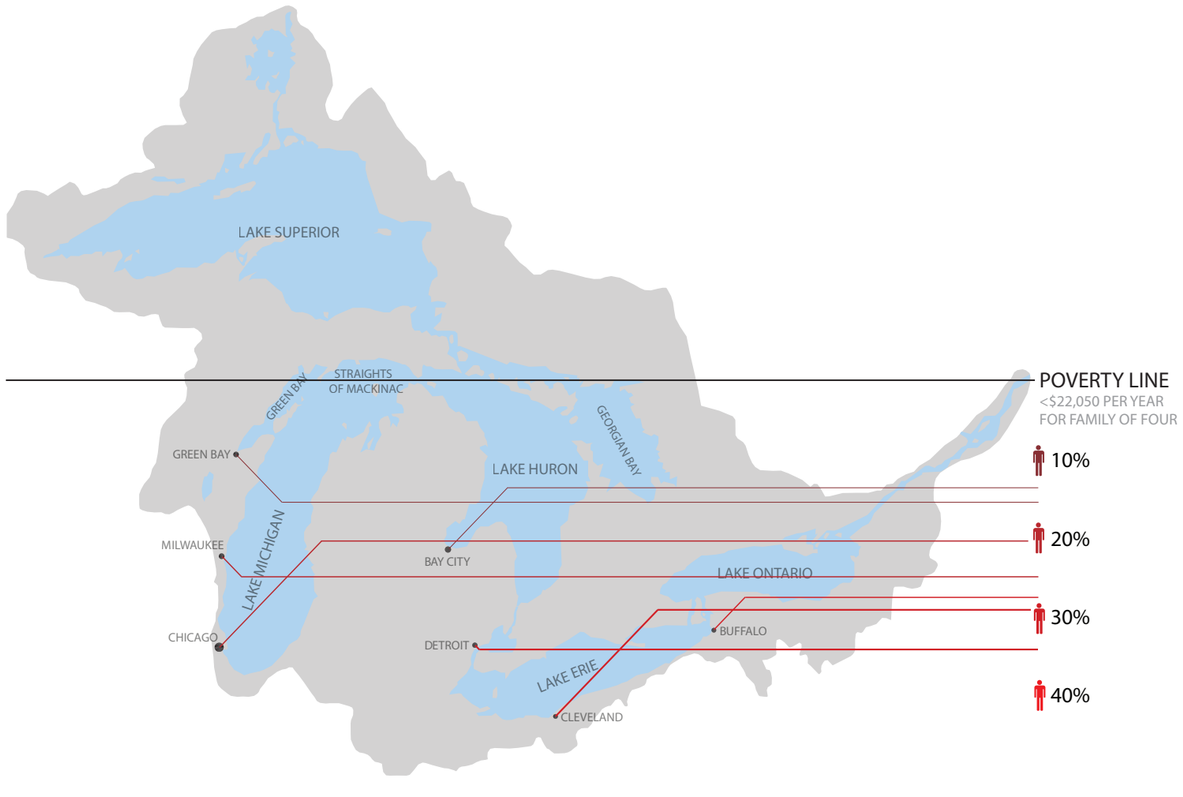
Proposition:
Relocate the world's anticipated one billion water refugees to the Great Lakes Basin. [A water refugee is a person who is displaced from his/her community of origin because of a severe water shortage.] The studio will investigate locating these one billion water refugees in a new series of urban environments where fresh water is abundant. The Great Lakes Basin holds 20% of the world's surface fresh water. Yet it has just .01% of the world's population. Every second, the Great Lakes naturally release (via the St. Lawrence River) over 250,000 cubic feet of fresh water into the Atlantic Ocean. Can this water can be first used and then later returned to the basin without interrupting the overall ecological system.

The studio will speculate on ways that the depopulated cities of the Rust Belt can be retroactively re-designed to accommodate one billion residents. At one time, Rust Belt cities attracted millions of immigrants. Today, the region is the fastest shrinking in the US. If designed well, one billion residents in the Great Lakes Basin means density, wealth, and power. New cultural and ecological urban architectures need to be invented to accommodate this new density. We will explore ways to leverage new infrastructural systems that hybridize economies and ecologies. We will integrate our proposed systems into existing urban fabrics and communities, generating new architectures and landscapes in the process. We will examine multiple sites and scales of intervention. We will speculate on programmatic, performative, and formal possibilities. We will deploy these new hybrid architectures as prototypes, testing them in multiple locations.

We will affiliate ourselves with the WPA 2.0 competition sponsored by cityLAB (www.wpa2.aud.ucla.edu).

great lakes watershed basin

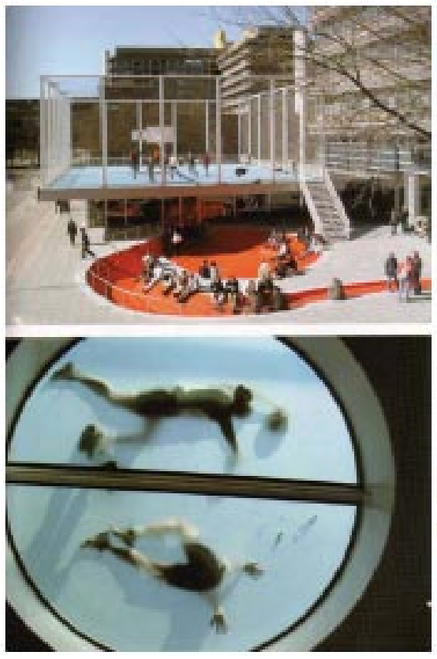
= PEOPLE LIVING IN POVERTY (2007)

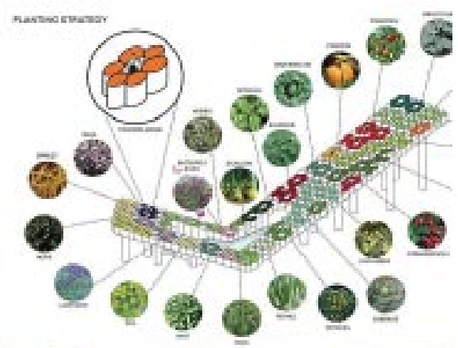


studio : 1,000,000,000

Example Reference Projects

The studio will consider and explore the value of infrastructure not merely as an engineering endeavor, but as a robust design opportunity to strengthen communities and revitalize the city. Unlike the previous era, the next generation of such projects will require surgical integration into the existing urban fabric, and will work by intentionally linking systems of points, lines and landscapes, hybridizing economies with ecologies and over- lapping architecture with planning. These systems include but are not limited to public architecture, parks, schools, open space, roads, transportation, storm water, waste, food systems, recreation, local economies, 'green' infrastructure, markets, landfills, energy-generating facilities, cemeteries, and smart utilities.





Basketbar, NL Architects
High Line, Diller Scofidio + Renfro / Field Operations
Public Farm, Work Architecture Company

elevator statement

My project is about alleviating the food crisis and giving access to free, healthy food to the homeless and economically disadvantaged. The design is made up of educational facilities and agricultural nodes, which together form a green path through Buffalo.

case statement

My project is being developed because nearly 30 percent of the population in the City of Buffalo lives below the poverty line, meaning this group of people does not have ready access to fresh, healthy food, housing or healthcare. Agricultural nodes will provide sustenance to a group of people who currently have trouble providing food for themselves and/or their families due to insufficient income. Support facilities with cooking, dining and more general education spaces will also allow residents to learn how to plant and maintain the vegetation, cook and provide for themselves in a way.

The poorest neighborhoods in Buffalo are spread apart, as are the public and non-profit resources within the city meant to serve the people of these neighborhoods. The agricultural nodes will be linked together to create an urban green path through the city, joining these resources and benefiting the population as a whole. Not only will the agriculture provide a community-building activity, it will give residents a sense of ownership in a neighborhood where they may only be living because that's where their Section 8 housing is located. Additionally, the vegetation will help the environment and provide an aesthetically pleasing sight for passers-by. A set of varying conditions will be developed to pair with the situation of each part of the food path. Some areas will be discrete and consist of a small agricultural intervention, which grows during warm periods and is allowed to go naturally dormant during the winter months. Other areas will have seasonally-responsive measures to allow for year-round growth, and yet a third scale will be introduced, which combines year-round growing with education and support facilities. Thousands of vacant lots and thousands of foreclosed, abandoned homes owned by the city provide ample space for such activity.

The urban agricultural intervention created by the project will generate positive publicity for the city, perhaps boosting migration back to the shrinking city. This project will provide much needed social services to the city on several levels through non-invasive means and will help return the city in at least some small way back to its former glory while providing for an immediate need of fresh food for the homeless.

process description

To develop my project, I will research the current economic situation of Buffalo and how it came to be that way, including neighborhood-specific research. I will be visiting Buffalo to see the sorts of sites where agricultural nodes could be placed and areas which might be well-suited for the support facilities. I also plan to contact city officials to gain a better understanding of what happens to the vacant lots and abandoned homes (since they are prominent in the economically-disadvantaged neighborhoods), as well as codes relating to agriculture within the city's limits. I will also be doing a great deal of more scientific research to understand what plants are best suited for growth in a climate such as Buffalo's, how vegetation might be winterized and respond to the extreme seasonal conditions, and what crops would be most appropriate nutritionally. Interviews would also be conducted with various stakeholders and professionals knowledgeable about urban agriculture.

goals

01_Providing healthy food to low income and homeless Buffalo residents

02_Creating community gathering spaces/environments, which will then foster city growth, revitalization and a sense of neighborhood ownership

guiding principles

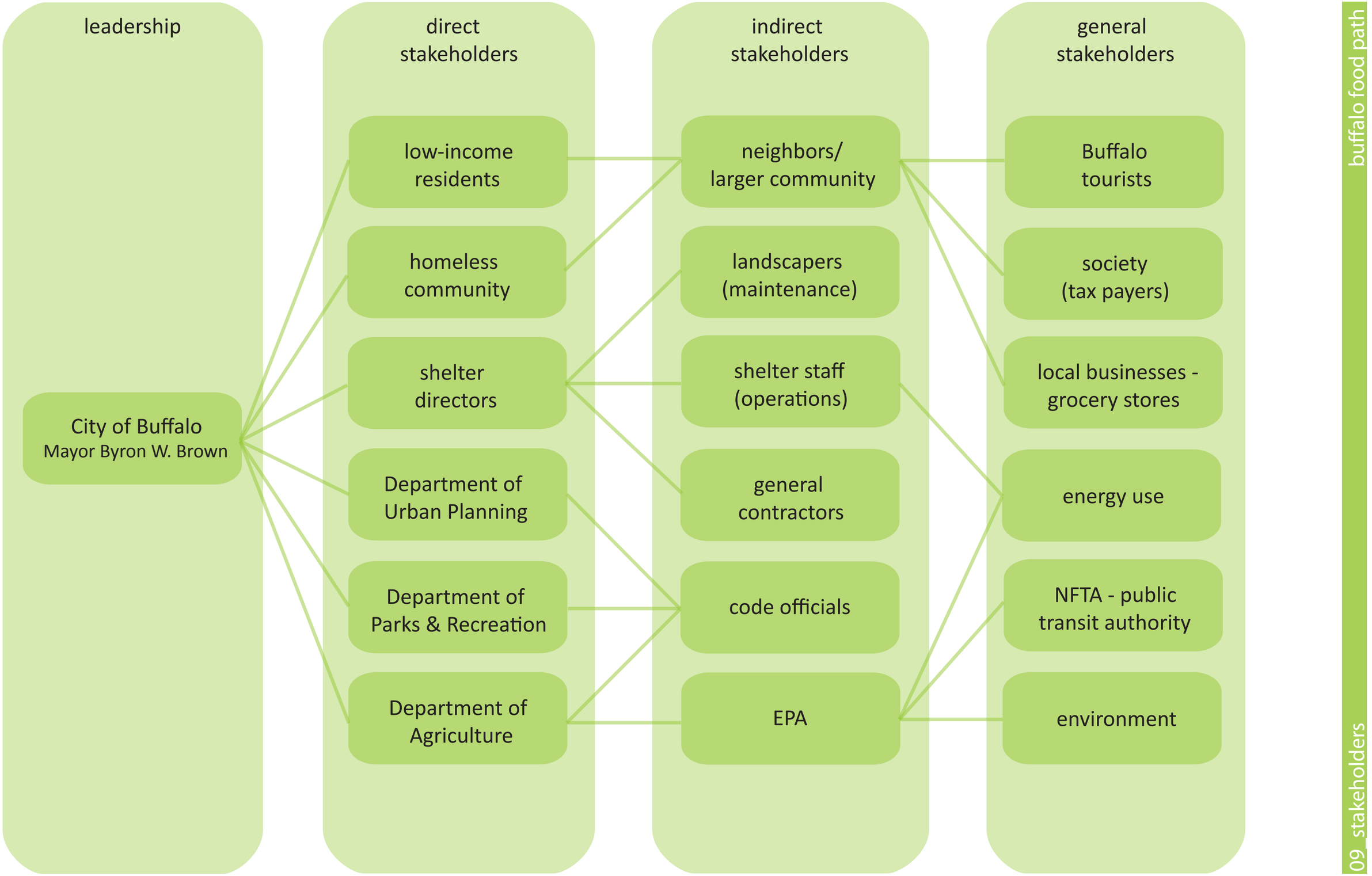
01_Adding only program and structures that will be of direct use to the community

02_Designing sustainably—using existing buildings, integrating waterways, harvesting rainwater, having least dependence on the "grid" as possible, etc.

03_Responding to the local climate—designing and creating program that is compatible with the long and intense winters the area experiences; adapting vegetation to indoor growth

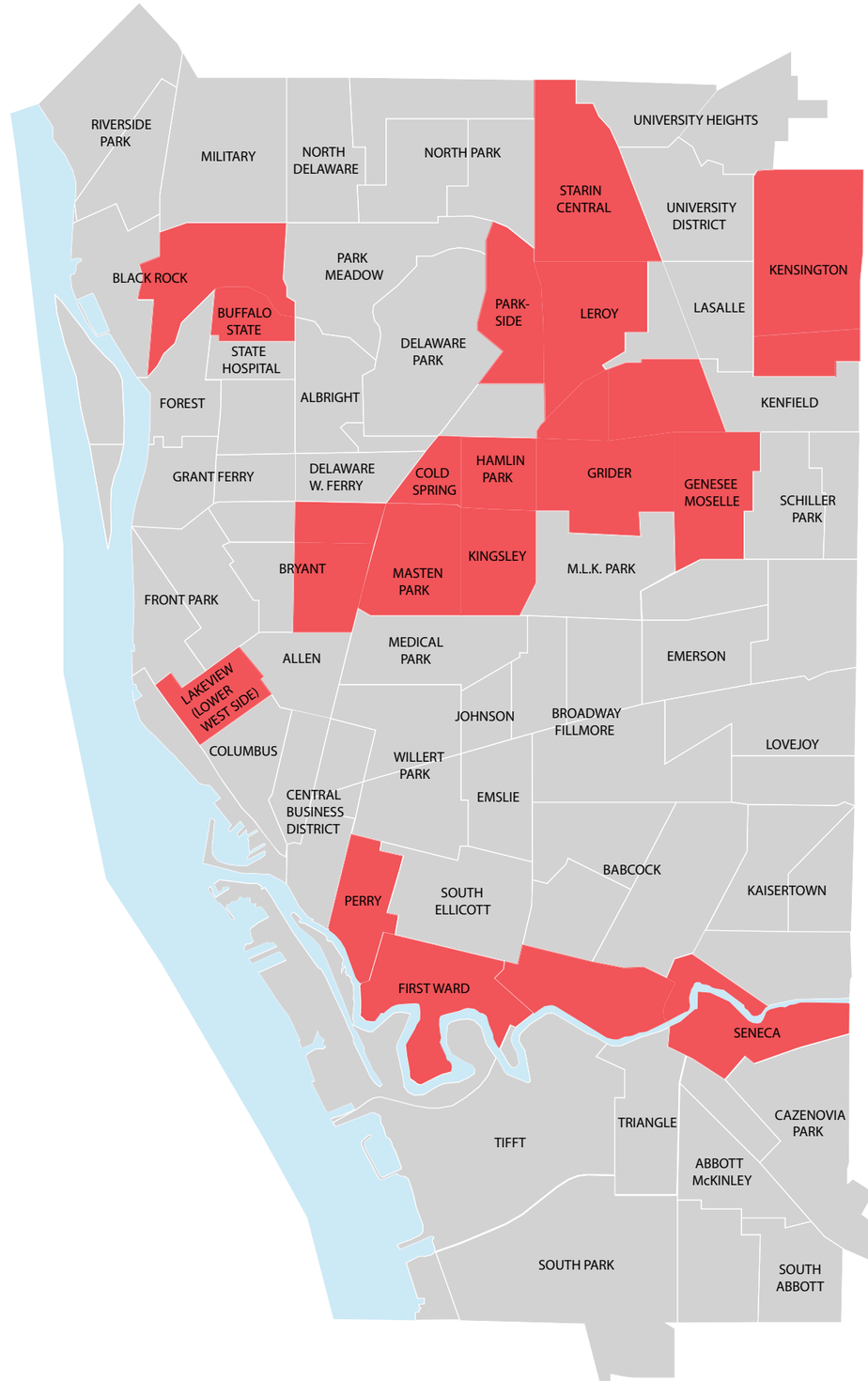
04_Relating each point of the food way/green path to its immediate surroundings

Icons @ right by WPA 2.0.


leadership
direct stakeholders
indirect stakeholders
general stakeholders
City of Buffalo Mayor Byron W. Brown
low-income residents
homeless community
shelter directors
Department of Urban Planning
Department of Parks & Recreation
Department of Agriculture
neighbors/ larger community
landscapers (maintenance)
shelter staff (operations)
general contractors
code officials
EPA
Buffalo tourists
society (tax payers)
local businesses - grocery stores
energy use
NFTA - public transit authority
environment

concept

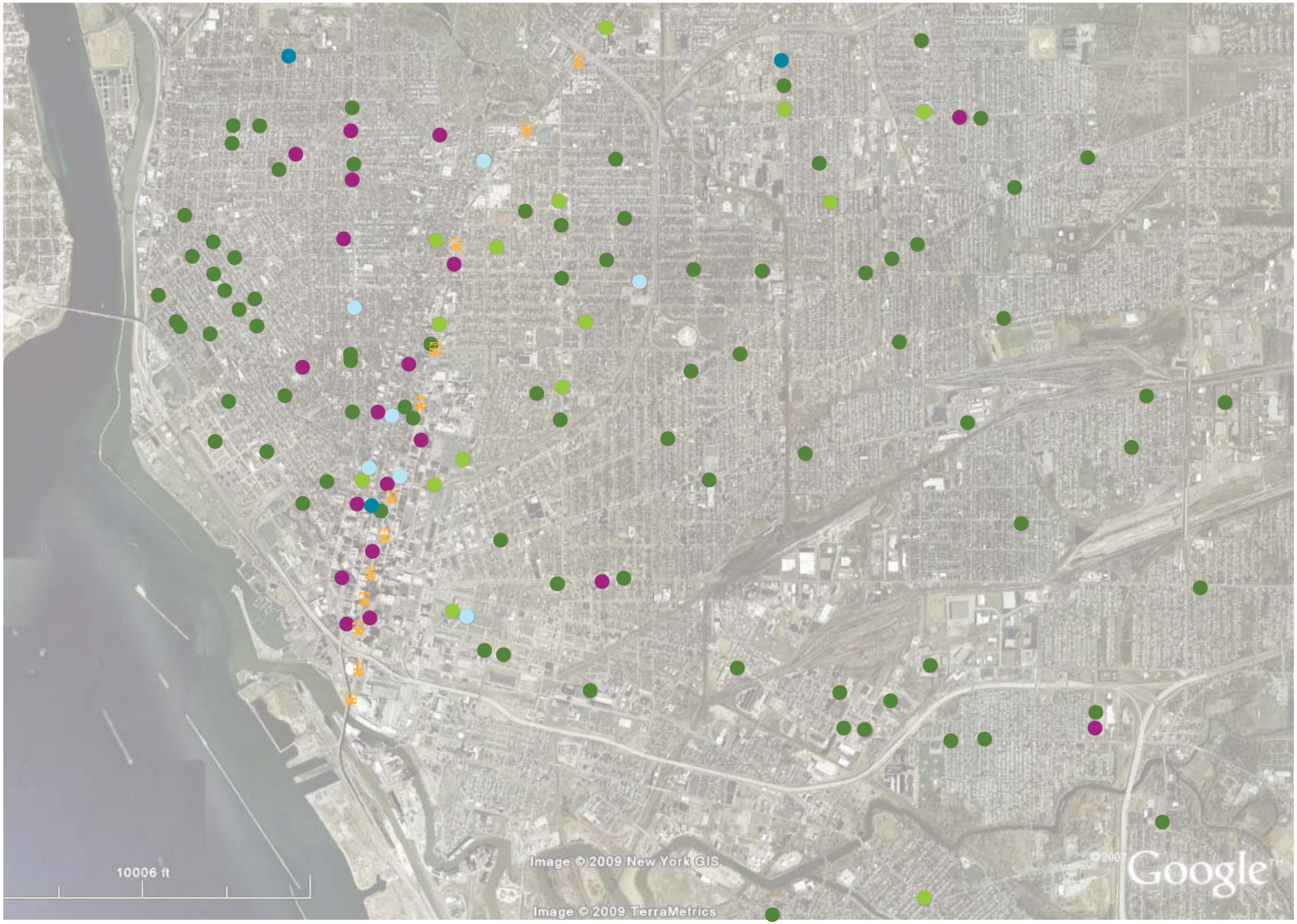
economic distribution of population



black rock	55% CAUCASIAN	23% BLACK	17% HISPANIC	5% OTHER	27.5% IN POVERTY	14% <H.S.	55% H.S./G.E.D.	31% BACHELORS
buffalo state	55% CAUCASIAN	23% BLACK	17% HISPANIC	5% OTHER	27.5% IN POVERTY	14% <H.S.	55% H.S./G.E.D.	31% BACHELORS
park-side	70% CAUCASIAN	20% BLACK	5% HISPANIC	5% OTHER	13.8% IN POVERTY	14% <H.S.	35% H.S./G.E.D.	41% BACHELORS
leroy	80% BLACK	10% CAUCASIAN	5% OTHER	4% HISPANIC	31.5% IN POVERTY	17% <H.S.	65% H.S./G.E.D.	18% BACHELORS
starin central	65% CAUCASIAN	25% BLACK	5% HISPANIC	5% OTHER	17.9% IN POVERTY	10% <H.S.	45% H.S./G.E.D.	45% BACHELORS
kensington	80% BLACK	10% CAUCASIAN	5% OTHER	4% HISPANIC	31.5% IN POVERTY	17% <H.S.	65% H.S./G.E.D.	18% BACHELORS
genesee-moselle	85% BLACK	9% CAUCASIAN	4% OTHER	2% HISPANIC	36.3% IN POVERTY	22% <H.S.	64% H.S./G.E.D.	14% BACHELORS
grider	87% BLACK	8% CAUCASIAN	3% OTHER	2% HISPANIC	29.2% IN POVERTY	25% <H.S.	60% H.S./G.E.D.	15% BACHELORS
hamlin park	82% BLACK	9% CAUCASIAN	5% HISPANIC	4% OTHER	43.7% IN POVERTY	24% <H.S.	60% H.S./G.E.D.	16% BACHELORS
kingsley	88% BLACK	6% CAUCASIAN	4% OTHER	2% HISPANIC	31.2% IN POVERTY	25% <H.S.	62% H.S./G.E.D.	14% BACHELORS
cold spring	85% BLACK	8% CAUCASIAN	4% HISPANIC	3% OTHER	32.6% IN POVERTY	23% <H.S.	58% H.S./G.E.D.	19% BACHELORS
masten park	85% BLACK	8% CAUCASIAN	4% HISPANIC	3% OTHER	35% IN POVERTY	22% <H.S.	60% H.S./G.E.D.	18% BACHELORS
bryant	65% CAUCASIAN	6% BLACK	12% HISPANIC	6% OTHER	25.9% IN POVERTY	17% <H.S.	49% H.S./G.E.D.	34% BACHELORS
lakeview	52% CAUCASIAN	34% BLACK	10% HISPANIC	4% OTHER	43.1% IN POVERTY	29% <H.S.	62% H.S./G.E.D.	9% BACHELORS
perry	56% BLACK	30% HISPANIC	11% CAUCASIAN	3% OTHER	57.1% IN POVERTY	37% <H.S.	55% H.S./G.E.D.	8% BACHELORS
first ward	85% BLACK	6% CAUCASIAN	5% HISPANIC	4% OTHER	35.8% IN POVERTY	24% <H.S.	59% H.S./G.E.D.	17% BACHELORS
seneca	94% CAUCASIAN	3% HISPANIC	3% OTHER	<1% BLACK	20.8% IN POVERTY	20% <H.S.	68% H.S./G.E.D.	12% BACHELORS

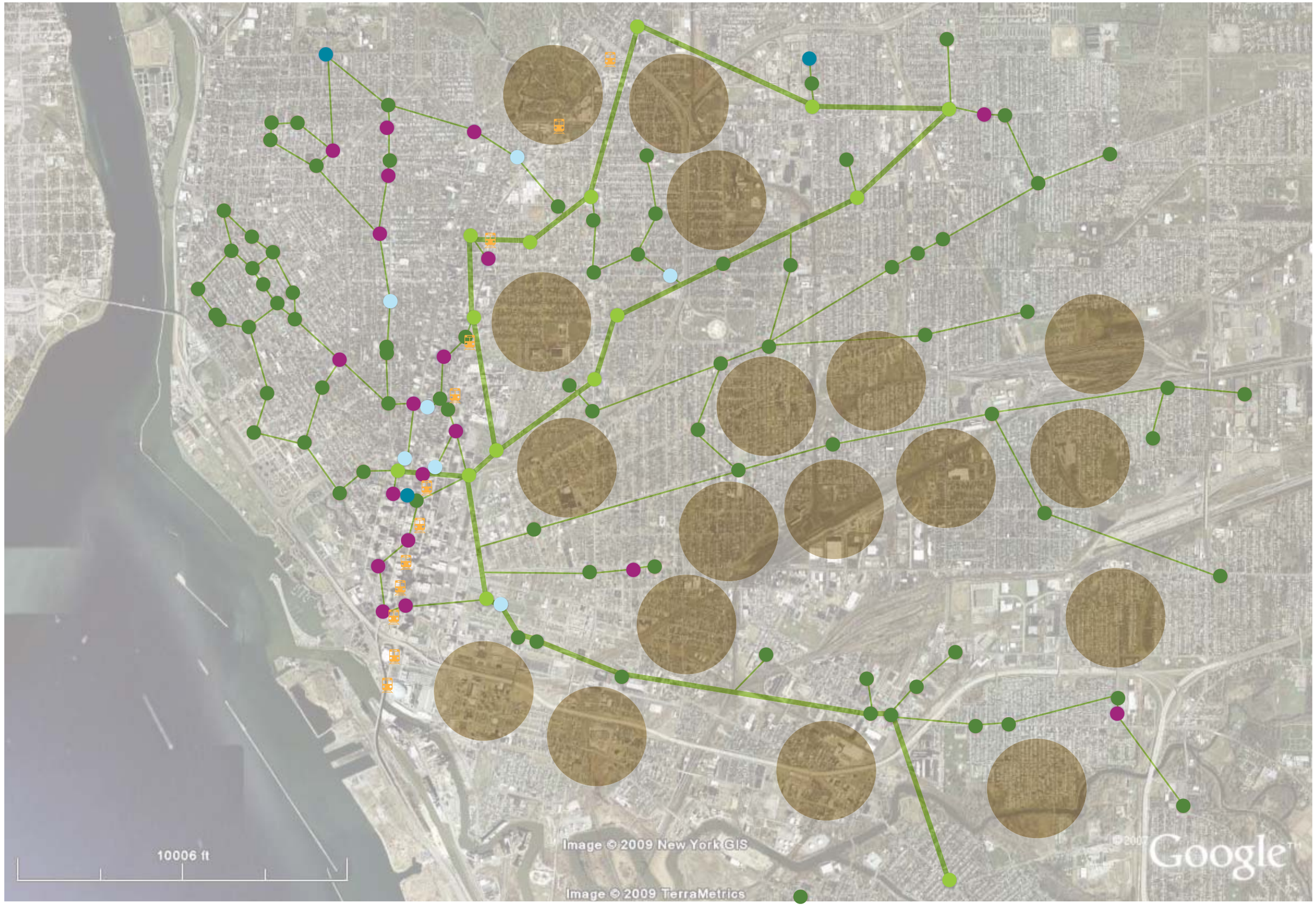
transit accessability and city walkability

existing resources for the economically disadvantaged



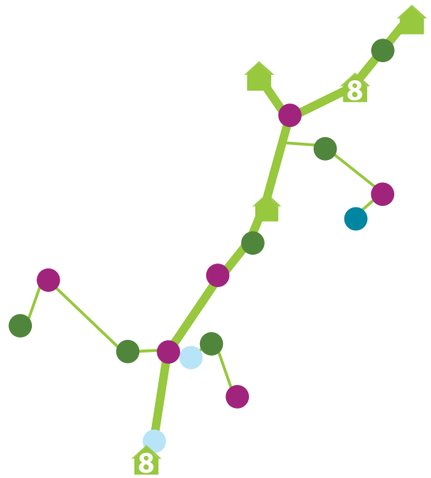
ousing grocery store / farmers market info and employment services health services fitness center

proposed network of resources for the economically disadvantaged

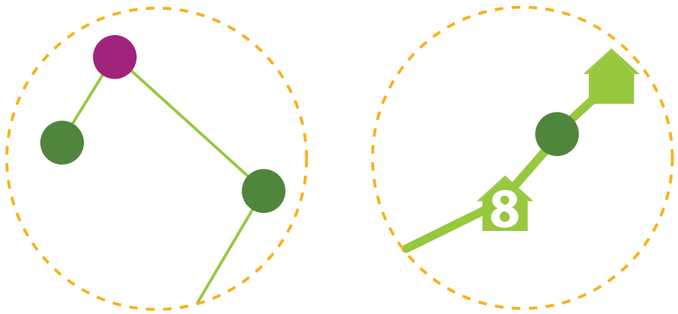


housing
grocery store / farmers market
info and employment services
health services
fitness center
food desert

rules of the food-path network



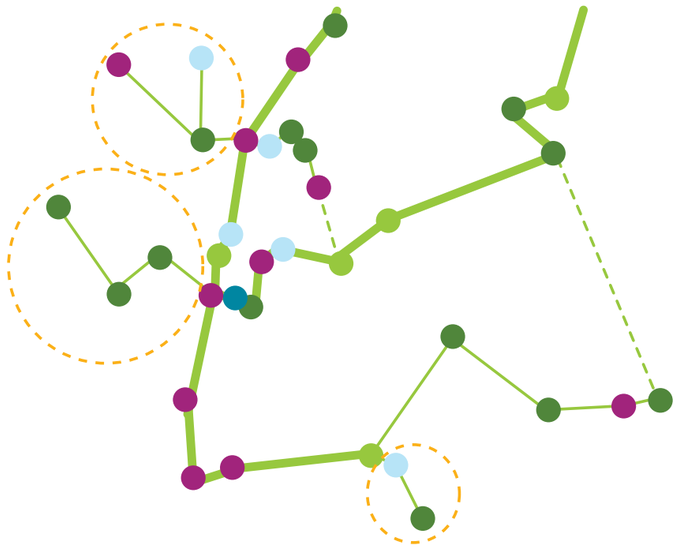
01_the portion of the path, which connects section 8 housing and shelters will form the primary path of
the network



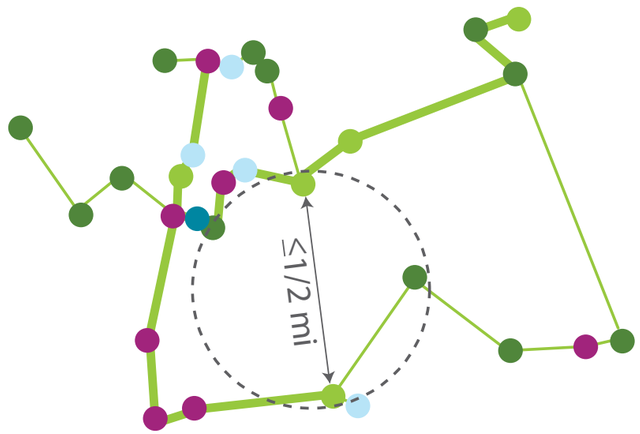
02_offshoots of the primary path, which connect to grocery stores and fitness centers will be considered secondary paths and will have a visual language of their own to differentiate them from the main path

03_if four or more nodes exist on a secondary path, it will be linked back into the network, forming a continuous web

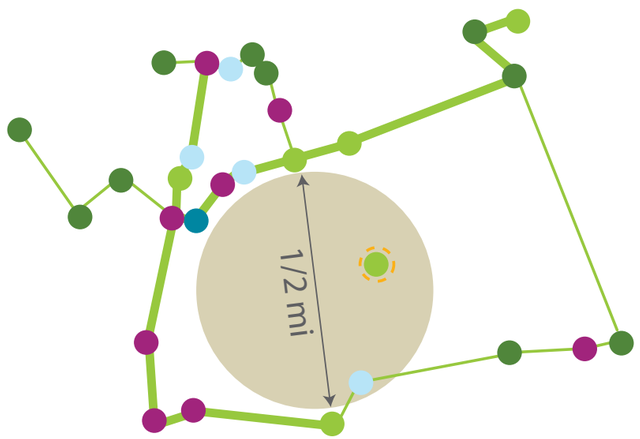
housing
grocery store / farmers market
info and employment services
health services
fitness center



04_if less than four nodes exist on a secondary path, it will be allowed to stand on its own as an extension without re-linking

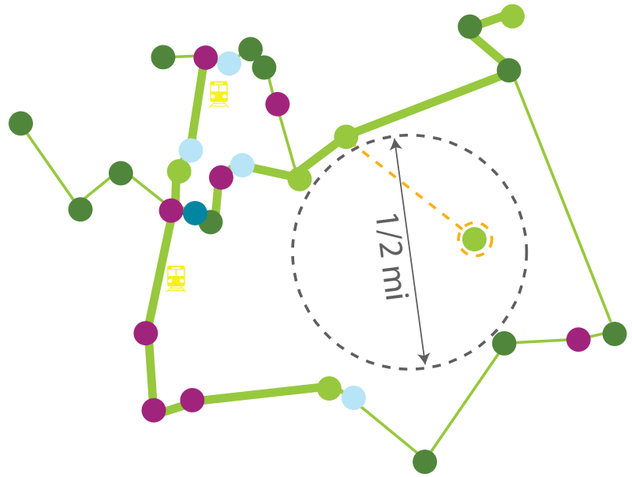


05_nodes on path will be no farther apart than ½ mi in order to maintain ease of pedestrian access

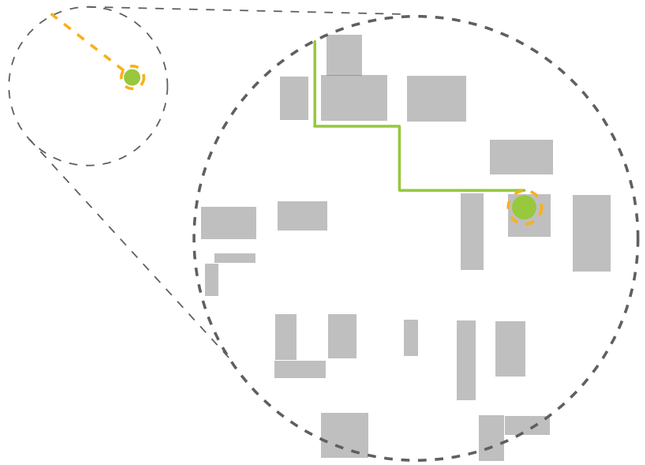


06_if only one node currently exists within a ½ mi radius of any area and it isn't providing food, it will be deemed a food desert and a food-providing node will be added as part of the secondary path

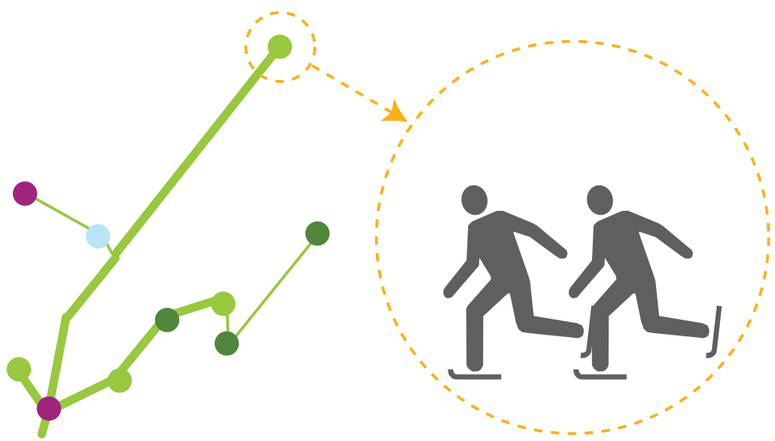
- housing
- grocery store / farmers market
- info and employment services
- health services
- fitness center



07_if no node or public transportation connection currently exists within a ½ mi radius of any area, a node will be added as part of a secondary path

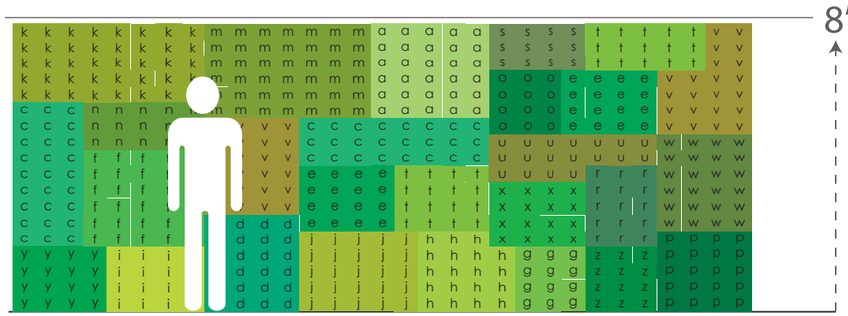


08_a vacant lot or abandoned home within the food deserts will be used as the site for a new node

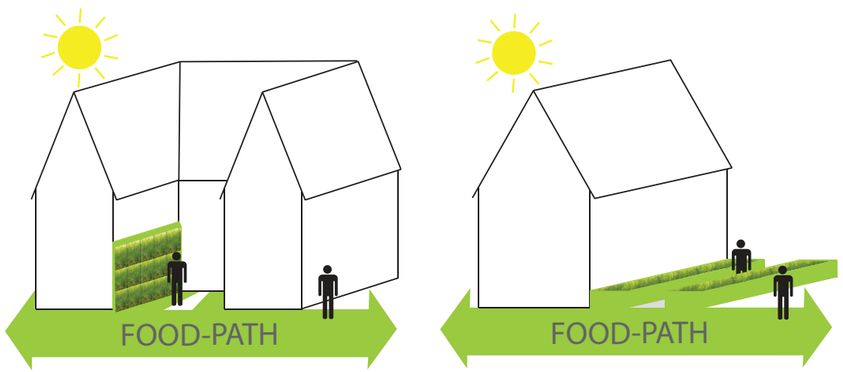


09_seasonal events happen at nodes farther away from city center to generate movement along the path during cold periods

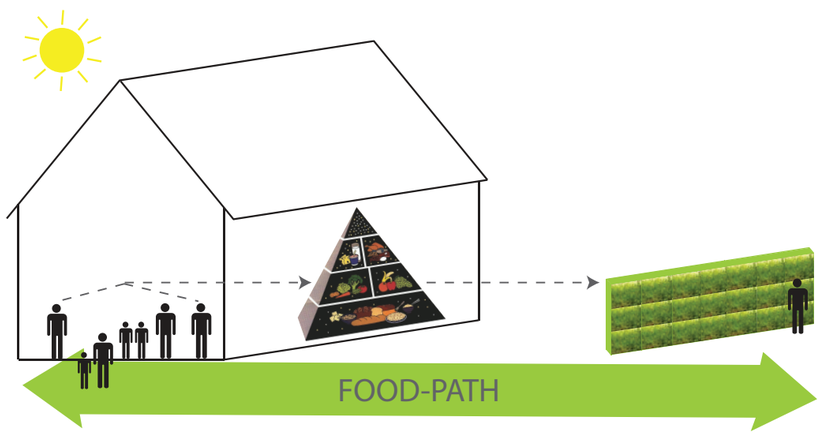
- housing
- grocery store / farmers market
- info and employment services
- health services
- fitness center



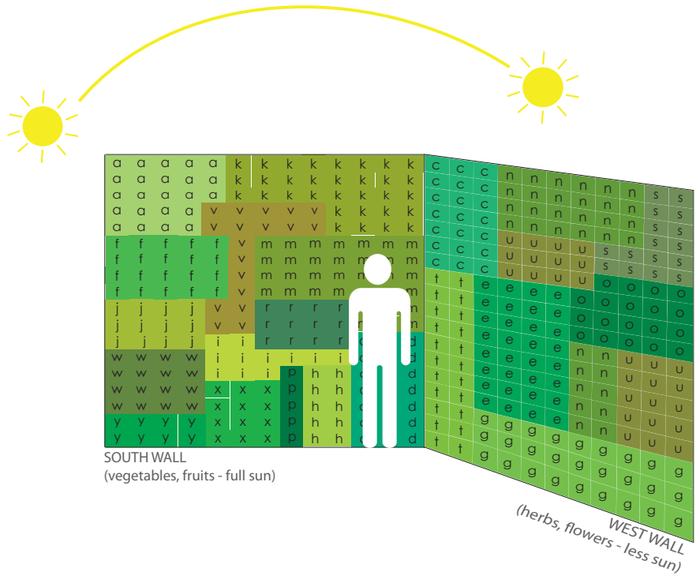
10_edible walls will be planted no higher than 8′, so as to not require the use of stools or ladders



11_edible walls will only be placed on or adjacent to housing



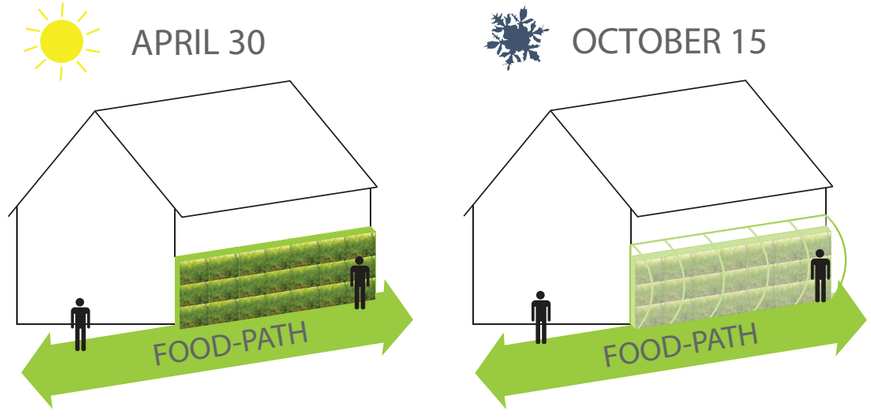
12_the ratio of vegetables : fruits : herbs will be planned in relation to number and type of people (children vs. adults) living in the housing it's attached to



13_edible walls will be planted according to sunlight received/solar orientation

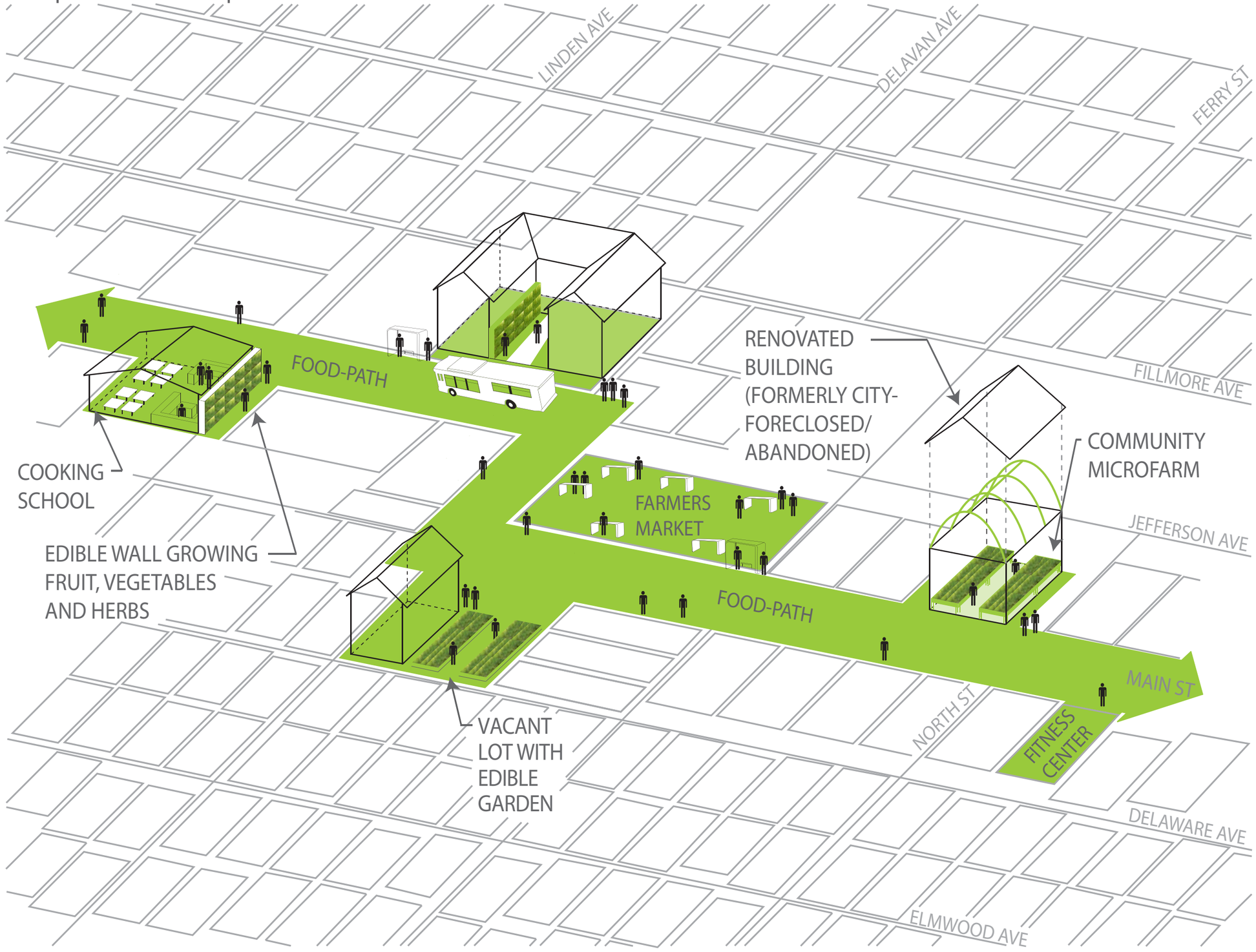
_herbs planted in areas of greater shade

_vegetables and fruits in areas of greater sun



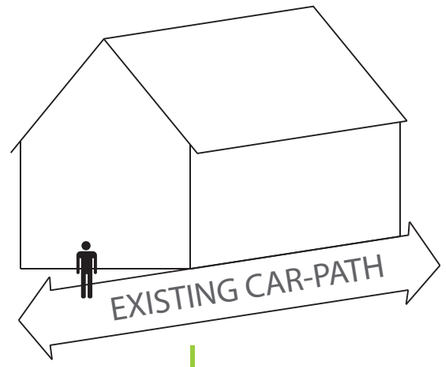
14_edible walls determined to need a seasonal hoop structure will be covered on October 15 and uncovered on April 30 (approximately six months a year)

food-path: edible components

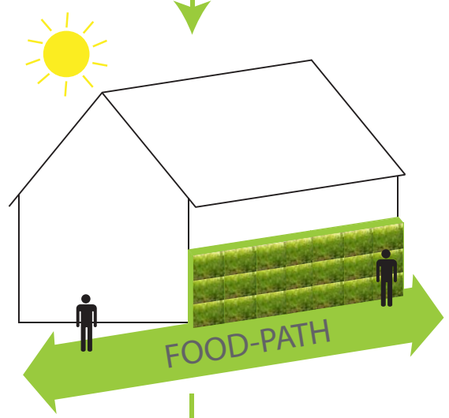


a: single-family housing with edible wall

TODAY



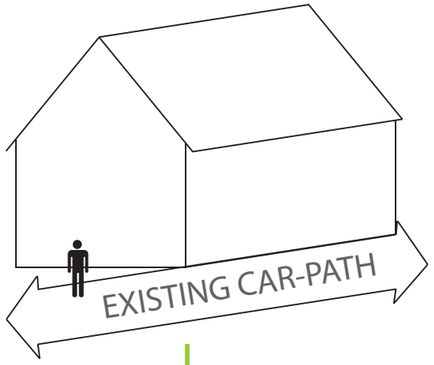
FUTURE
SUMMER



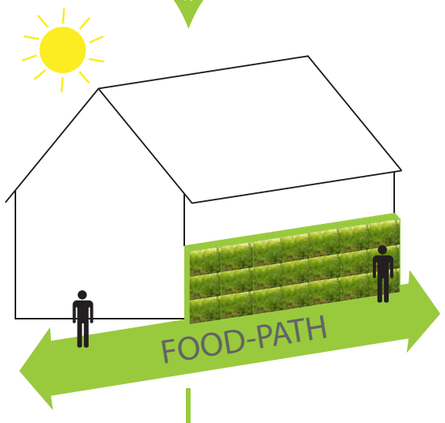
FUTURE
WINTER

b: single-family housing with edible wall

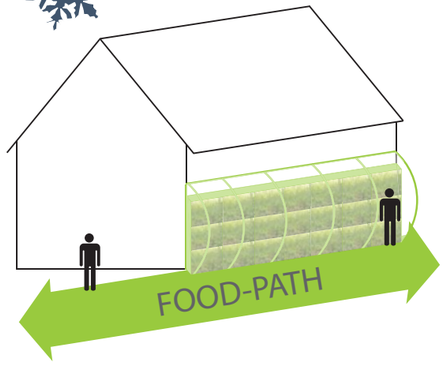
TODAY



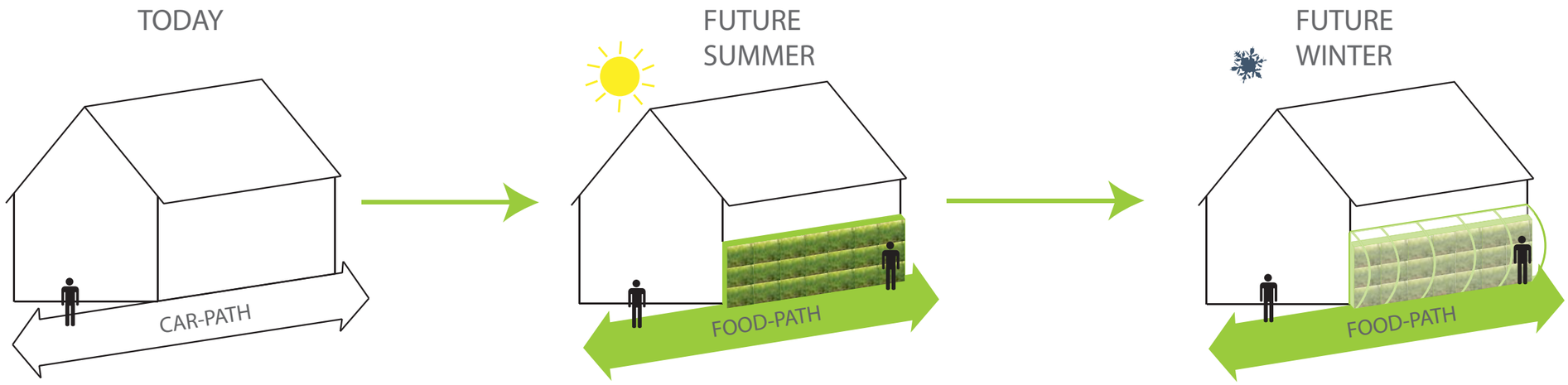
FUTURE
SUMMER



FUTURE
WINTER



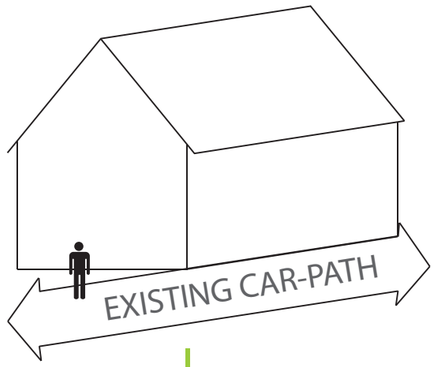
a/b: single-family housing with edible wall



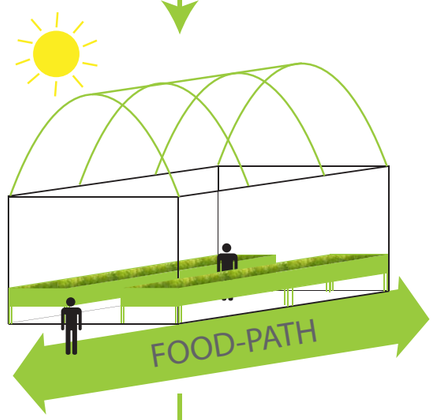
	SPACE	% OF OVERALL SPACE	NO. USERS	ADJACENCIES	QUALITATIVE CRITERIA
01	GREEN SPACE	33%			
	.01 HERBS	(3%)		SIDEWALK	SAGE, ROSEMARY, BASIL, MINT, PARSLEY
	.02 VEGETABLES	(18%)		SIDEWALK	SPINACH, LEEK, CHIVES, PEPPER, ONIONS
	.03 FRUITS	(9%)		SIDEWALK	MELONS, STRAWBERRIES, TOMATO
	.04 FLOWERS	(3%)		SIDEWALK	MARIGOLDS, LAVENDER, ALOE
02	HARDSCAPE	66%			
	.01 SIDEWALK	(14%)	4 PEOPLE ACROSS (WIDE)	GREEN SPACE, BUS LANE	
	.02 BUS-LANE	(15%)	1 BUS (WIDE) = 75 PEOPLE	SIDEWALK, CAR-LANE	
	.03 CAR-LANE	(15%)	1 CAR (WIDE) = 5 PEOPLE	BUS-LANE, DRIVEWAY	
	.04 DRIVEWAY	(7%)	4 CARS = 20 PEOPLE	CAR-LANE, PARKING	
	.05 PARKING	(15%)	1 CAR (STREET) = 5 PEOPLE	DRIVEWAY	
	SUB-TOTAL	100%			

c: single-family housing with green house

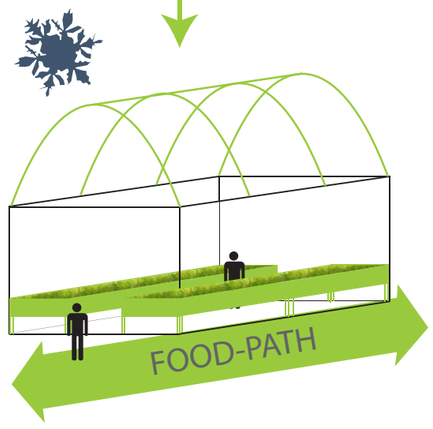
TODAY



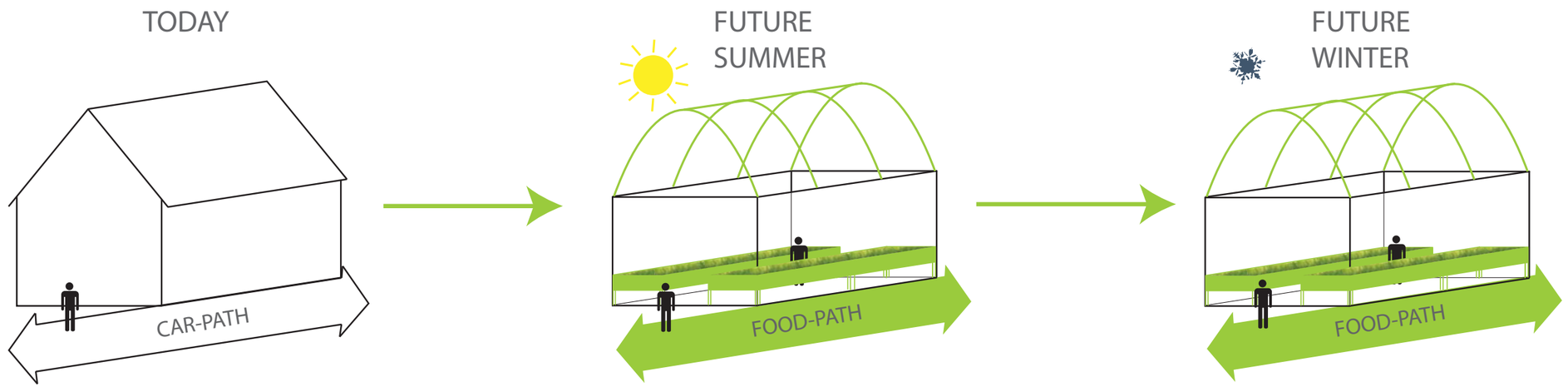
FUTURE
SUMMER



FUTURE
WINTER



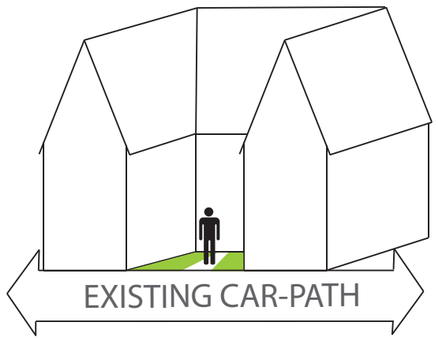
c: single-family housing with edible wall



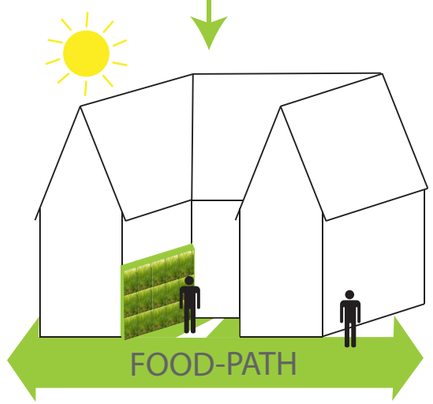
	SPACE	% OF OVERALL SPACE	NO. USERS	ADJACENCIES	QUALITATIVE CRITERIA
01	GREEN SPACE (INTERIOR)	15%			
	.01 HERBS	(1.5%)		SIDEWALK	SAGE, ROSEMARY, BASIL, MINT, PARSLEY
	.02 VEGETABLES	(8%)		SIDEWALK	SPINACH, LEEK, CHIVES, PEPPER, ONIONS
	.03 FRUITS	(4%)		SIDEWALK	MELONS, STRAWBERRIES, TOMATOES
	.04 FLOWERS	(1.5%)		SIDEWALK	MARIGOLDS, LAVENDAR, ALOE
02	HARDSCAPE	40%			
	.01 SIDEWALK	(8.5%)	4 PEOPLE ACROSS (WIDE)	GREEN SPACE, BUS-LANE	
	.02 BUS-LANE	(9%)	1 BUS (WIDE) = 75 PEOPLE	SIDEWALK, CAR-WAY	
	.03 CAR-WAY	(9%)	1 CAR (WIDE) = 5 PEOPLE	BUS-LANE, DRIVEWAY	
	.04 DRIVEWAY	(4.5%)	4 CARS = 20 PEOPLE	CAR-WAY, PARKING	
	.05 PARKING	(9%)	1 CAR (STREET) = 5 PEOPLE	DRIVEWAY	
03	BROWN SPACE	10%			
	.01 YARD	(10%)	10-15 SEATED/25 STANDING		ADJACENCIES & DETAILS WILL VARY BY SITE
04	SUPPORT SPACE (INTERIOR)	35%			
	.01 KITCHEN	(11%)	15 USERS (@15SF/PERSON)	GREEN SPACE, LEARNING, CIRCULATION	PLUS EQPT, CABINETS/STORAGE, WASHING
	.02 FLEX LEARNING SPACE	(13%)	15-25 (BY ARRANGEMENT)	KITCHEN, CIRCULATION	DINING/LEARNING TABLES
	.03 INTERIOR CIRCULATION	(6%)	2 PEOPLE ACROSS (WIDE)	SIDEWALK, KITCHEN, LEARNING, W.C.	
	.04 UNISEX RESTROOM / W.C.	(5%)	1 ADA USER (5' RADIUS)	INTERIOR CIRCULATION	
	SUB-TOTAL	100%			

d: multi-family housing with edible wall

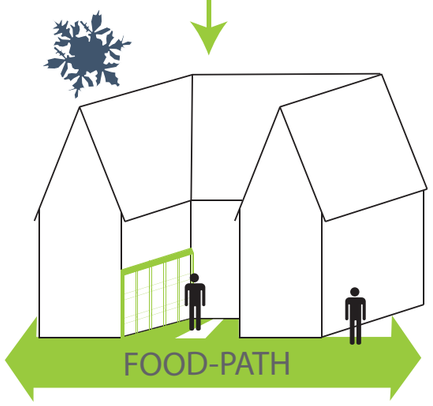
TODAY



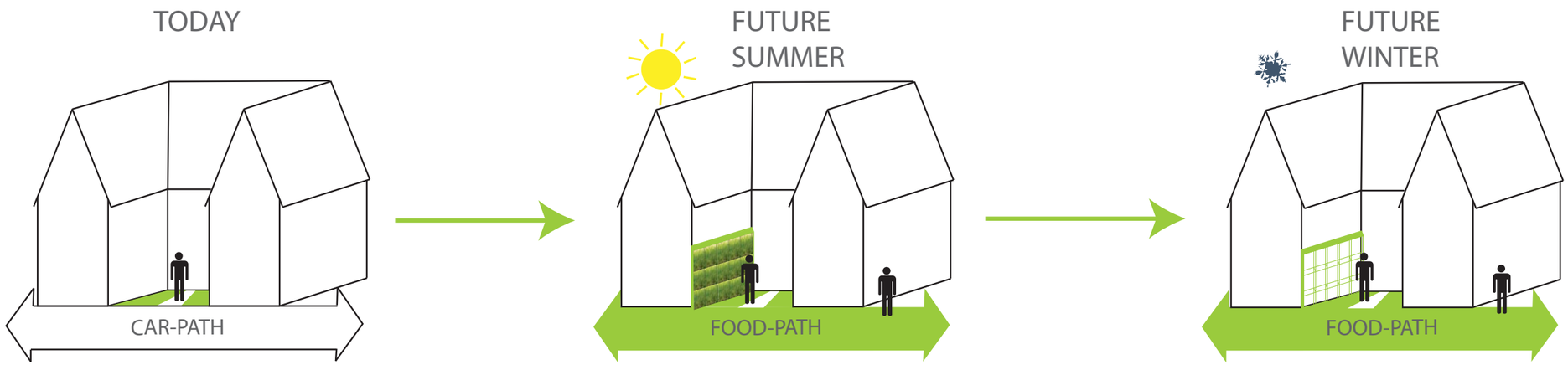
FUTURE
SUMMER



FUTURE
WINTER



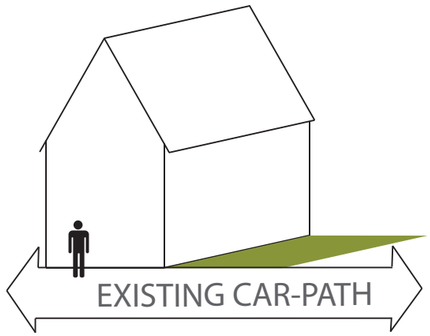
d: single-family housing with edible wall



	SPACE	% OF OVERALL SPACE	NO. USERS	ADJACENCIES	QUALITATIVE CRITERIA
01	GREEN SPACE	33%			
	.01 HERBS	(3%)		SIDEWALK	SAGE, ROSEMARY, BASIL, MINT, PARSLEY
	.02 VEGETABLES	(18%)		SIDEWALK	SPINACH, LEEK, CHIVES, PEPPER, ONIONS
	.03 FRUITS	(9%)		SIDEWALK	MELONS, STRAWBERRIES, TOMATO
	.04 FLOWERS	(3%)		SIDEWALK	MARIGOLDS, LAVENDER, ALOE
02	HARDSCAPE	66%			
	.01 SIDEWALK	(13%)	4 PEOPLE ACROSS (WIDE)	GREEN SPACE, BUS LANE	
	.02 BUS-LANE	(15%)	1 BUS (WIDE) = 75 PEOPLE	SIDEWALK, CAR-WAY	
	.03 CAR-WAY	(15%)	1 CAR (WIDE) = 5 PEOPLE	BUS-LANE, DRIVEWAY	
	.04 DRIVEWAY	(6%)	2 CARS (WIDE0 ENTRY/EXIT	CAR-LANE, PARKING	
	.05 PARKING	(17%)		DRIVEWAY	STREET PARKING + LOT
	SUB-TOTAL	100%			

e: vacant lot with edible garden

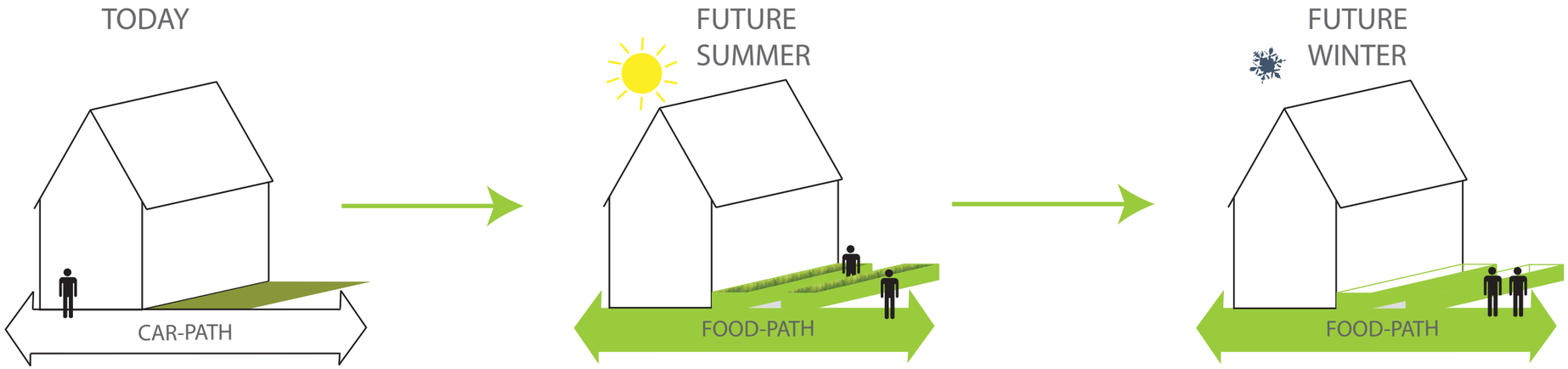
TODAY



FUTURE
SUMMER

FUTURE
WINTER

e: single-family housing with edible wall

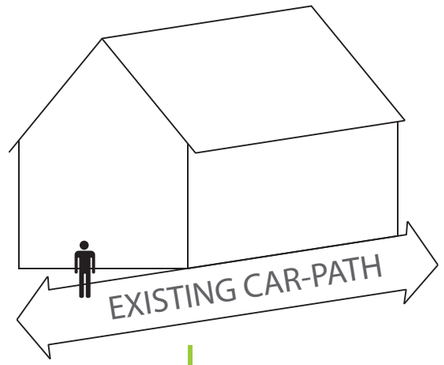


	SPACE	% OF OVERALL SPACE	NO. USERS	ADJACENCIES	QUALITATIVE CRITERIA
01	GREEN SPACE	33%			
	.01 HERBS	(3%)		SIDEWALK	SAGE, ROSEMARY, BASIL, MINT, PARSLEY
	.02 VEGETABLES	(18%)		SIDEWALK	SPINACH, LEEK, CHIVES, PEPPER, ONIONS
	.03 FRUITS	(9%)		SIDEWALK	MELONS, STRAWBERRIES, TOMATO
	.04 FLOWERS	(3%)		SIDEWALK	MARIGOLDS, LAVENDER, ALOE
02	HARDSCAPE	66%			
	.01 SIDEWALK	(21%)	4 PEOPLE ACROSS (WIDE)	GREEN SPACE, BUS LANE	
	.02 BUS-LANE	(15%)	1 BUS (WIDE) = 75 PEOPLE	SIDEWALK, CAR-LANE	
	.03 CAR-LANE	(15%)	1 CAR (WIDE) = 5 PEOPLE	BUS-LANE, PARKING	
	.04 DRIVEWAY	(0%)			
	.05 PARKING	(15%)	1 CAR (STREET) = 5 PEOPLE	CAR-LANE, SIDEWALK	
	SUB-TOTAL	100%			

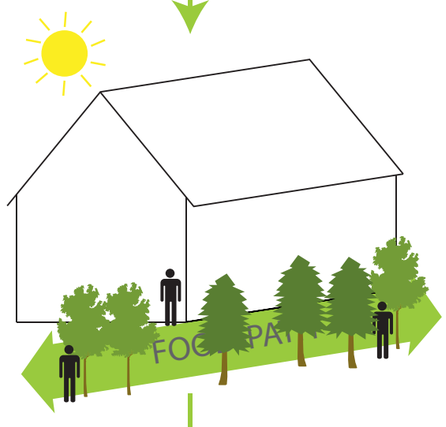
food-path: ecological components

f: housing with tree path

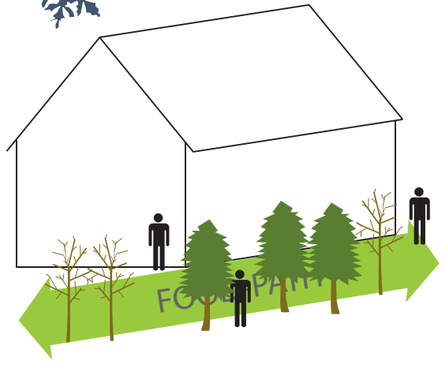
TODAY



FUTURE
SUMMER



FUTURE
WINTER

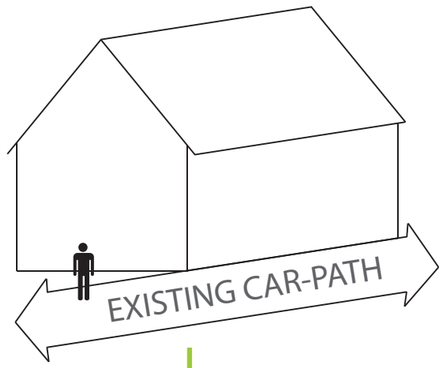


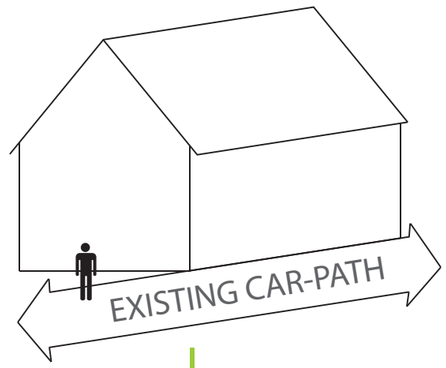
g: bio-swale

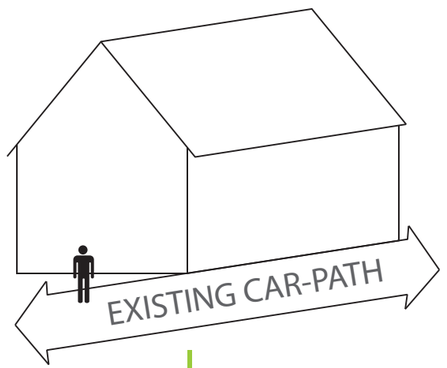
h: rain garden / water filtration

i: flower boxes and plantings

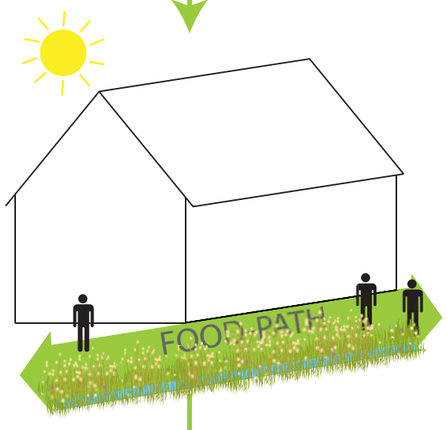
TODAY

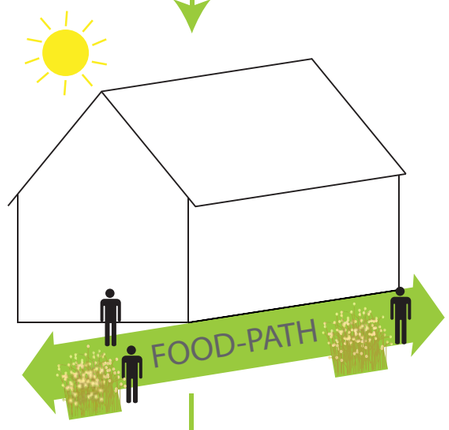


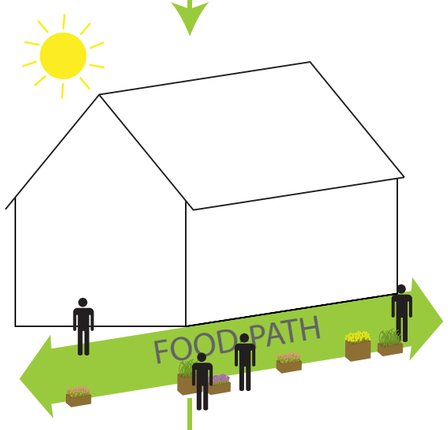




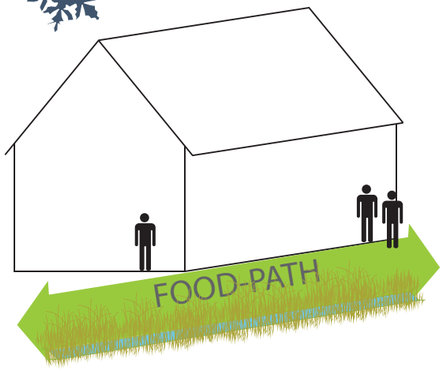
FUTURE
SUMMER

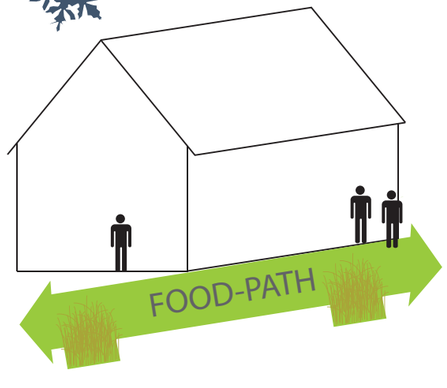


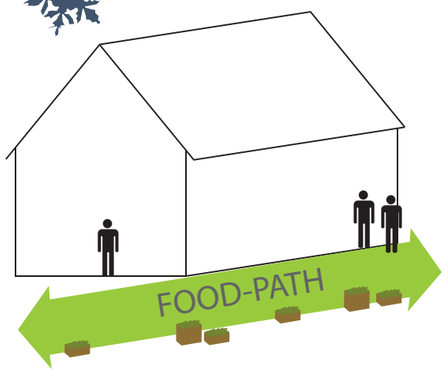




FUTURE
WINTER



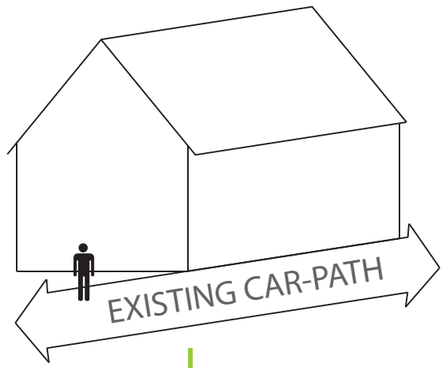


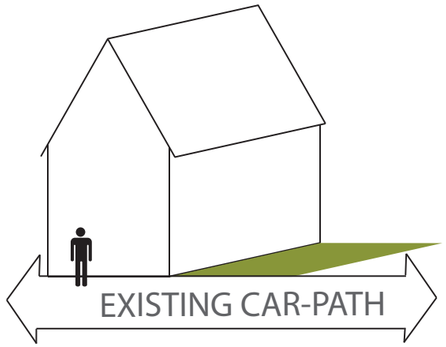


j: bird house row

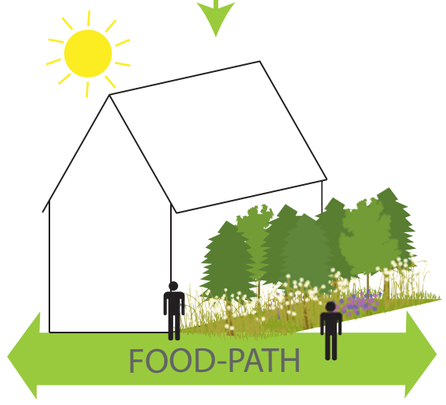
k: vacant lot to native landscape

TODAY



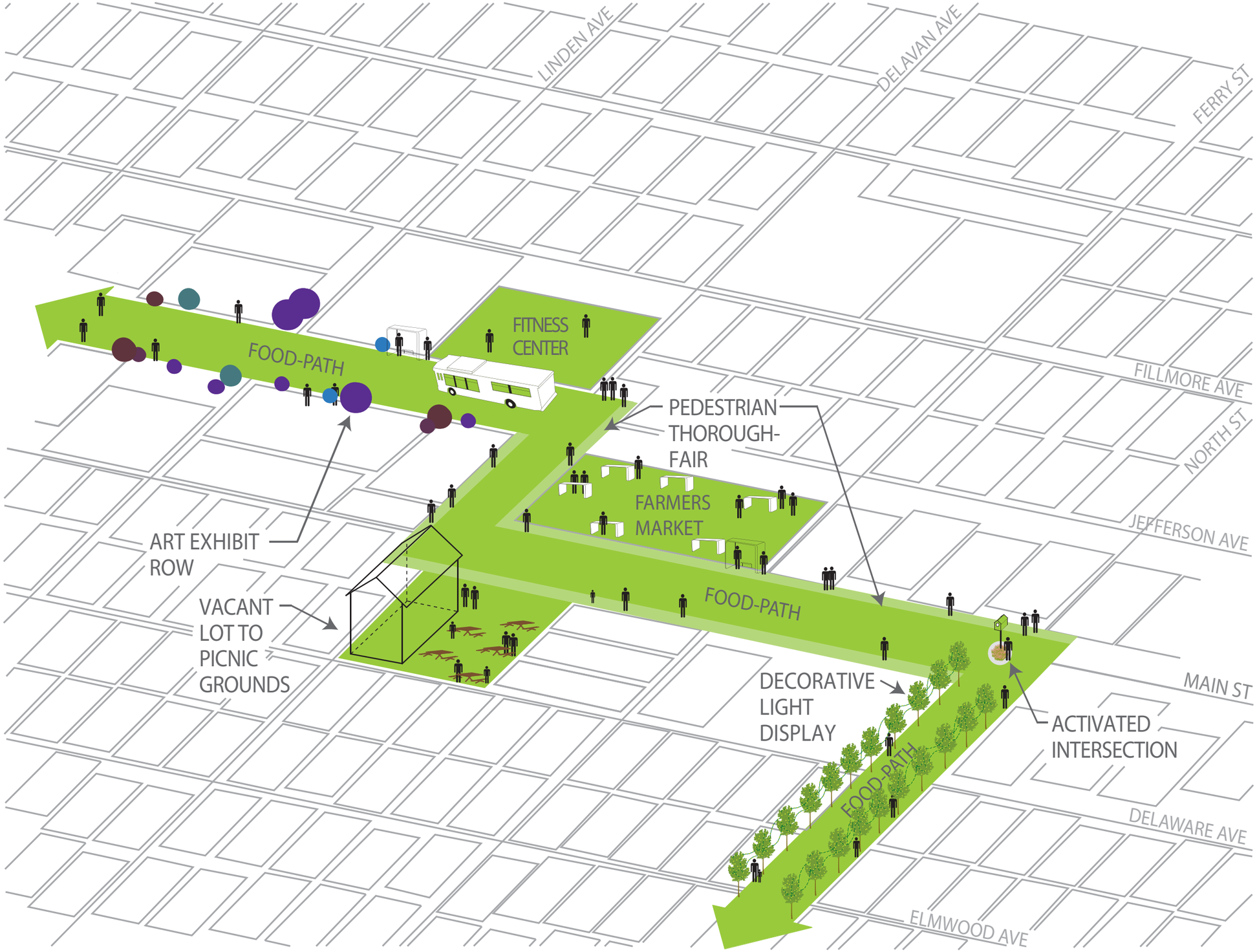


FUTURE
SUMMER



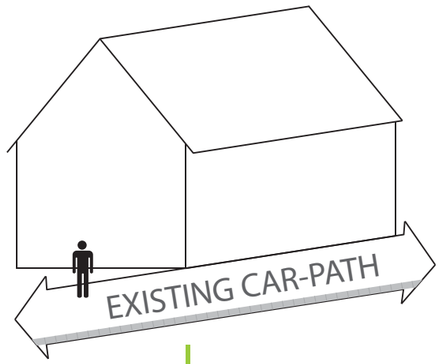
FUTURE
WINTER

food-path: socio-cultural components

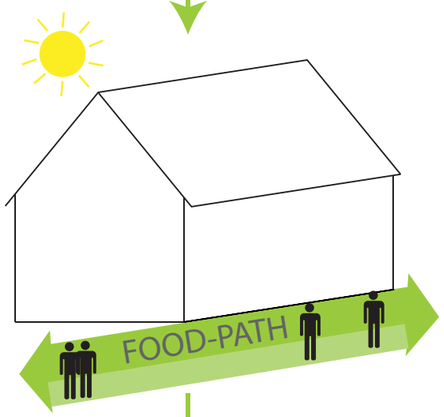


I: pedestrian thoroughfair

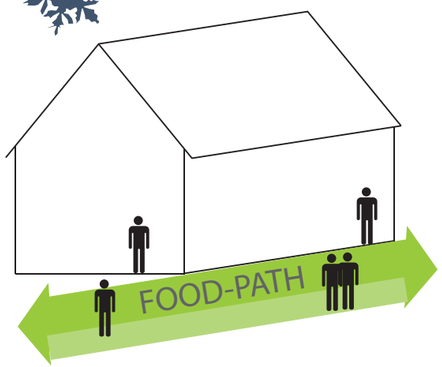
TODAY



FUTURE
SUMMER

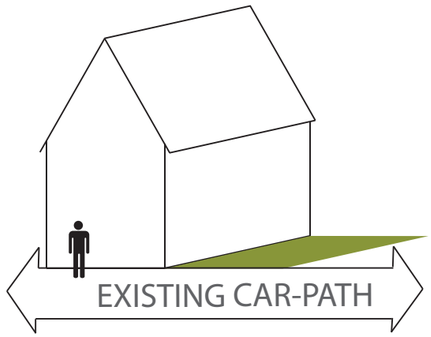


FUTURE
WINTER



m: vacant lot to picnic grounds

TODAY

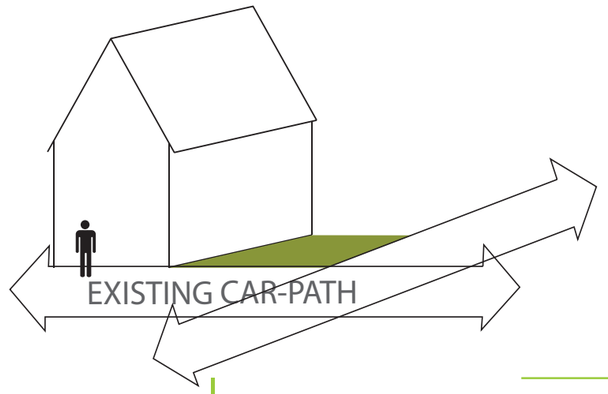


FUTURE
SUMMER

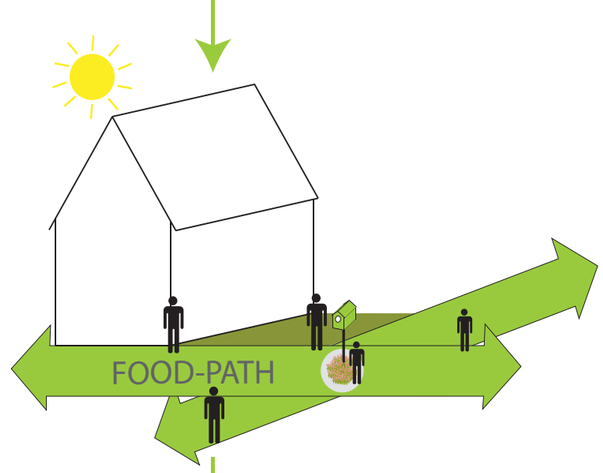
FUTURE
WINTER

n: activated intersection

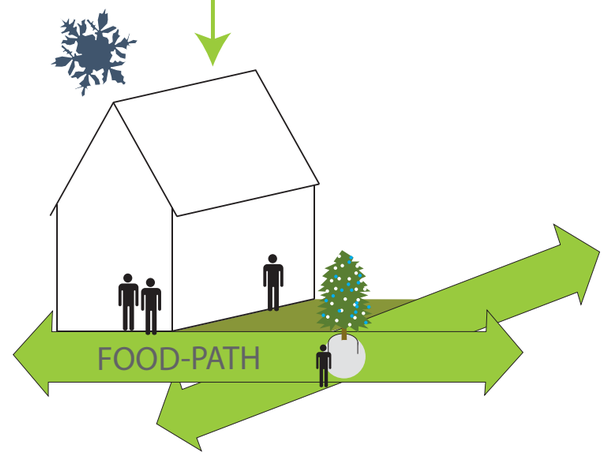
TODAY



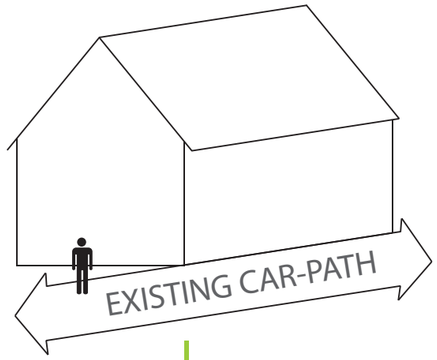
FUTURE
SUMMER



FUTURE
WINTER

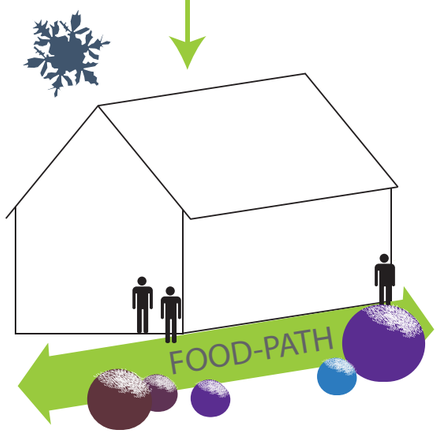


TODAY



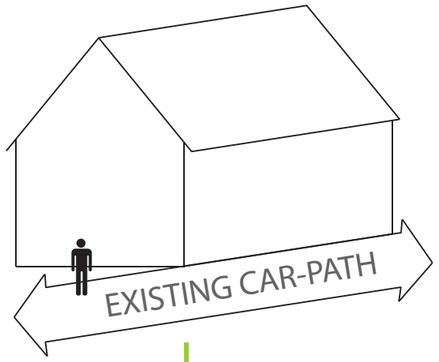
FUTURE
SUMMER

FUTURE
WINTER

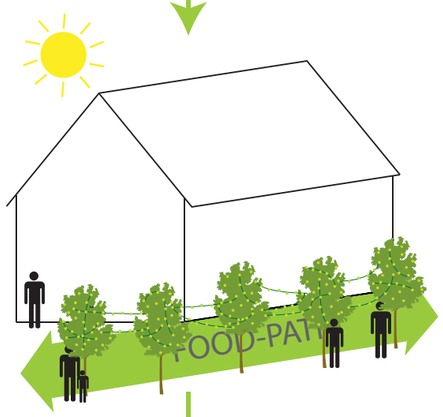


p: decorative light display

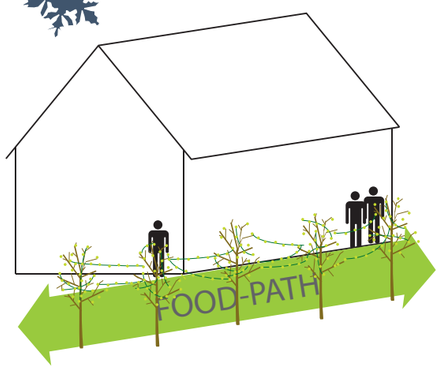
TODAY



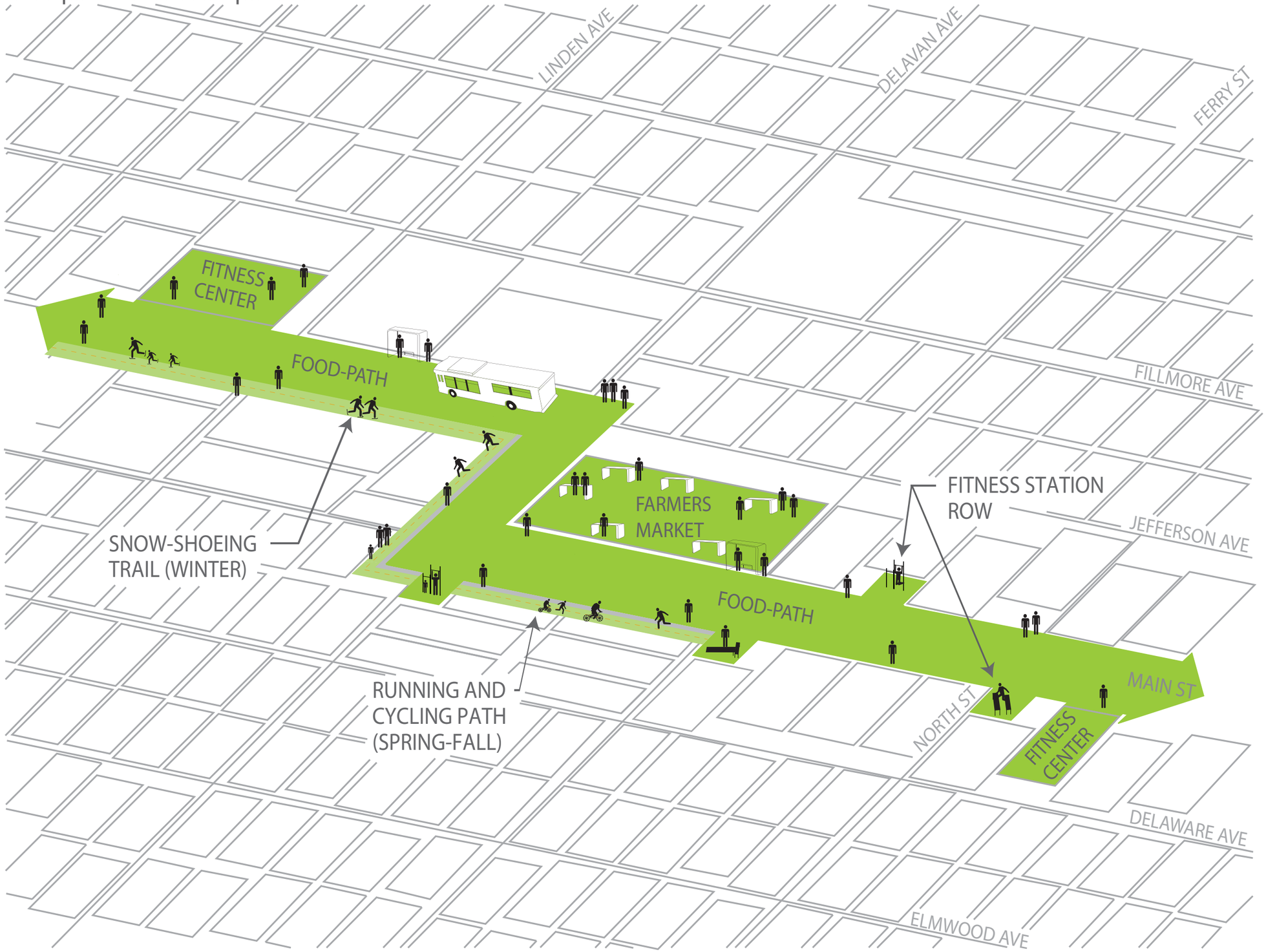
FUTURE
SUMMER



FUTURE
WINTER

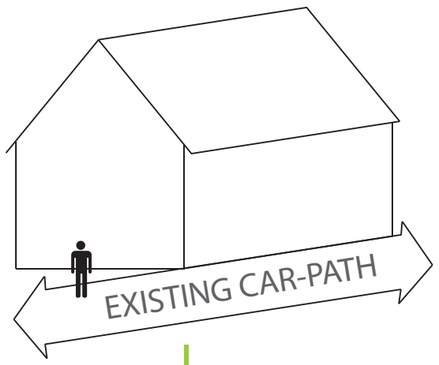


food-path: fitness components

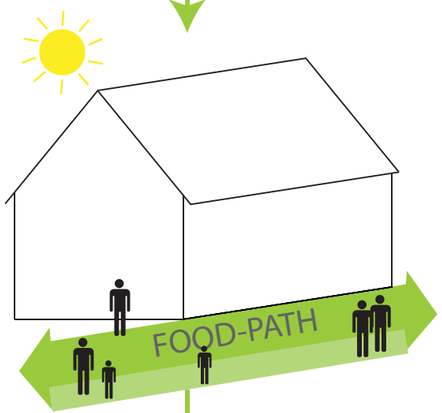


q: snow-shoeing trail

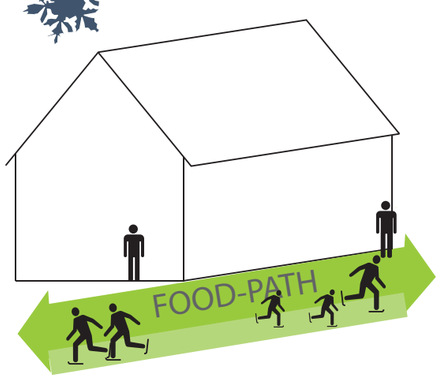
TODAY



FUTURE
SUMMER

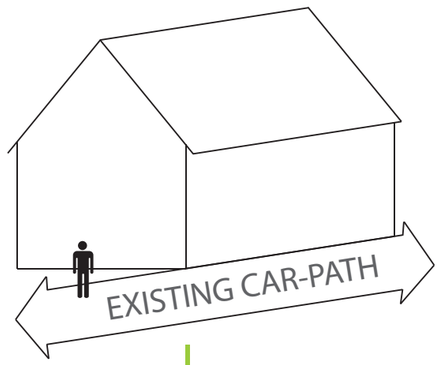


FUTURE
WINTER

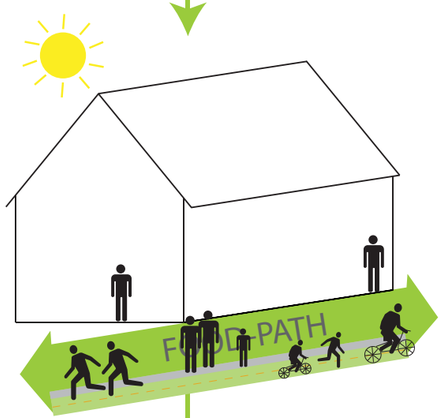


r: running and cycling path

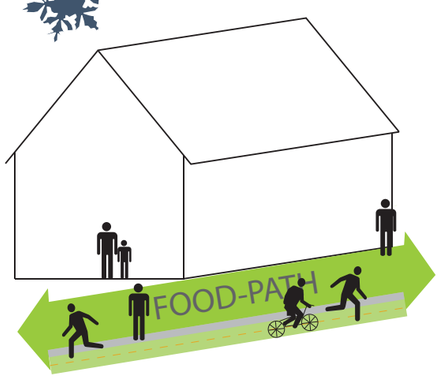
TODAY



FUTURE
SUMMER

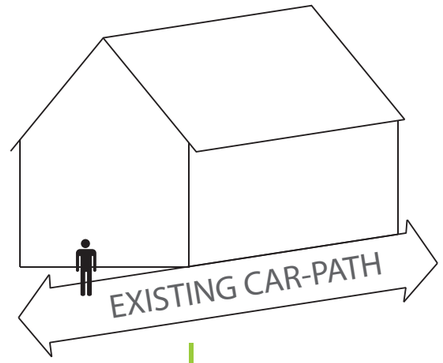


FUTURE
WINTER

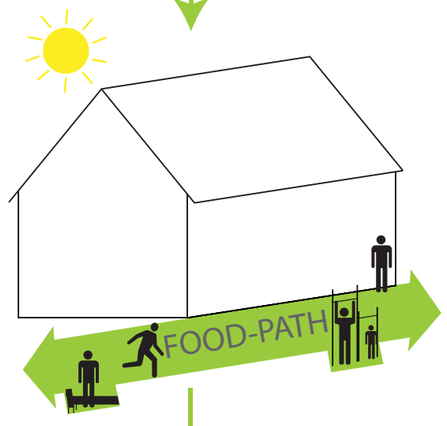


s: fitness station row

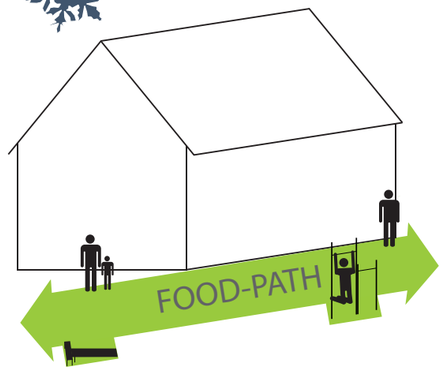
TODAY

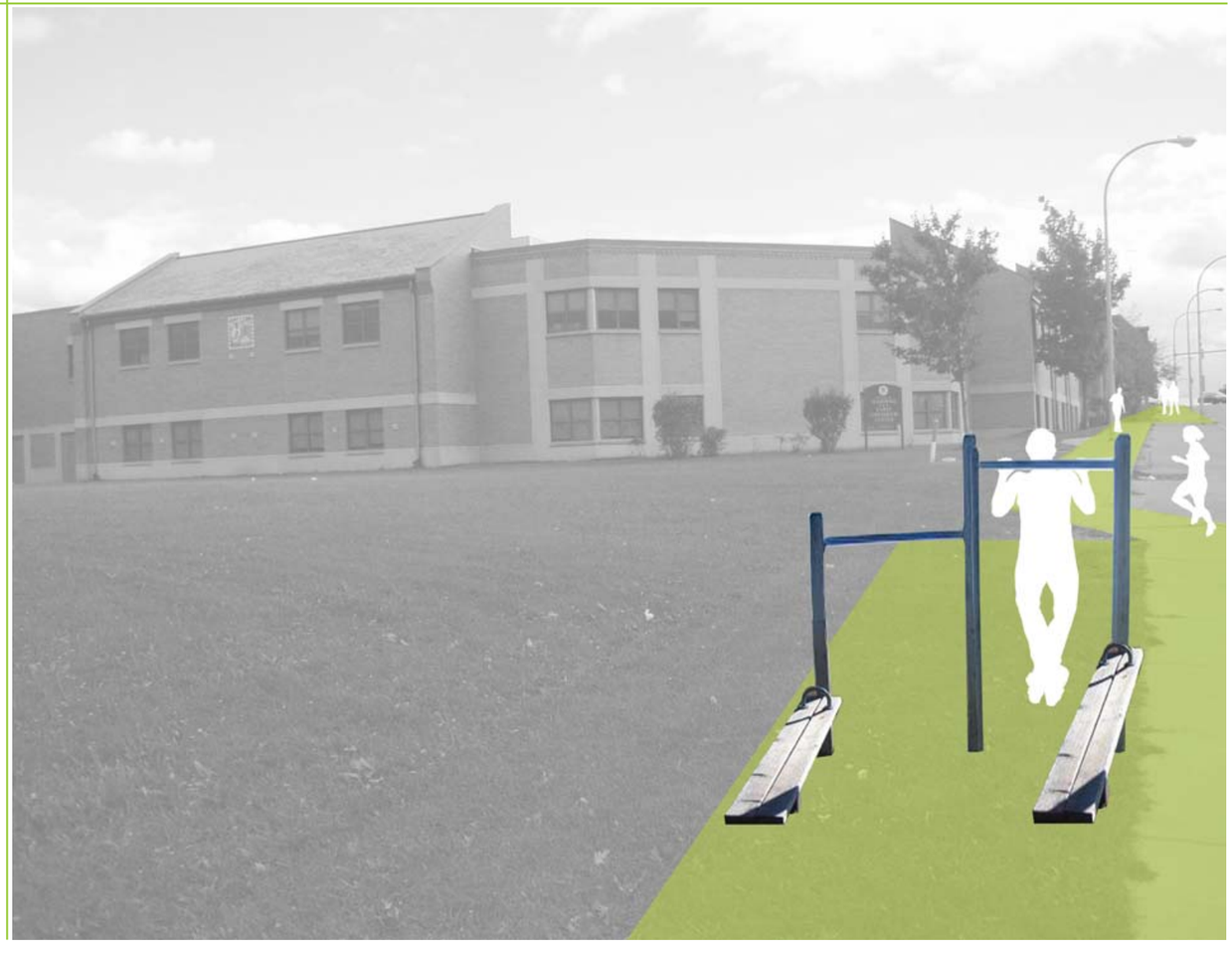


FUTURE
SUMMER



FUTURE
WINTER

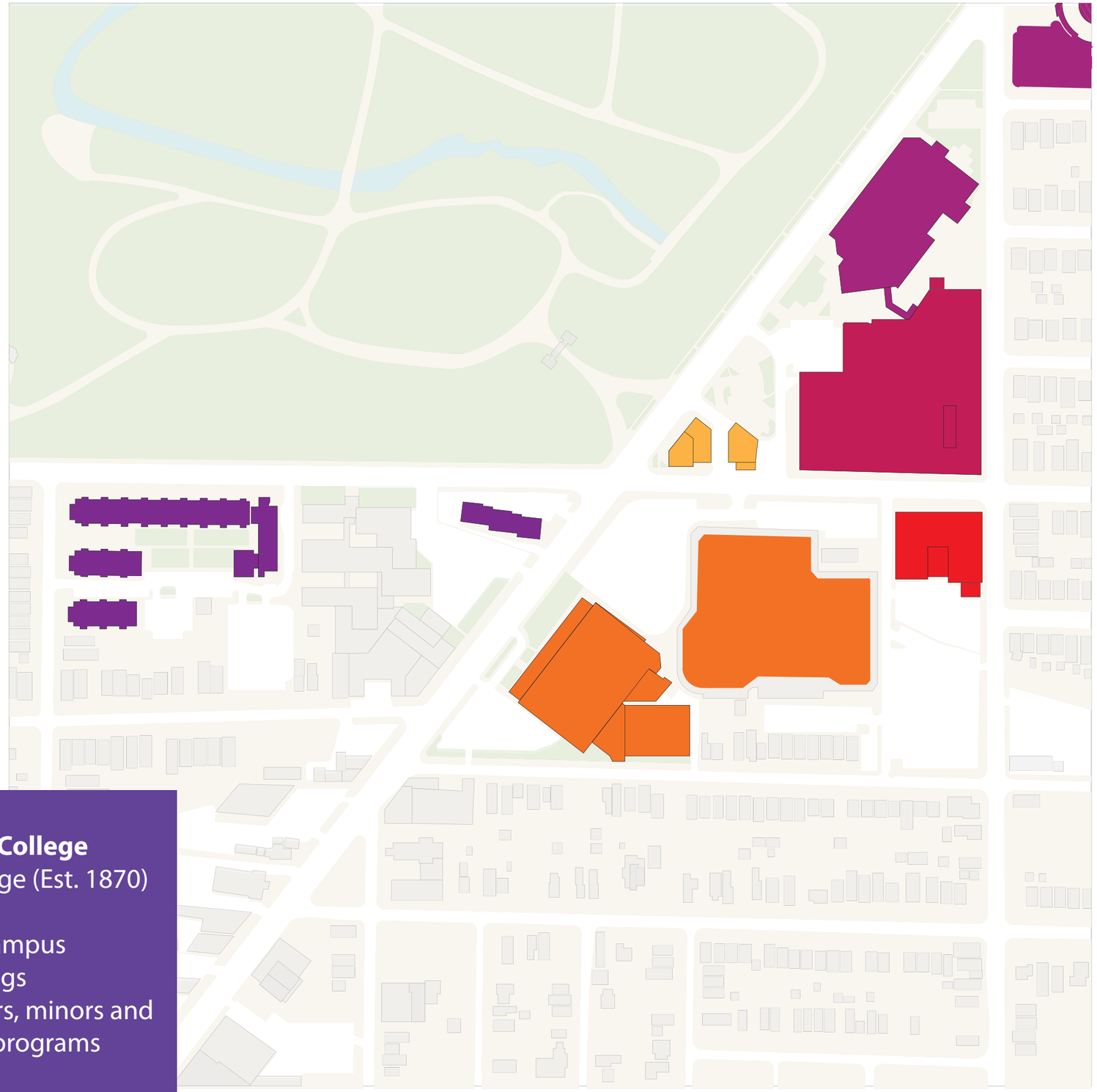




anchoring the network

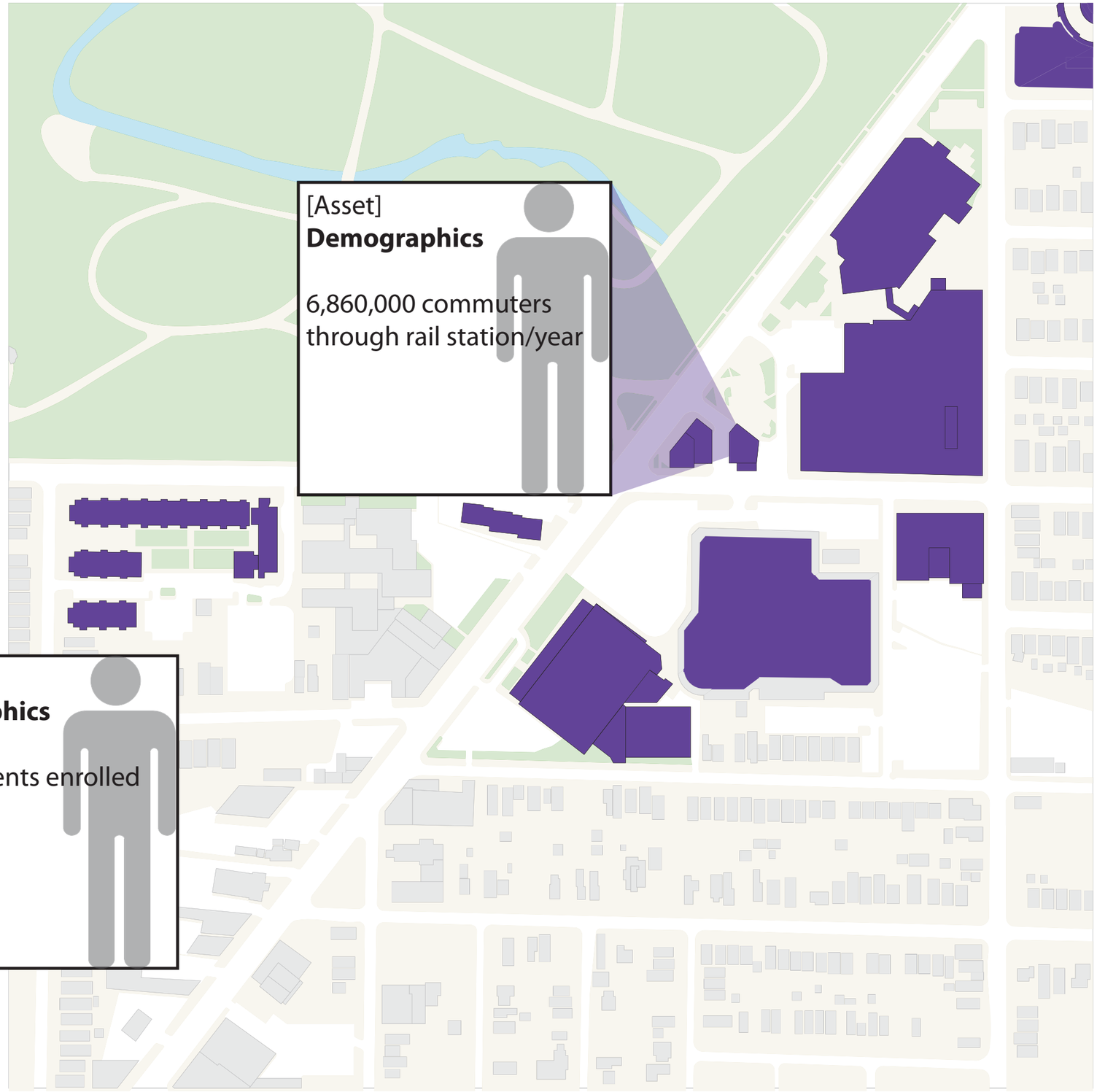

N
deciduous trees
evergreen trees
green space
stream
existing buildings
concrete
roads
50’
100’

Existing Site



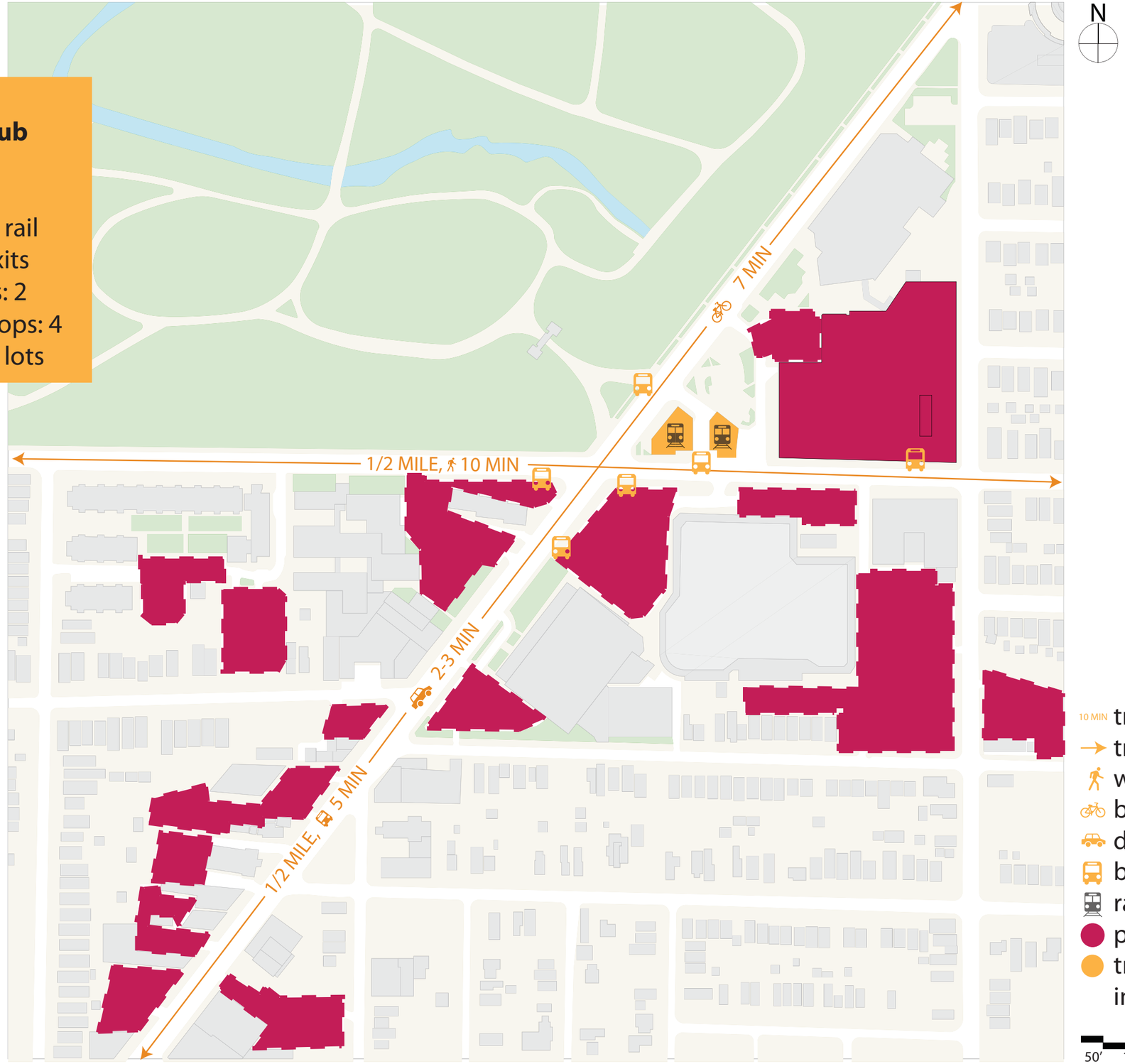
[Asset]
Carnesius College
Jesuit college (Est. 1870)

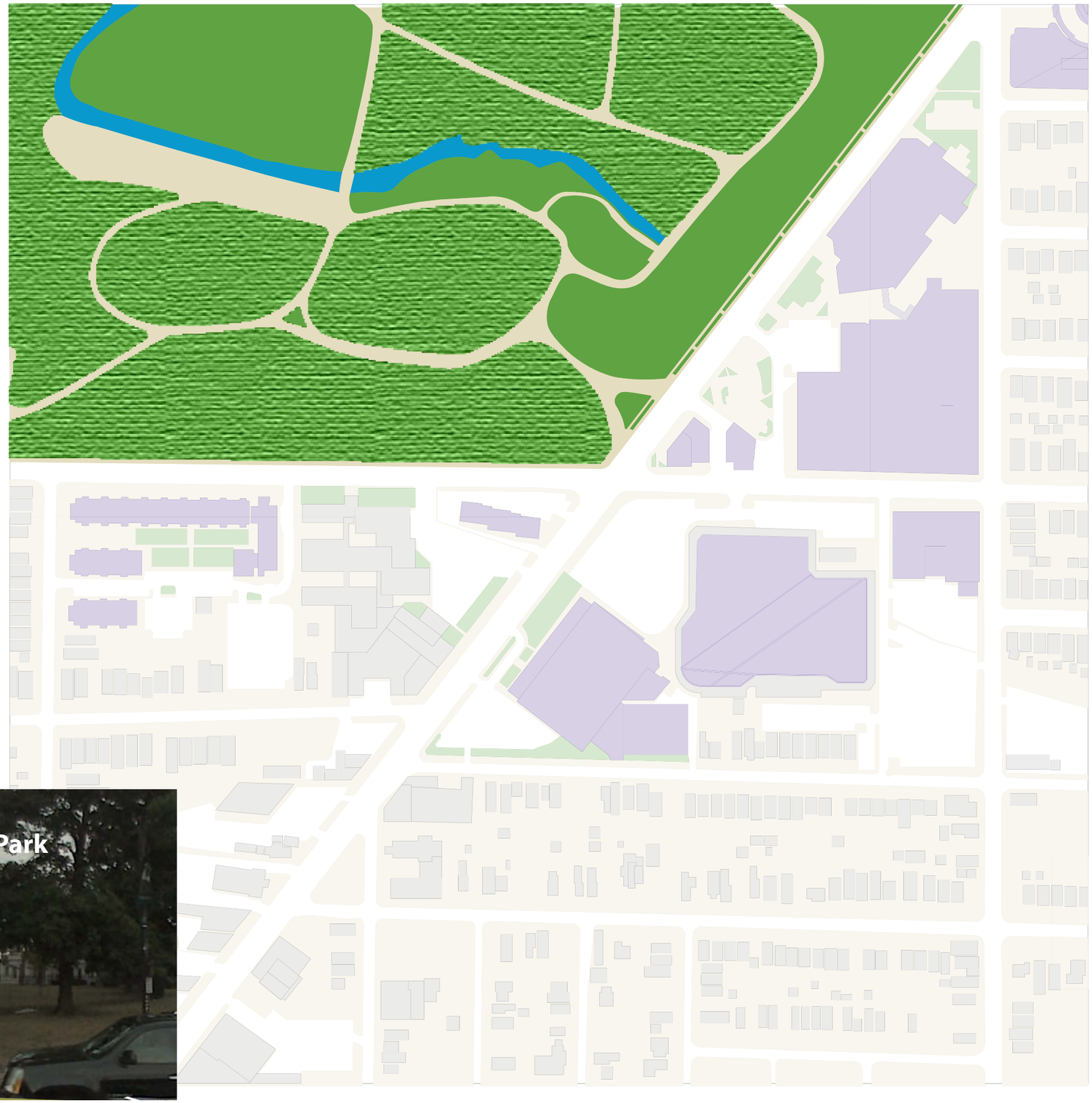
_77-acre campus
_32 buildings
_70+ majors, minors and specialty programs


[Asset]
Demographics
6,860,000 commuters
through rail station/year
[Asset]
Demographics
4,850 students enrolled
N
campus buildings
50'
100'

[Asset]
Transportation Hub and Parking Lots

_Delavan/Canisius rail
two entrances/exits
_Main St bus stops: 2
_Delavan St bus stops: 4
_parking garage + lots

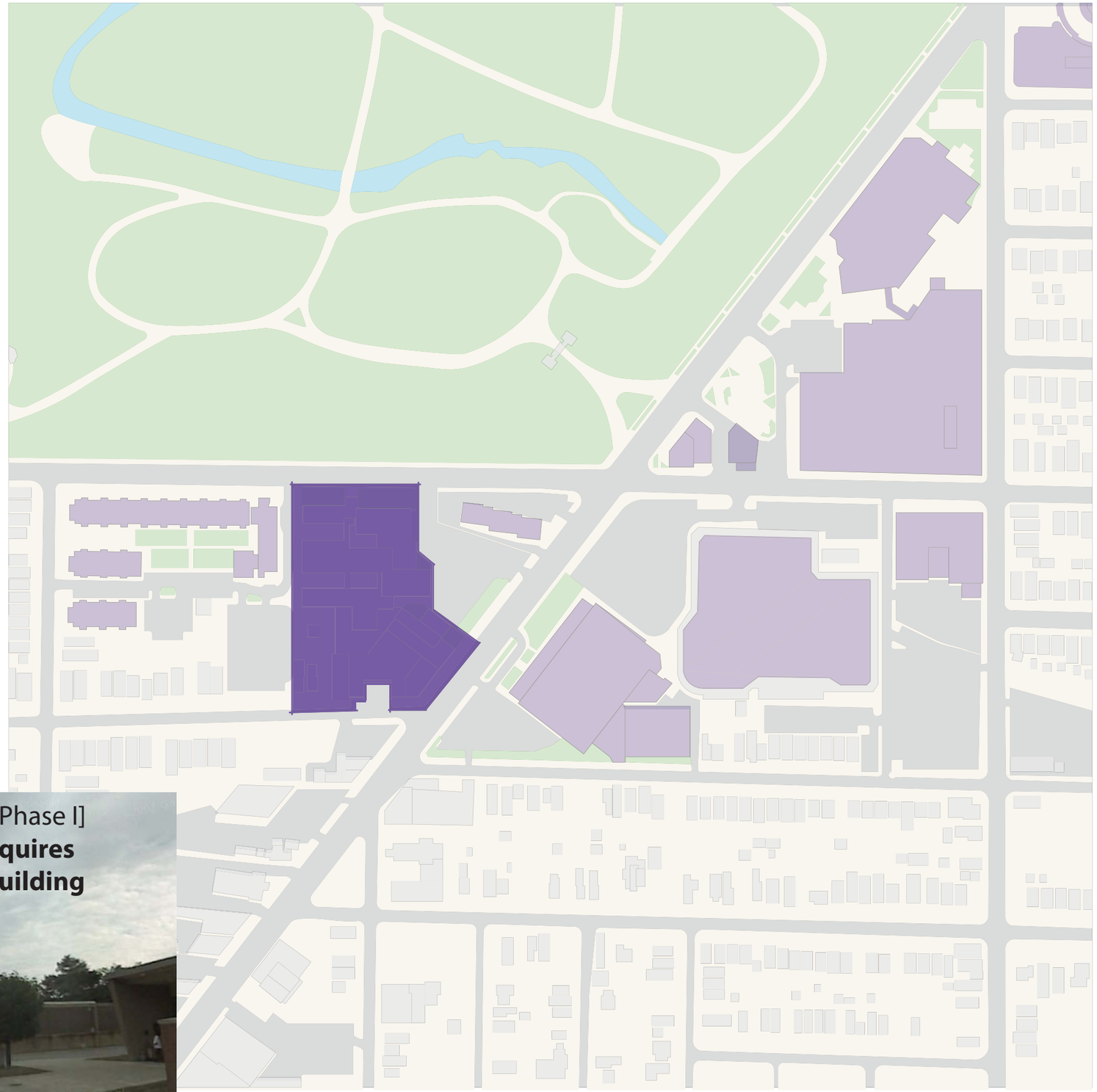



N
concrete
cemetary
green space
stream
campus buildings
50’
100’

[Asset]
Delaware Park
W Delavan Ave


N
[Challenge]
Lack of Some Sidewalks & Busy Major Intersection
challenging infrastructure
existing buildings
50'
100'

[Challenge]
Non-College Building Dividing the Campus



[Proposal - Phase I]
College Acquires Dividing Building

[Proposal - Phase II]
Reconceptualize Relationship to Area

developing the anchor

buffalo food path

1

2

3

ADA

private (residential)
semi-private (academic)
public (agricultural)

N

10' 50' 100'

florist
equipment rental and repair
grocery
grocery
mtg room
WC
WC
mtg room
community mtg space
office
office
office
office
office
employment services
WC
WC
reception
public ag
classroom
classroom
office
exam rm
exam rm
exam rm
procedure room
storage
clinic
office
file room
office
staff lounge
FT faculty office
FT faculty office
PT faculty office
healthy classroom
classroom
classroom
public ag
sun room
community kitchen
computer lab
lab
lab
computer lab
classroom
classroom
classroom
classroom
public ag
public ag
public ag
public ag
ADA
ADA
ADA
ADA
58
57
56
55
54
53
52
51
50
49
48
47
46
45
44
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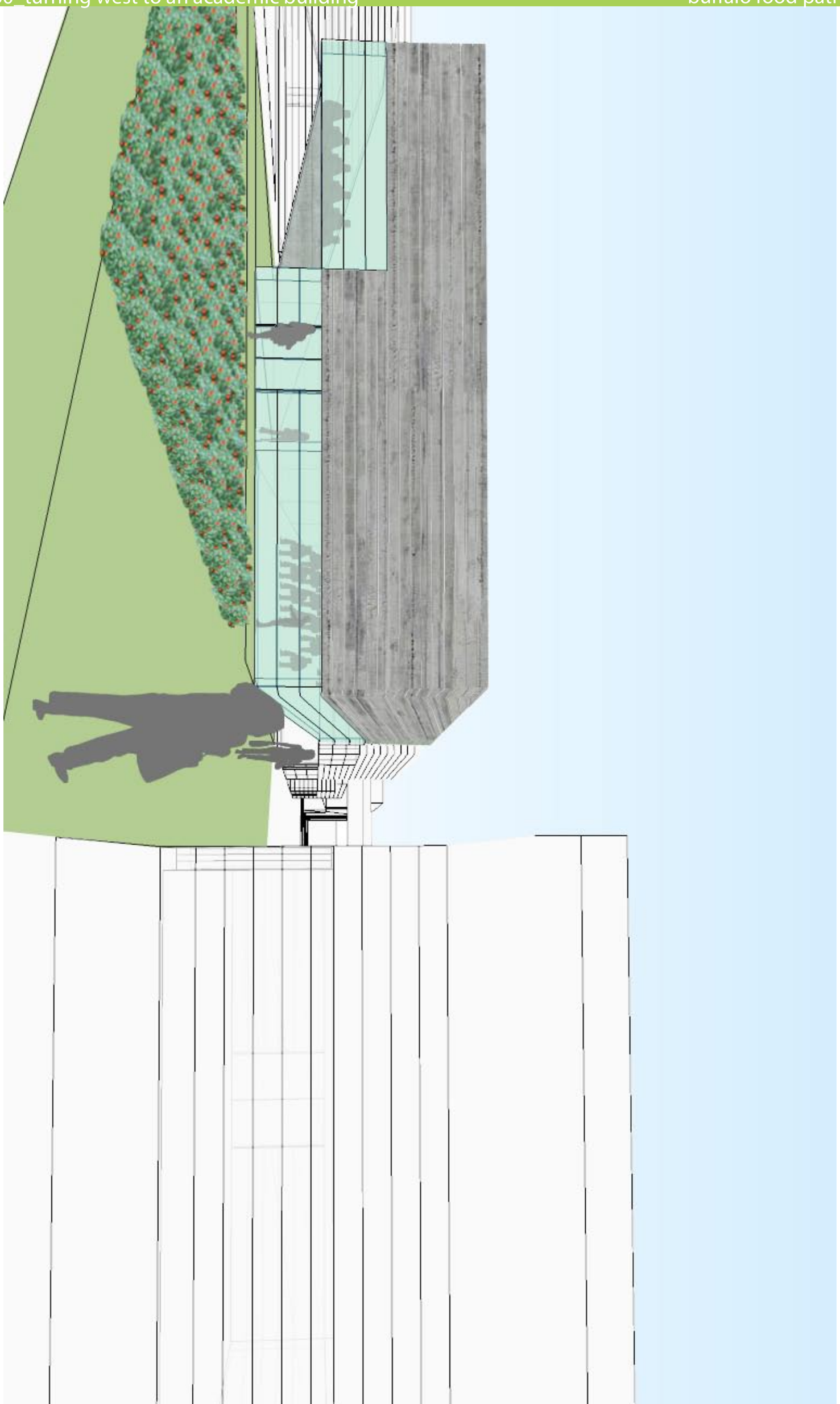
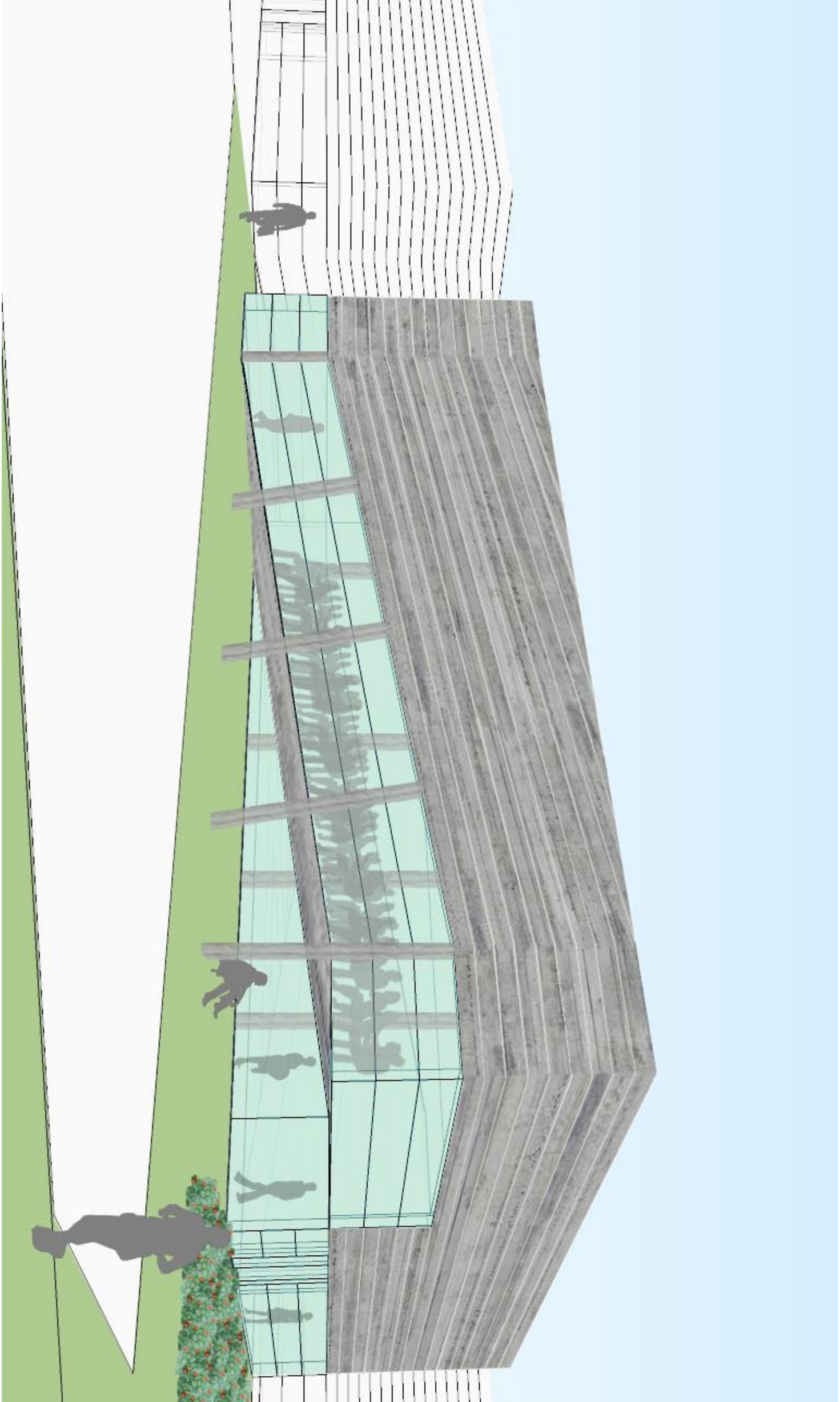
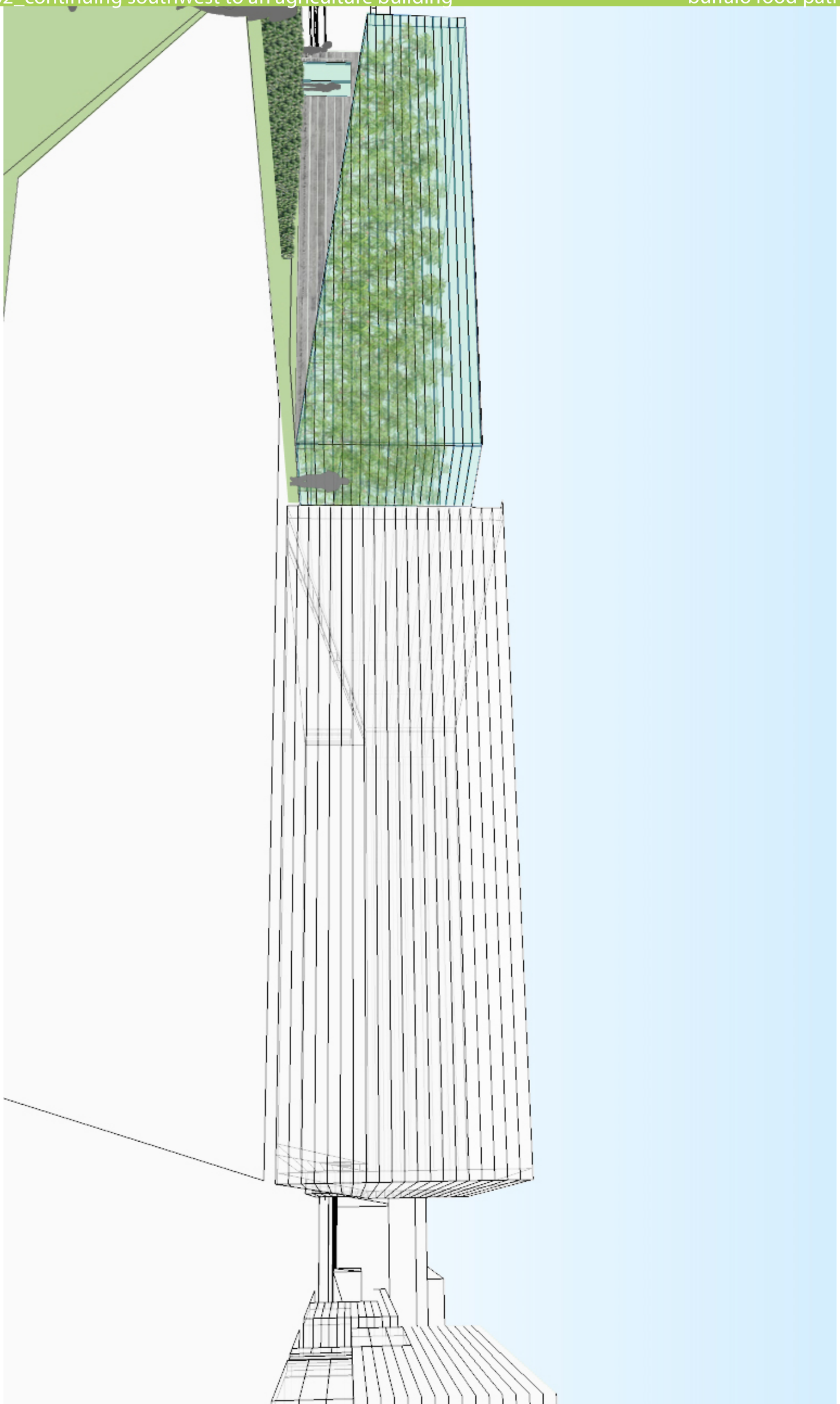
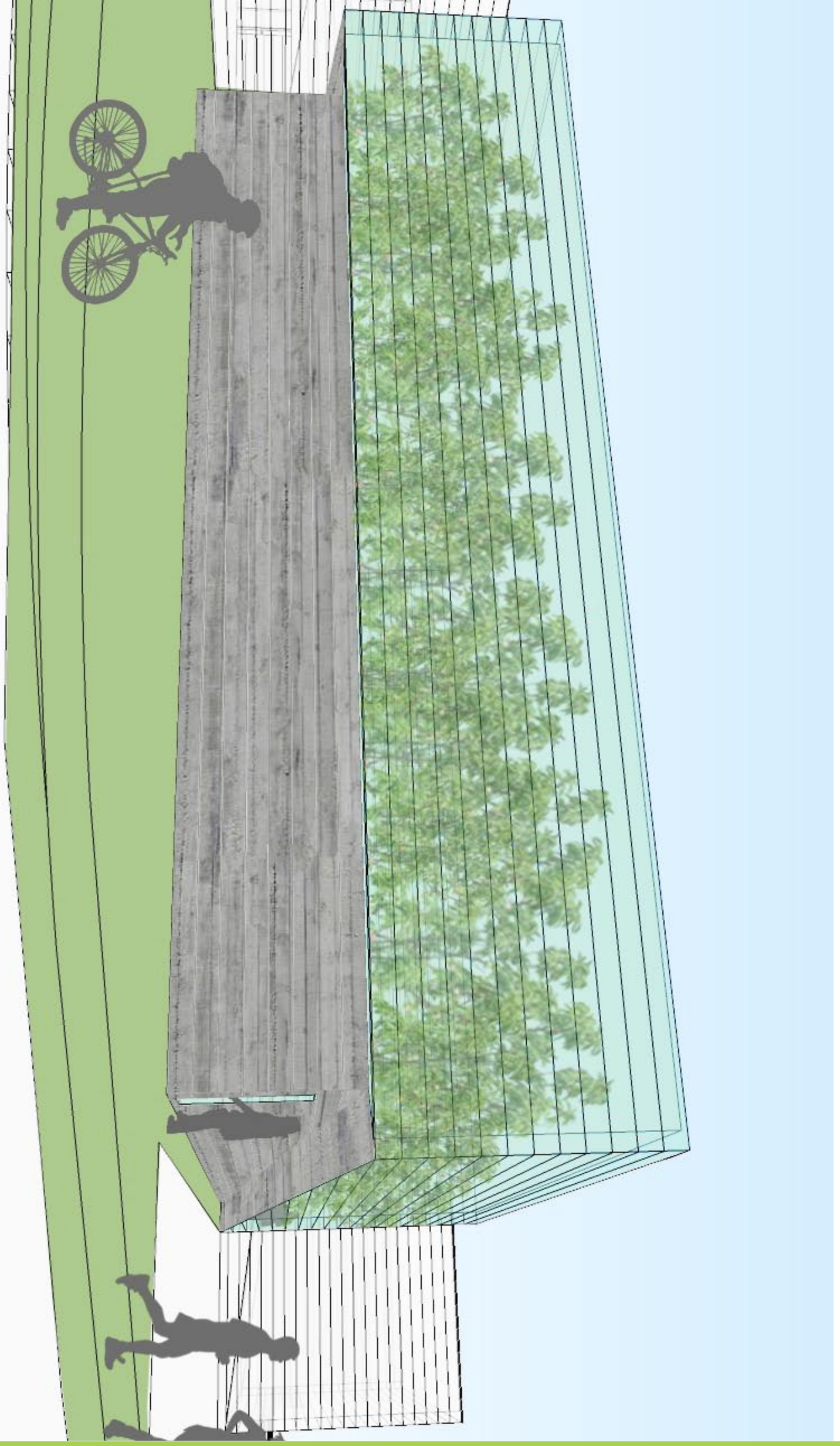
38
25
24
23
22
21
20
19
18
17
16
15
14
13
1
2
5
6
7
8
10
11
12
buffalo food path
N
10’
50’
100’
57_site plan

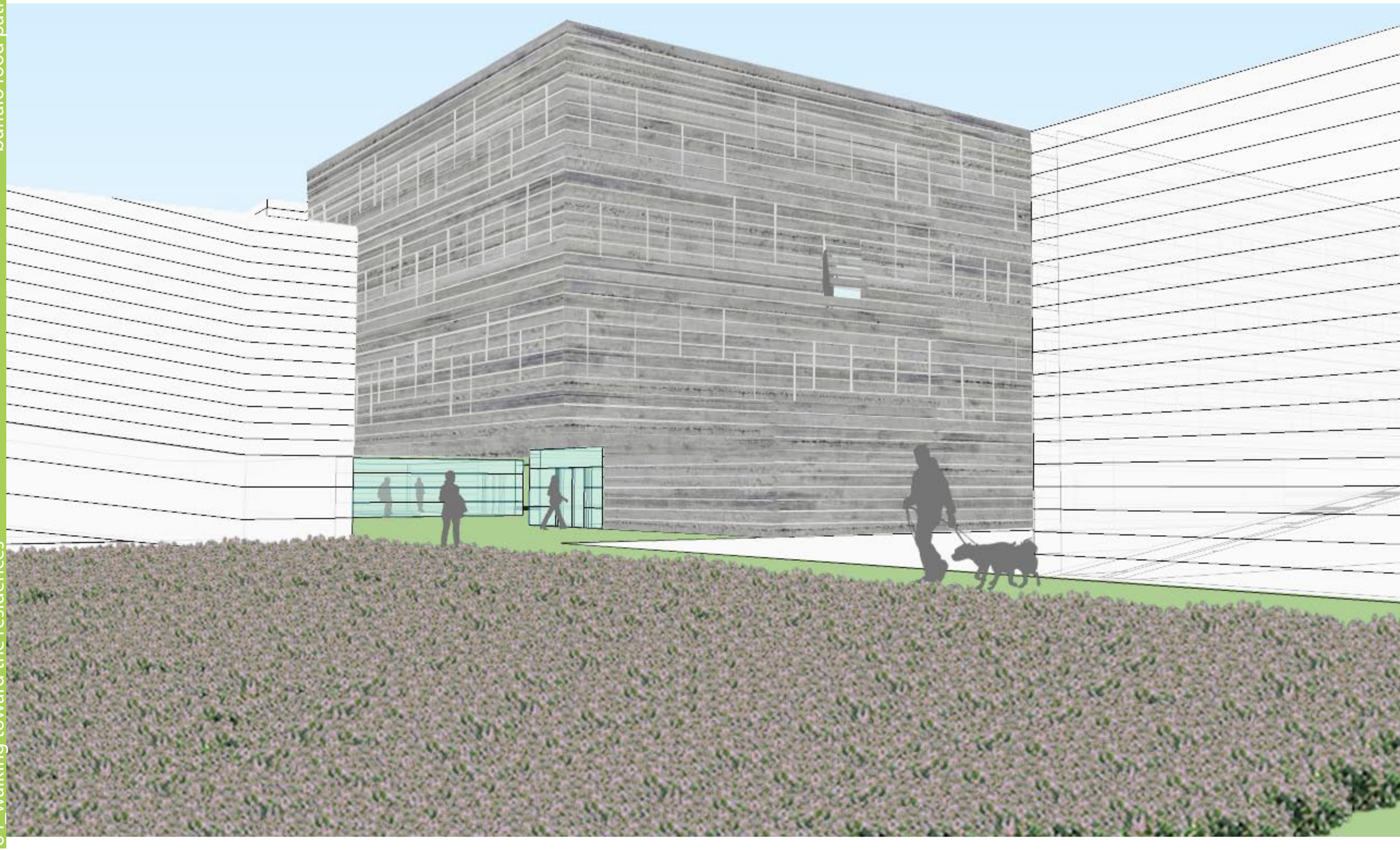
59_walking southwest along the site







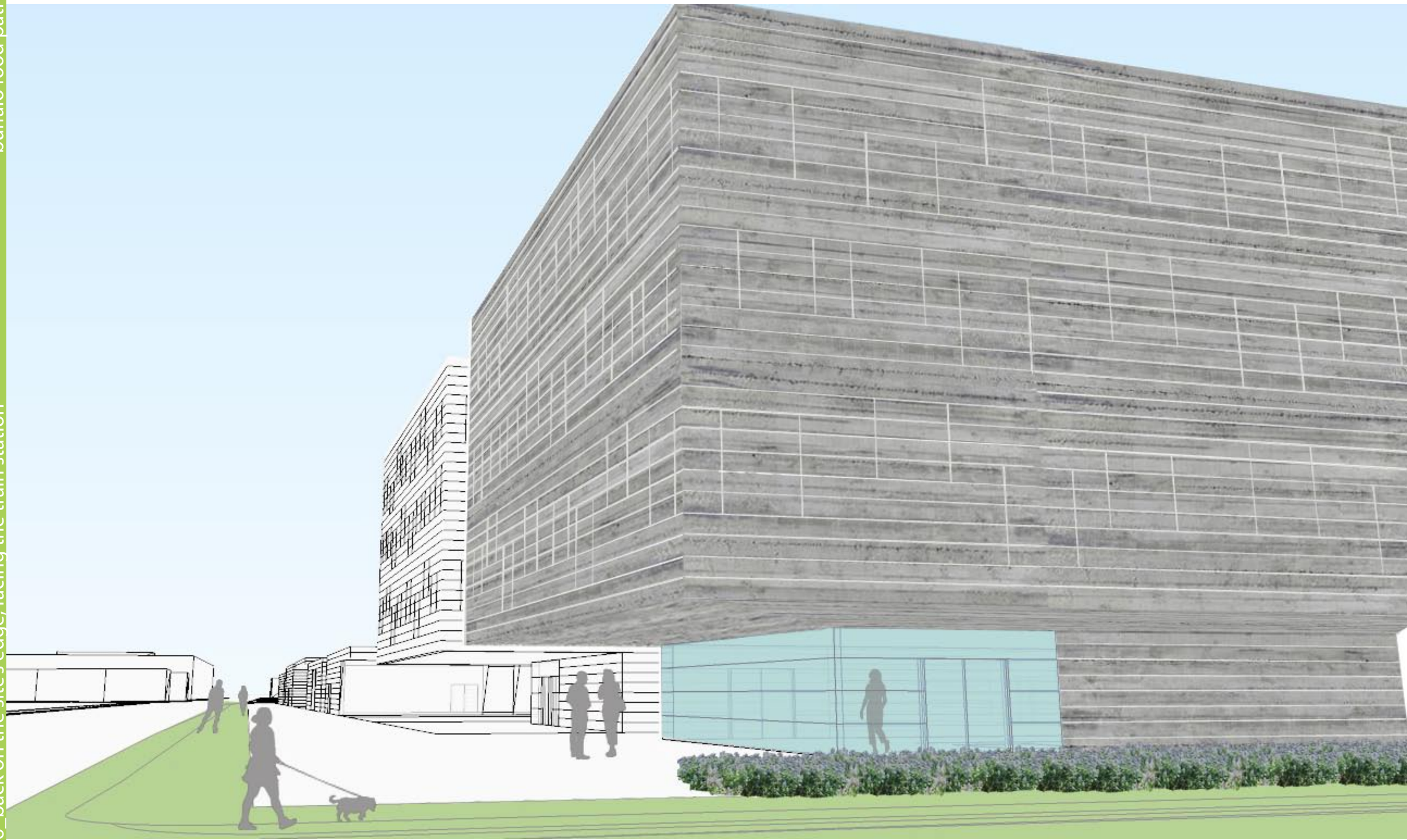




64_ walking toward the residences

buffalo food path

65_beside the residences facing the park



66_back on the site's edge, facing the train station

AA

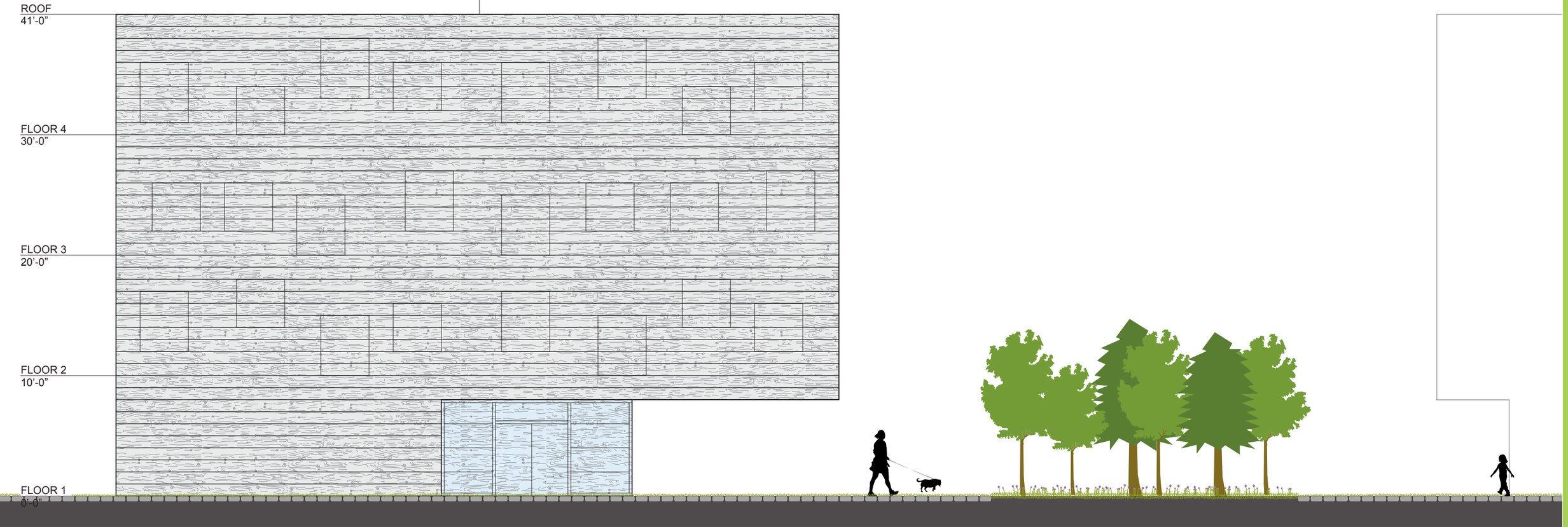
ROOF
41’-0”

FLOOR 4
30’-0”

FLOOR 3
20’-0”

FLOOR 2
10’-0”

FLOOR 1
0’-0”

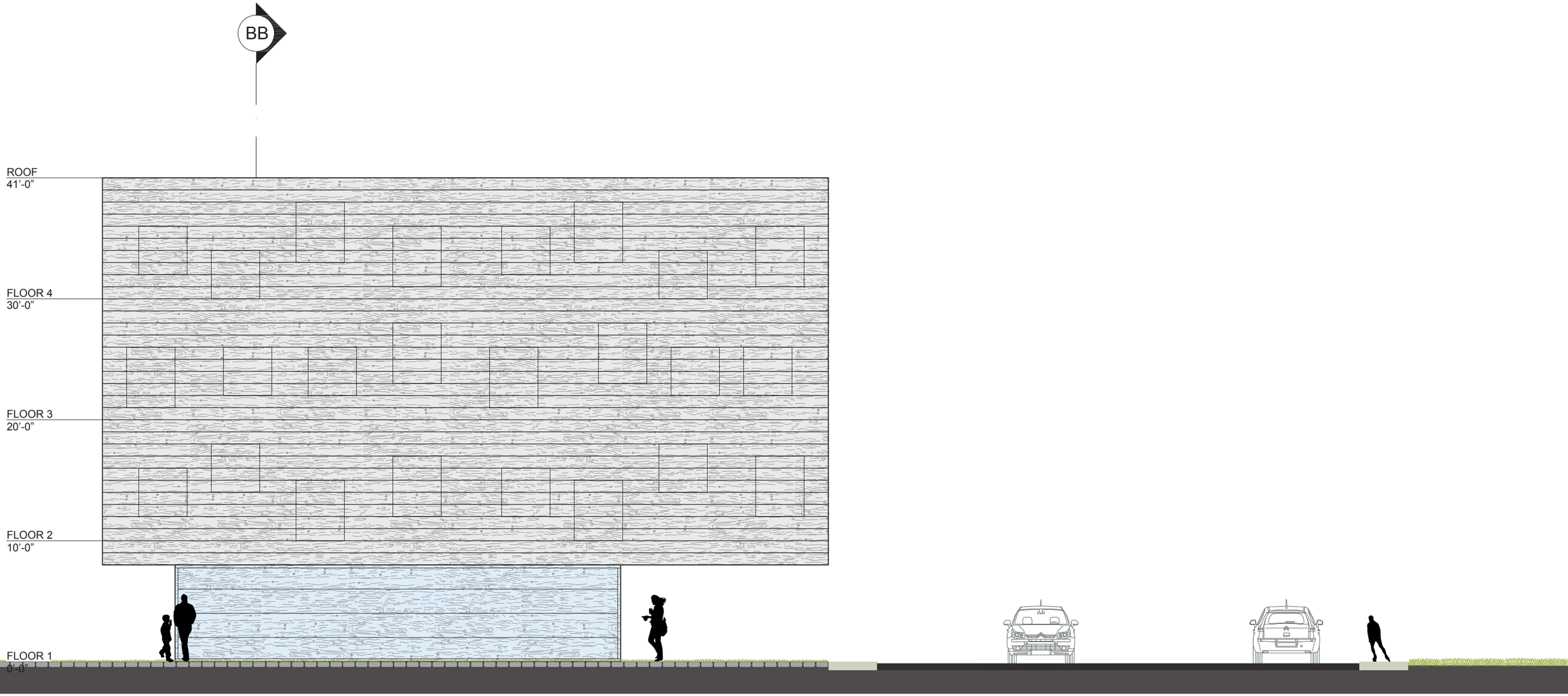


1’ 10’

buffalo food path

67_residences - south

buffalo food path



68_residences - east

AA

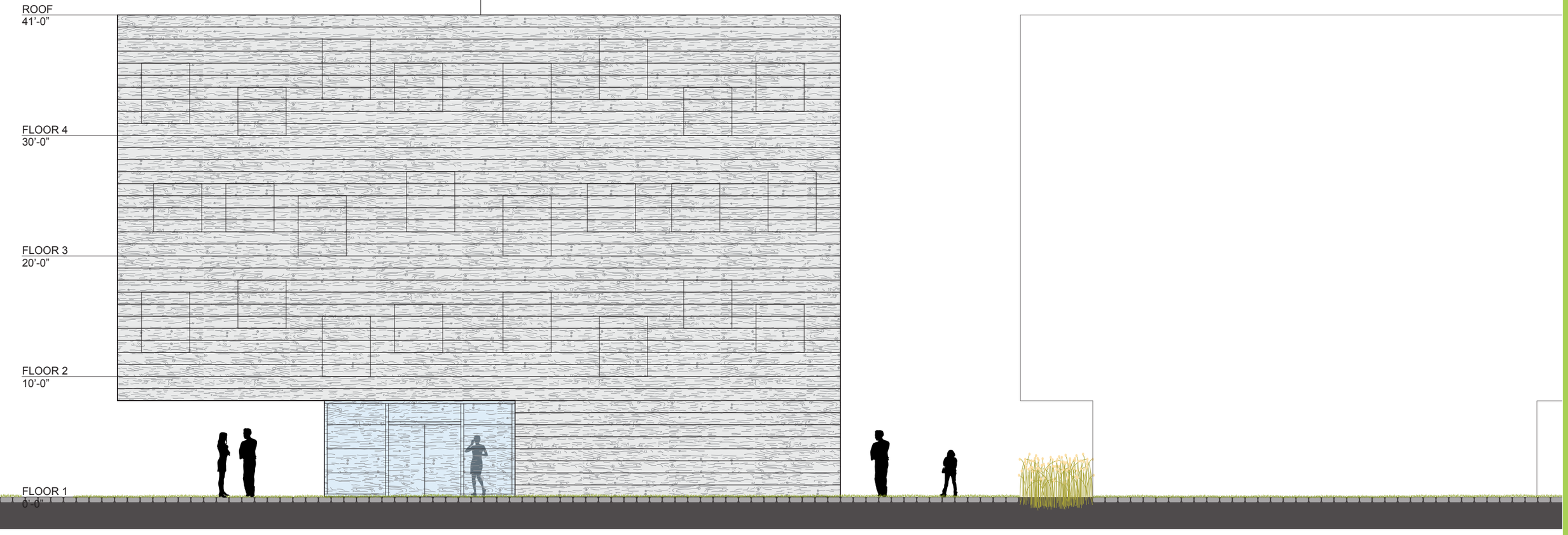
ROOF
41'-0"

FLOOR 4
30'-0"

FLOOR 3
20'-0"

FLOOR 2
10'-0"

FLOOR 1
0'-0"



1' 10'

buffalo food path

69_residences - north

buffalo food path

70_residences - west

BB

ROOF
41'-0"

FLOOR 4
30'-0"

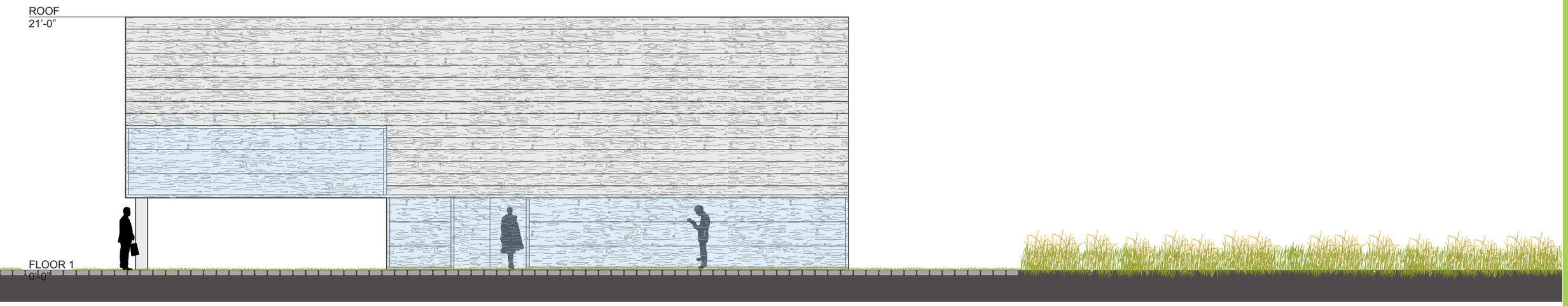
FLOOR 3
20'-0"

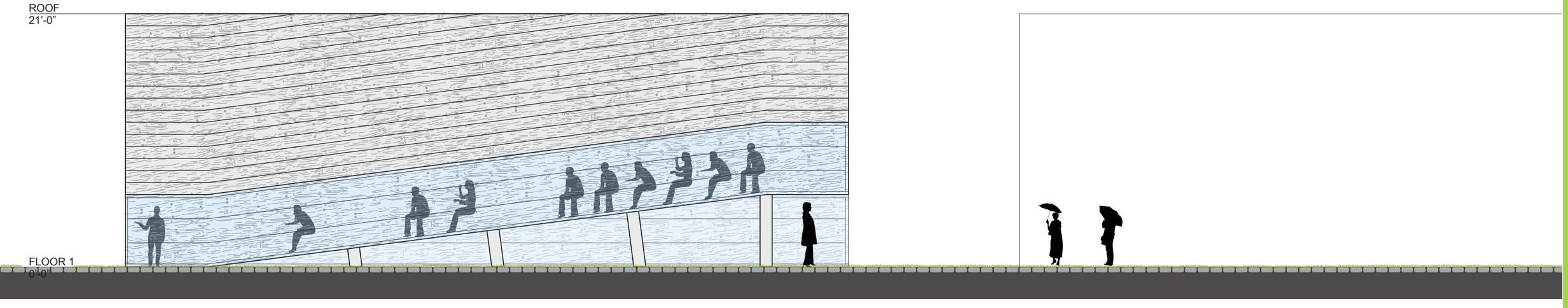
FLOOR 2
10'-0"

FLOOR 1
0'-0"

1'

10'





buffalo food path

71_academic building

1’ 10’

buffalo food path

AA

ROOF
20’-0”

FLOOR 1
0’-0”

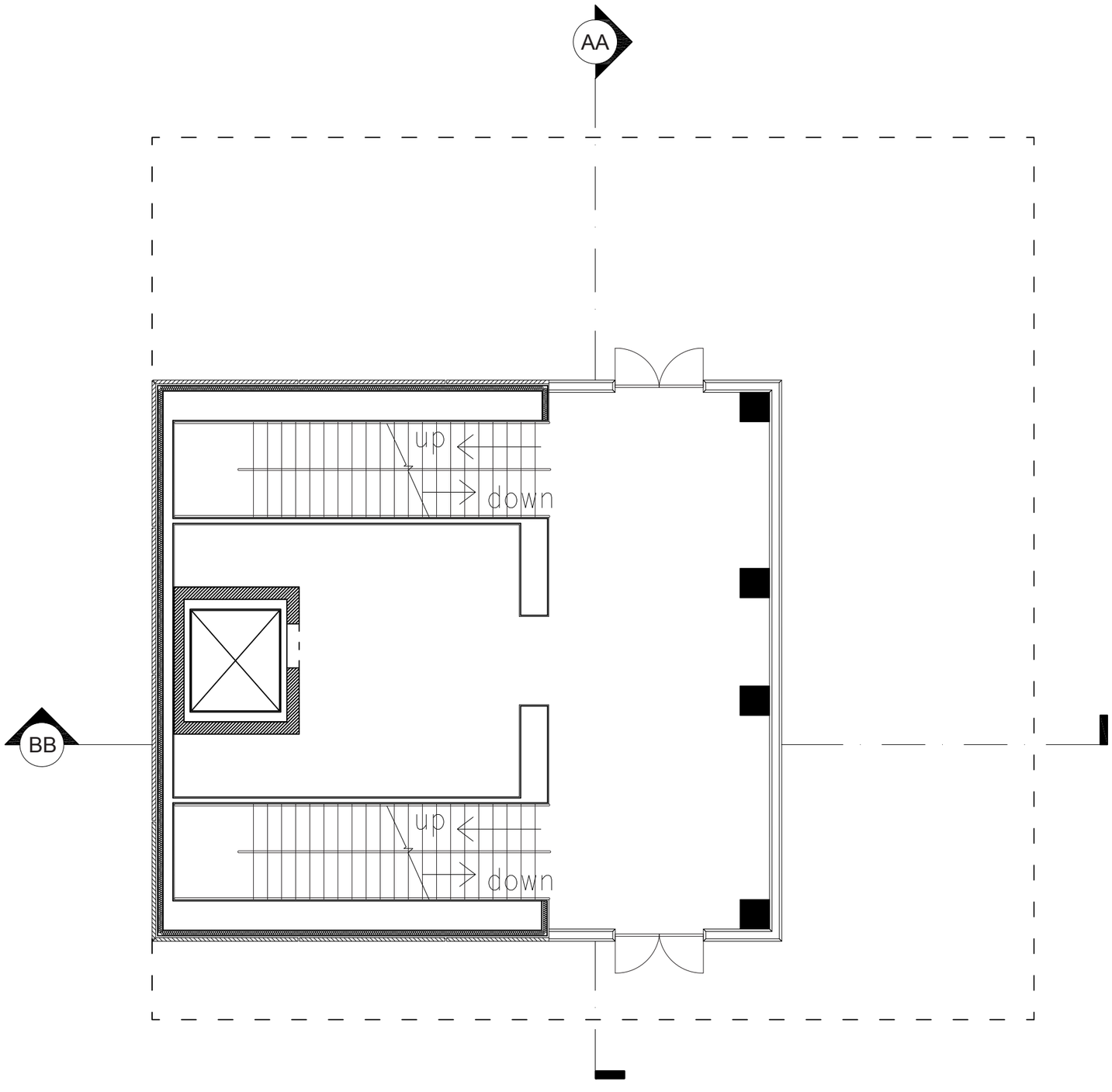
BB

ROOF
20’-0”

FLOOR 1
0’-0”

1’ 10’

72_public agriculture building

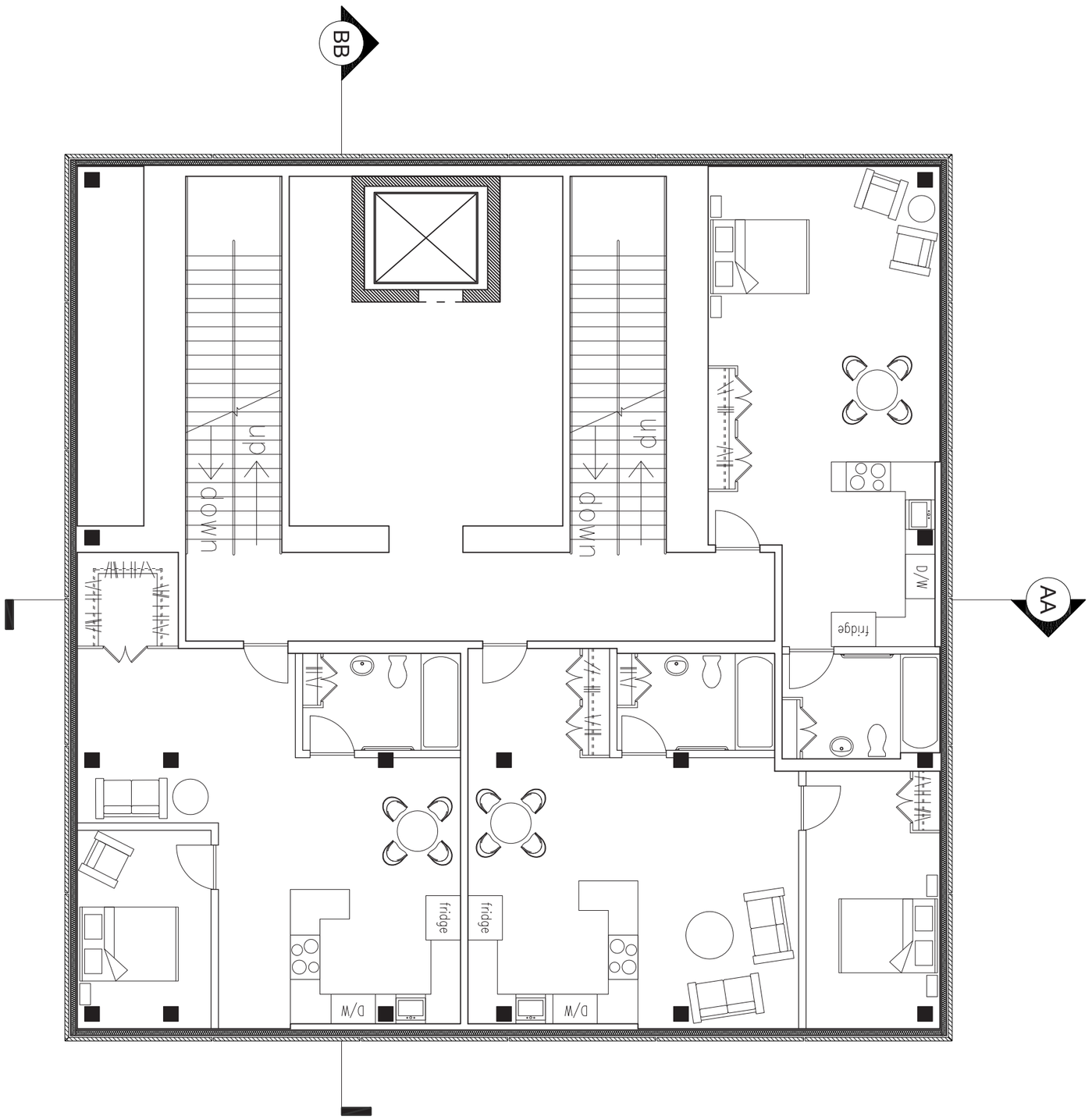


N

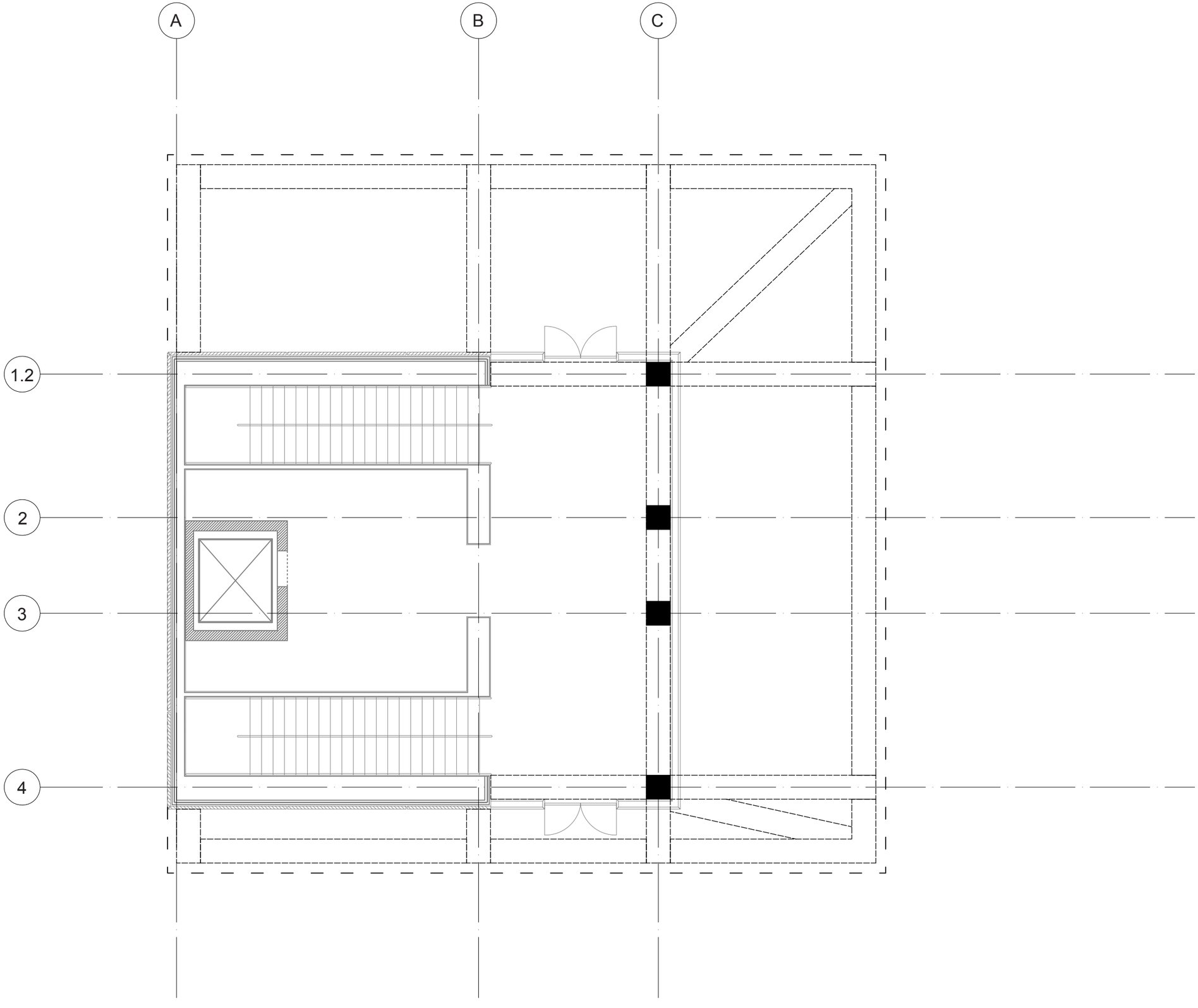
1’ 10’

buffalo food path

73_residences - floorplan 01



1'
10'
N



buffalo food path

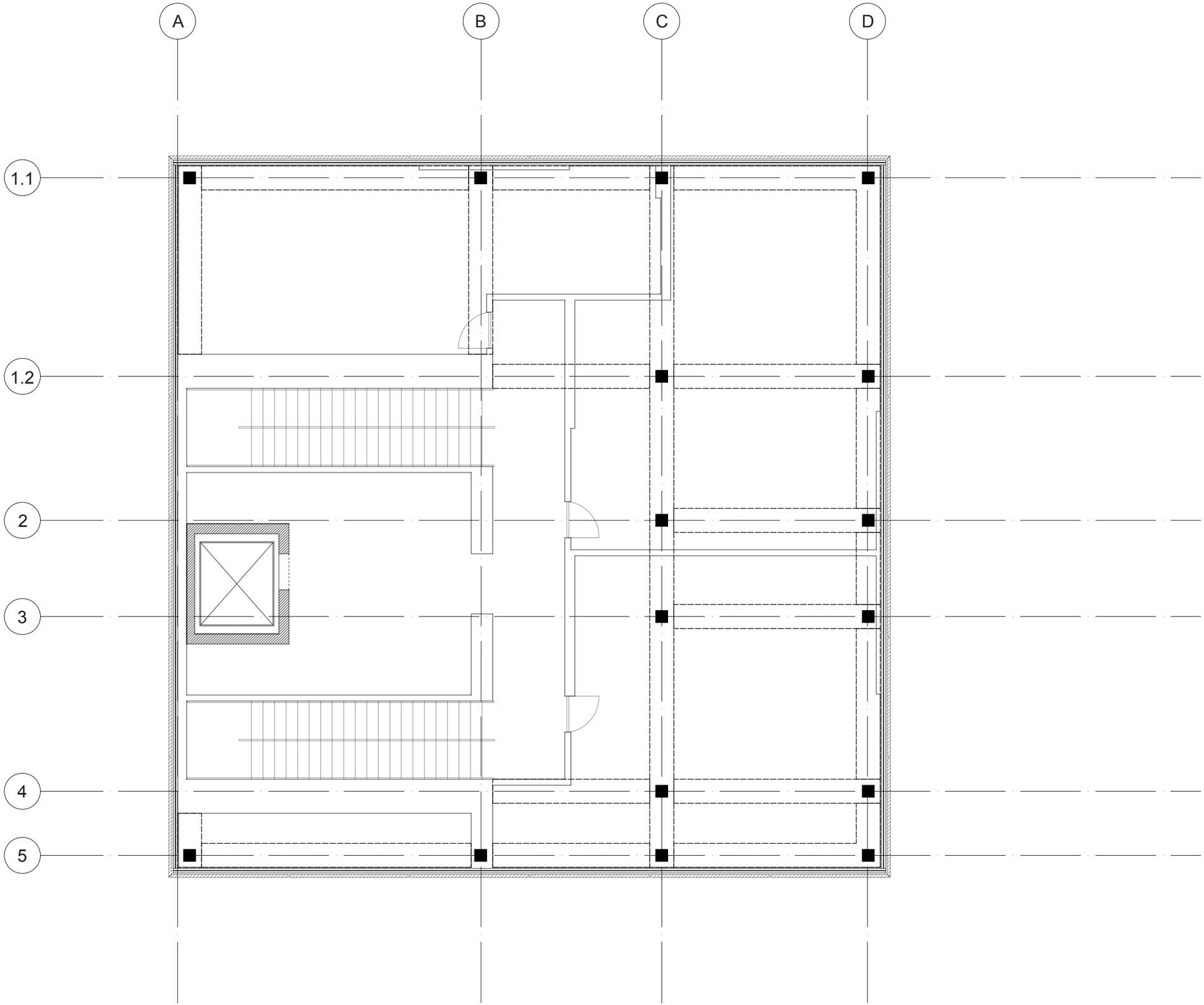
75_residences - structure 01

N

1' 10'

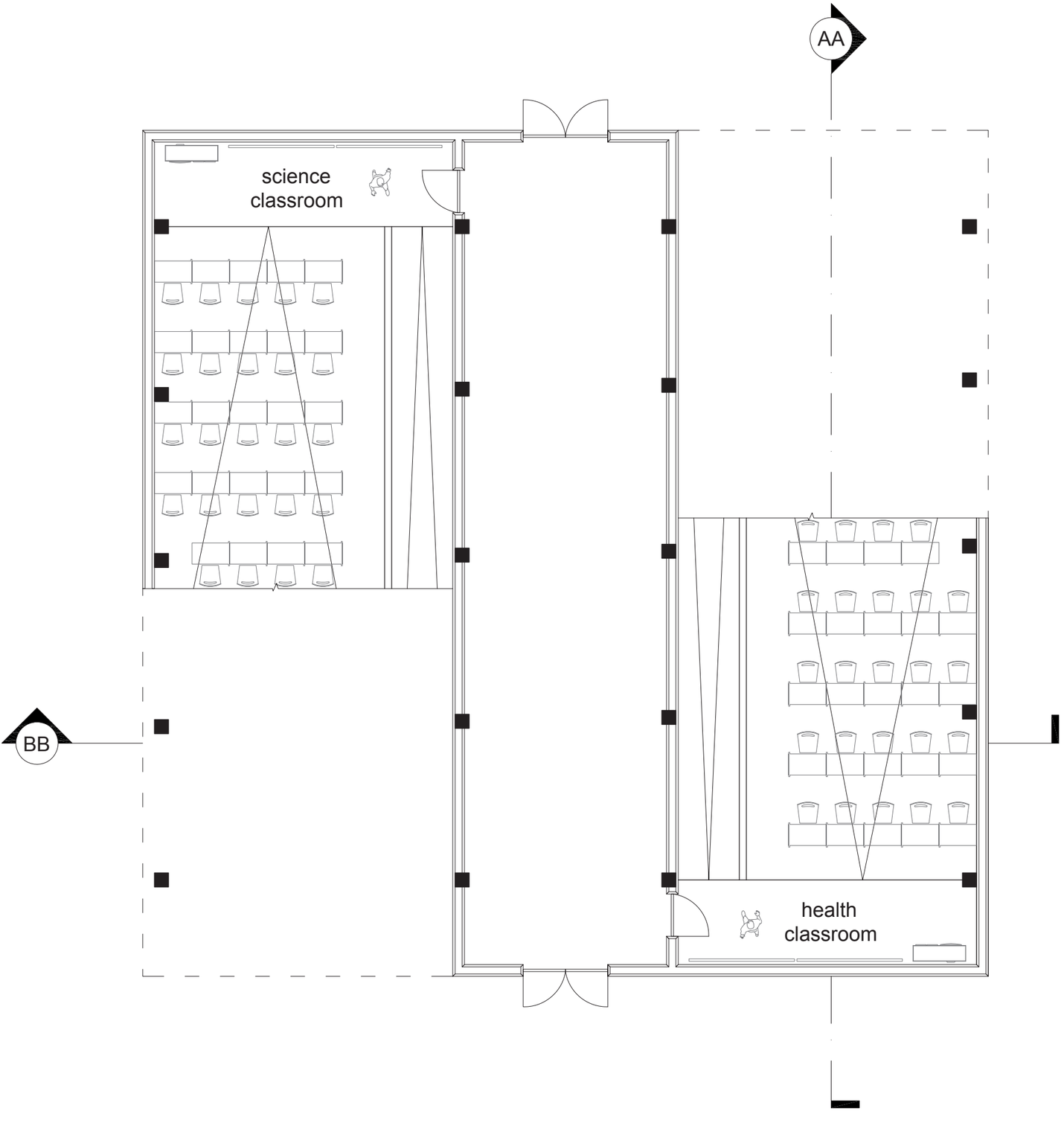
buffalo food path

76_residences - structure 02-04



N

1' 10'

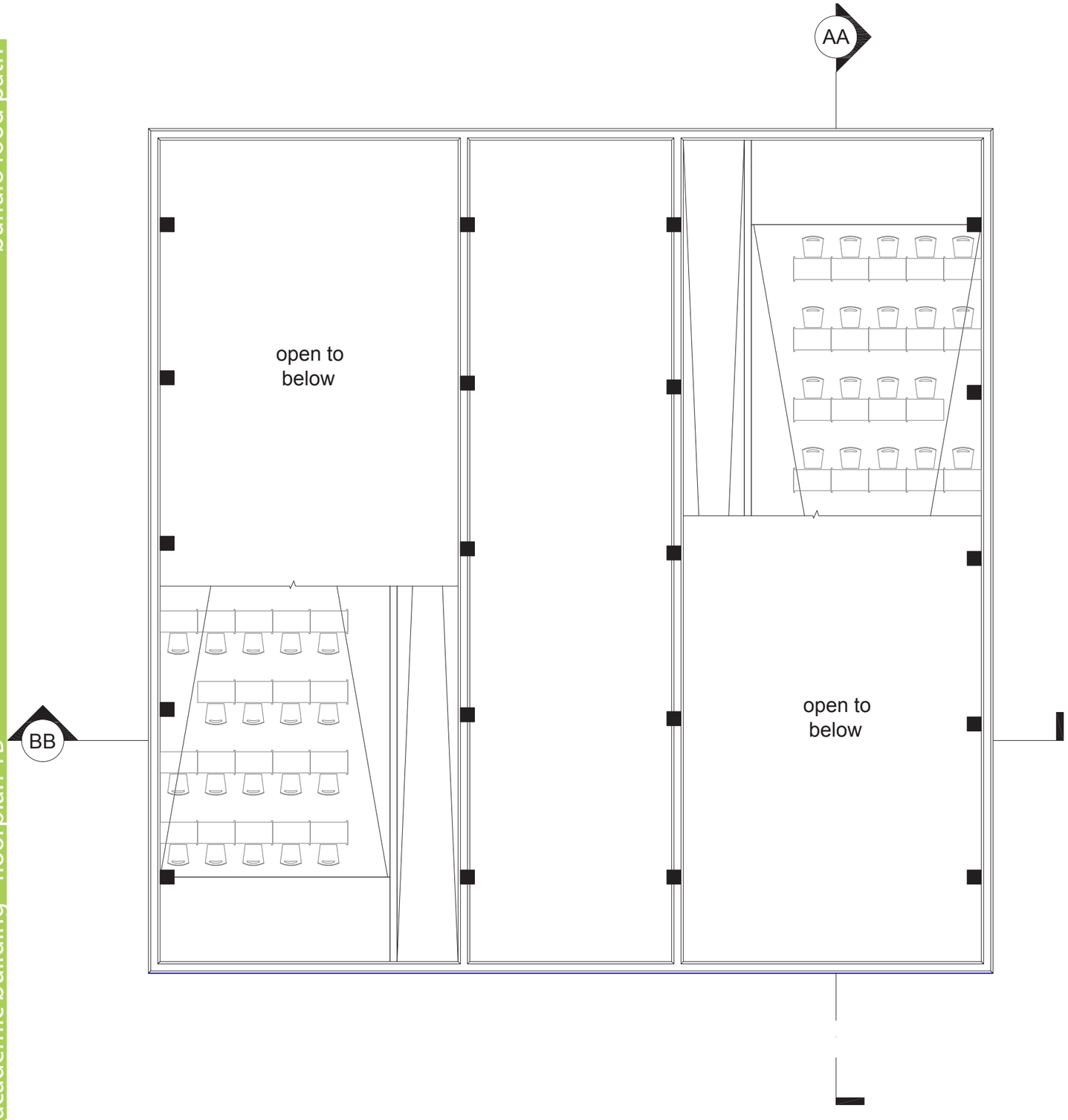


buffalo food path

77_academic building - floorplan 1A

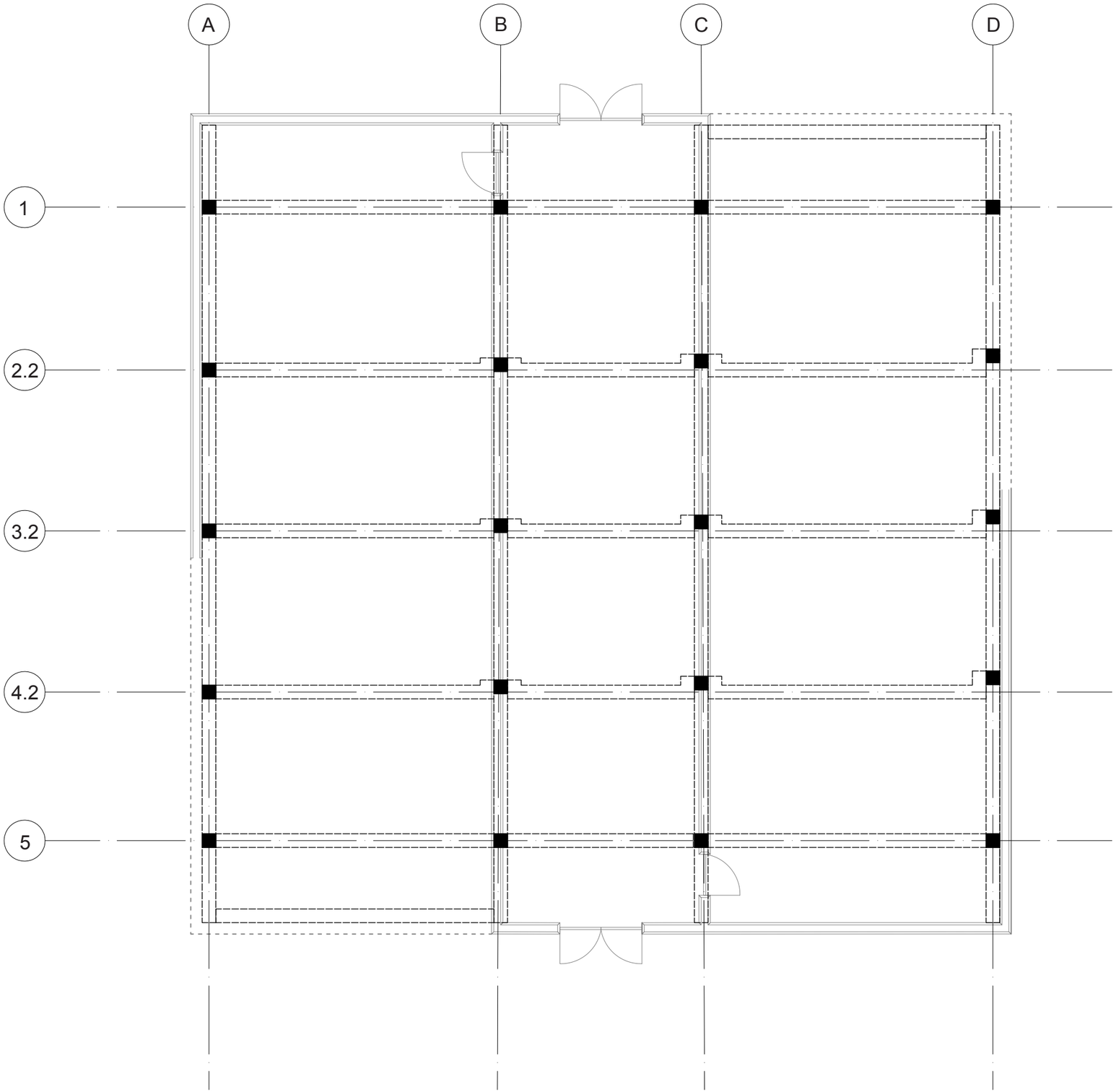
N

1' 10'



N

1’ 10’



buffalo food path

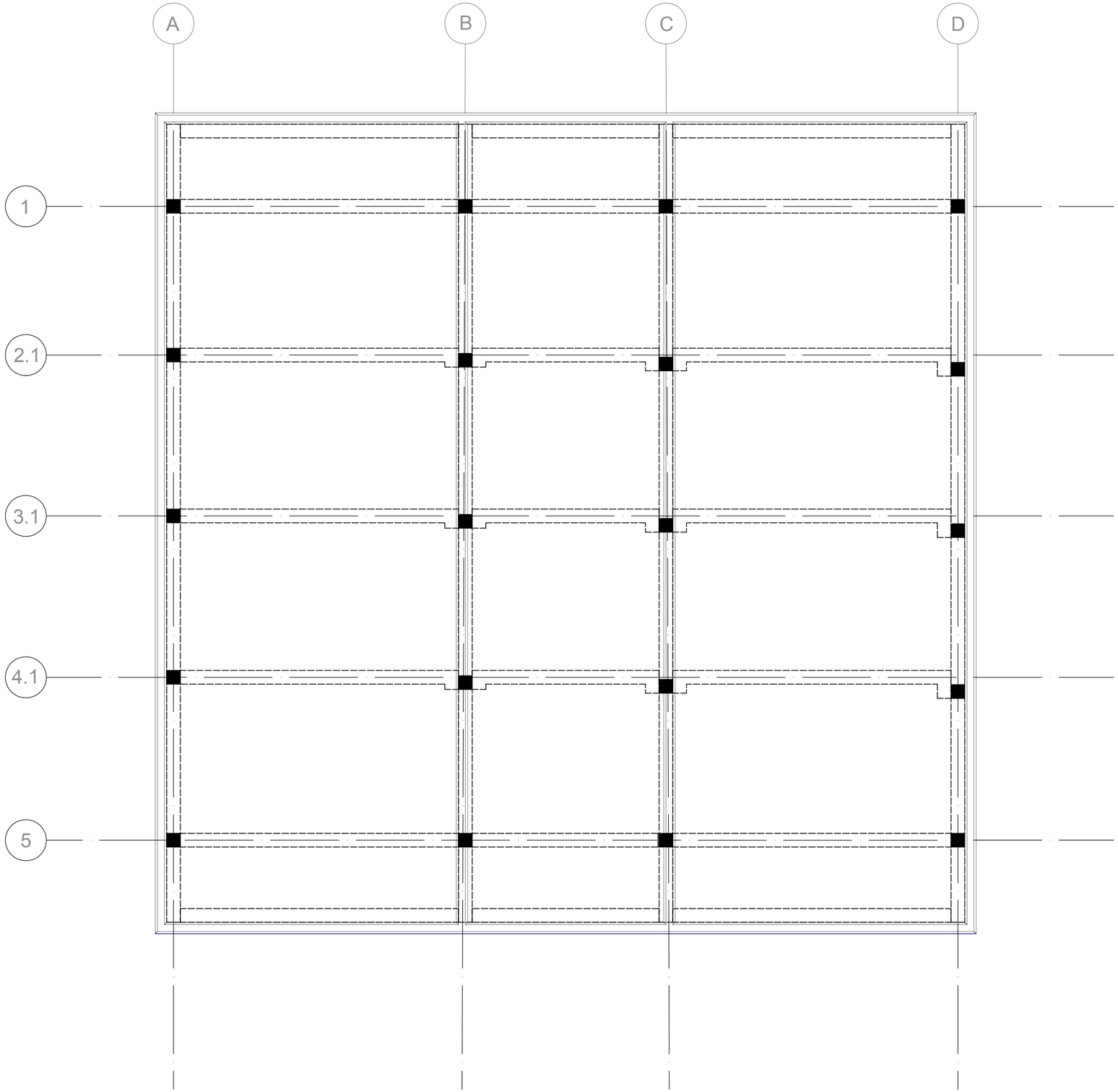
79_academic building - structure 1A

N

1’ 10’

buffalo food path

80_academic building - structure 1B



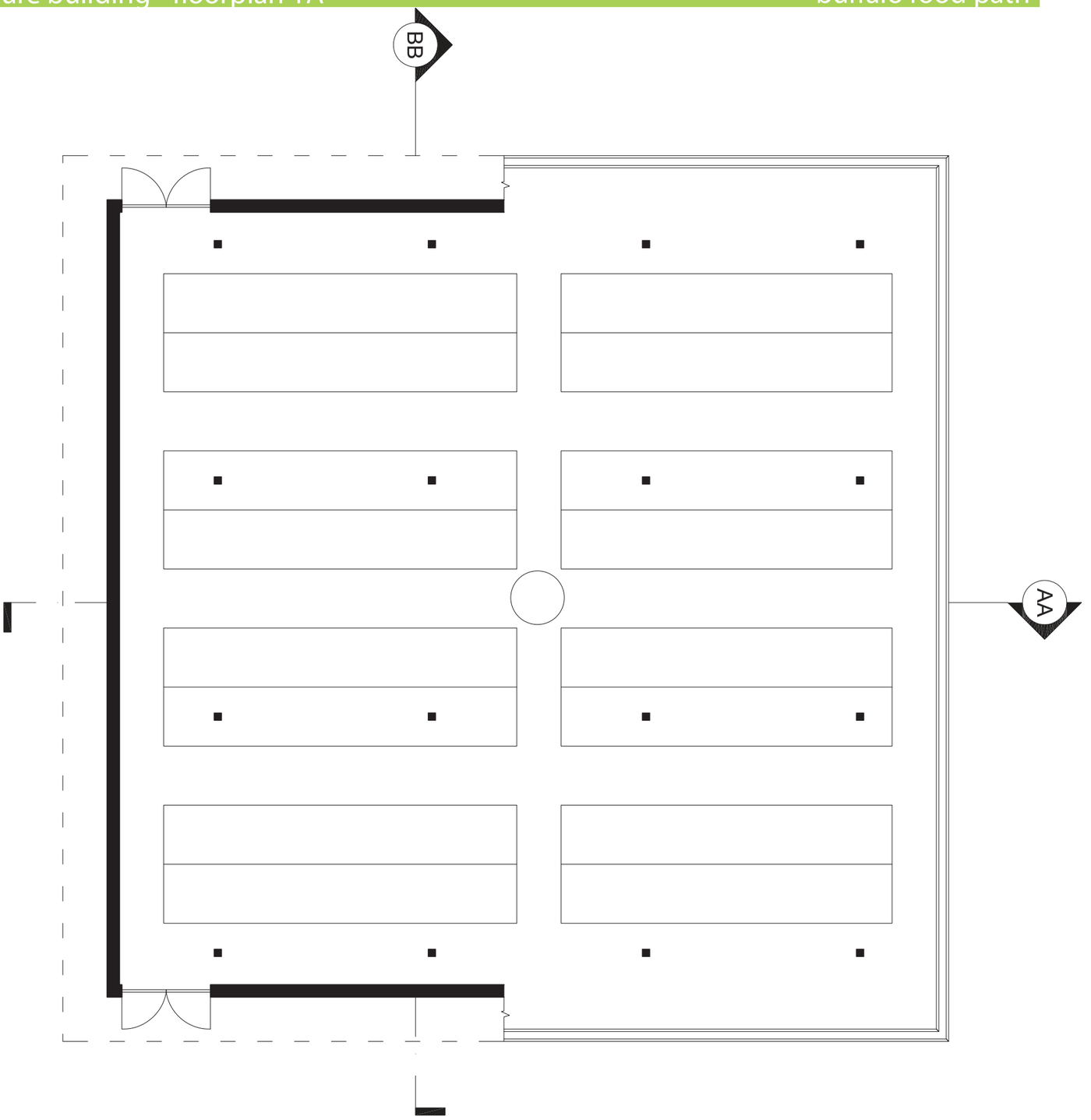
N

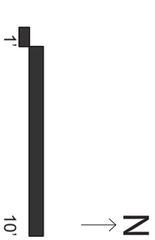
1' 10'

N

1’ 10’

81_academic building - roof plan


BB
AA


1'
10'
N

AA

BB

N

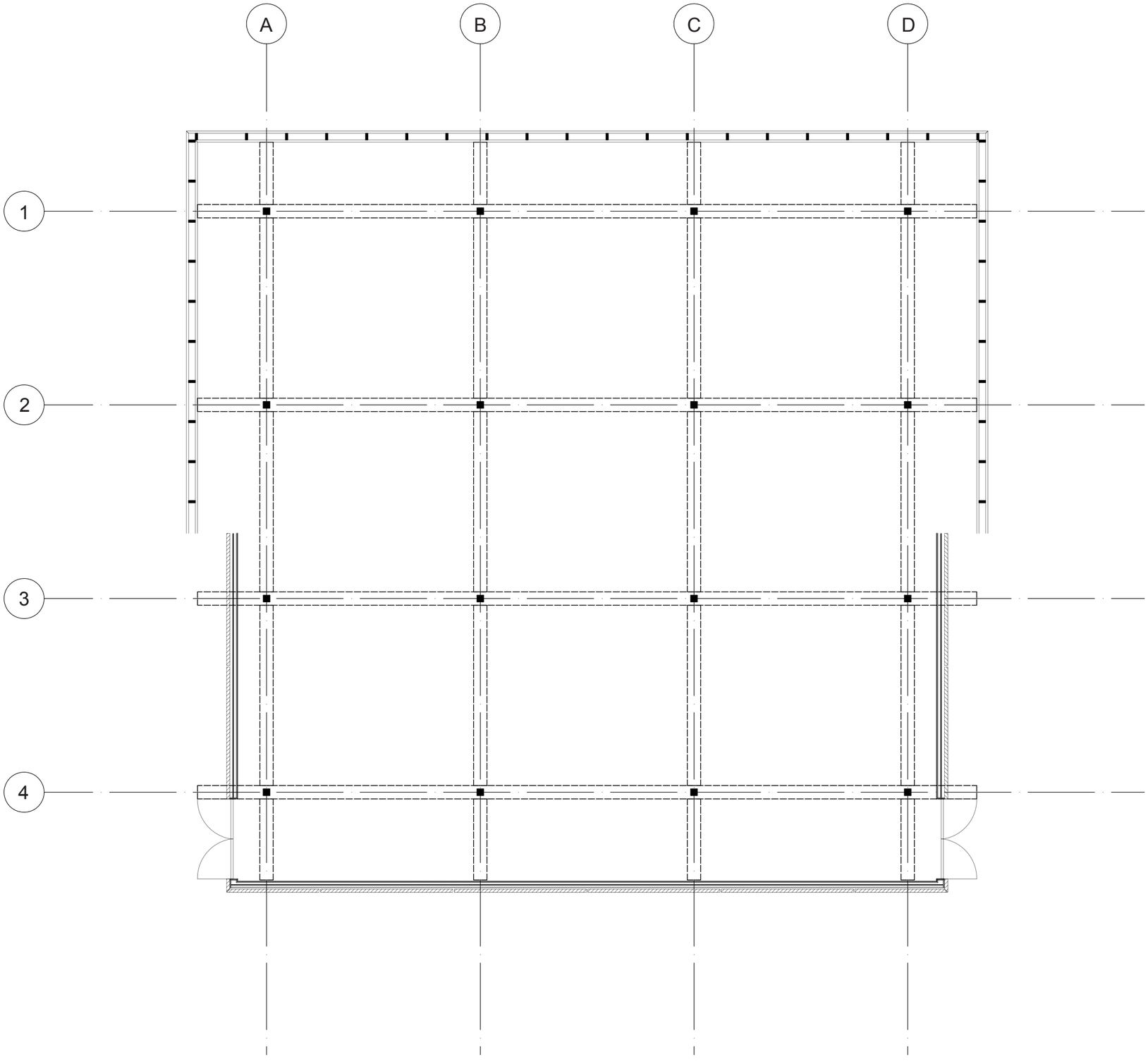
1’ 10’

buffalo food path

83_agriculture building - floorplan 1B

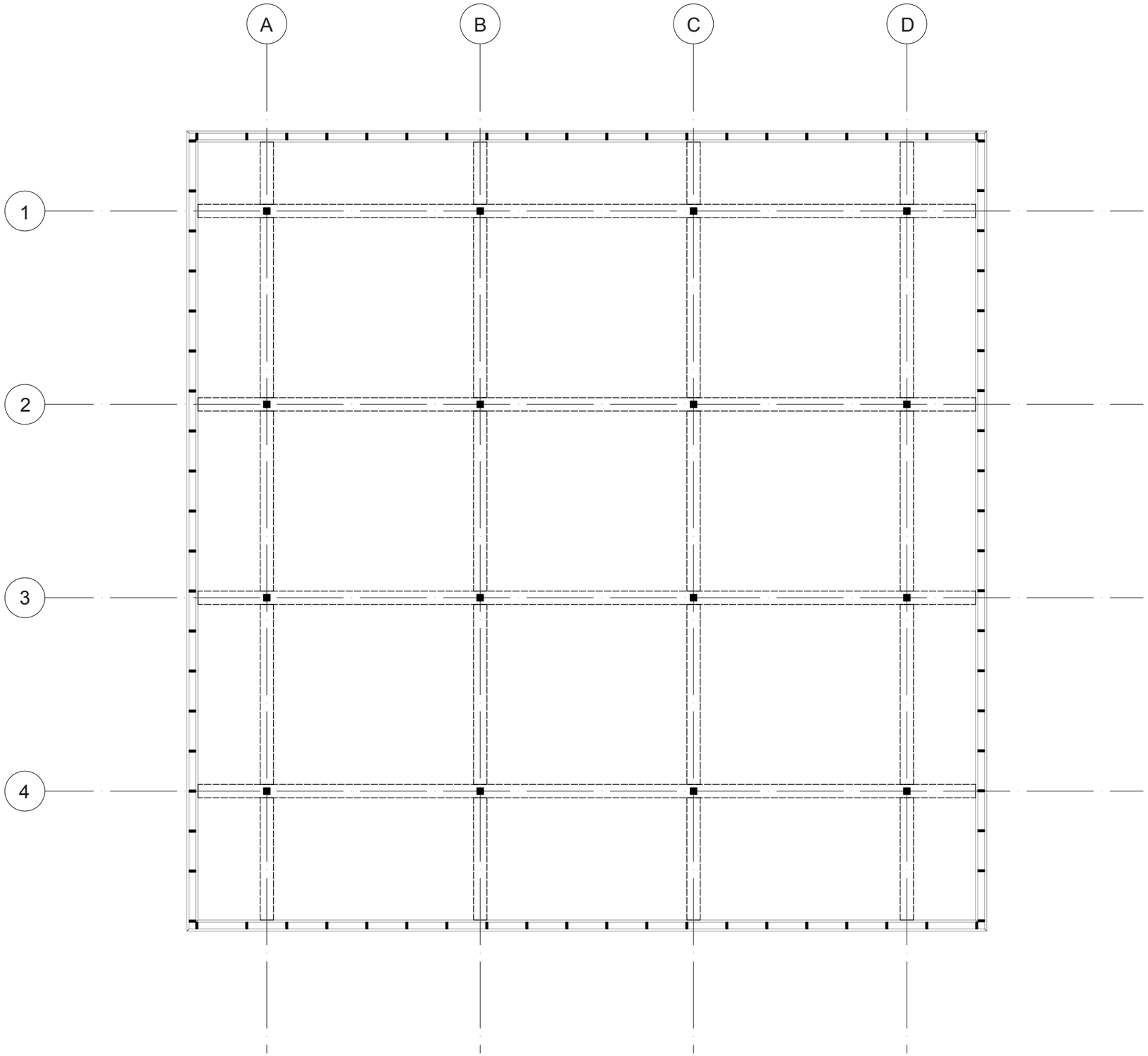
buffalo food path

84_agriculture building - structure 1A



N

1' 10'



buffalo food path

85_agriculture building - structure 1B

N

1’ 10’

AA

ROOF
41'-0"

FLOOR 4
30'-0"

FLOOR 3
20'-0"

FLOOR 2
10'-0"

FLOOR 1
0'-0"

BB

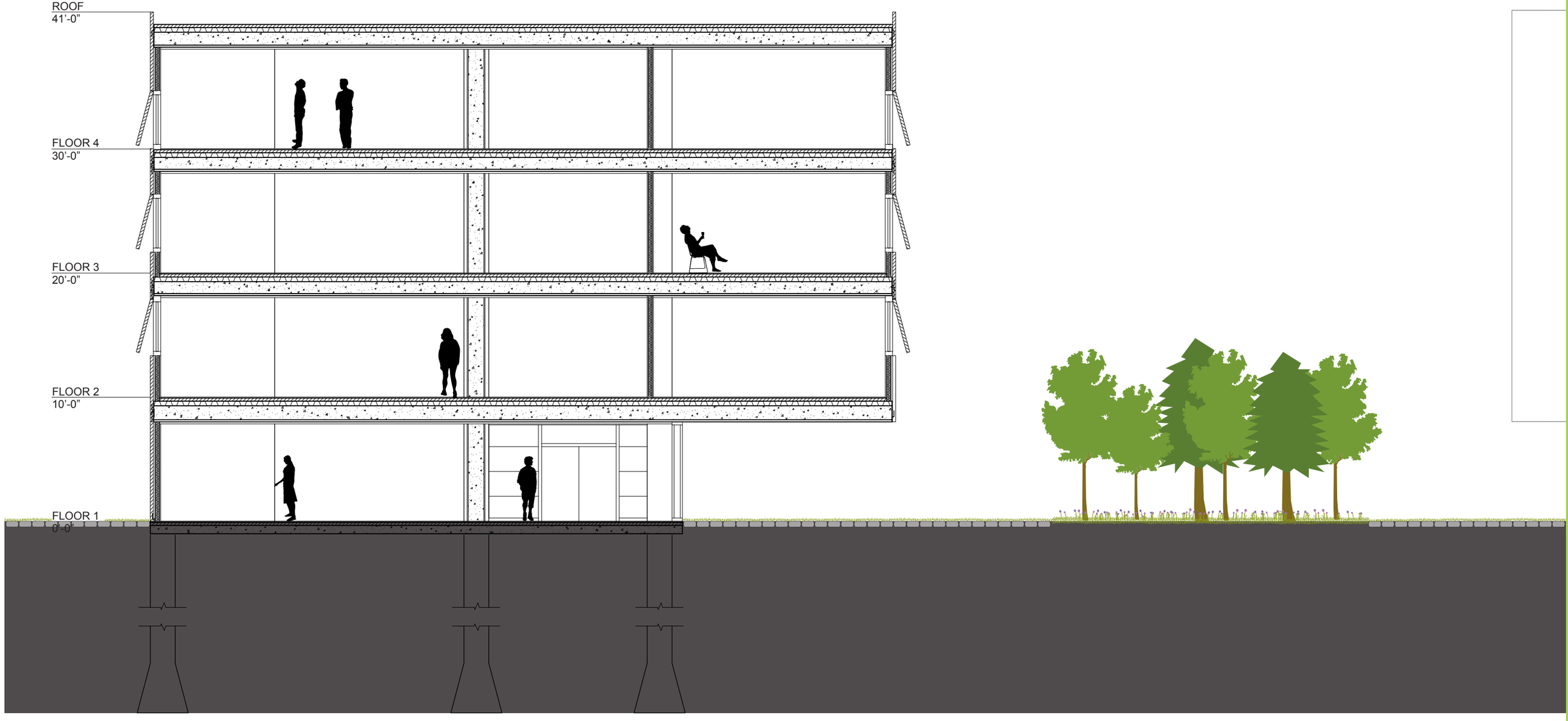
ROOF
41’-0”

FLOOR 4
30’-0”

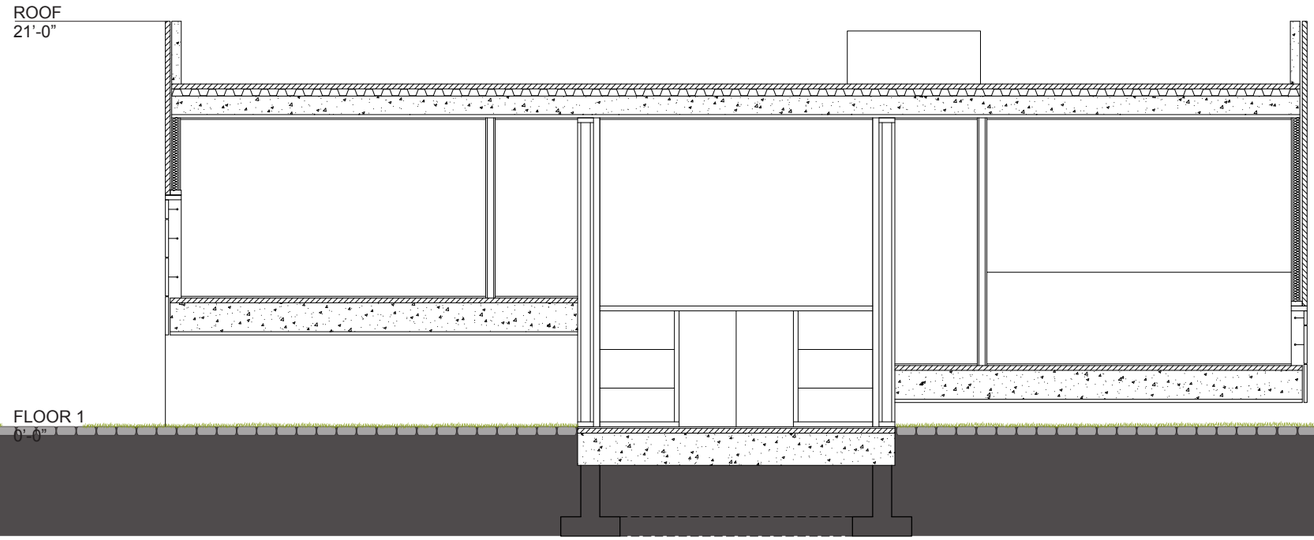
FLOOR 3
20’-0”

FLOOR 2
10’-0”

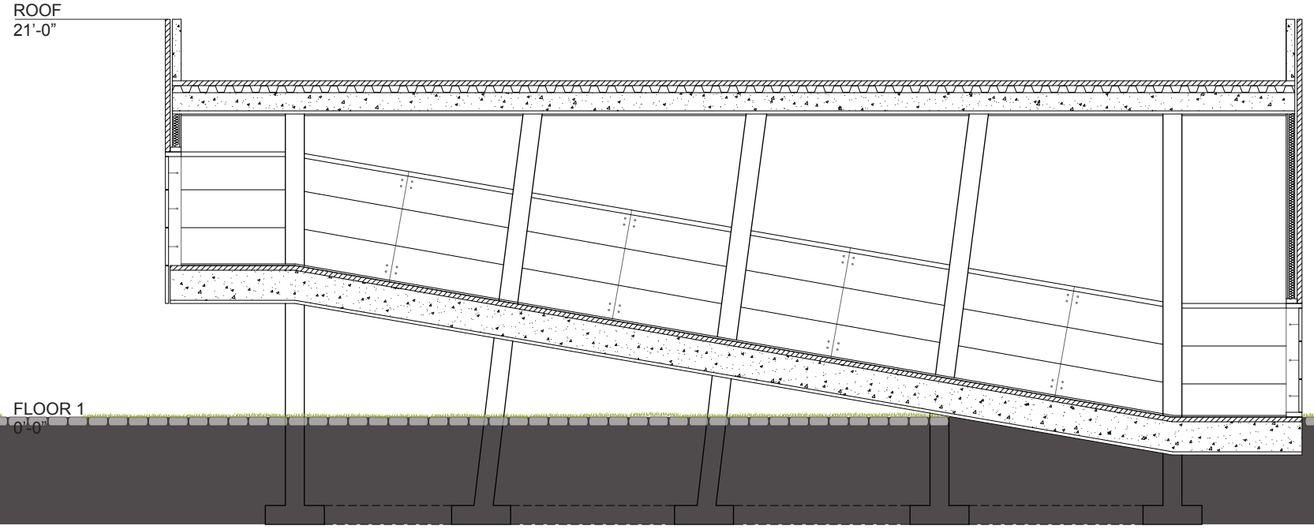
FLOOR 1
0’-0”



BB



AA

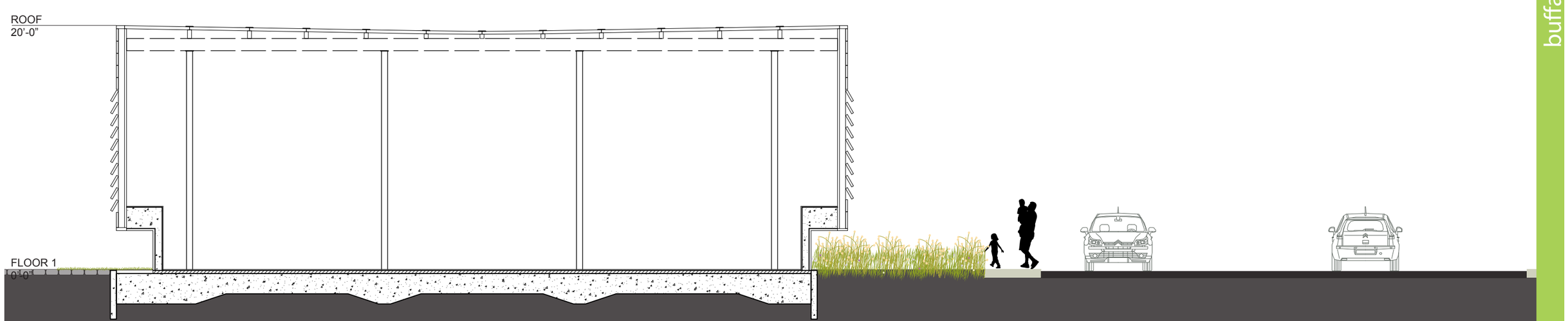


1' 10'

BB

ROOF
20’-0”

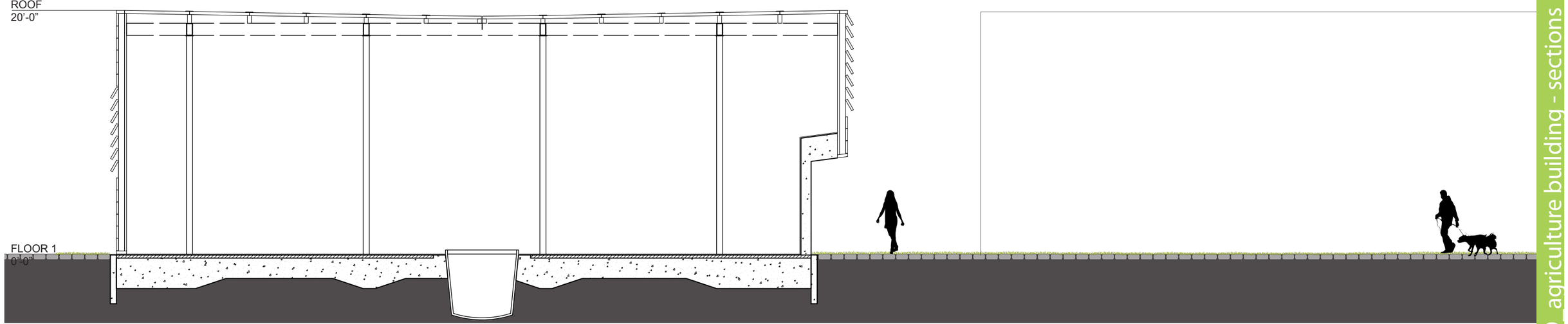
FLOOR 1
0’-0”



AA

ROOF
20’-0”

FLOOR 1
0’-0”



1’ 10’

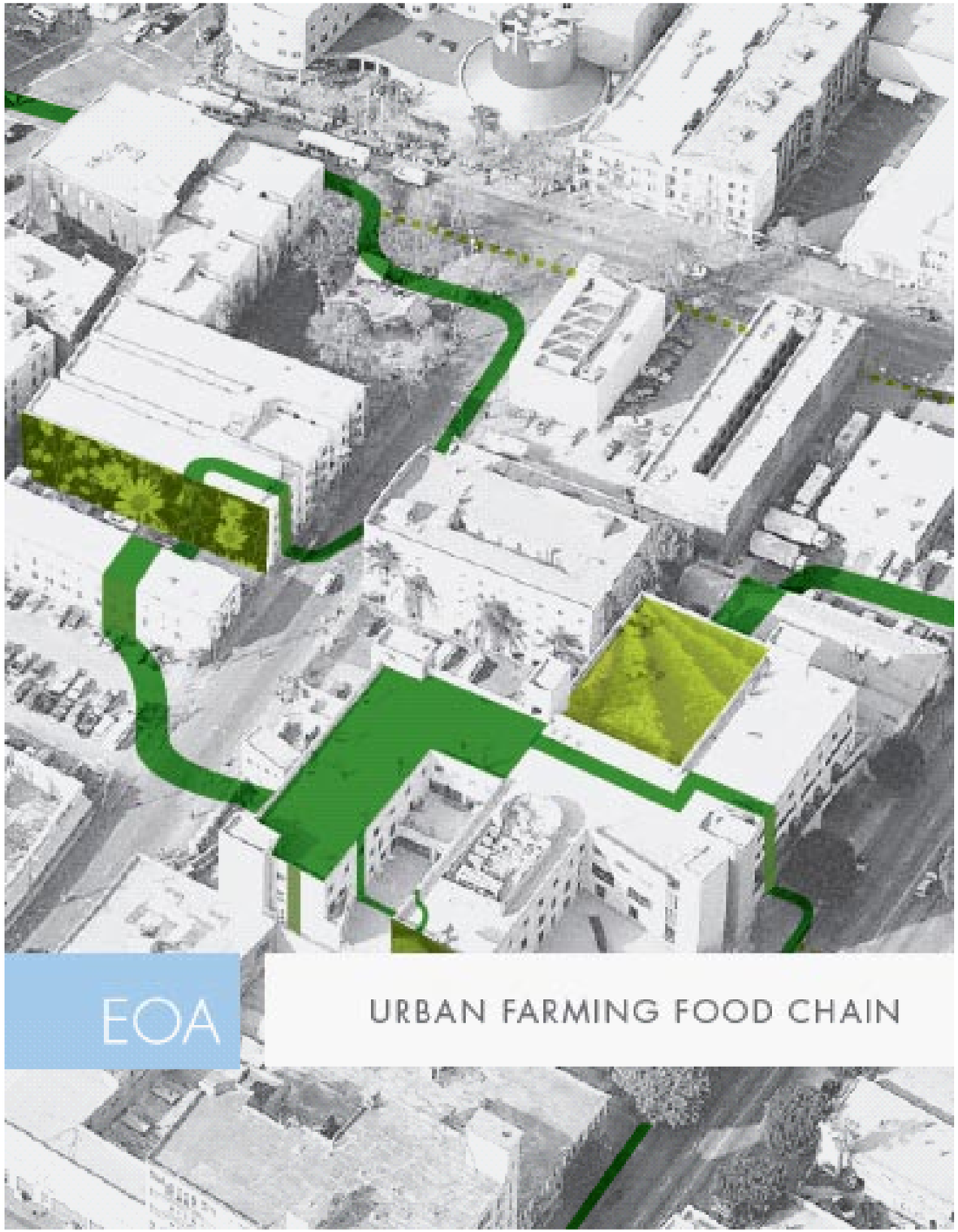
buffalo food path

89_agriculture building - sections

appendix

precedent: urban farming network

EOA and Urban Farming Food Chair Project
Skid Row - Los Angeles, California (2008)



external parameters

zoning, codes, regulations

- 01_Department of Housing and Urban Development (City of Buffalo):
  - a_Good Neighbors Planning Alliance is a community empowerment process whereby community members an of fice voice in determining the future direction of their own neighborhoods. Goals include:
    - i_Establish new partnerships within the community
    - ii_Include diverse individuals and groups in the process of improving the community
    - iii_Build the community's capacity to address complex problems
    - iv_Improve conditions such as housing, education, recreation and the physical environment
    - v_Improve the quality of life for all
  - b_Planning organizational strategy breaks down issues into E – environment, ED – economic development, H-housing, HP – historic preservation, L – libraries, P – parks, PS – police/public safety, PW – public works, S – schools, T – transportation, VL – vacant lots, Y – youth
    - i_The food path would apply to a number of these planning categories: E, ED, H, P, PW, T, VL and Y
- 02_Department of Parks and Recreation (City of Buffalo):
  - a_Division of Parks
    - i_Sponsor and support various gardening projects, major seasonal events, Adopt-a-Park program
    - ii_Issue permits for major and minor parks, playgrounds and medians
  - b_Division of Recreation
    - i_Issue permits for various playing fields and responsible for city wide field coordination
    - ii_Maintain recreation centers
  - c_Division of Forestry
    - i_Plant and transplant trees
    - ii_Remove undesirable vegetation, diseased trees and brush, etc.
    - iii_Maintain all trees along city streets and those located in parks, including spraying, pruning, trimming and clean-up of storm damaged or vehicle damaged trees

economics and financing

- 01_Financial support to be provided by the city and ultimately, by Buffalo taxpayers
- 02_Sites bridge and connect several political districts (and neighborhoods) within the city
- 03_TIFs (tax-increment financing) is likely applicable to these distressed areas
- 04_CERCLA/Superfund assistance will add financial assistance with brownfield sites
- 05_Federal and state grants for a "greening" and revitalization project may apply, as well as grants from independent agencies, outside non-profits and private donors

bibliography

precedents

01_ "1,000,000,000 Global Water Refugees" by UrbanLab. Chicago, IL/Great Lakes Watershed Basin Region. 2009/2010.
02_"Center for Urban Agriculture" by Mithun Architects. Winning competition entry. 2007.
03_"Food Chain Project" by Urban Farming Food Chain Project and EOA (Elmslie Osler Architects). Skid Row – Los Angeles, CA. Completed 2008.
04_Garden Walk Buffalo by Garden Walk Buffalo, Inc. Annual event with maps and city residential info.
05_MAP (Massachusetts Avenue Project). Buffalo, NY. Ongoing work.
06_"Pig City" by MVRDV. Conceptual prototype project. 2006.
07_"Publc Farm at P.S. 1" by Work Architecture Company.
08_"Sky Farm" by Gordon Graff. Concept project for Toronto, Canada. 2007.
09_"The High Line" by Diller Scofidio + Renfro with Field Operations. New York, NY. 2009.

books

01_Blatt, Harvey. America's Food: What You Don't Know About What You Eat. Cambridge, Mass.: MIT Press (2008).
02_Bridgewood, Les. Hydroponics: Soilless Growing Explained. Marlborough: Crowood (2003).
03_ Eckholm, Erik P. Losing Ground: Environmental Stress and World Food Prospects. New York, Norton (1976).
04_ Hardy, Steve. Environmental Tectonics: Forming Climatic Change. London: AA Publication (2008).
05_ Kemp, Jack and Marc Lipsitz. Revitalizing out cities: new approaches to solving urban planning problems: proceedings of a seminar. Washington D.C.: Fund for an American Renaissance and the National Center for Neighborhood Enterprise (1986).
06_Kennedy, Benjamin N. Vertical Urban Farming: Growing a Better City With Urban Agriculture. Chicago: IIT Thesis (2008).
07_ London, Bruce. The Revitalization of Inner City Neighborhoods. Monticello, IL: Vance Bibliographies (1978).
08_Mott, George Fox. Urban Change and the Planning Syndrome. Philadelphia, PA: American Academy of Political and Social Science (1973).
09_Mougeot, Luc J. A. Growing Better Cities: Urban Agriculture for Sustainable Development. Ottowa, ON: International Development Research Centre (2006).
10_Norquist, John O. The Wealth of Cities: Revitalizing the Centers of American Life. Reading, MA: Addison-Wesley (1998).
11_Raviv, Michael and Lieth, Johann Heinrich. Soilless Culture: Theory and Practice. Amsterdam, Boston: Elsevier Science (2008).
12_Redwood, Mark. Agriculture in Urban Planning: Generating Livlihoods and Food Security. Ottowa, ON: International Development Research Centre (2009).
13_ Rosenthal, Donald B. Urban Revitalization. Beverly Hills, CA: Sage Publications (1980).
14_ Steiber, Steven R. The Humanistic Element in Urban Planning. Monticello, IL: Vance Bibliographies (1978).
15_Widner, Ralph R. and Marvin E. Wolfgang. Revitalizing the Industrial City. Newbury Park: Sage Publications (1986).

interviewees

01_Belmont Management: Section 8 housing real estate management.
02_City of Buffalo, Brian Higgins: contact for Slum and Blight inspections.
03_Elmslie Osler Architects, Robin Osler: architect for the Food Chain Network in Skid Row, L.A.
04_Fix Buffalo, David: resident and long-time blogger on the urban woes of Buffalo
05_Garden Rant, Elizabeth Licata: resident of Buffalo and joint gardening blogger with three other Buffalo residents
06_Homeless Alliance of Western New York: independent non-profit working to eliminate homelessness; facilitate action be tween government, public and private sectors
07_PUSH (People United for Sustainable Housing) Buffalo: non-profit, community organization working to rebuild the West Side of Buffalo

government, codes, etc.

01_Buffalo District Map. Buffalo Police Department. <www.bpdny.org/>
02_Buffalo Neighborhoods Map. University at Buffalo, The State University of New York. <http://library.buffalo.edu/maps/buffalo-wnymaps/buffalo_neighborhoods.php>
03_Building Code/ "The Charter." City of Buffalo. <www.ci.buffalo.ny.us/Home/City_Departments/EDPIS/Inspections/Building Code>
04_New York State Department of Agriculture and Markets. <www.agmkt.state.ny.us/>
05_"Rebuilding America's Infrastructure." U.S. Department of Transportation, American Recovery and Reinvestment Act (ARRA). <www.recovery.gov/?q=content/rebuilding-infrastructure>
06_U.S. Army Corps of Engineers, Project Fact Sheets and Maps. <www.lrb.usace.army.mil/general/maps/district.htm>
07_U.S. Environmental Protection Agency, Green Infrastructure. "Managing Wet Weather with Green Infrastructure." <http://cfpub.epa.gov/npdes/home.cfm?program_id=298>

sites/external considerations/other

01_"For the Greener Good." Panel Discussion hosted/sponsored by National Building Museum. (2009).
02_Green Living Technologies, LLC - Green Roofs and Green Walls. Manufacturer of vertical farming hardware/installation sys tems.
03_Ventura River Ecosystem (blog). Paul Jenkin, Environmental Director of the Ventura County Chapter of the Surfrider Foun dation. Ventura, CA.
04_WPA 2.0 (SE) Competition. cityLAB, University of California Los Angeles. <http://wpa2.aud.ucla.edu>

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Atlantic White Cedar	*Chamaecyparis thyoides*	Cupressaceae, Cypress	Evergreen, aromatic tree with narrow, pointed, spirelike crown and slender, horizontal branches.	50-90' (15-27 m)	1 1/2-2' (0.5-0.6 m)	evergreen; opposite; 1/16-1/8" (1.5-3 mm) long. Scalelike; dull blue-green, with gland-dot. Bark: reddish-brown; thin, fibrous, with narrow connecting or forking ridges, becoming scaly and loose	
	Common Juniper / Pasture Juniper	*Juniperus communis*	Cupressaceae, Cypress	Usually a spreading low shrub, sometimes forming broad or prostrate clumps; rarely a small tree with an open irregular crown.	1-4' (0.3-1.2 m), rarely 15-25' (4.6-7.6 m).	trunk to 8" (20 cm)	evergreen; 3/8-1/2" (10-12 mm) long. Awl-shaped; stiff, very sharp-pointed, jointed at base; in 3's, spreading at right angles. Whitish and grooved above, shiny yellow-green beneath	
	Eastern Red Cedar	*Juniperus virginiana*	Cupressaceae, Cypress	Evergreen, aromatic tree with trunk often angled and buttressed at base and narrow, compact, columnar crown; sometimes becoming broad and irregular	40-60' (12-18 m)	1-2' (0.3-0.6 m)	evergreen; opposite in 4 rows forming slender 4-angled twigs; 1/16" (1.5 mm) long, to 3/8" (10 mm) long on leaders. Scalelike, not toothed; dark green, with gland-dot	
	North White Cedar / Arborvitae	*Thuja occidentalis*	Cupressaceae, Cypress	Resinous and aromatic evergreen tree with angled, buttressed, often branched trunk and a narrow, conical crown of short, spreading branches	40-70' (12-21 m)	1-3' (0.3-0.9 m)	evergreen; opposite in 4 rows; 1/16-1/8" (1.5-3 mm) long. Scalelike; short-pointed; side pair keeled, flat pair with gland-dot. Dull yellow-green above, paler blue-green beneath	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
reddish-brown; thin, fibrous, with narrow connecting or forking ridges, becoming scaly and loose	very slender, slightly flattened or partly 4-angled, irregular branched			tiny, 1/4" (6 mm) in diameter; bluish-purple with a bloom, becoming dark red-brown; with 6 cone-scales ending in short point; maturing in 1 season; 1-2 gray-brown seeds under cone-scale	Wet, peaty, acid soils; forming pure stands in swamp forests	Central Maine south to N. Florida and west to Mississippi in narrow coastal belt; to 100' (30 m)	Ancient logs buried in swamps have been mined and found to be well preserved and suitable for lumber. Pioneers prized the durable wood for log cabins, including floors and shingles. During the Revolutionary War, the wood produced charcoal for gunpowder. One fine forest is preserved at Green Bank State Forest in southern New Jersey. As an ornamental, this species is the hardiest of its genus northward
reddish-brown to gray; thin, rough, scaly, and shreddy	light yellow; slender, 3-angled, hairless			/4-3/8" (6-10 mm) in diameter; berrylike; whitish blue with a bloom; hard; mealy; sweetish and resinous; aromatic; maturing in 2-3 years and remaining attached; 1-3 brown, pointed seeds. Pollen cones mostly on same plant	Rocky slopes in coniferous forests of mountains and plains	Widespread from Alaska east to Labrador and S. Greenland, south to New York, and west to Minnesota and Wyoming; also south in mountains to NW. South Carolina and central Arizona; also Iceland and across N. Eurasia; to 8000-11,5000' (2438-3505 m) in south	Although commonly a tree in Eurasia, Common Juniper is only rarely a small tree in New England and other northeastern States. In the West, it is a low shrub, often at timberline. Including geographic varieties, this species is the most widely distributed native conifer in both North America and the world. Juniper "berries" are food for wildlife, especially grouse, pheasants, and bobwhites. They are an ingredient in gin, producing the distinctive aroma and tang
reddish-brown; thin, fibrous and shreddy				1/4-3/8" (6-10 mm) in diameter; berrylike; dark blue with a bloom; soft, juicy, sweetish, and resinous; 1-2 seeds. Pollen cones on separate trees	From dry uplands, especially limestone, to flood plains and swamps; also abandoned fields and fence rows; often in scattered pure stands	S. Ontario and widespread in eastern half of United States from Maine south to N. Florida, west to Texas, and north to North Dakota	The most widely distributed eastern conifer, native in 37 states, Eastern Red Cedar is resistant to extremes of drought, heat, and cold. The aromatic wood is used for fenceposts, cedar chests, cabinetwork, and carvings. First observed at Roanoke Island, Virginia, in 1564, it was prized by the colonists for building furniture, rail fences, and log cabins. Cedar oil for medicine and perfumes is obtained from the wood and leaves. The heartwood was once almost exclusively the source of wood for pencils; Incense Cedar (Calocedrus decurrens Torr.) is now used instead. Grown for Christmas trees, shelterbelts, and in many cultivated varieties for ornament. The juicy "berries" are consumed by many kinds of wildlife, including the cedar waxwing, named for this tree. Red Cedar can be injurious to apple orchards because it is an alternate host for cedar-apple rust, a fungus disease
light red-brown; thin, fibrous and shreddy, fissured into narrow connecting ridges	branching in horizontal plane; much flattened; jointed			3/8" (10 mm) long; elliptical; light brown; upright from short curved stalk; with 8-10 paired, leathery, blunt-pointed cone-scales, 4 usually bearing 2 tiny narrow-winged seeds each	Adapted to swamps and to neutral or alkaline soils on limestone uplands; often in pure stands	SE. Manitoba east to Nova Scotia and Maine, south to New York, and west to Illinois; south locally to North Carolina; to 3000' (914 m) in south	Probably the first North American tree introduced into Europe, it was discovered by French explorers and grown in Paris about 1536. The year before, tea prepared from the foliage and bark, now known to be high in vitamin C, saved the crew of Jacques Cartier from scurvy. It was named arborvitae, Latin for "tree-of-life," in 1558. The trees grow slowly and reach an age of 400 years or more. The lightweight, easily split wood was preferred for canoe frames by Native Americans, who also used the shredded outer bark and the soft wood to start fires. Today, the wood is used principally for poles, cross-ties, posts, and lumber. Cedar oil for medicine is distilled from the twigs

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Balsam Fir	*Abies balsamea*	Pinaceae, Pine	The only fir native to the Northeast, with narrow, pointed, spirelike crown of spreading branches and aromatic foliage	40-60' (12-18 m)	1-1/2' (0.3-0.5 m)		evergreen; 1/2-1" (1.2-2.5 cm) long. Spreading almost at right angles in 2 rows on hairy twigs, curved upward on upper twigs; flat, with rounded tip (sometimes notched or sharp-pointed). Shiny dark green above, with 2 narrow whitish bands beneath
	Black Spruce	*Picea mariana*	Pinaceae, Pine	Tree with open, irregular, conical crown of short, horizontal or slightly drooping branches; a prostrate shrub at timberline	20-60' (6-18 m)	4-12" (0.1-0.3 m)		evergreen; 1/4-5/8" (6-15 cm) long. Stiff, 4-angled, sharp-pointed; spreading on all sides of twig from very short leafstalks; ashy blue-green with whitish lines
	Red Spruce	*Picea rubens*	Pinaceae, Pine	The only spruce southward in eastern mountains, a handsome tree with broad or narrow, conical crown	50-80' (15-24 m)	1-2' (0.3-0.6 m)		evergreen; 1/2-5/8" (12-15 mm) long. Stiff, 4-angled, sharp-pointed; spreading on all sides of twig from very short leafstalks. Shiny green, with whitish lines
	Shortleaf Pine	*Pinus echinata*	Pinaceae, Pine	The most widely distributed of the southern yellow pines, a large tree with broad, open crown	70-100' (21-30 m)	1 1/2-3' (0.5-0.9 m)		evergreen; 2 3/4-4 1/2" (7-11 cm) long, 2 or sometimes 3 in bundle; slender, flexible; dark blue-green.
	Red Pine / Norway Pine	*Pinus resinosa*	Pinaceae, Pine	A common, large tree with small cones and broad, irregular or rounded crown of spreading branches, 1 row added a year	70-80' (21-24 m)	1-3' (0.3-0.9 m), often larger		evergreen; 4 1/4-6 1/2" (11-16.5 cm) long; 2 in bundle; slender; dark green

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
brown, thin, smooth, with many resin blisters, becoming scaly				2-3 1/4" (5-8 cm) long; cylindrical; dark purple; upright on topmost twigs; cone-scales finely hairy, bracts mostly short and hidden; paired long-winged seeds	Coniferous forests; often in pure stands	Alberta east to Labrador and south to Pennsylvania, west to Minnesota and NE. Iowa; local in West Virginia and Virginia; to timberline in north and above 4000' (1219 m) in south	A major pulpwood species. Interior knotty pine paneling is a special product; Christmas trees, wreaths, and balsam pillows utilize the aromatic foliage. Canada balsam, an aromatic oleoresin obtained from swellings or resin blisters in the bark, is used for mounting microscopic specimens and for optical cement. Deer and moose browse the foliage in winter
gray or blackish, thin, scaly; brown beneath; cut surface of inner bark yellowish	brown; slender, hairy, rough, with peglike bases			5/8-1 1/4" (1.5-3 cm), long; egg-shaped or rounded; dull gray; curved downward on short stalk and remaining attached, often clustered near top of crown; cone-scales stiff and brittle, rounded and finely toothed; paired, brown, long-winged seeds	Wet soils and bogs including peats, clays, and loams; in coniferous forests; often in pure stands	Across N. North America near northern limit of trees from Alaska and British Columbia east to Labrador, south to N. New Jersey, and west to Minnesota; at 2000-5000' (610-1524 m)	Black Spruce is one of the most widely distributed conifers in North America. Uses are similar to those of White Spruce; however, the small size limits lumber production. The lowest branches take root by layering when deep snows bend them to the ground, forming a ring of small trees around a large one. Spruce gum and spruce beer were made from this species and Red Spruce
reddish-brown; thin, scaly	brown; slender, finely hairy, rough with peglike bases			1 1/4-1 1/2" (3-4 cm) long; cylindrical; reddish-brown; hanging down on short, straight stalk; falling at maturity; cone-scales stiff, rounded, often finely toothed; paired brown long-winged seeds	Rocky mountain soils; often in pure stands	Ontario east to Nova Scotia; from New England south in mountains to W. North Carolina and E. Tennessee; to 4500-6500' (1372-1981 m) in south	Extensive virgin spruce-fir forests are preserved in Great Smoky Mountains National Park. This species is a handsome ornamental; the wood has uses similar to White Spruce. Spruce gum, a forerunner of modern chewing gum made from chicle (gum from a tropical American tree), was obtained commercially from resin of both Red and Black spruce trunks. The young leafy twigs were boiled with flavoring and sugar to prepare spruce beer. Where the ranges overlap, Black Spruce is distinguishable from Red by its smaller dull gray cones curved downward on short stalks and remaining attached
reddish-brown, with large irregular flat scaly plates				1 1/2-2 1/2" (4-6 cm) long; conical or narrowly egg-shaped, dull brown; short-stalked; opening at maturity but remaining attached; cone-scales thin, keeled, with small prickle	From dry rocky mountain ridges to sandy loams and silt loams of flood plains, and in old fields; often in pure stands or with other pines and oaks	Extreme se. New York and New Jersey south to n. Florida, west to e. Texas, and north to s. Missouri; to 3300' (1006 m)	Shortleaf Pine is native in 21 southeastern states. An important timber species, producing lumber for construction, millwork, and many other uses, as well as plywood and veneer for containers. This and other southern pines are the major native pulpwoods and leading woods in production of barrels. Seedlings and small trees will sprout after fire damage or injury
reddish-brown or gray; with broad, flat, scaly plates; becoming thick				1 1/2-2 1/4" (4-6 cm) long; egg-shaped; shiny light brown; almost stalkless; opening and shedding soon after maturity; cone-scales slightly thickened, keeled, without prickle	Well-drained soils; particularly sand plains; usually in mixed forests	SE. Manitoba east to Nova Scotia, south to Pennsylvania and west to Minnesota. Local in Newfoundland, N. Illinois and E. West Virginia. at 700-1400' (213-427 m) northward; to 2700' (823 m) in Adirondacks; and at 3800-4300' (1158-1311 m) in West Virginia	The misleading alternate name "Norway Pine" for this New World species may be traced to confusion with Norway Spruce by early English explorers. Another explanation is that the name comes from the tree's occurrence near Norway, Maine, founded in 1797. Because the name was in usage before this time, the former explanation is more likely. Red Pine is an ornamental and shade tree; the wood is used for general construction, planing-mill products, millwork, and pulpwood

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Pitch Pine	*Pinus rigida*	Pinaceae, Pine	Medium-sized tree often bearing tufts of needles on trunk, with a broad, rounded or irregular crown of horizontal branches	50-60' (15-18 m)	1-2' (0.3-0.6 m)		evergreen; 3-5" (7.5-13 cm) long; 3 in bundle; stout, stiff, often twisted; yellow-green
	Eastern White Pine	*Pinus strobus*	Pinaceae, Pine	The largest northeastern conifer, a magnificent evergreen tree with straight trunk and crown of horizontal branches, 1 row added a year, becoming broad and irregular	100' (33 m), formerly 150' (46 m) or more	3-4' (0.9-1.2 m) or more		evergreen; 2 1/2-5" (6-13 cm) long, 5 in bundle; slender; blue-green
	Eastern Hemlock	*Tsuga canadensis*	Pinaceae, Pine	Evergreen tree with conical crown of long, slender, horizontal branches often drooping down to the ground, and a slender, curved, and drooping leader	60-70' (18-21 m)	2-3' (0.6-0.9 m)		evergreen; 3/8-5/8" (10-15 mm) long. Flat, flexible, rounded at tip; spreading in 2 rows from very short leafstalks. Shiny dark green above, with 2 narrow whitish bands beneath and green edges often minutely toothed
	Canada Yew / American Yew	*Taxus canadensis*	Taxaceae, Yew	A low, straggling, evergreen shrub or ground cover with short, straight, flat needles and spreading limbs that ascend at the tips. Bark shreddy, reddish brown	3-6' (0.9-1.8 m) tall; may be twice as wide			3/4" (2 cm) long, pointed, flattened, in 2 rows. Dark green above, pale green below; takes on a reddish-brown tint in winter

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
dark gray; thick, rough, deeply furrowed into broad scaly ridges, exposing brown inner layers				1 1/4-2 3/4" (3-7 cm) long; egg-shaped; yellow-brown; opening at maturity but remaining attached; cone-scales raised and keeled, with slender sharp prickle	Shallow sands and gravels on steep slopes and ridges, also in river valleys and swamps. Forms temporary pure stands, gradually replaced by hardwoods; also in mixed forests	S. Maine west to New York and southwest mostly in mountains to N. Georgia; local in extreme S. Quebec and extreme SE. Ontario. From sea level in Coastal Plain to about 2000' (610 m) in north; 1400-4500' (427-1372 m) in upper Piedmont and southern mountains	Now used principally for lumber and pulpwood, Pitch Pine was once a source of resin. Colonists produced turpentine and tar used for axle grease from this species before naval stores were developed from the southern pines. Pine knots, when fastened to a pole, served as torches at night. The common name refers to the high resin content of the knotty wood. Pitch Pine is suitable for planting on dry rocky soil that other trees cannot tolerate, becoming open and irregular in shape in exposed situations. This hardy species is resistant to fire and injury, forming sprouts from roots and stumps. It is the pine at Cape Cod; and the New Jersey pine barrens are composed of dwarf sprouts of Pitch Pine following repeated fires
gray; smooth becoming rough; thick and deeply furrowed into narrow scaly ridges				4-8" (10-20 cm) long; narrowly cylindrical; yellow-brown; long-stalked; cone-scales thin, rounded, flat	Well-drained sandy soils; sometimes in pure stands	SE. Manitoba east to Newfoundland, south to N. Georgia, and west to NE. Iowa; a variety in Mexico. From near sea level to 2000' (610 m); in the southern Appalachians to 5000' (1524 m)	The largest conifer and formerly the most valuable tree of the Northeast, Eastern White Pine is used for construction, millwork, trim, and pulpwood. Younger trees and plantations have replaced the once seemingly inexhaustible lumber supply of virgin forests. The tall straight trunks were prized for ship masts in the colonial period. It is the state tree of Maine, the Pine Tree State; the pine cone and tassel are the state's floral emblem. The seeds were introduced in England (where it is called Weymouth Pine) from Maine in 1605 by Captain George Weymouth of the British Navy
cinnamon brown; thick, deeply furrowed into broad scaly ridges	yellow-brown; very slender, finely hairy, rough with peglike bases			5/8-3/4" (15-19 mm) long; elliptical; brown; short-stalked; hanging down at ends of twigs; composed of numerous rounded cone-scales; paired light brown, long-winged seeds	Acid soils; often in pure stands. Characteristic of moist cool valleys and ravines; also rock outcrops, especially north-facing bluffs	S. Ontario east to Cape Breton Island, south in mountains to N. Alabama, and west to E. Minnesota. To 3000' (914 m) in north; at 2000-5000' (610-1524 m) in south	The bark was once a commercial source of tannin in the production of leather. Pioneers made tea from leafy twigs and brooms from the branches. A graceful shade tree and ornamental, it can also be trimmed into hedges
		small, pointed seed enclosed in fleshy, bright red, berry-like cup			Cool, moist, mixed woods	Newfoundland to southeastern Manitoba south through the northeastern United States west to Minnesota, south to northern Illinois and northeastern Iowa, and locally to Virginia and Tennessee	This native of northeastern woodlands is often cultivated as an evergreen hedge plant or a foundation shrubbery. Care must be taken to warn children against eating the berries. Birds, however, eat the fleshy red cups and deposit the toxic seeds with impunity

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Box Elder / Ashleaf Maple	*Acer negundo*	Aceraceae, Maple	Small to medium-sized tree with short trunk and broad, rounded crown of light green foliage	30-60' (9-18 m)	2 1/2' (0.8 m)	opposite; pinnately compound; 6" (15 cm) long; with slender axis. 3-7 leaflets sometimes slightly lobed, 2-4" (5-10 cm) long, 1-1 1/2" (2.5-4 cm) wide; paired and short-stalked (except at end); ovate or elliptical, long-pointed at tip, short-pointed at base; coarsely saw-toothed, sometimes lobed. Light green and mostly hairless above, paler and varying in hairiness beneath; turning yellow (or sometimes red) in autumn	
	Striped Maple	*Acer pensylvanicum*	Aceraceae, Maple	Small tree with short trunk and open crown of striped, upright branches and coarse foliage; often a shrub	30' (9 m)	8" (20 cm)	opposite; 5-7" (13-18 cm) long and nearly as wide. With 3 short broad long-pointed lobes at tip; doubly saw-toothed; with 3 main veins from base; with rust-colored hairs when young and in vein angles; stout leafstalk. Light green above, paler beneath; turning yellow in autumn	
	Red Maple	*Acer rubrum*	Aceraceae, Maple	Large tree with narrow or rounded, compact crown and red flowers, fruit, leafstalks, and autumn foliage	60-90' (18-27 m)	2 1/2' (0.8 m)	opposite; 2 1/2-4" (6-10 cm) long and nearly as wide. Broadly ovate, with 3 shallow short-pointed lobes (sometimes with 2 smaller lobes near base); irregularly and wavy saw-toothed, with 5 main veins from base; long red or green leafstalk. Dull green above, whitish and hairy beneath; turning red, orange, and yellow in autumn	
	Silver Maple	*Acer saccharinum*	Aceraceae, Maple	Large tree with short, stout trunk, few large forks, spreading, open, irregular crown of long, curving branches, and graceful cut-leaves	50-80' (15-24 m)	3' (0.9 m)	opposite; 4-6" (10-15 cm) long and nearly as wide. Broadly ovate, deeply 5-lobed and long-pointed (middle lobe often 3-lobed); doubly saw-toothed, with 5 main veins from base; becoming hairless; slender drooping reddish leafstalk. Dull green above, silvery-white beneath; turning pale yellow in autumn	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
light gray-brown; with many narrow ridges and fissures, becoming deeply furrowed	green, often whitish or purplish; slender, ringed at nodes, mostly hairless	3/16" (5 mm) long; with very small yellow-green calyx of 5 lobes or sepals; several clustered on slender drooping stalks; male and female on separate trees; before leaves in early spring	1-1 1/2" (2.5-4 cm) long; paired, slightly forking keys with flat narrow body and long, curved wing, pale yellow, 1-seeded; maturing in summer and remaining attached in winter		Wet or moist soils along stream banks and in valleys, with various hardwoods; also naturalized in waste places and roadsides	S. Alberta east to extreme S. Ontario and New York, south to central Florida, and west to S. Texas; also scattered from New Mexico to California and naturalized in New England; to 8000' (2438 m) in the Southwest	Box Elder is classed with maples, having similar, paired key fruits, but is easily distinguishable by the pinnately compound leaves. Hardy and fast-growing, it is planted for shade and shelterbelts but is short-lived and easily broken in storms. Common and widely distributed, it is spreading in the East as a weed tree. Plains Indians made sugar from the sap. The common name indicates the resemblance of the foliage to that of elders (Sambucus) and the whitish wood to that of Box (Buxus sempervirens L.)
bright green with white stripes, becoming reddish-brown with long pale vertical lines; thin; smooth or warty	green, becoming striped with whitish lines	3/8" (10 mm) wide; bell-shaped; with 5 bright yellow petals; slender-stalked; male and female usually in separate clusters to 6" (15 cm) long; drooping at end of leafy twigs; in late spring	1 1/4" (3 cm) long; many paired, widely forking keys; long-winged, light brown, 1-seeded; maturing in autumn		Moist upland soils in understory of hardwood forests	S. Ontario east to Nova Scotia, south to n. Georgia, and west to s. Minnesota; to 5500' (1676 m)	Striped Maple is easily recognized, even in winter, by the striped twigs and bark, which make it a popular ornamental. Rabbits, beavers, deer, and moose eat the bark, especially in winter.
gray; thin, smooth, becoming fissured into long thin scaly ridges	reddish, slender, hairless	1/8" (3 mm) long; reddish; crowded in nearly stalkless clusters along twigs; male and female in separate clusters; in late winter or very early spring before leaves	3/4-1" (2-2.5 cm) long including long wing; paired forking keys; red turning reddish-brown; 1-seeded; maturing in spring		Wet or moist soils of stream banks, valleys, swamps, and uplands and sometimes on dry ridges; in mixed hardwood forests	Extreme SE. Manitoba east to E. Newfoundland, south to S. Florida, west to E. Texas; to 6000' (1829 m)	Red Maple is a handsome shade tree, displaying red in different seasons. Pioneers made ink and cinnamon-brown and black dyes from a bark extract. It has the greatest north-south distribution of all tree species along the East Coast
gray; becoming furrowed into long scaly shaggy ridges	light green to brown; long, spreading and often slightly drooping, hairless; with slightly unpleasant odor when crushed	1/4" (6 mm) long; reddish buds turning greenish-yellow; crowded in nearly stalkless clusters; male and female in separate clusters; in late winter or very early spring before leaves	1 1/2-2 1/2" (4-6 cm) long including long broad wing; paired, widely forking keys; light brown, 1-seeded; maturing in spring		Wet soils of stream banks, flood plains, and swamps; with other hardwoods	S. Ontario east to New Brunswick, south to NW. Florida, west to E. Oklahoma, north to N. Minnesota; to 2000' (610 m), higher in mountains	Its rapid growth makes Silver Maple a popular shade tree; however, its form is not generally pleasing, its brittle branches are easily broken in windstorms, and the abundant fruit produces litter. Sugar can be obtained from the sweetish sap, but yield is low

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Sugar Maple	*Acer saccharum*	Aceraceae, Maple	Large tree with rounded, dense crown and striking, multicolored foliage in autumn	70-100' (21-30 m)	2-3" (0.6-0.9 m)	opposite; 3 1/2-5 1/2" (9-14 cm) long and wide; palmately lobed with 5 deep long-pointed lobes; few narrow long-pointed teeth; 5 main veins from base; leafstalks long and often hairy. Dull dark green above, paler and often hairy on veins beneath; turning deep red, orange, and yellow in autumn	
	Mountain Maple	*Acer spicatum*	Aceraceae, Maple	Shrub or small tree with short trunk and slender, upright branches	25' (7.6 m)	6" (15 cm)	opposite; 2 1/2-4 1/2" (6-11 cm) long and wide; with 3 (sometimes 5) short broad lobes; short-pointed; coarsely saw-toothed; 3 or 5 main veins from base; long leafstalks often turn red. Light green and becoming hairless above, hairy beneath; turning bright red and orange in autumn	
	Gallberry / Inkberry	*Ilex glabra*	Aquifoliaceae, Holly	mound-shaped, colony-forming shrub, somewhat open with age	6-12' (1.8-3.6 m) tall and wide		2" (5 cm) long, lance-shaped, sparingly toothed, glossy, leathery	
	Winterberry / Common Winterberry / Michigan Holly / Black Alder	*Ilex verticillata*	Aquifoliaceae, Holly	A deciduous holly shrub with very small white flowers that grow in the leaf axils	3-10' (90-300 cm)		2" (5 cm) long, elliptical, toothed but not spiny	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
light gray; becoming rough and deeply furrowed into narrow scaly ridges	greenish to brown or gray; slender	3/16" (5 mm) long; with bell-shaped 5-lobed yellowish-green calyx; male and female in drooping clusters on long slender hairy stalks; with new leaves in early spring	1-1 1/4" (2.5-3 cm) long including long wing; paired forking keys; brown, 1-seeded; maturing in autumn		Moist soils of uplands and valleys, sometimes in pure stands	Extreme SE. Manitoba east to Nova Scotia, south to North Carolina, and west to E. Kansas; local in NW. South Carolina and N. Georgia; to 2500' (762 m) in north and 3000-5500' (914-1676 m) in southern Appalachians	Maples, particularly Sugar Maple, are among the leading furniture woods. This species is used also for flooring, boxes and crates, and veneer. Some trees develop special grain patterns, including birdseye maple with dots suggesting the eyes of birds, and curly and fiddleback maple, with wavy annual rings. Such variations in grain are in great demand. The boiled concentrated sap is the commercial source of maple sugar and syrup, a use colonists learned from the Indians. Each tree yields between 5 and 60 gallons of sap per year; about 32 gallons of sap make 1 gallon of syrup or 4 1/2 pounds of sugar
brown; thin; scaly or slightly furrowed	light gray; slender; hairy when young	1/4" (6 mm) wide; greenish-yellow; short-stalked; in narrow upright hairy clusters to 5" (13 cm); at end of leafy twig; male and female in separate clusters; in early summer	3/4-1" (2-2.5 cm) long; paired forking long-winged keys; clustered along slender stalk; 1-seeded; red or yellow when immature; turning brown in autumn		Moist rocky uplands, especially mountains; in understory of hardwood forests	E. Saskatchewan east to Newfoundland, south to Pennsylvania, and west to NE. Iowa; also in southern Appalachians to N. Georgia; to 6000' (1829 m)	Mountain Maple is hardy and adapted to partial shade. The Latin species name, meaning "spiked," refers to the long spikelike flower clusters. Rabbits, beavers, deer, and moose browse the bark, and ruffed grouse eat the buds
		tiny, white, inconspicuous; bloom February-July	tiny, berry-like, purple-black		Pinelands, thickets, bogs, wet woods of coastal plains	Coastal Plain from Nova Scotia to Florida, west to Louisiana and eastern Texas	The black berries persist well into winter, making this a valuable wildlife plant. The evergreen foliage varies in color from dark to light green both in summer and fall. Native populations of this holly are endangered in some of the northeastern states
		in clusters 1/4-1/2" (6-13 mm) wide, each flower 4- to 6-parted. Flowering: June-August	berry-like, showy red, less than 1/4" (6 mm) wide, on very short stalks, singly or in small clusters along the branches		Swamps, damp thickets, pond margins	Ontario to Nova Scotia; south from New England to Georgia; west to Mississippi; north to Tennessee, Missouri, Michigan, and Minnesota	Extremely showy in late fall and early winter when covered with their bright red fruit, these shrubs are either male or female--a trait typical of the holly family. Birds are readily attracted to them. Since this shrub grows in both wet and dry sites, it is an adaptable naturalizer. The southern species Ilex decidua, found in thickets and moist sites from Virginia to Texas, also has the distinctive red fruit

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Speckled Adler	*Alnus incana ssp. rugosa (Alnus rugosa)*	Betulaceae, Birch	A low and clump-forming shrub; sometimes a small tree	20' (6 m)	4" (10 cm)	in 3 rows; 2-4" (5-10 cm) long, 1 1/4-3" (3-7.5 cm) wide. Elliptical or ovate, broadest near or below middle; doubly and irregularly saw-toothed and wavy-lobed; with 9-12 nearly straight parallel veins on each side; short, hairy stalks. Dull dark green with network of sunken veins above; whitish-green and often with soft hairs, and with prominent veins and veinlets arranged in rows like a ladder beneath	
	Yellow Birch	*Betula alleghaniensis*	Betulaceae, Birch	Large, aromatic tree with broad, rounded crown of drooping branches and slight odor of wintergreen in crushed twigs and foliage. Height: 70-100' (21-30 m)	70-100' (21-30 m)	2 1/2' (0.8 m)	3-5" (7.5-13 cm) long, 1 1/2-2" (4-5 cm) wide. Elliptical, short-pointed or rounded at base; sharply and doubly saw-toothed; mostly with 9-11 veins on each side; hairy when young. Dark dull green above, light yellow-green beneath; turning bright yellow in autumn	
	River Birch / Red Birch	*Betula nigra*	Betulaceae, Birch	Often slightly leaning and forked tree with irregular, spreading crown	40-80' (12-24 m)	1-2' (0.3-0.6 m)	1 1/2-3" (4-7.5 cm) long, 1-2 1/4" (2.5-6 cm) wide. Ovate or nearly 4-sided; coarsely doubly saw-toothed or slightly lobed; usually with 7-9 veins on each side. Shiny dark green above, whitish and usually hairy beneath; turning dull yellow in autumn.	
	Paper Birch / White Birch	*Betula papyrifera*	Betulaceae, Birch	One of the most beautiful native trees, with narrow, open crown of slightly drooping to nearly horizontal branches; sometimes a shrub	50-70' (15-21 m)	1-2' (0.3-0.6 m)	2-4" (5-10 cm) long, 1 1/2-2" (4-5 cm) wide. Ovate, long-pointed; coarsely and doubly saw-toothed; usually with 5-9 veins on each side. Dull dark green above, light yellow-green and nearly hairless beneath; turning light yellow in autumn	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
gray, smooth	gray-brown, slender, slightly hairy when young; with 3-angled pith	tiny; in early spring before leaves. Male in drooping catkins 1 1/2-3" (4-7.5 cm) long. Female in cones 1/4" (6 mm) long		1/2-5/8" (12-15 mm) long; elliptical, blackish, hard, short-stalked; maturing in autumn; with tiny rounded flat nutlets	Wet soil along streams and lakes, and in swamps	Widespread across Canada from Yukon and British Columbia to Newfoundland, south to West Virginia, west to NE. Iowa, and north to NE. North Dakota; almost to northern limit of trees; in south to 2600' (792 m)	The Latin subspecies name, meaning "rugose" or "wrinkled," refers to the network of sunken veins prominent on the lower leaf surfaces. Planted as an ornamental at water edges. Alder thickets provide cover for wildlife, browse for deer and moose, and seeds for birds
shiny yellowish or silvery-gray; separating into papery curly strips; becoming reddish-brown and fissured into scaly plates	greenish-brown, slender, hairy	tiny; in early spring. Male yellowish, with 2 stamens, many in long drooping catkins near tip of twigs. Female greenish, in short upright catkins back of tip of same twig		3/4-1 1/4" (2-3 cm) long; oblong; hairy; brownish; upright; nearly stalkless; with many hairy scales and 2-winged nutlets; maturing in autumn	Cool moist uplands including mountain ravines; with hardwoods and conifers	Extreme SE. Manitoba east to S. Newfoundland, south to extreme NE. Georgia, and west to NE. Iowa; to 2500' (762 m) in north and 3000-6000' (914-1829 m) or higher in south	One of the most valuable birches and one of the largest hardwoods in northeastern North America. Yellow Birch when fairly mature is easily recognized by its distinctive bark. Young specimens, which may be mistaken for Sweet Birch, are most readily identified by their hairy twigs and buds and most persistently hairy leaves with mostly unbranched side veins
shiny pinkish-brown or silvery-gray; separating into papery scales; becoming thick, fissured, and shaggy	reddish-brown, slender, hairy	tiny; in early spring. Male yellowish, with 2 stamens, many in long drooping catkins near tip of twigs. Female greenish, in short upright catkins back of tip of same twig		1-1 1/2" (2.5-4 cm) long; cylindrical, brownish, upright, short-stalked; with many hairy scales and hairy 2-winged nutlets; maturing in late spring or early summer	Wet soil of stream banks, lakes, swamps, and flood plains; with other hardwoods	Sw. Connecticut south to n. Florida, west to e. Texas, and north to se. Minnesota; local in Massachusetts and s. New Hampshire; to 1000' (305 m); to 2500' (762 m) in southern Appalachians	This is the southernmost New World birch and the only birch that occurs at low altitudes in the southeastern United States. Its ability to thrive on moist sites makes it useful for erosion control
chalky to creamy white; smooth, thin, with long horizontal lines; separating into papery strips to reveal orange inner bark; becoming brown, furrowed, and scaly at base; bronze to purplish in varieties	reddish-brown, slender, mostly hairless	tiny; in early spring. Male yellowish, with 2 stamens, many in long drooping catkins near tip of twigs. Female greenish, in short upright catkins back of tip of same twig		1 1/2-2" (4-5 cm); narrowly cylindrical, brownish, hanging on slender stalk; with many 2-winged nutlets; maturing in autumn	Moist upland soils and cutover lands; often in nearly pure stands	Transcontinental across North America near northern limit of trees from NW. Alaska east to Labrador, south to New York, and west to Oregon; local south to N. Colorado and W. North Carolina; to 4000' (1219 m), higher in southern mountains	Paper Birch is used for specialty products such as ice cream sticks, toothpicks, bobbins, clothespins, spools, broom handles, and toys, as well as pulpwood. Indians made their lightweight birchbark canoes by stretching the stripped bark over frames of Northern White-cedar, sewing it with thread from Tamarack roots, and caulking the seams with pine or Balsam Fir resin. Souvenirs of birch bark should always be from a fallen log, since stripping bark from living trees leaves permanent ugly black scars

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Gray Birch	*Betula populifolia*	Betulaceae, Birch	Small, bushy tree with open, conical crown of short slender branches reaching nearly to the ground; more often a clump of several slightly leaning trunks from an old stump	30' (9 m)	1' (0.3 m)	2-3" (5-7.5 cm) long, 1 1/2-2 1/2" (4-6 cm) wide. Triangular, tapering from near base to long-pointed tip; sharply and doubly saw-toothed; usually with 4-8 veins on each side; leafstalks slender, with black gland-dots. Shiny dark green above, paler with tufts of hairs along midvein beneath; turning pale yellow in autumn	
	American Elderberry / Common Elderberry / Mexican Elderberry / Black Elder	*Sambucus nigra ssp. canadensis (Sambucus canadensis, Sambucus mexicana)*	Caprifoliaceae, Honeysuckle	Large shrub or small tree with irregular crown of few, stout, spreading branches, clusters of white flowers, and many small black or purple berries	16-25' (5-7.6 m)	6" -1" (15-30 cm)	opposite; pinnately compound; 5-9" (13-23 cm) long; with yellow-green axis. 3-7 leaflets 1 1/2-4" (4-10 cm) long, 3/4-2" (2-5 cm) wide; paired (except at end); elliptical; sharply saw-toothed; stalkless or nearly so. Shiny green above, dull light green and hairy along midvein beneath. Often evergreen and leathery in South and Southwest. Leaves sometimes partly bipinnate, with up to 13 leaflets	
	Southern Arrowwood	*Viburnum dentatum*	Caprifoliaceae, Honeysuckle	A shrub with downy twigs, coarsely toothed leaves, and flat-topped clusters of small, white flowers	3-15' (1-4.5 m)		1 1/2-3" (3.8-7.5 cm) long; rounded or heart-shaped at the base, opposite, ovate, or egg-shaped, with saw-like teeth	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
chalky or grayish-white; smooth, thin, not papery; becoming darker and fissured at base	reddish-brown, slender, with warty gland-dots	tiny; in early spring. Male yellowish, with 2 stamens, many in long drooping catkins near tip of twigs. Female greenish, in short upright catkins back of tip of same twig		3/4-1 1/4" (2-3 cm) long; cylindrical, brownish, spreading, short-stalked; with many hairy scales and hairy 2-winged nutlets; maturing in autumn	Dry barren uplands, also on moist soils, in mixed woodlands	S. Ontario east to Cape Breton Island, south to Pennsylvania and New Jersey; local to W. North Carolina and NW. Indiana; to 2000' (610 m)	A pioneer tree on clearings, abandoned farms, and burned areas, Gray Birch grows rapidly but is short-lived. A nurse tree, it shades and protects seedlings of the larger, long-lived forest trees. The wood is used for spools and other turned articles and for firewood. Its trunks are so flexible that when weighted with snow, the upper branches may bend to the ground without breaking. The long-stalked leaves dance in the slightest breeze
light gray or brown with raised dots; smooth or becoming fissured and rough	light green, stout, angled, with ringed nodes and thick white pith	1/4" (6 mm) wide; with white corolla of 5 or 4 lobes; fragrant; many in upright flat-topped, much-branched clusters, 2-8" (5-20 cm) wide; in late spring and early summer (year-round in South Southwest), shedding early	1/4" (6 mm) in diameter; black, purplish-black, or dark blue berry; juicy; 3-5 1-seeded nutlets; maturing in late summer and autumn (year-round in South and Southwest)		Wet soils, especially in open areas near water at forest edges; along streams and drainages	SE. Manitoba east to Nova Scotia, south to S. Florida, and westward across Texas and plains states to California and south into Mexico; to 5000' (1524 m)	This common, widespread shrub sprouts from roots. Elderberries, inedible when fresh and raw, are used for making jelly, preserves, pies, and wine. Birds and mammals of many species also feed on the berries. The bark, leaves, and flowers have served in home remedies but can be toxic. This subspecies incorporates several other forms that used to be considered separate species, including S. mexicana and S. canadensis
		1/5" (5 mm) wide, in clusters 2-3" (5-7.5 cm) wide; petals 5. Flowering: May-August	purplish-black or blue-gray berry-like drupes		Wet or dry thickets and borders of woods	Ontario to New Brunswick; south to Florida; west to Texas	Some botanists recognize two separate species for this highly variable plant, the other being northern Arrowwood (V. recognitum) with smooth twigs

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Nannyberry	*Viburnum lentago*	Caprifoliaceae, Honeysuckle	Shrub or small tree with short trunk, compact, rounded crown of drooping branches, small white flowers in clusters, and small bluish-black fruit	20' (6 m)	6" (15 cm)	opposite; 2 1/2-4" (6-10 cm) long, 1 1/2-2 1/2" (4-6 cm) wide. Elliptical, long-pointed; finely saw-toothed; with prominent network of veins; broad, often hairy leafstalk. Shiny green above, yellow-green with tiny black dots beneath; turning purplish-red and orange in autumn	
	Wild Raisin / Witherod	*Viburnum nudum var. cassinoides (Viburnum cassinoides)*	Caprifoliaceae, Honeysuckle	A shrub with flat-topped, stalked clusters of small, white, fragrant flowers	3-12' (30-360 cm)		2-4" (5-10 cm) long, opposite, thick, dull green, oval to ovate, edges usually wavy or toothed, occasionally untoothed, with brownish hairs beneath	
	Cranberry Viburnum / Highbush Cranberry / American Cranberry-bush	*Viburnum opulus var. americanum (Viburnum trilobum)*	Caprifoliaceae, Honeysuckle	A medium to large shrub with dense upright or arching branches that create a round outline. Large, showy white outer flowers ring each cluster; bunches of red berries follow. The bark is smooth and gray	6-16' (1.8-4.8 m)		3" (7.5 cm), opposite, with 3 wide, serrated, pointed lobes; turn reddish	
	Blackhaw / Stagbush / Sweethaw / Smooth Blackhaw	*Viburnum prunifolium*	Caprifoliaceae, Honeysuckle	Shrub or small tree with short trunk, spreading, rounded or irregular crown, many showy, small, white flowers, and small, blue-black fruit	20' (6 m)	4" (10 cm)	opposite; 1 1/2-3" (4-7.5 com long, 3/4-2" (2-5 cm) wide. Elliptical; finely saw-toothed; slightly thick; hairless or nearly so. Shiny green with network of sunken veins above, dull light green beneath; turning shiny red in autumn	
	Sweet Pepperbush / Coastal Sweet Pepperbush / Summer Sweet	*Clethra alnifolia*	Clethraceae, Clethra	tall, many-branched, leafy shrub with spike-like, upright clusters of fragrant white flowers.	3-10' (90-300 cm)		up to 3" (7.5 cm) long; wedge-shaped, sharply toothed above the middle, untoothed at the base, blunt or broadly pointed at tip	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
reddish-brown or gray; irregularly furrowed into scaly plates; with unpleasant skunklike odor	light green, slender, slightly hairy when young, ending in long-pointed hairy reddish bud	1/4" (6 mm) wide; with 5 rounded white corolla lobes; slightly fragrant; in branched upright, stalkless clusters of many flowers each, 3-5" (7.5-13 cm) wide; in late spring	1/2" (12 mm) long; elliptical or sometimes nearly round, slightly flat, blue-black with whitish bloom; sweet juicy pulp; somewhat flat stone; drooping on slender reddish stalks; maturing in autumn and remaining attached in winter		Moist soils of valleys and rocky uplands; at forest edges	SE. Saskatchewan east to New Brunswick and Maine, south to West Virginia, west to Nebraska and NE. Wyoming; local in SW. Virginia; to 2500' (762 m); to 5000' (1524 m) in Black Hills	When cut, the plants sprout from roots, and old branches will often arch down and take root. Songbirds, gamebirds, and mammals eat the fruit in winter
		About 1/4" (6 mm) wide; petals 5; cluster about 4" (10 cm) wide. Flowering: May-early August	Blue-black, raisin-like drupe with sweet pulp		Wet thickets, swamps, clearings, and woodland borders	Ontario east to Newfoundland, south to Georgia, and west to Texas; Tennessee north to Wisconsin	This is one of several relatively similar Viburnum species with edible fruit. Blackhaw (V. prunifolium) is more tree-like, growing to 20' (6 m) high, with finely toothed, oval leaves and many short twiggy branches borne at right angles to the stem. Nannyberry (V. lentago) is a shrub or tree growing to 30' (9 m) high, with long, tapering leaf tips and winged petioles
		white, in 3" (7.5 cm) clusters; inner flowers tiny, outer ones 3/4" (2 cm) wide	1/2" (12 mm), bright red, translucent, juicy berries; ripe late summer, last to early winter		Cool woods; thickets; rocky shores; slopes; streamsides; wooded hillsides	Newfoundland to British Columbia, south to New Jersey, n. Indiana, n. Illinois, Black Hills of South Dakota, Wyoming, and Washington	Highbush Cranberry is an attractive native plant for the garden. The pretty, white, flat-topped clusters of flowers are followed by persistent red berries suitable for jam. The maple-like, deciduous foliage is colorful in fall
gray, rough, furrowed into rectangular plates	gray, slender, stiff, ending in flat, oblong, hairy brown bud	1/4" (6 mm) wide; with 5 rounded white corolla lobes; in upright flat, stalkless clusters, 2-4" (5-10 cm) wide; spring	1/2" (12 mm) long; elliptical, slightly flat, dark blue-black with whitish bloom; thin, slightly sweetish edible pulp; somewhat flat stone; drooping on long slender reddish stalks; maturing in autumn, remaining attached into early winter		Moist soils, especially in valleys, and on slopes; in thickets and at borders of forests	SW. Connecticut south to Alabama, west to E. Kansas, and north to SE. Wisconsin and SW. Iowa; to 3000' (914 m)	The fruit is consumed by songbirds, gamebirds, and mammals and can be made into preserves. The astringent bark was formerly used medicinally. The Latin species name refers to the leaves' resemblance to plum leaves
		each about 1/3" (8 mm) wide; stamens 10, style protruding. Flowering: July-September	small, globular capsules with persistent style		Wetlands, especially swamps, and sandy woods	Coastal, from southern Maine south to Florida; west to eastern Texas	This shrub forms sizable patches. Its dry fruiting capsules remain long after flowering and help identify this plant in winter. Mountain Pepperbush (C. acuminata) has more pointed leaves and is found in southern mountains

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Silky Dogwood	*Cornus amomum*	Cornaceae, Dogwood	A woody shrub that has slightly silky-haired red twigs with tan pith and clusters of delicate flowers followed by dark blue berries	to 9' (2.7 m)		2-4" (5-10 cm) long, opposite, ovate, with curving veins	
	Gray Dogwood / Gray-stemmed Dogwood	*Cornus racemosa*	Cornaceae, Dogwood	a thicket-forming, deciduous shrub	to 16 ft. in			
	Red Osier Dogwood / Red-twig Dogwood	*Cornus sericea ssp. sericea (Cornus stolonifera, Swida sericea)*	Cornaceae, Dogwood	Large, spreading, thicket-forming shrub with several stems, clusters of small white flowers, and small whitish fruit; rarely a small tree	commonly 3- 10' (0.9-3 m), rarely to 15' (4.6 m)	3" (7.5 cm)	opposite; 1 1/2-3 1/2" (4-9 cm) long, 5/8-2" (1.5-5 cm) wide. Elliptical or ovate; short- or long-pointed; without teeth; 5-7 long, curved, sunken veins on each side of midvein. Dull green above, whitish green and covered with fine hairs beneath; turning reddish in autumn	
	Black Tupelo / Blackgum / Sourgum	*Nyssa sylvatica*	Cornaceae, Dogwood	Tree with a dense, conical or sometimes flat-topped crown, many slender, nearly horizontal branches, and glossy foliage turning scarlet in autumn	50-100' (15-30 m)	2-3' (0.6-0.9 m)	2-5" (5-13 cm) long, 1-3" (2.5-7.5 cm) wide. Elliptical or oblong; not toothed (rarely with a few teeth); slightly thickened; often crowded on short twigs. Shiny green above, pale and often hairy beneath; turning bright red in early autumn	
	Black Crowberry	*Empetrum nigrum*	Empetraceae, Crowberry	A low, dense, mounded, heather-like shrub	to 6 in. in		foliage is dark green and linear, resembling tiny, fat fir needles. The leaves are arranged in whorls of four along the tough, prostrate stems	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
		white to greenish-white; cluster 2" (5 cm) wide; 4 petals and 4 sepals; May-July	dense cluster of blue to purple berry-like drupes		Streamsides, ravines, and other wet habitats	Eastern United States	This species is not as showy as the Red Osier Dogwood, which also has red stems but has white fruits rather than blue. Silky Dogwood is a good choice for a moist spot in a native plant garden. Birds and other wildlife eat dogwood fruits, making these good plants for a backyard wildlife habitat
	Young twigs are reddish	greenish-white blossoms in open, terminal clusters	pedicels remain conspicuously red into late fall and early winter. Fruit itself is a white, 1/4 in. drupe that usually does not remain on the shrub for long		Thickets; riverbank woods; wet to dry, low, open areas	Maine to Ontario and Manitoba, south to South Carolina and Arkansas	The fruit of this dogwood is eaten by birds and other wildlife
gray or brown, smooth or slightly furrowed into flat plates	purplish-red, slender, hairy when young, with rings at nodes	1/4" (6 mm) wide; with 4 spreading, white petals; many, crowded in upright, flattish clusters 1 1/4-2" (3-5 cm) wide; in late spring and early summer	1/4-3/8" (6-10 mm) in diameter; whitish, juicy; stone with 2 seeds; maturing in late summer		Moist soils, especially along streams; forming thickets and in understory of forests	Central Alaska east to Labrador and Newfoundland, south to N. Virginia, and west to California; also N. Mexico; to 5000' (1524 m); to 9000' (2743 m) in the Southwest	Red Osier Dogwood is useful for erosion control on stream banks. The common name recalls the resemblance of the reddish twigs to those of some willows called osiers, used in basketry. Branch tips of this tree will root upon touching the ground and form new shoots
gray or dark brown; thick, rough, deeply furrowed into rectangular or irregular ridges	light brown; slender, often hairy, with some short spurs	greenish; at end of long stalks at base of new leaves in early spring; many tiny male flowers in heads 1/2" (12 mm) wide; 2-6 female flowers 3/16" (5 mm) long; male and female usually on separate trees	3/8-1/2" (10-12 mm) long; berrylike, elliptical, blue-black; with thin bitter or sour pulp; stone slightly 10- to 12-ridged; maturing in autumn		Moist soils of valleys and uplands in hardwood and pine forests	Extreme S. Ontario east to SW. Maine, south to S. Florida, west to E. Texas, and north to central Michigan; local in Mexico; to 4000' (1219 m), sometimes higher in southern Appalachians	A handsome ornamental and shade tree, Black Tupelo is also a honey plant. The juicy fruit is consumed by many birds and mammals. Swamp Tupelo (var. biflora (Walt.) Sarg.), a variety with narrower oblong leaves, occurs in swamps in the Coastal Plain from Delaware to eastern Texas
	short, erect, leafy branches	Small, rather inconspicuous, purplish-brown flowers occur in leaf axils	flowers are followed by showy, purplish-black fruits		Peat bogs; moist, mossy places; exposed, rocky bluffs	Circumpolar, south in North America through the Cascades to n. California; at high altitudes in n. New England and New York, and to Great Lakes region	Easier to grow than its heather look-alikes, the phyllodoces

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Bog Rosemary	*Andromeda polifolia*	Ericaceae, Heath	A low evergreen shrub with clusters of pendulous, small, pinkish flowers	10-18" (25-50 cm)		1-2" (2.5-5 cm) long; alternate, linear, with white bloom beneath and margins enrolled	
	Kinnikinnick / Bearberry / Red Bearberry	*Arctostaphylos uva-ursi*	Ericaceae, Heath	low, matted evergreen shrub with smooth, red-brown, woody trailing stems, leathery, dark green leaves, and small, pink, bell- or lantern-shaped flowers in racemes on short branches	creeper, the leaves and flower clusters about 6-12" (15-30 cm) high, the stems to 10' (3 m) long		1/4-1 1/2" (1.3-3.8 cm) long, wedge- or spatulate-shaped, widest near blunt tips, smooth, leathery, green on both sides	
	Leatherleaf	*Chamaedaphne calyculata*	Ericaceae, Heath	A low, erect, many-branched, evergreen shrub with white, bell- or urn-shaped flowers hanging along 1-sided racemes	1-4' (30-120 cm)		3/4-2" (2-5 cm) long, leathery, elliptical, dull green; dotted with round dry scales, heaviest beneath; older leaves brownish bronze above, yellowish beneath	
	Mountain Laurel	*Kalmia latifolia*	Ericaceae, Heath	Evergreen, many-stemmed, thicket-forming shrub or sometimes a small tree with short, crooked trunk; stout, spreading branches; a compact, rounded crown; and beautiful, large, pink flower clusters	20' (6 m)	6" (15 cm)	evergreen; alternate or sometimes opposite or in 3's; 2 1/2-4" (6-10 cm) long, 1-1 1/2" (2.5-4 cm) wide. Narrowly elliptical or lance-shaped; hard whitish point at tip; without teeth; thick and stiff. Dull dark green above, yellow-green beneath	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
		1/4" (6 mm) long, urn-shaped; May-June	capsule		Bogs	Alaska and Canada south in West to Washington and Idaho and in East to New Jersey, West Virginia, and west to Indiana and Minnesota	Bog Rosemary is one of several heath shrubs often found in boggy areas in association with Leatherleaf (Chamaedaphne calyculata), Sheep Laurel (Kalmia angustifolia), Bog Laurel (K. polifolia), and Labrador Tea (Ledum groenlandicum)
		corolla 1/4" (6 mm) long, with 5 lobes around small opening. Bloom March-July	bright red berry 3/8" (9 mm) wide		Open places and rocky or sandy sites near the coast or high in the mountains	From arctic regions across Canada, south to New Mexico in the West and Virginia in the East	This ground-trailing shrub has the papery, reddish, exfoliating bark typical of woody plants in northern climates. It is frequently seen as a ground cover in sandy areas such as the New Jersey pine barrens. It is very common on Cape Cod, where it covers vast areas in open, sandy, pine-studded communities. It is a hardy shrub for landscaping rocky or sandy sites. The fruit is edible but mealy and tasteless; it is much favored by birds and other wildlife. In Greek arctos is "bear" and staphyle "grape," whereas in Latin uva is "a bunch of grapes" and ursus is "bear." The berries are indeed eaten by bears, as the name redundantly indicates. Kinnikinnick, an Indian word for many tobacco substitutes, is most frequently applied to this species, which also had many medicinal uses, including the alleged control of several sexually transmitted diseases. An astringent tea can be made by steeping the dried leaves in boiling water (sometimes used as a laxative). A similar species found in the Cascade Mountains and Sierra Nevada, Pinemat Manzanita (A. nevadensis), has a tiny sharp point at the tip of the leaf. One other species, Alpine Bearberry (A. alpina), is found on New England mountaintops
		1/4" (6 mm) long. Flowering: March-July	Round capsule		Peat bogs and pondsides	Alberta east to Newfoundland, south to South Carolina, and northwest to Illinois and Minnesota; also in Alaska and western Canadian provinces and territories, except Arctic islands	One of the many evergreen members of the heath family, this species also occurs in Asia; it is typical of boggy wetlands and highly acidic sites. In Massachusetts, Leatherleaf colonies can expand radially at the rate of one foot per decade. The genus name is from the Greek chamai ("on the ground") and daphne ("laurel")
dark reddish-brown; thin, fissured into long narrow ridges and shredding	reddish-green with sticky hairs when young; later turning reddish-brown, peeling, and exposing darker layer beneath	3/4-1" (2-2.5 cm) wide; saucer-shaped, with 5-lobed pink or white corolla with purple lines, from pointed deep pink buds; on long stalks covered with sticky hairs; in upright branched flat clusters 4-5" (10-13 cm) wide; in spring	1/4" (6 mm) wide; a rounded dark brown capsule; with long threadlike style at tip; covered with sticky hairs; 5-celled, splitting open along 5 lines; many tiny seeds; maturing in autumn and remaining attached		Dry or moist acid soils; in understory of mixed forests on upland mountain slopes and in valleys; also in shrub thickets called "heath balds" or "laurel slicks"	SE. Maine south to N. Florida, west to Louisiana, and north to Indiana; to 4000' (1219 m), higher in southern Appalachians	Mountain Laurel is one of the most beautiful native flowering shrubs and is well displayed as an ornamental in many parks. The stamens of the flowers have an odd, springlike mechanism which spreads pollen when tripped by a bee. The wood has been used for tool handles and turnery, and the burls, or hard knotlike growths, for briar tobacco pipes. Linnaeus named this genus for his student Peter Kalm (1716-79), a Swedish botanist who traveled in Canada and the eastern United States

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Lowbush Blueberry / Late Lowbush Blueberry	*Vaccinium angustifolium*	Ericaceae, Heath	A low, straggling shrub	usually 6 in. to 2 ft. tall and wide		Glossy foliage turns from red-green in spring to dark blue-green in summer to maroon-purple in fall	
	Highbush Blueberry	*Vaccinium corymbosum*	Ericaceae, Heath	A multi-stemmed shrub with green, or often red, twigs and terminal clusters of small, urn-shaped white flowers	5-15' (1.5-4.5 m)		1 1/2-3" (3.8-7.5 cm) long; elliptic, entire, smooth above but usually somewhat hairy beneath	
	Large Cranberry	*Vaccinium macrocarpon*	Ericaceae, Heath	The ascending branches of this evergreen, trailing shrub have nodding, pinkish-white flowers with 4 backward-pointing petals in clusters arising in the leaf axils	creeper, with branches to 8" (20 cm) high		1/5-2/3" (5-16 mm) long; alternate, oval, blunt, shiny above but slightly whitish beneath	
	White Oak / Northern White Oak / Stave Oak	*Quercus alba*	Fagaceae, Beech	The classic eastern oak, with widespreading branches and a rounded crown, the trunk irregularly divided into spreading, often horizontal, stout branches	80-100' (24-30 cm) or more	3-4' (0.9-1.2 m) or more	4-9" (10-23 cm) long, 2-4" (5-10 cm) wide. Elliptical; 5- to 9-lobed; widest beyond middle and tapering to base; hairless. Bright green above, whitish or gray-green beneath; turning red or brown in fall, often remaining attached in winter	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
	Multiple stems; twiggy branches	Small, white, pink-tinged, bell-shaped flowers	flowers are followed by edible blue fruit		Open, conifer woods; sandy or rocky balds and old fields	Labrador to Saskatchewan, south to New England, Delaware, West Virginia, Ohio, n. Illinois, and Iowa	The berries are relished by wildlife and humans alike
		1/4-1/2" (6-13 mm) long; corolla 5-toothed. Flowers, May-June	blue berry with whitish bloom; fruit June-August		Swamps or dry upland woods	Quebec to Nova Scotia; south to Georgia; west to Alabama, north to Wisconsin	Our cultivated blueberries have been derived from the tall-growing shrub. It is often found in wet areas, but closely related growths occur in dry sites. These plants are very important to wildlife: their berries are relished by songbirds, game birds, bear, and small mammals; the twigs and foliage are eaten by deer and rabbits. Because of their food value and spectacular red fall foliage, these shrubs are excellent for naturalized landscaping
		about 1/2" (1.3 cm) long; stamens 8-10, with anthers united into a long, pointed cone projecting upward. Flowering: June-August	dark red, globose berry		Open bogs, swamps, and lake shores	Ontario east to Newfoundland, south to North Carolina, west to Tennessee, and north to Illinois and Minnesota; also in British Columbia, Washington, and California	Cultivated cranberry varieties developed from this native species are grown extensively on Cape Cod and in the Pine Barrens of New Jersey. Small Cranberry (V. oxycoccus), a native of North America and Eurasia that occurs in mainland Canada and across the northern United States, has smaller leaves that are whiter beneath and have rolled edges. These two species were originally known as craneberries because of the resemblance of their petals and beaked anther to the head of those wading birds; they are sometimes placed in their own genus, Oxycoceus. Wild cranberries often form low dense masses over peaty, boggy areas. The berries are ready for picking in the fall
light gray; shallowly fissured into long broad scaly plates or ridges, often loose				Acorns: 3/8-1 1/4" (1-3 cm) long; egg-shaped; about 1/4 enclosed by shallow cup; becoming light gray; with warty, finely hairy scales; maturing first year	Moist well-drained uplands and lowlands, often in pure stands	S. Ontario and extreme S. Quebec east to Maine, south to N. Florida, west to E. Texas, and north to E. central Minnesota; to 5500' (1676 m), or above in southern Appalachians	The most important lumber tree of the white oak group, its high-grade wood is useful for all purposes. It is sometimes called "Stave Oak" because the wood is outstanding in making tight barrels for whiskey and other liquids. In colonial times the wood was important in shipbuilding

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Swamp White Oak	*Quercus bicolor*	Fagaceae, Beech	Large tree with narrow, rounded, open crown of often-drooping branches	60-70' (18-21 m)	2-3' (0.6-0.9 m)	4-7" (10-18 cm) long, 2-4 1/2" (5-11 cm) wide. Obovate, rounded or blunt at tip, broadest beyond middle, gradually narrowed to pointed base; edges wavy with 5-10 shallow rounded lobes on each side. Green and slightly shiny above, soft whitish hairs beneath; turning brown to red in fall	
	Northern Red Oak	*Quercus rubra*	Fagaceae, Beech	Large tree with rounded crown of stout, spreading branches	60-90' (18-27 m)	1-2 1/2' (0.3-0.8 m)	4-9" (10-23 cm) long, 3-6" (7.5-15 cm) wide. Elliptical; usually divided less than halfway to midvein into 7-11 shallow wavy lobes with a few irregular bristle-tipped teeth. Usually dull green above, dull light green beneath with tufts of hairs in angles along midvein; turning brown or dark red in fall	
	Witch-hazel / American Witch-hazel	*Hamamelis virginiana*	Hamamelidaceae, Witch-hazel	Slightly aromatic shrub or small tree with a broad, open crown of spreading branches and small yellow flowers present in autumn or winter	20-30' (6-9 m)	4-8" (10-20 cm)	3-5" (7.5-13 cm) long, 2-3" (5-7.5 cm) wide. Broadly elliptical, pointed or rounded at tip, blunt to notched and unequal at base, broadest and wavy-lobed beyond middle; with 5-7 straight veins on each side; hairy when young. Dull dark green above, paler below; turning yellow in autumn	
	Shaqbark Hickory	*Carya ovata*	Juglandaceae, Walnut	Large tree with tall trunk, narrow irregular crown, and distinctive rough shaggy bark	70-100' (21-30 m)	2 1/2' (0.8 m)	pinnately compound; 8-14" (20-36 cm) long. 5 (rarely 7) elliptical or ovate leaflets, 3-7" (7.5-18 cm) long; stalkless; edges finely saw-toothed and hairy; yellow-green above, paler (and hairy when young) beneath; turning golden-brown in autumn	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
light gray; with large thin scales, becoming furrowed into plates				Acorns: 3/4-1 1/4" (2-3 cm) long; egg-shaped; 1/3 or more enclosed by deep cup of many distinct scales, becoming light brown; usually 2 on long slender stalk, maturing first year	Wet soils of lowlands, including stream borders, flood plains, and swamps subject to flooding; in mixed forests	Extreme S. Ontario east to extreme S. Quebec and Maine, south to Virginia, west to Missouri, and north to SE. Minnesota; local to SE. Maine, North Carolina, and NE. Kansas; to 1000' (305 m), locally to 2000' (610 m)	The Latin species name, meaning "two-colored," refers to the leaves, which are green above and whitish beneath
dark gray or blackish; rough, furrowed into scaly ridges; inner bark reddish				Acorns: 5/8-1 1/8" (1.5-2.8 cm) long; egg-shaped, less than 1/3 enclosed by broad cup of reddish-brown, blunt, tightly overlapping scales; maturing second year	Moist, loamy, sandy, rocky, and clay soils; often forming pure stands	W. Ontario to Cape Breton Island, south to Georgia, west to E. Oklahoma, and north Minnesota; to 5500' (1676 m) in south	The northernmost eastern oak, it is also the most important lumber species of red oak. Most are used for flooring, furniture, millwork, railroad cross-ties, mine timbers, fenceposts, pilings, and pulpwood. A popular handsome shade and street tree, with good form and dense foliage. One of the most rapid-growing oaks, it transplants easily, is hardy in city conditions, and endures cold
light brown; smooth or scaly	slender, zigzag, with gray or rust-colored hairs	1" (2.5 cm) wide; with 4 bright yellow petals, threadlike and twisted; few, short-stalked, along leafless twigs in autumn or winter	1/2" (12 mm) long; a hard elliptical capsule ending in 4 sharp curved points, light brown, opening in 2 parts; maturing in autumn; with 1 or 2 shiny blackish seeds 1/4" (6 mm) long; ejected with force by contracting capsule walls		Moist soil in understory of hardwood forests	S. Ontario east to Nova Scotia, south to central Florida, west to E. Texas, and north to central Wisconsin; local in NE. Mexico; to 5000' (1524 m), sometimes higher in southern Appalachians	The aromatic extract of leaves, twigs, and bark is used in mildly astringent lotions and toilet water. A myth of witchcraft held that a forked branch of Witch-hazel could be used to locate underground water. The foliage and fruits slightly resemble those of the shrub hazel (Corylus). Upon drying, the contracting capsule can eject its small seed as far as 30' (9 m)
light gray; separating into long narrow curved strips loosely attached at middle	brown; stout; ending in large brown hairy buds	tiny; greenish; in early spring before leaves. Male, with 4 stamens, many in slender drooping catkins, 3 hanging from 1 stalk. 2-5 female flowers at tip of same twig	1 1/4-2 1/2" (3-6 cm) long nearly round; flattened at tip; with husk thick, becoming dark brown or blackish and splitting to base. Hickory nut elliptical or rounded, slightly flattened and angled, light brown, with edible seed		Moist soils of valleys and upland slopes in mixed hardwood forests	Extreme S. Quebec and SW. Maine, south to Georgia, west to SE. Texas, and north to SE. Minnesota; also NE. Mexico; to 2000' (610 m) in north and 3000' (914 m) in southern Appalachians	Wild trees and improved cultivated varieties produce commercial hickory nuts. Carolina Hickory (var.australis (Ashe) Little), a variety found in southeastern mountains, has small lance-shaped leaflets and small nuts. The name "hickory" is from pawcohiccora, the American Indian word for the oily food removed from pounded kernels steeped in boiling water. This sweet hickory milk was used in cooking corn cakes and hominy. Pioneers made a yellow dye from the inner bark. The nickname "Old Hickory" was given by his backwoods militia to General Andrew Jackson (afterwards our seventh President) because he was "tough as hickory."

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Spicebush / Northern Spicebush	*Lindera benzoin*	Lauraceae, Laurel	deciduous shrub with dense clusters of tiny, pale yellow flowers that bloom before the leaves from globose buds along the twigs	6—17’ (1.8—5.1 m)		2—5 1/2” (5—13.8 cm) long; dark green, oblong, smooth, untoothed, and have an aromatic, spicy fragrance when crushed	
	Northern Bayberry / Candleberry	*Morella pensylvanica (Myrica pensylvanica)*	Myricaceae, Wax-myrtle	Woody shrub with fragrant, dark green leaves and waxy berries	1 1/2-6' (0.45-1.8 m)		to 4" (10 cm) long; slightly toothed near tip	
	White Ash	*Fraxinus americana*	Oleaceae, Olive	Large tree with straight trunk and dense, conical or rounded crown of foliage with whitish lower surfaces	80' (24 m)	2' (0.6 m)	opposite; pinnately compound; 8-12" (20-30 cm) long. Usually 7 (5-9) leaflets 2 1/2-5" (6-13 cm) long, 1 1/4-2 1/2" (3-6 cm) wide; paired (except at end); ovate or elliptical; finely saw-toothed or almost without teeth. Dark green above, whitish and sometimes hairy beneath; turning purple or yellow in autumn	
	Black Ash	*Fraxinus nigra*	Oleaceae, Olive	Tree with narrow, rounded crown of upright branches	30-50' (9-15 m)	1' (0.3 m)	opposite; pinnately compound; 12-16" (30-41 cm) long. 7-11 leaflets 3-5" (7.5-13 cm) long, 1-1 1/2" (2.5-4 cm) wide; paired (except at end); broadly lance-shaped; finely saw-toothed; stalkless. Dark green above, paler beneath with tufts of rust-colored hairs along midvein; turning brown in autumn	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
		1/8” (3 mm) wide; sepals and petals all alike, 6. Male and female flowers occur on separate plants; March—April	ovoid, shiny, red, berrylike drupes		Swamps and wet woods	Maine south to Florida; west to Texas; north to Missouri, Iowa, and Ontario	In the North this plant is thought of as the “forsythia of the wilds” because its early spring flowering gives a subtle yellow tinge to many lowland woods where it is common. A tea can be made from the aromatic leaves and twigs
			round, grayish-white, wax-covered berry, 1/8" (3-4 mm) in diameter, growing in clusters from stem below leaves		Dry sandy areas, coastal and inland, including dunes, pine barrens, bogs, and watersides	Maritime Provinces south to ne. North Carolina; inland to w. New York and Pennsylvania	The closely related Southern Bayberry (M. cerifera) occurs from New Jersey to Florida and along the Gulf Coast to Texas. It is a much larger plant, reaching a tree-size height of up to 30' (10 m). Distinguishing between the northern and southern species in regions where they are both found may be difficult, since they hybridize readily. The thick wax that coats the fruits of these plants is used to make candles, but large quantities of berries are needed to produce even one candle
dark gray; thick, with deep diamond-shaped furrows and forking ridges	gray or brown, stout, mostly hairless	1/4" (6 mm) long; purplish, without corolla; many in small clusters before leaves in early spring; male and female on separate trees	1-2" (2.5-5 cm) long; brownish key with narrow wing not extending down cylindrical body; hanging in clusters; maturing in late summer and autumn		Moist soils of valleys and slopes, especially deep well-drained loams; in forests with many other hardwoods	S. Ontario east to Cape Breton Island, south to N. Florida, west to E. Texas, and north to E. Minnesota; to 2000' (610 m) in the north; to 5000' (1524 m) in the south	The wood of White Ash is particularly suited for making baseball bats, tennis racquets, hockey sticks, polo mallets, oars, and playground equipment. A variation with hairs covering twigs, leafstalks, and underleaf surfaces has been called Biltmore Ash
gray; corky, fissured into soft scaly plates that rub off easily	gray, stout, becoming hairless	1/8" (3 mm) long; purplish, without calyx or corolla; in small clusters of many flowers each; before leaves in early spring. Male and female flowers on separate trees	1-1 1/2" (2.5-4 cm) long; key with broad oblong wing extending to base of flat body; hanging in clusters; maturing in late summer		Wet soils of swamps, peat bogs, and streams, especially cold swamps where drainage is poor; in coniferous and hardwood forests	SE. Manitoba east to Newfoundland, south to West Virginia, and west to Iowa; local in NE. North Dakota and N. Virginia; to 3500' (1067 m)	The northernmost native ash, Black Ash takes its name from the dark brown heartwood. Baskets, barrel hoops, and woven chair bottoms are made from thin rough strips of split wood, giving rise to the other names

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Green Ash	*Fraxinus pennsylvanica*	Oleaceae, Olive	Tree with dense, rounded or irregular crown of shiny green foliage	60' (18 m)	1 1/2' (0.5 m)	opposite; pinnately compound; 6-10" (15-25 cm) long; 5-9 (usually 7) leaflets 2-5" (5-13 cm) long, 1-1 1/2" (2.5-4 cm) wide; paired (except at end); lance-shaped or ovate; coarsely saw-toothed or almost without teeth; mostly hairless. Shiny green above, green or paler and slightly hairy beneath; turning yellow in autumn	
	American Sycamore / Planetree / Buttonwood	*Platanus occidentalis*	Platanaceae, Sycamore	One of the largest eastern hardwoods, with an enlarged base, massive, straight trunk, and large, spreading, often crooked branches forming a broad open crown	60-100' (18-30 m)	2-4' (0.6-1.2 m), sometimes much larger	4-8" (10-20 cm) long and wide (larger on shoots). Broadly ovate, with 3 or 5 shallow broad short-pointed lobes; wavy edges with scattered large teeth; 5 or 3 main veins from notched base. Bright green above, paler beneath and becoming hairless except on veins; turning brown in autumn. Leafstalk long, stout, covering side bud at enlarged base	
	Sweet Crabapple	*Malus coronaria (Pyrus coronaria)*	Rosaceae, Rose	A small tree with a short trunk and several stout branches forming broad, open crown	30' (9 m)	1' (0.3 m)	2-4" (5-10 cm) long, 1 1/2" (4 cm) wide. Ovate; coarsely saw-toothed beyond middle; slightly lobed on young twigs; both blades and leafstalks with fine reddish hairs when young. Yellow-green above, pale beneath; turning yellow in autumn	
	Black Chokeberry	*Photinia melanocarpa (Aronia melanocarpa)*	Rosaceae, Rose	A usually low-growing shrub with small terminal clusters of white flowers, followed by small black fruits, on hairless twigs	4-6' (1.2-1.8 m)		2-4" (5-10 cm) long; ovate; shiny green above, hairless below; edges finely toothed	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
gray; furrowed into scaly ridges, with reddish inner layer	green, becoming gray and hairless; slender	1/8" (3 mm) long; greenish; without corolla; in small clusters of many flowers each; before leaves in early spring. Male and female flowers on separate trees	1 1/4-2 1/4" (3-6 cm) long; yellowish key with narrow wing extending nearly to base of narrow body; hanging in clusters; maturing in late summer and autumn		Moist alluvial soils along streams in floodplain forests	SE. Alberta east to Cape Breton Island; south to N. Florida, west to Texas; to 3000' (914 m) in southern Appalachians	The most widespread native ash, this species extends westward into the plains and nearly to the Rocky Mountains. A northeastern variation with twigs, leafstalks, and underleaf surfaces all densely covered with hairs has been called Red Ash. One of the most successful hardwoods in the Great Plains shelterbelts, hardy, fast-growing Green Ash is also planted on spoil banks after strip mining, as well as for shade
smooth, whitish and mottled; peeling off in large thin flakes, exposing patches of brown, green, and gray; base of large trunks dark brown, deeply furrowed into broad scaly ridges	greenish, slender, zigzag, with ring scars at nodes	tiny; greenish; in 1-2 ball-like drooping clusters; male and female clusters on separate twigs; in spring	1" (2.5 cm) in diameter; usually 1 brown ball hanging on long stalk, composed of many narrow nutlets with hair tufts; maturing in autumn, separating in winter		Wet soils of stream banks, flood plains, and edges of lakes and swamps; dominant in mixed forests	SW. Maine, south to NW. Florida, west to S. central Texas, north to E. Nebraska; also NE. Mexico; to 3200' (975 m)	Sycamore pioneers on exposed upland sites such as old fields and strip mines. The wood is used for furniture parts, millwork, flooring, and specialty products such as butcher blocks, as well as pulpwood, particleboard, and fiberboard. A shade tree, Sycamore grows to a larger trunk diameter than any other native hardwood. The present champion's trunk is about 11' (3.4 m) in diameter; an earlier giant's was nearly 15' (4.6 m). The hollow trunks of old, giant trees were homes for chimney swifts in earlier times
red-brown; fissured and scaly	red-brown; covered with gray hairs when young	nearly 1 1/2" (4 cm) wide; with 5 rounded white or pink petals; in clusters, on long stalks; in spring	1-1 1/4" (2.5-3 cm) in diameter; like a small apple; yellow-green, long-stalked; maturing in late summer		Moist soils in openings and borders of forests	S. Ontario east to New York, south to extreme N. Georgia, west to NE. Arkansas, and north to N. Illinois; to 3300' (1006 m) in southern Appalachians	The common crabapple of the Ohio Valley, it is sometimes planted as an ornamental. Double-flowered varieties have a greater number of larger and deeper pink flowers. The fruit can be made into preserves and cider
		small; 5 petals around protruding reproductive parts; in upright clusters; May-June	small black berries, shiny at first but shriveled up by early fall		Thickets, clearings, low woods, and swamps	Ontario east to Newfoundland and south to Georgia and Arkansas	Red, Purple, and Black Chokeberries are very similar, differing in berry color and in the degree of hairiness on the twigs, buds, and leaves: Red is the hairiest, Black is hairless, and Purple is in between. All three species are wonderful species for a native plant garden. In the wild, Black Chokeberry fruits are eaten by various species of birds

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Red Chokeberry	*Photinia pyrifolia (Aronia arbutifolia, Pyrus arbutifolia)*	Rosaceae, Rose	A spreading shrub with terminal clusters of white or pink-tinged flowers on hairy stalks	3-12' (90-360 cm)		1-3" (2.5-7.5 cm) long, toothed, oval to broadly lanceolate, with pointed tips, dark green and smooth above, densely hairy and pale beneath; glands along upper midrib visible with hand lens	
	American Plum	*Prunus americana*	Rosaceae, Rose	A thicket-forming shrub or small tree with short trunk, many spreading branches, broad crown, showy large white flowers, and red plums	30' (9 m)	1' (0.3 m)	2 1/2-4" (6-10 cm) long, 1 1/4-1 3/4" (3-4.5 cm) wide. Elliptical, long-pointed at tip; sharply and often doubly saw-toothed; slightly thickened. Dull green with slightly sunken veins above, paler and often slightly hairy on veins beneath	
	Pin Cherry / Fire Cherry	*Prunus pensylvanica*	Rosaceae, Rose	Small tree or shrub with horizontal branches; narrow, rounded, open crown; shiny red twigs; bitter, aromatic bark and foliage; and tiny red cherries	30' (9 m)	1' (0.3 m)	2 1/2-4 1/2" (6-11 cm) long, 3/4-1 1/4" (2-3 cm) wide. Broadly lance-shaped, long-pointed; finely and sharply saw-toothed; becoming hairless. Shiny green above, paler beneath; turning bright yellow in autumn. Slender leafstalks often with 2 gland-dots near tip	
	Meadowsweet / White Meadowsweet	*Spiraea alba*	Rosaceae, Rose	A woody shrub with a dense, pyramidal, terminal cluster of small, white or pale pinkish flowers	2-5' (60-150 cm)		1 1/2-2 3/4" (4-7 cm) long, narrowly ovate to broadly lanceolate, hairless or nearly so, coarsely toothed, pale beneath	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
		1/2" (1.5 cm) wide; petals 5; stamens numerous, with conspicuous, black or dark red anthers. Bloom April-July	Bright or dull red, berry-like, 1/4" (6 mm) wide		Thickets, clearings, low woods, and swamps	Ontario east to Nova Scotia, south to Florida, west to Texas, and north to Kentucky, Arkansas, and Oklahoma	A native shrub, this species forms sizable colonies and is excellent for naturalistic landscaping. A closely related, black-fruited species, Black Chokeberry (P. melanocarpa), has leaves that are hairless beneath; it is found from Ontario east to Newfoundland and south to Georgia and Arkansas. Growing in much the same range, Purple Chokeberry (P. floribunda), which appears to be derived by hybridization of Red and Black Chokeberry, has purple fruit. Although chokeberry fruits persist through much of the winter, they appear to be of little importance to wildlife; they are occasionally eaten by game birds and songbirds and reportedly by bears. Chokeberry species are sometimes placed in the genus Aronia
dark brown; scaly	light brown, slender, hairless; short twigs ending in spine	3/4-1" (2-2.5 cm) wide; with 5 rounded white petals; in clusters of 2-5 on slender equal stalks; slightly unpleasant odor; in early spring before leaves	a plum 3/4-1" (2-2.5 cm) in diameter; thick red skin; juicy sour edible pulp; large stone; maturing in summer		Moist soils of valleys and low upland slopes	Se. Saskatchewan east to New Hampshire, south to Florida, west to Oklahoma, and north to Montana; to 3000' (914 m) in the South and to 6000' (1829 m) in the Southwest	The plums are eaten fresh and used in jellies and preserves, and are also consumed by many kinds of birds. Numerous cultivated varieties with improved fruit have been developed. A handsome ornamental with large flowers and relatively big fruit, American Plum is also grown for erosion control, spreading by root sprouts
reddish-gray, smooth, thin; becoming gray and fissured into scaly plates	1/2" (12 mm) wide; with 5 rounded white petals; 3-5 flowers on long equal stalks; in spring with leaves	a cherry 1/4" (6 mm) in diameter; red skin; thin sour pulp; large stone; in summer			Moist soil, often in pure stands on burned areas and clearings; with aspens, Paper Birch, and Eastern White Pine	British Columbia and s. Mackenzie east across Canada to Newfoundland, south to n. Georgia, west to Colorado; to 6000' (1829 m) in southern Appalachians	This species is often called "Fire Cherry" because its seedlings come up after forest fires. The plants grow rapidly and can be used for fuel and pulpwood. It is also a "nurse" tree, providing cover and shade for the establishment of seedlings of the next generation of larger hardwoods. The cherries are made into jelly and are also consumed by wildlife
		About 1/4" (6 mm) wide; sepals and petals 5 each; stamens numerous; pistils usually 5. Flowering: June-September	Pod, opening along one side		Meadows, old fields, and low moist ground	Alberta east to Newfoundland, south to North Carolina, west to Missouri, and northwest to North Dakota	The brown fruit, which persists after flowering, is a distinctive feature of all Spiraea. Although less spectacular than the showy, introduced garden spiraeas, this native species is most suitable for naturalistic landscaping. Virginia Spiraea (S. virginiana), with a rounded, short, broad flower cluster and thin oblong leaves, is found from Ohio and Pennsylvania south to Georgia and Louisiana

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Buttonbush / Honey-balls	*Cephalanthus occidentalis*	Rubiaceae, Madder	Spreading, much-branched shrub or sometimes small tree with many branches (often crooked and leaning), irregular crown, balls of white flowers resembling pincushions, and buttonlike balls of fruit	20' (6 m)	4" (10 cm)	opposite or 3 at a node (whorled); 2 1/2-6" (6-15 cm) long, 1-3" (2.5-7.5 cm) wide. Ovate or elliptical, pointed at tip, rounded at base; without teeth. Shiny green above, paler and sometimes hairy beneath; at southern limit nearly evergreen	
	Common Prickly-Ash / Toothache Tree / Northern Prickly-ash	*Zanthoxylum americanum (Xanthoxylum americanum)*	Rutaceae, Citrus	Much-branched shrub, often forming thickets, and rarely a round-crowned tree; aromatic, spiny, and with tiny gland-dots on foliage, flowers, and fruit	20' (6 m) or more	6" (15 cm)	pinnately compound; 5-10" (13-25 cm) long; 5-11 paired leaflets, 1-2" (2.5-5 cm) long; elliptical or ovate; blunt-pointed at ends; edges straight or slightly wavy; hairy when young; stalkless. Dull green with sunken veins above, paler and hairy on veins beneath	
	Eastern Cottonwood	*Populus deltoides*	Salicaceae, Willow	Large tree with a massive trunk often forked into stout branches, and broad, open crown of spreading and slightly drooping branches	100' (30 m)	3-4' (0.9-1.2 m), often larger	3-7" (7.5-18 cm) long, 3-5" (7.5-13 cm) wide. Triangular; long-pointed; usually straight at base; curved, coarse teeth; slightly thickened; shiny green, turning yellow in autumn. Leafstalks long, slender, flattened	
	Pussy Willow	*Salix discolor*	Salicaceae, Willow	Many-stemmed shrub or small tree with open rounded crown; silky, furry catkins appear in late winter and early spring	20' (6 m)	8" (20 cm)	1 1/2-4 1/4" (4-11 cm) long, 3/8-1 1/4" (1-3 cm) wide. Lance-shaped or narrowly elliptical; irregularly wavy-toothed; stiff; hairy when young; slender-stalked. Shiny green above, whitish beneath	

BARK	TWIGS	FLOWERS	FRUIT	CONES, ACORNS	HABITAT	RANGE	DISCUSSION
gray or brown; becoming deeply furrowed into rough scaly ridges	mostly in 3's; reddish-brown, stout, sometimes hairy, with rings at nodes	5/8" (15 mm) long; with narrow, tubular, white 4-lobed corolla and long threadlike style; fragrant; stalkless; crowded in upright long-stalked white balls of many flowers each, 1-1 1/2" (2.5-4 cm) in diameter; from late spring through summer	3/4-1" (2-2.5 cm) in diameter; compact rough brown balls composed of many small, narrow, dry nutlets 1/4" (6 mm) long, each 2-seeded; maturing in autumn		Wet soils bordering streams and lakes	S. Quebec and SW. Nova Scotia, south to S. Florida, west to Texas, and north to SE. Minnesota; to 3000' (914 m); in Arizona and California to 5000' (1524 m); also Mexico, Central America, and Cuba	The bitter bark has served in home remedies, but its medicinal value is doubtful. Buttonbush is a handsome ornamental suited to wet soils and is also a honey plant. Ducks and other water birds and shorebirds consume the seeds
gray to brown; smooth	brown or gray; hairy when young; often with paired short stout spines less than 3/8" (10 mm) long	less than 3/16" (5 mm) wide; with 5 spreading fringed yellow-green petals; in short-stalked clusters; male and female on separate plants; in spring before leaves	3/16" (5 mm) long; podlike, elliptical, brown, slightly fleshy; maturing in late summer and splitting open		Moist soils in valleys and rocky uplands	S. Ontario east to S. Quebec, south to Pennsylvania, west to central Oklahoma, and north to E. North Dakota; local to Georgia; to 2000' (610 m)	The northernmost representative of a tropical genus named from Greek words meaning "yellow" and "wood". A drug formerly was obtained from the dried, bitter, aromatic bark. The fresh bark is chewed for relief from toothache, numbing the pain
yellowish-green and smooth; becoming light gray, thick, rough, and deeply furrowed	brownish; stout, with large resinous or sticky buds	catkins 2-3 1/2" (5-9 cm) long; brownish; male and female on separate trees; in early spring	3/8" (10 mm) long; elliptical capsules, light brown; maturing in spring and splitting into 3-4 parts; many on slender stalks in catkin to 8" (20 cm) long; many tiny cottony seeds		Bordering streams and in wet soils in valleys; in pure stands or often with willows. Pioneers on new sandbars and bare flood plains	Widespread S. Alberta east to extreme S. Quebec and New Hampshire, south to NW. Florida, west to W. Texas, and north to central Montana; to 1000' (305 m) in east, to 5000' (1524 m) in west	One of the largest eastern hardwoods, it is used for boxes and crates, furniture, plywood, woodenware, matches and pulpwood. Planted as a shade tree and for shelterbelts. The common name refers to the abundant cottony seeds; another name, "Necklace Poplar," alludes to the resemblance of the long, narrow line of seed capsules to a string of beads. Although short-lived, it is one of the fastest-growing native trees; on favorable sites in the Mississippi Valley, trees average 5' (1.5 m) in height growth annually with as much as 13' (4 m) the first year. Plains Cottonwood (var. occidentalis Rydb.), a western variety, has slightly smaller leaves that are often broader than long and more coarsely toothed
gray, fissured, scaly	brown; stout; hairy when young	catkins 1-2 1/2" (2.5-6 cm) long; cylindrical; thick with blackish scales; covered with silky whitish hairs; in late winter and early spring long before leaves	5/16-1/2" (8-12 mm) long; narrow capsules; light brown; finely hairy, in early spring before leaves		Wet meadows soils and borders of streams and lakes; usually in coniferous forests	N. British Columbia to Labrador, south to Delaware, west to NE. Missouri, and north to N. Wyoming and North Dakota; to 4000' (1219 m)	The large flower buds burst and expose their soft silky hair, or "pussy fur," early in the year. In winter, cut Pussy Willow twigs can be put in water and the flowers forced at warm temperatures. Some twigs will produce beautiful golden stamens, while others will bear slender greenish pistils. The Latin species name refers to the contrasting colors of the leaf surfaces, which aid in recognition

IMAGE	COMMON NAME	SCIENTIFIC NAME	FAMILY	DESCRIPTION	HEIGHT	DIAMETER	LEAVES	NEEDLES
	Black Willow	*Salix nigra*	Salicaceae, Willow	Large tree with 1 or more straight and usually leaning trunks, upright branches, and narrow or irregular crown	60-100' (18-30 m)	1 1/2-2 1/2' (0.5-0.8 m)	3-5" (7.5-13 cm) long, 3/8-3/4" (10-19 mm) wide. Narrowly lance-shaped, often slightly curved to one side; long-pointed, finely saw-toothed, hairless or nearly so; shiny green above, paler beneath	
	Northern Hackberry / Common Hackberry	*Celtis occidentalis*	Ulmaceae, Elm	Tree with rounded crown of spreading or slightly drooping branches, often deformed as bushy growths called witches'-brooms	50-90' (15-27 m)	1 1/2-3' (0.5-0.9 m)	in 2 rows; 2-5" (5-13 cm) long, 1 1/2-2 1/2" (4-6 cm) wide, Ovate, long-pointed; usually sharply toothed except toward unequal-sided, rounded base; 3 main veins. Shiny green and smooth (sometimes rough) above, paler and often hairy on veins beneath; turning yellow in autumn	
	American Elm	*Ulmus americana*	Ulmaceae, Elm	Large, handsome, graceful tree, often with enlarged buttresses at base, usually forked into many spreading branches, drooping at ends, forming a very broad, rounded, flat-topped or vaselike crown, often wider than high	100' (30 m)	4' (1.2 m), sometimes much larger	in 2 rows; 3-6" (7.5-15 cm) long, 1-3" (2.5-7.5 cm) wide. Elliptical, abruptly long-pointed, base rounded with sides unequal; doubly saw-toothed; with many straight parallel side veins; thin. Dark green and usually hairless or slightly rough above, paler and usually with soft hairs beneath; turning bright yellow in autumn	
	Slippery Elm	*Ulmus rubra*	Ulmaceae, Elm	Tree with broad, open, flat-topped crown of spreading branches and large rough leaves	70' (21 m)	2-3' (0.6-0.9 m)	in 2 rows; 4-7" (10-18 cm) long, 2-3" (5-7.5 cm) wide. Elliptical, abruptly long-pointed, base rounded with sides very unequal; doubly saw-toothed with many straight parallel side veins; thick. Green to dark green and very rough above, densely covered with soft hairs beneath; turning dull yellow in autumn	