Sustainable Manhattan 2050:

Visions for Resilient Community in the Age of Peak Oil and Climate Destabilization

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Department of Architecture
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Manhattan, KS

A Perfect Storm

- Exponential Population Growth
- Peak Oil and Natural Gas
- Climate Destabilization
- Environmental Degradation

Exponential Population Growth

From 6.7 billion people today

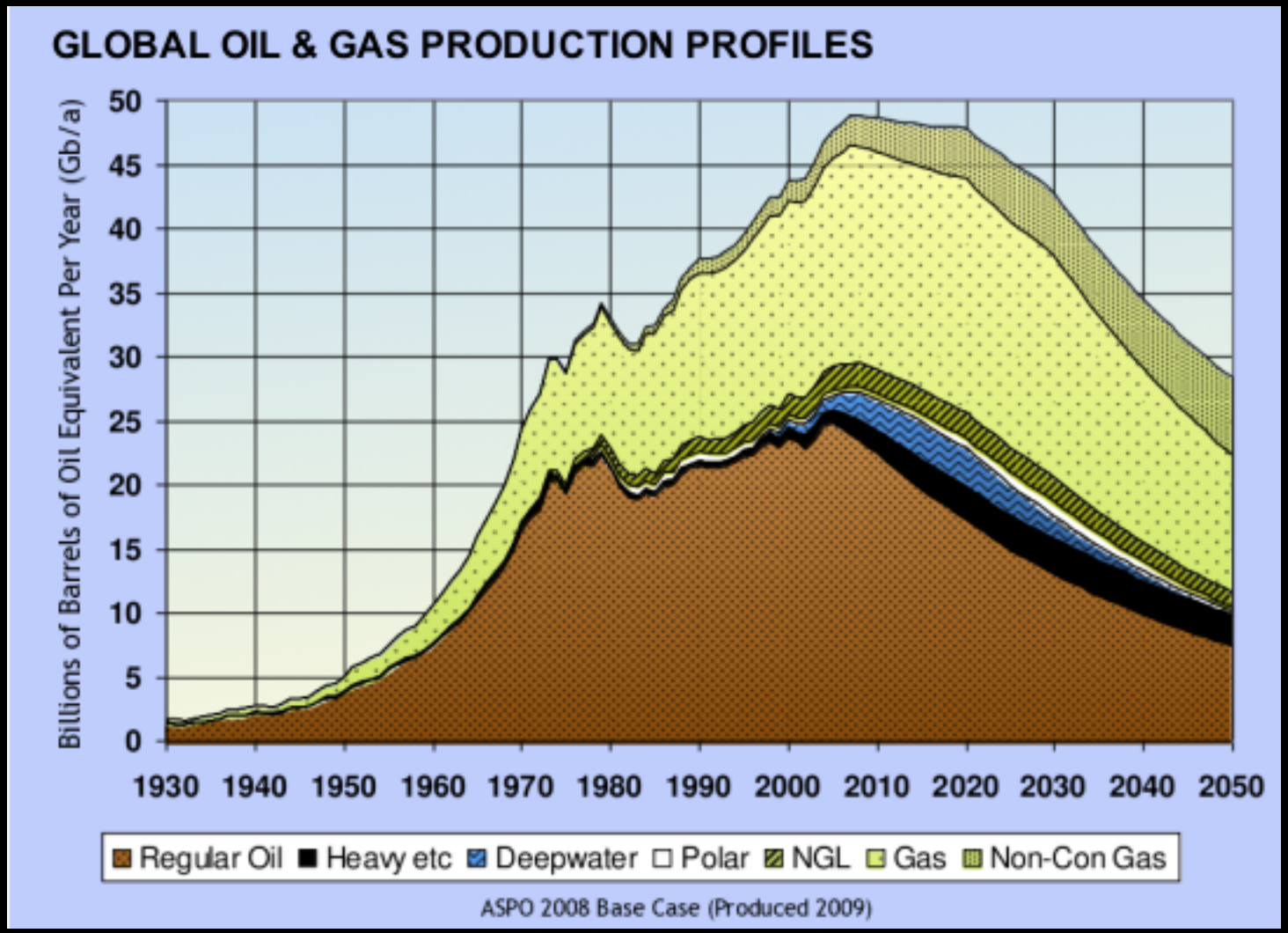
To 9 billion in 2050

Peak Oil and Natural Gas

2030: 25% less oil than today

2050: 50% less oil than today

No natural gas available in North America


GLOBAL OIL & GAS PRODUCTION PROFILES
Billions of Barrels of Oil Equivalent Per Year (Gb/a)
50
45
40
35
30
25
20
15
10
5
0
1930
1940
1950
1960
1970
1980
1990
2000
2010
2020
2030
2040
2050
Regular Oil
Heavy etc
Deepwater
Polar
NGL
Gas
Non-Con Gas
ASPO 2008 Base Case (Produced 2009)

Climate Destabilization

The world seems committed to an increase In global temperature of nothing less than 3 degrees C, which will cause us to cross a number of key tipping points, possibly leading to:

- The disappearance of summer arctic sea ice
- An increase in massive floods and sustained droughts
- The melting of the Himalayan glaciers
- The melting of much of the Greenland and West Antarctic ice sheets (increase in sea level of some 7 meters)

Environmental Degradation and Species Extinction

More than 60% of ecosystems are stressed beyond sustainable levels

We are now living in the epoch of the Sixth Great Extinction

By the end of the century from one quarter to one half of all species on earth will become extinct

Alternative Futures

- Civilizational Collapse
- Sustainable Enclaves for the Rich
- Urban Deconstruction and Re-ruralization
- A Meta-Industrial Society comprised of Resilient Cities and Sustainable Bioregions

Question

How can Manhattan, KS take steps now to prepare for the radically different world which will exist in 2050?

Resilient Cities

1) The Renewable Energy City
2) The Carbon Neutral City
3) The Distributed City
4) The Photosynthetic City
5) The Eco-efficient city
6) The Place-Based City
7) The Sustainable Transport City

Eco-communities:
Building Blocks for a Sustainable Society

The creation of socially and economically diverse, humanly scaled, face-to-face communities of shared space, personal responsibility and mutual obligation are essential to our ability to recover the wisdom, civility and compassion necessary to make the transition to a meta-industrial society.

Resilient Cities

Compact, socially diverse, mixed-use, pedestrian friendly neighborhoods, towns and cities that integrate:

* renewable energy production and consumption
* multi-modal transportation linkages
* climatically adapted passive solar architecture
* living, working, recreation, education, shopping and worship
* ecological landscape design and land-use planning
* organic urban agriculture and local food systems

Flint Hills Square: A Green Urban District

The GREEN circle shows a 5-minute walking, 1/4 mile.
The LIGHT BLUE circle shows a 10-minute walkings, 1/2 mile.
The DARK BLUE circle shows a 15-minute walkings, 3/4 mile.

Food

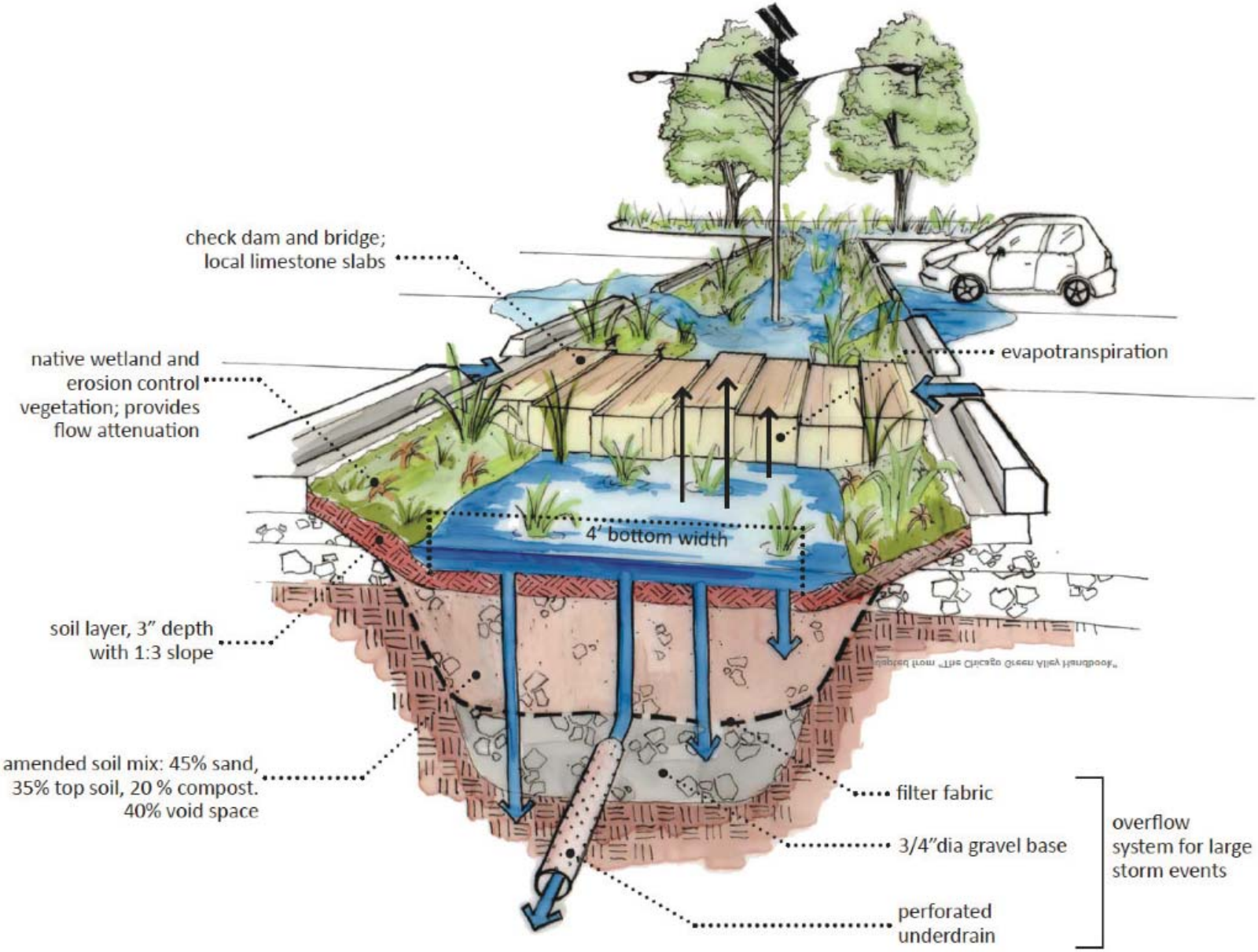
- Harry's
- AJ's Pizzeria
- Old Chicago
- Della Voce
- Applebee's
- Chili's
- Whiskey Creek
- Olive Garden
- Longhorns
- Smash Burger
- Orange Leaf
- McAlisters
- The Chef
- Carlos O'Kelly's
- Hu Hot

Entertainment/ Shopping

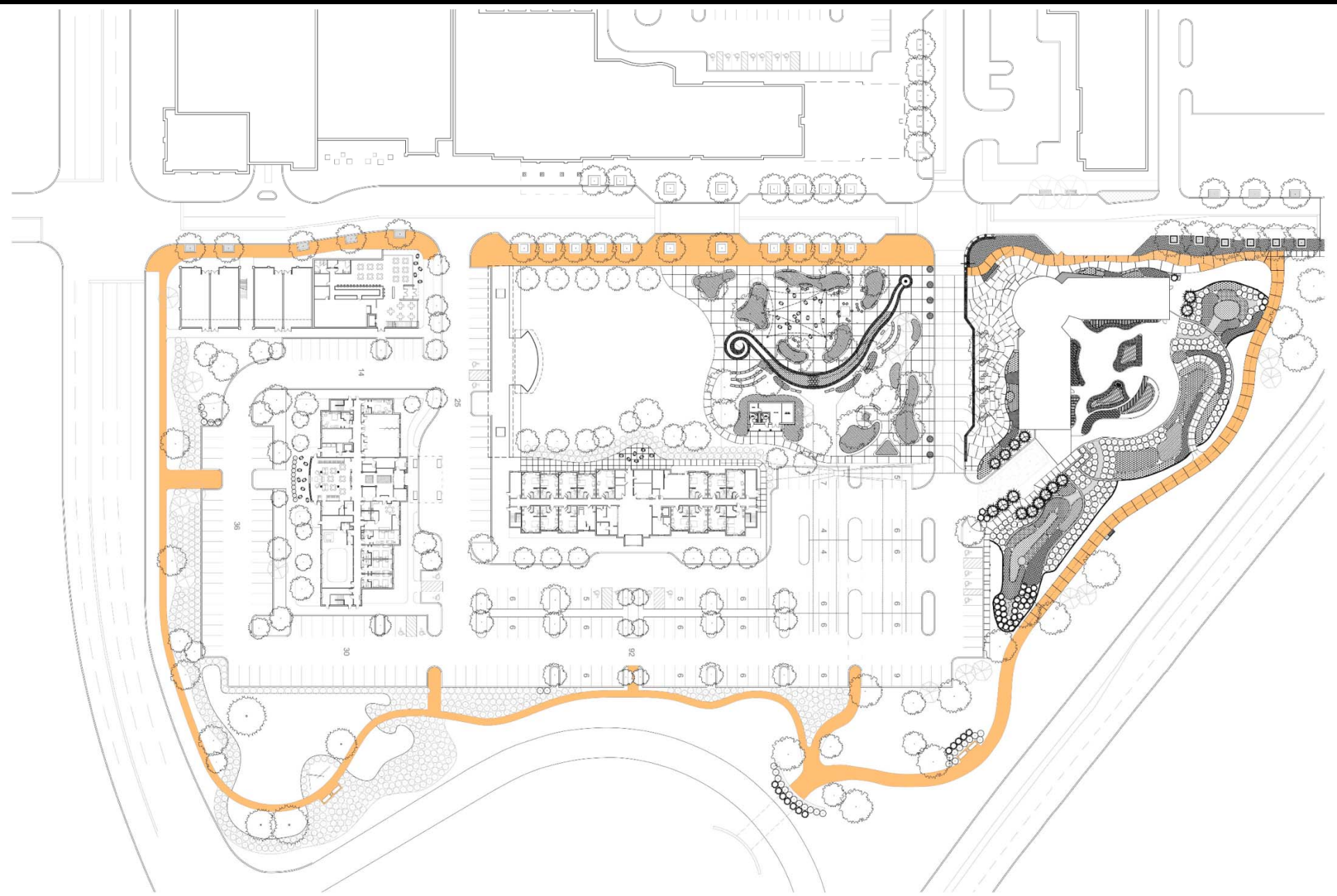
- Town Center
  - Sears
  - JC Penney
  - Dillard's
  - Kansas Store
  - Varney's K-State Place
- Pathfinders
- Wareham Opera House
- Strecker Nelson Art Gallery
- Best Buy
- Bed Bath & Beyond
- Hy-Vee
- Walgreens
- Petco
- Dick's (2011)
- Discovery Center
- Union Pacific Train Depot


3RD STREET


bioswale
green technologies
atmospheric regulation
climate regulation
erosion control
sediment control
soil formation
flow attenuation
filtration
infiltration
treatment
flow attenuation

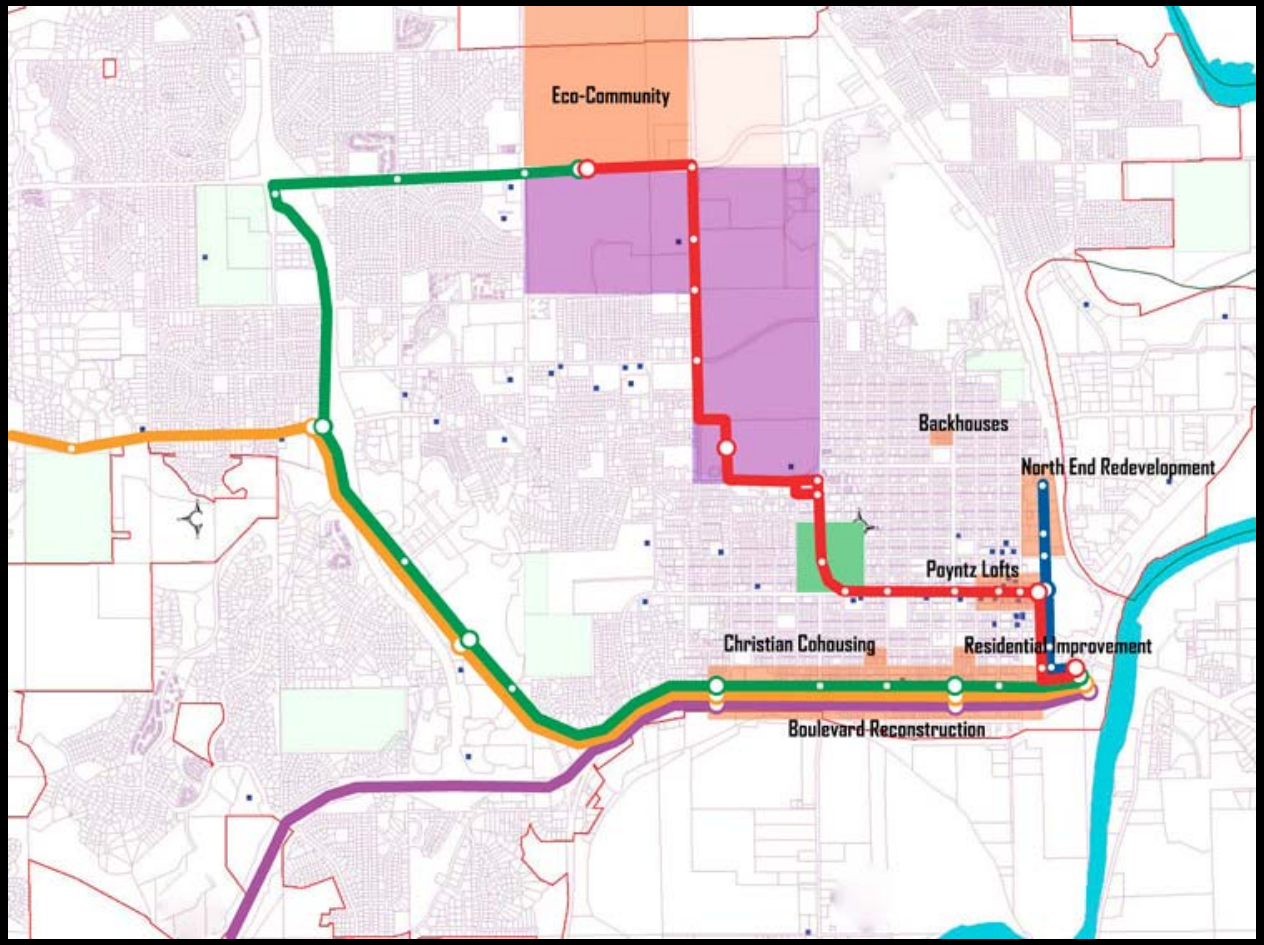

check dam and bridge;
local limestone slabs
native wetland and
erosion control
vegetation; provides
flow attenuation
evapotranspiration
4' bottom width
soil layer, 3" depth
with 1:3 slope
amended soil mix: 45% sand,
35% top soil, 20 % compost.
40% void space
filter fabric
3/4"dia gravel base
perforated
underdrain
overflow
system for large
storm events

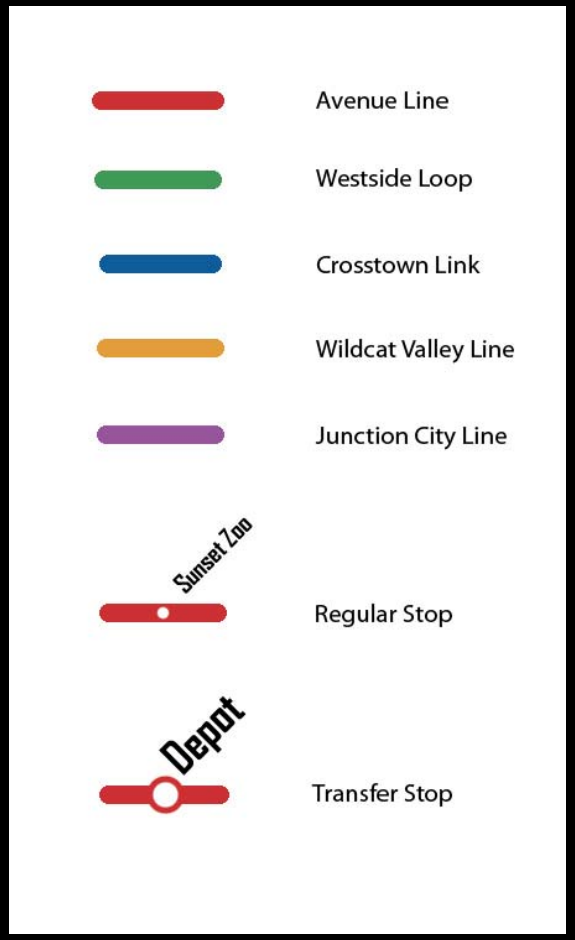

atmospheric regulation
evapotranspiration
climate regulation
heat island mitigation
carbon regulation
shaded parking
education
infiltration
erosion control
filtration
sediment control
flow attenuation
green technologies
pervious pavement




climate regulation
evapotranspiration
land mitigation
recreation
infiltration
flow attenuation
filtration
habitat
detention area

Toward a Renewable Energy-Based Multi-Modal Transportation System

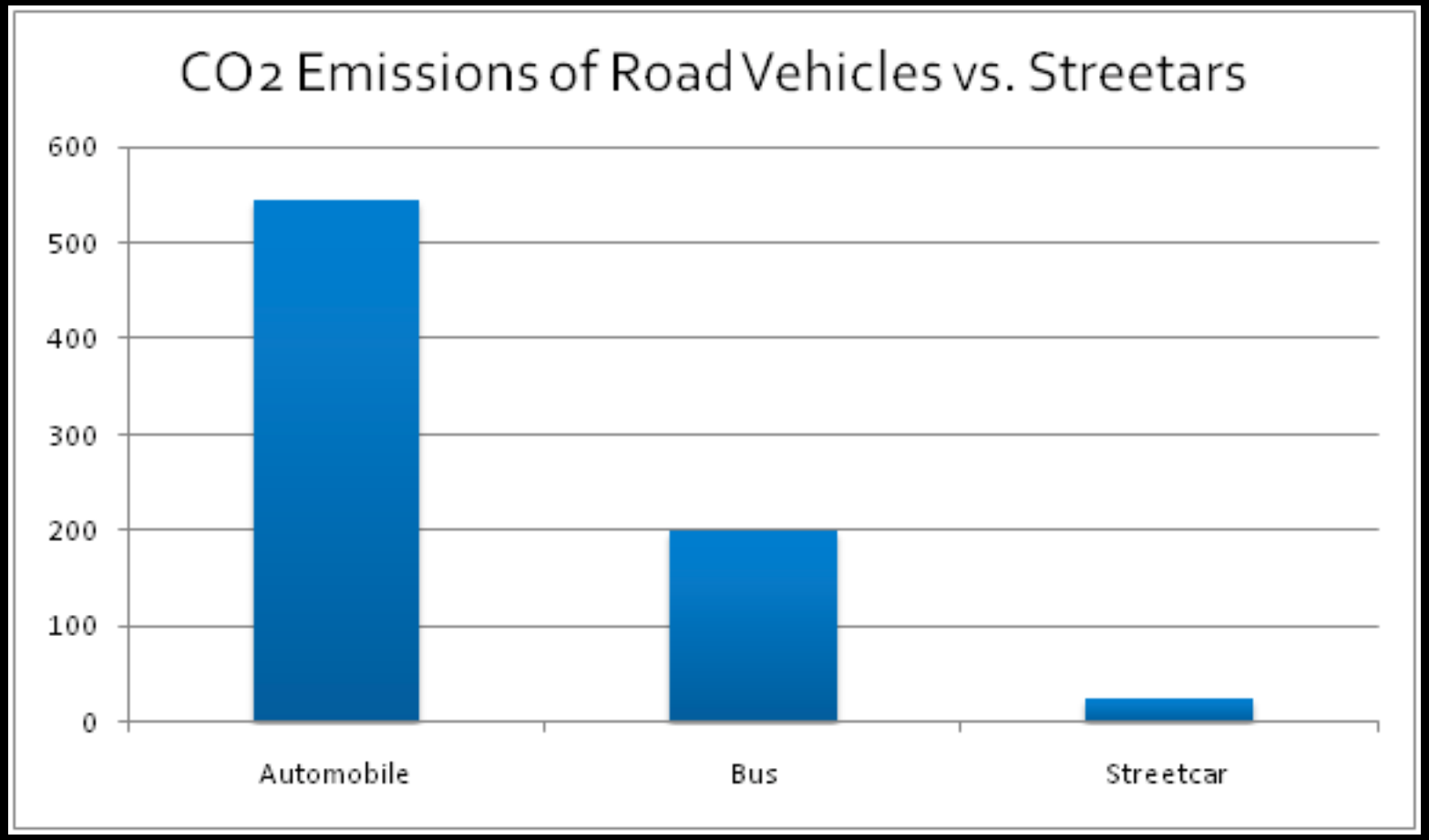




Little Rock, Arkansas

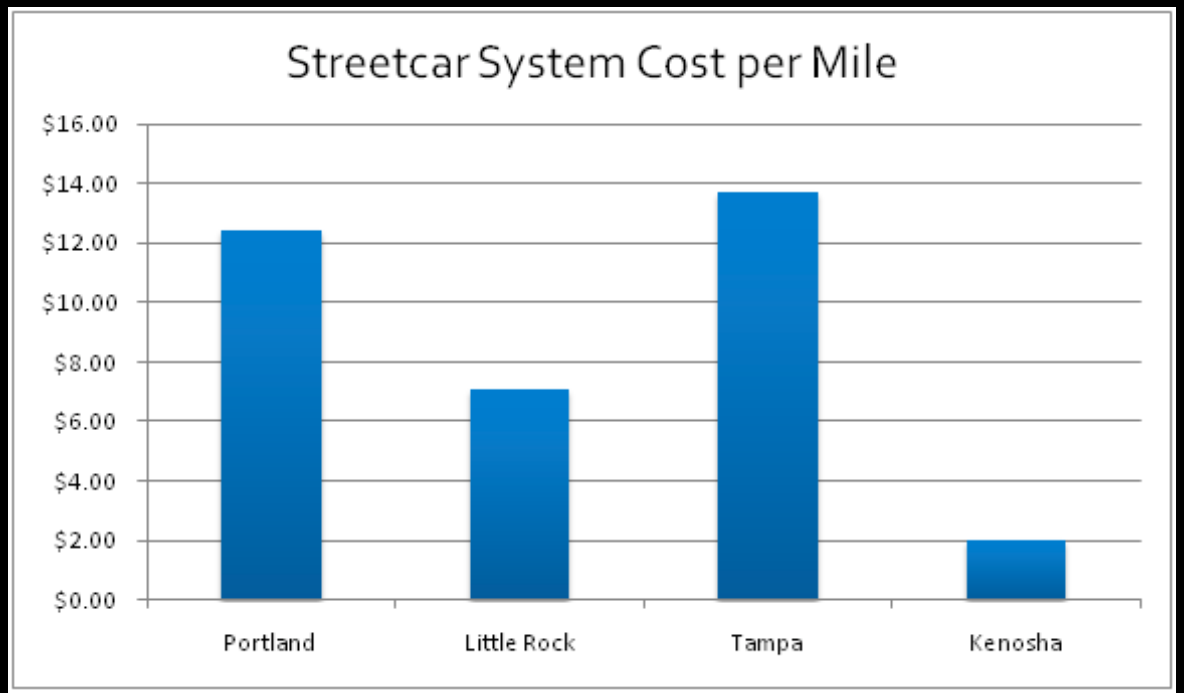
Portland, Oregon

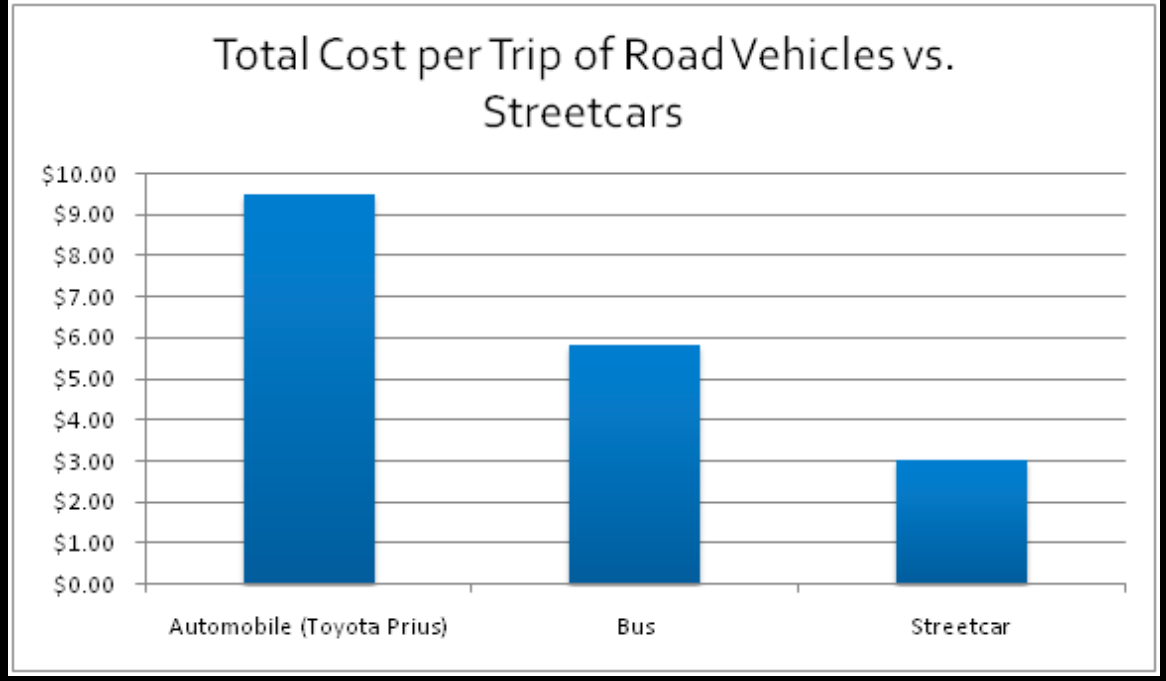
Tampa Bay, Florida

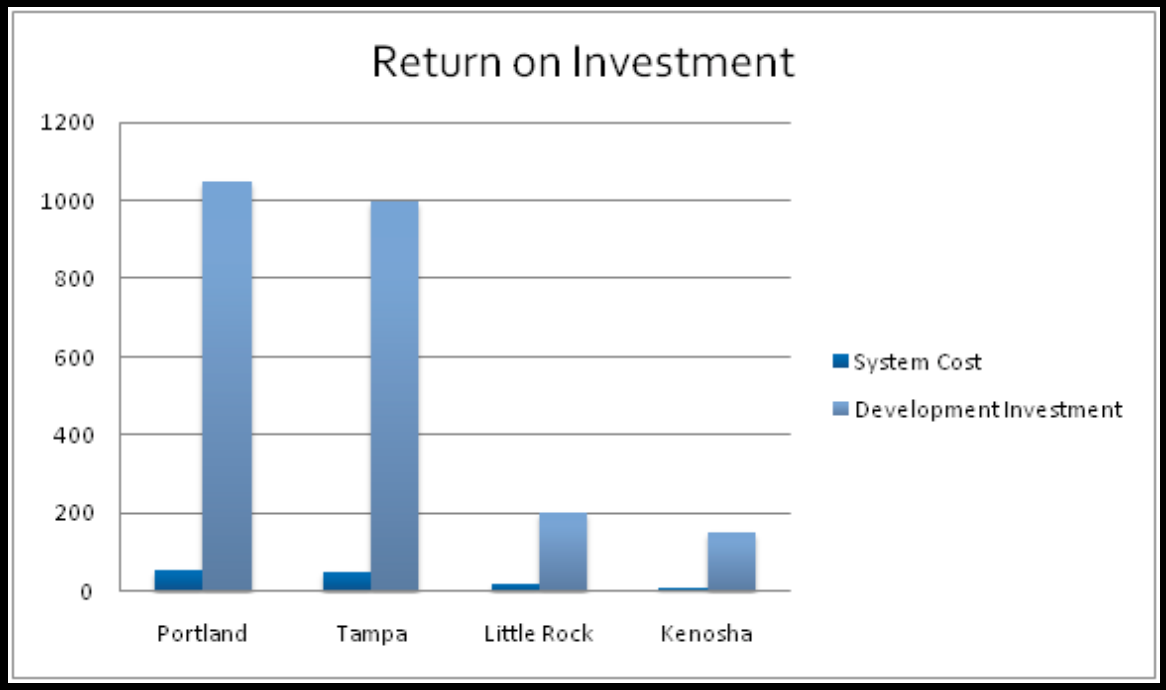

CO2 Emissions of Road Vehicles vs. Streetars
600
500
400
300
200
100
0
Automobile
Bus
Streetcar

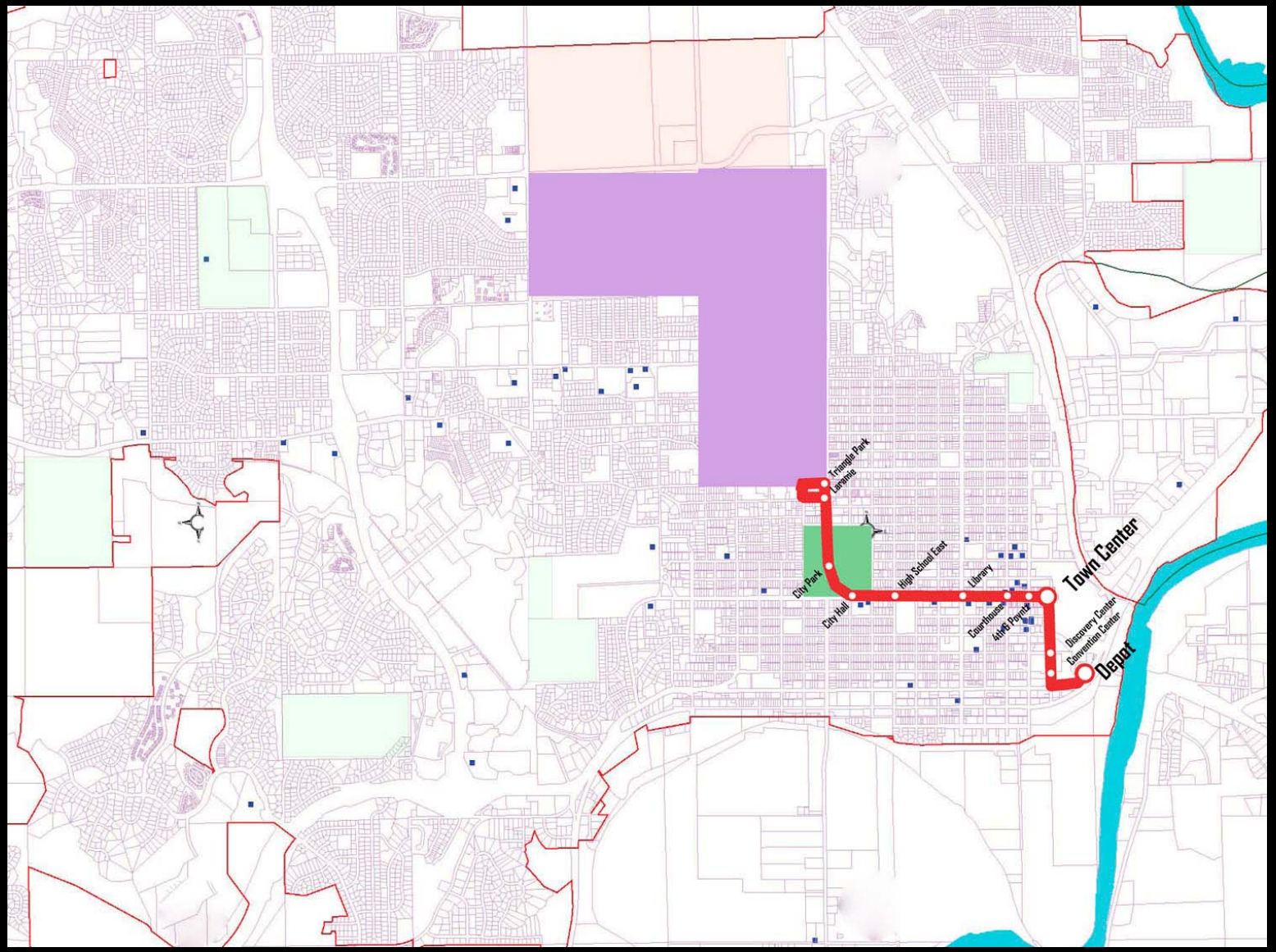

KENOSHA

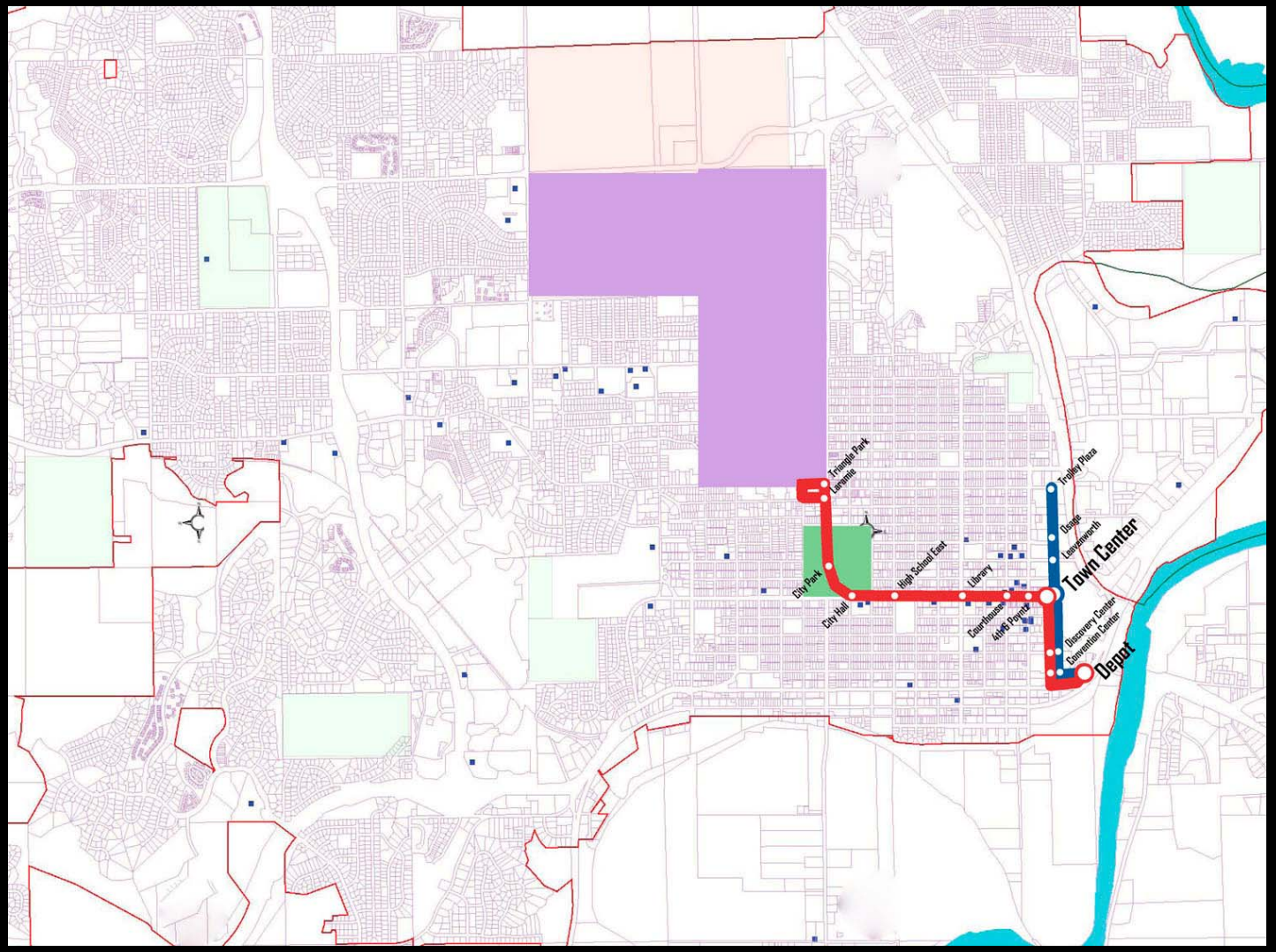
Kenosha, WI

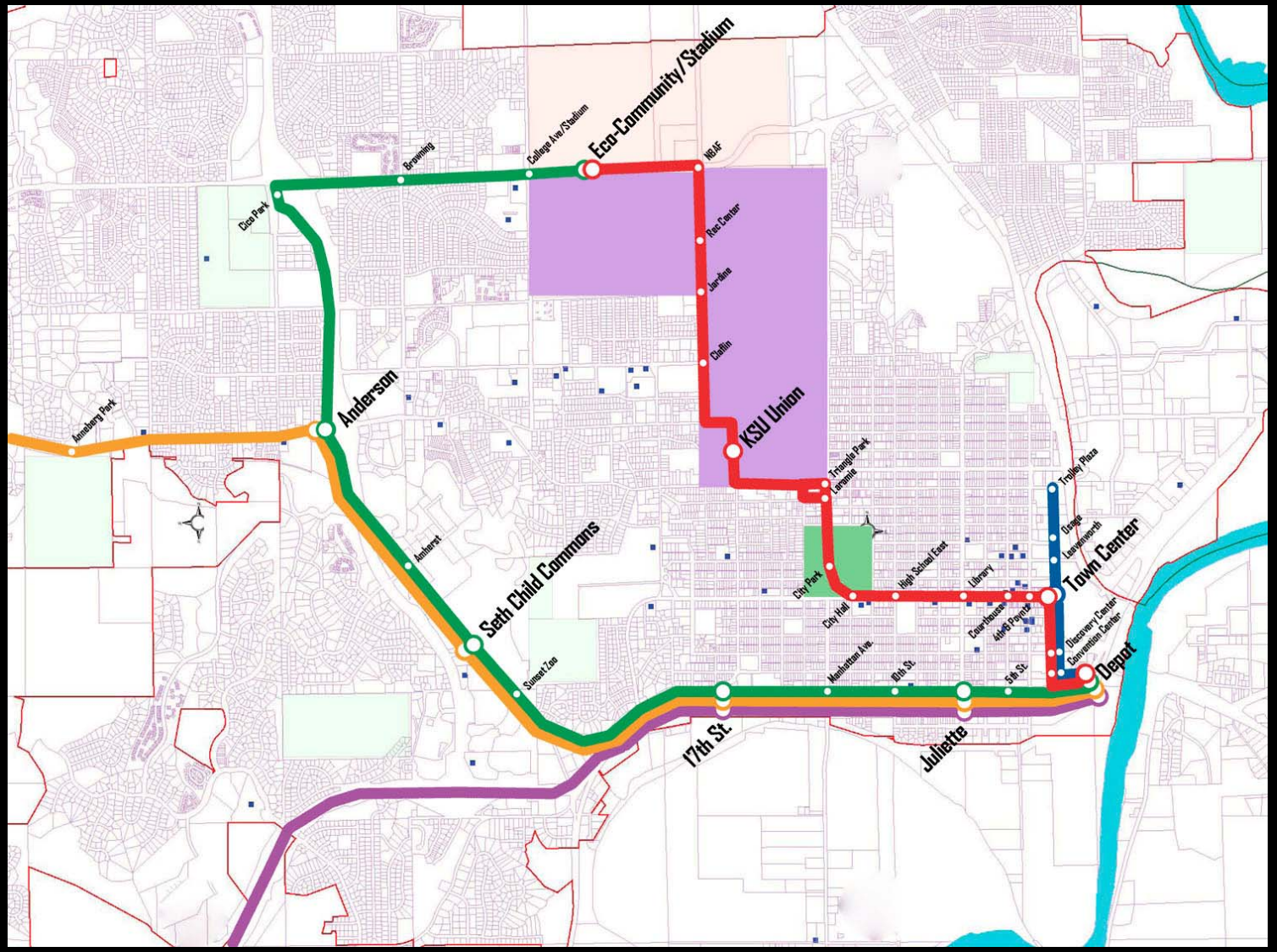

Streetcar System Cost per Mile
$16.00
$14.00
$12.00
$10.00
$8.00
$6.00
$4.00
$2.00
$0.00
Portland
Little Rock
Tampa
Kenosha

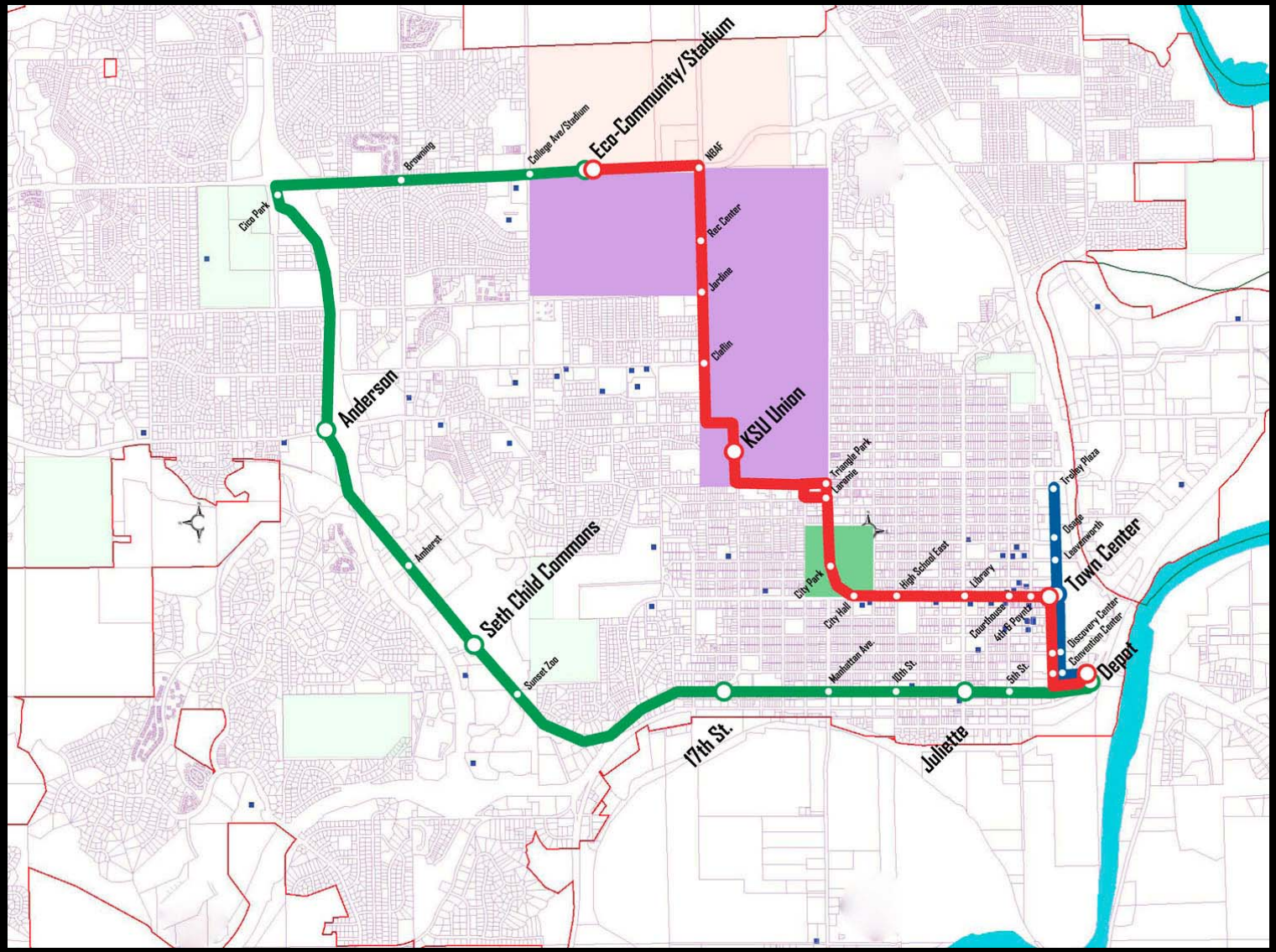

Total Cost per Trip of Road Vehicles vs. Streetcars
$10.00
$9.00
$8.00
$7.00
$6.00
$5.00
$4.00
$3.00
$2.00
$1.00
$0.00
Automobile (Toyota Prius)
Bus
Streetcar

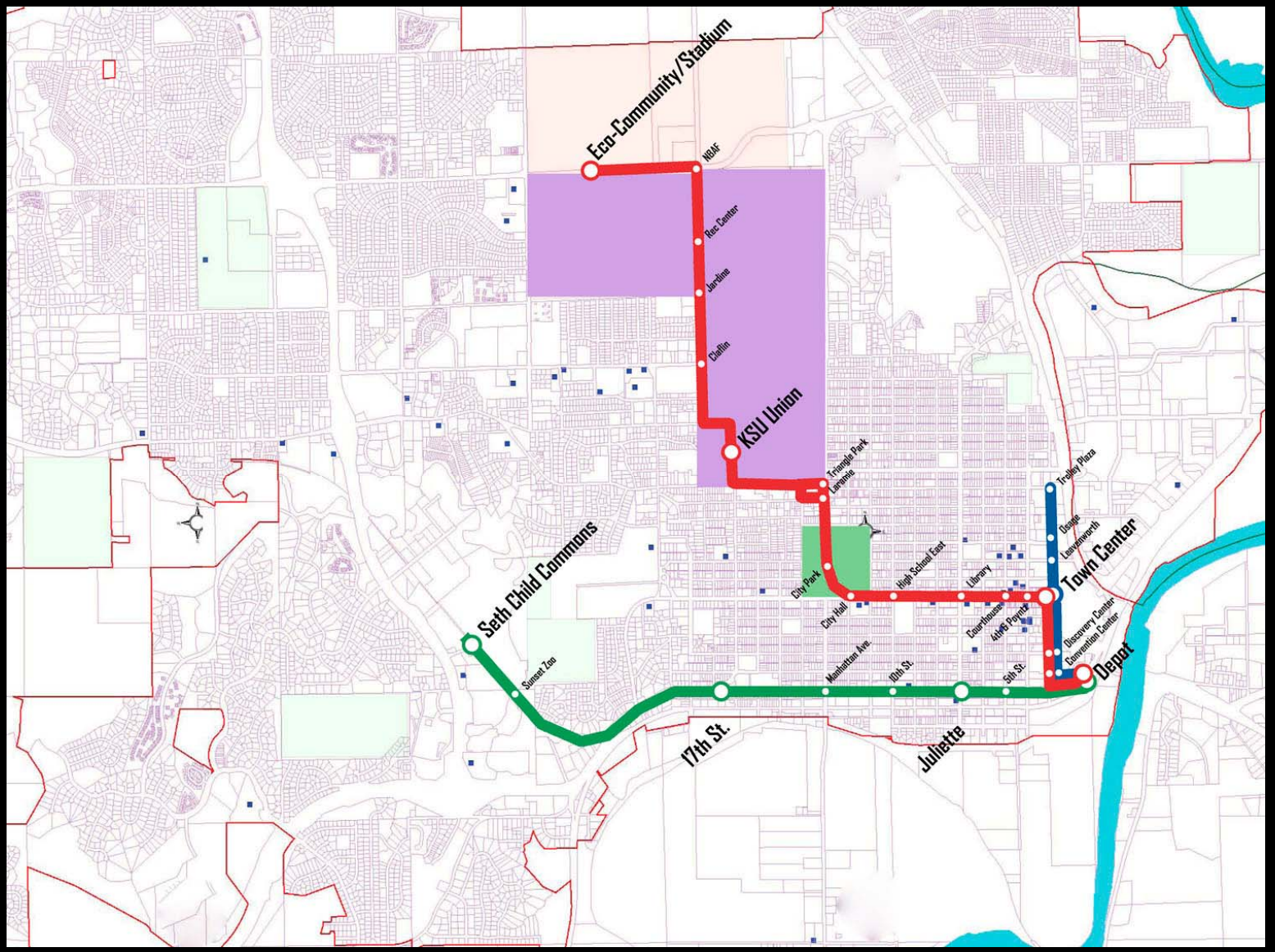

Return on Investment
1200
1000
800
600
400
200
0
Portland
Tampa
Little Rock
Kenosha
System Cost
Development Investment


Triangle Park
Laramie
City Park
City Hall
High School East
Library
Courthouse
4th/5 Ponds
Town Center
Discovery Center
Convention Center
Depot


Triangle Park
Laramie
City Park
City Hall
High School East
Library
Courthouse
4th/6 Permit
Discovery Center
Convention Center
Depot
Town Center
Leavenworth
Osage
Trolley Plaza


Eco-Community/Stadium
College Ave/Stadium
Browning
Cico Park
NBAF
Rec Center
Jardine
Claflin
KSU Union
Anderson
Amsberg Park
Triangle Park
Laramie
Trolley Plaza
Bosque
Leavenworth
Town Center
Amherst
Seth Child Commons
City Park
High School East
Library
City Hall
Courthouse
Adult Pavilion
Discovery Center
Convention Center
Depot
Manhattan Ave.
11th St.
5th St.
Sunset Zoo
17th St.
Juliette


Eco-Community/Stadium
College Ave/Stadium
Browning
NBAF
Rec Center
Jardine
Claflin
KSU Union
Cico Park
Anderson
Triangle Park
Lemmon
Trolley Plaza
Deuce
Leavenworth
Town Center
Amherst
Seth Child Commons
City Park
High School East
Library
City Hall
Courthouse
4th & Poyntz
Discovery Center
Convention Center
Depot
Manhattan Ave.
10th St.
5th St.
Sunset Zoo
17th St.
Juliette


Eco-Community/Stadium
NBAF
Rec Center
Jardine
Claflin
KSU Union
Triangle Park
Laramie
Trolley Plaza
Denison
Leavenworth
Town Center
High School East
Library
City Park
City Hall
Courthouse
4th & Poyntz
Discovery Center
Convention Center
Depot
Seth Child Commons
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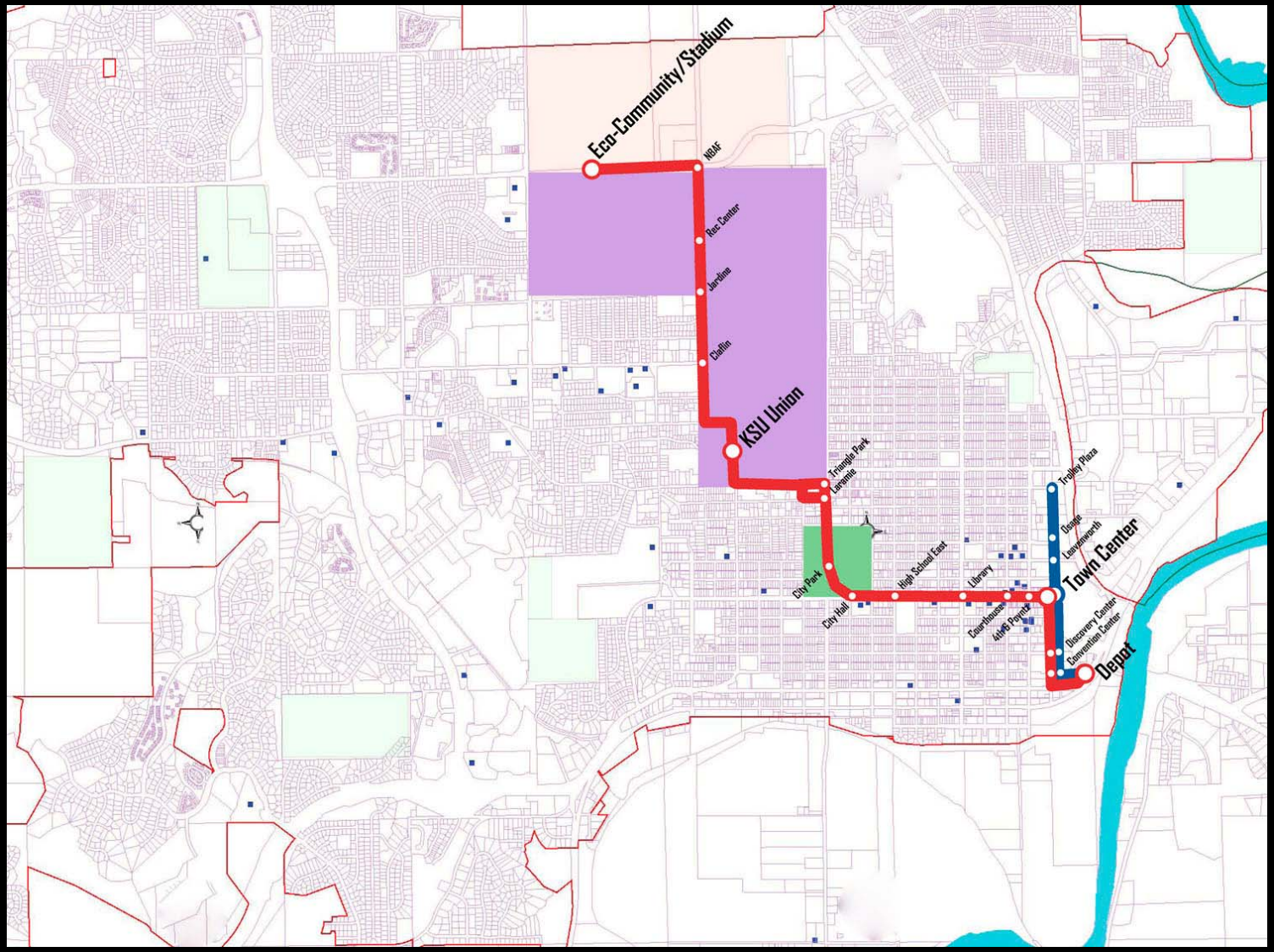
Manhattan Ave.
10th St.
5th St.
17th St.
Juliette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Trolley Plaza
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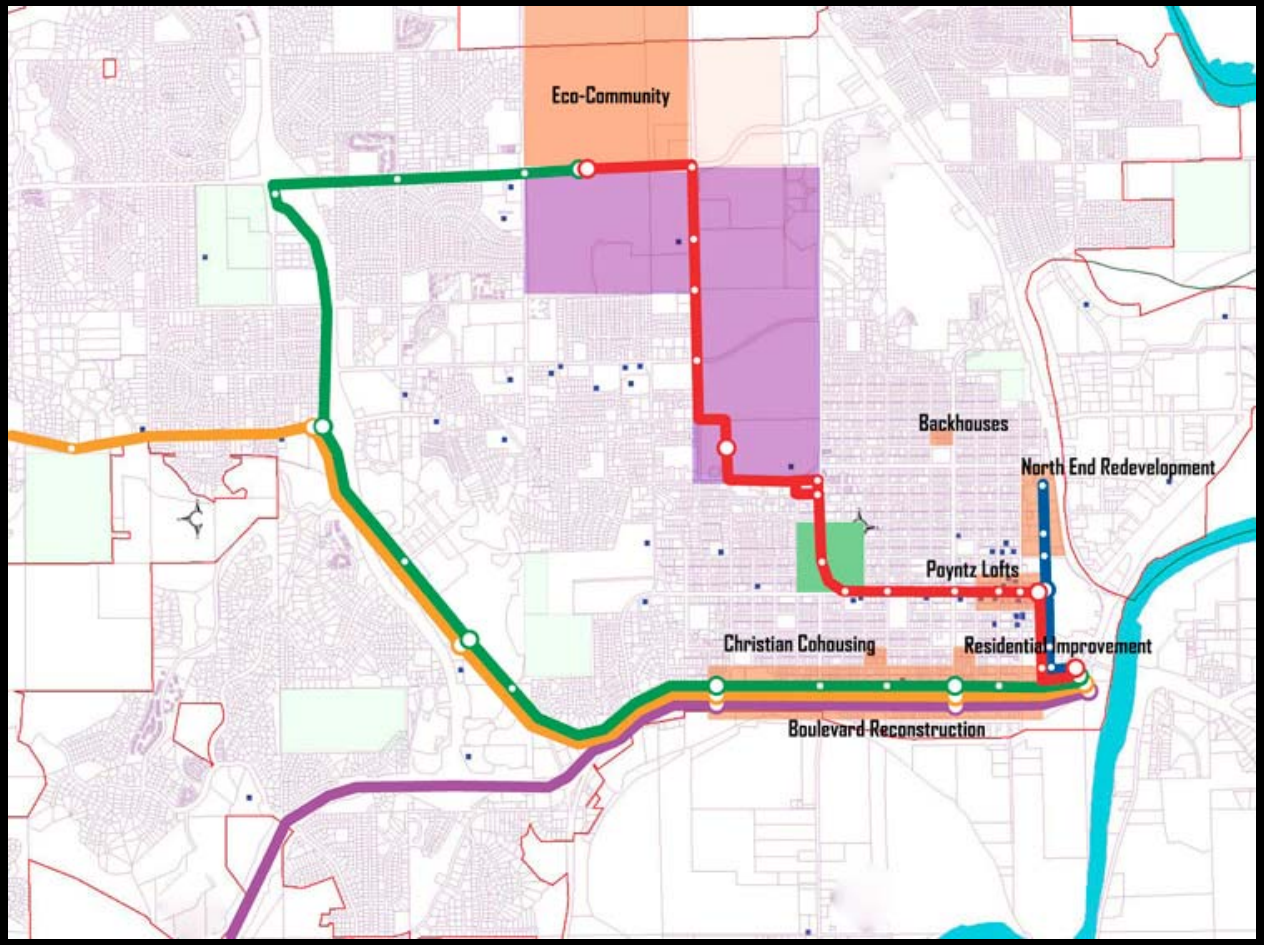
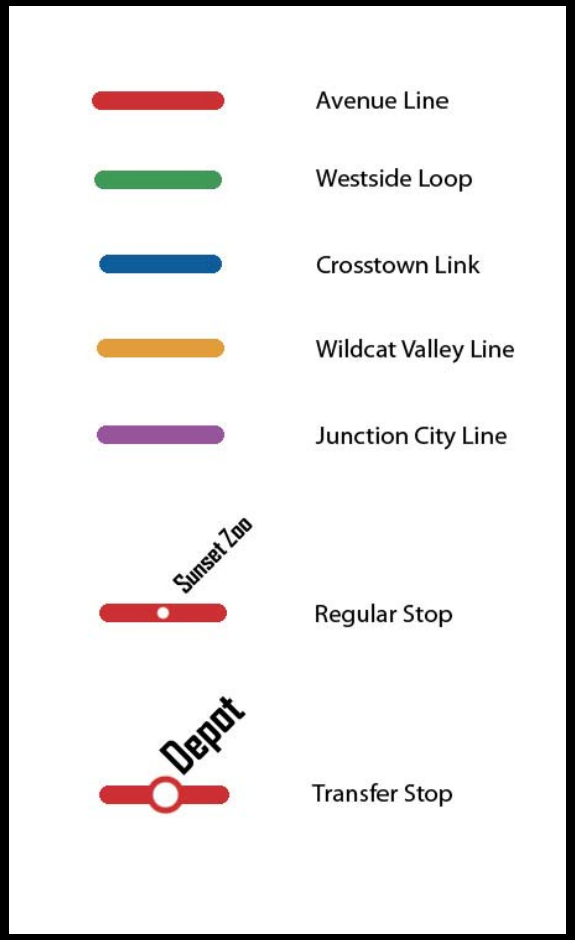
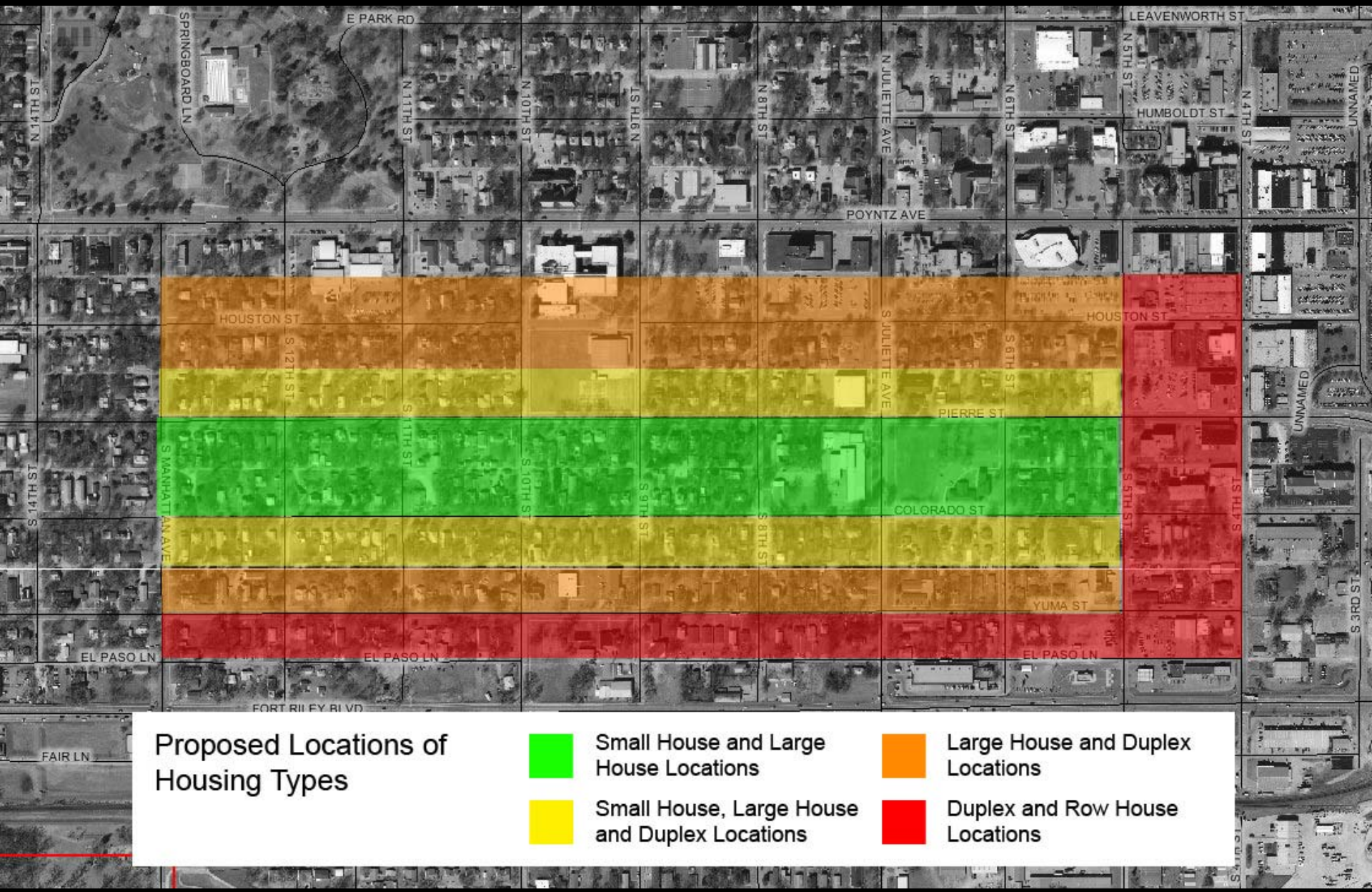
Toward a Renewable Energy-Based Multi-Modal Transportation System

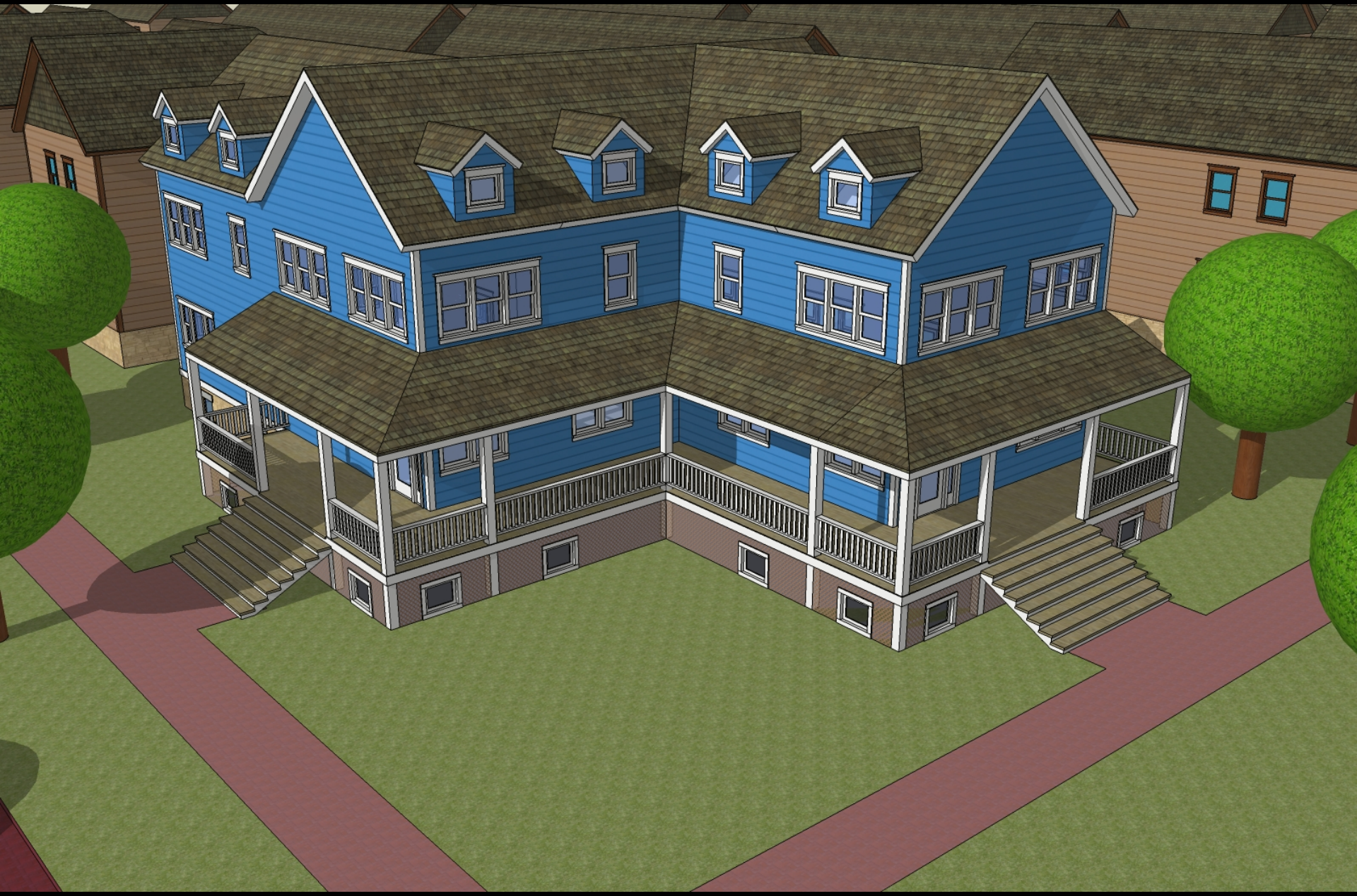




Fort Riley Boulevard and the Southeast Quadrant of Older Manhattan

Creating a Mixed-Use Boulevard and a Denser Urban Neighborhood


E PARK RD
LEAVENWORTH ST
SPRINGBOARD LN
N 14TH ST
N 11TH ST
N 10TH ST
N 9TH ST
N 8TH ST
N JULIETTE AVE
N 6TH ST
N 5TH ST
HUMBOLDT ST
N 4TH ST
UNNAMED
POYNTZ AVE
HOUSTON ST
S 12TH ST
S 11TH ST
S 10TH ST
S 9TH ST
S 8TH ST
S JULIETTE AVE
S 6TH ST
PIERRE ST
S MANHATTAN AVE
S 14TH ST
COLORADO ST
S 5TH ST
S 4TH ST
S 3RD ST
YUMA ST
EL PASO LN
FORT RILEY BLVD
FAIR LN
Proposed Locations of Housing Types
Small House and Large House Locations
Large House and Duplex Locations
Small House, Large House and Duplex Locations
Duplex and Row House Locations



Christian Co-Housing Community


Guests
Elderly
Contemplative Gardens
Families
Community Gardens
Common House
Single Parents & Couples
Playing Field
Students
Young Professionals

Kimball Avenue Eco-Community (Agricultural Urbanism)

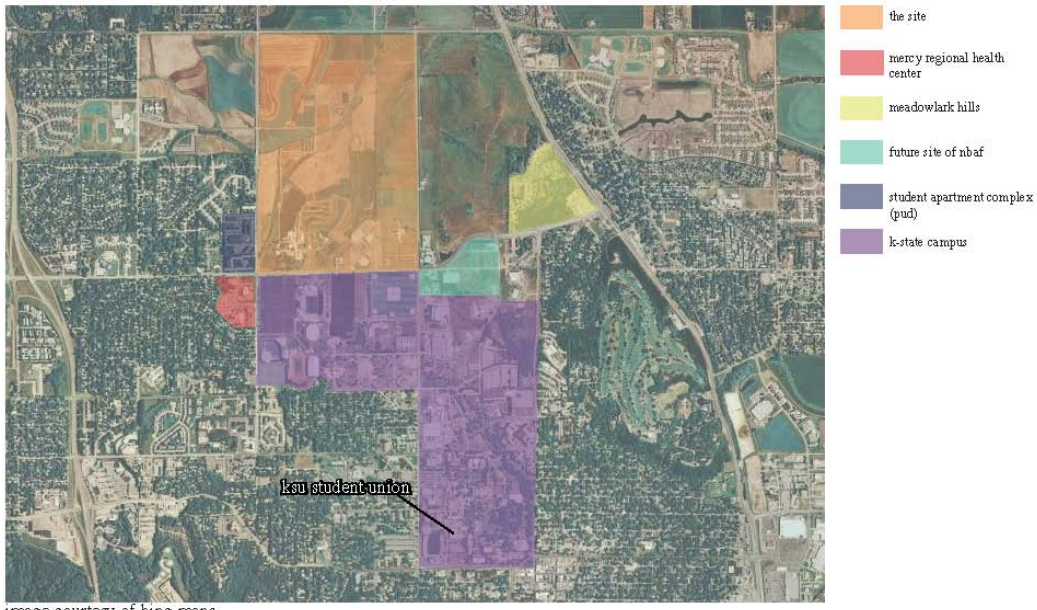


image courtesy of bing maps

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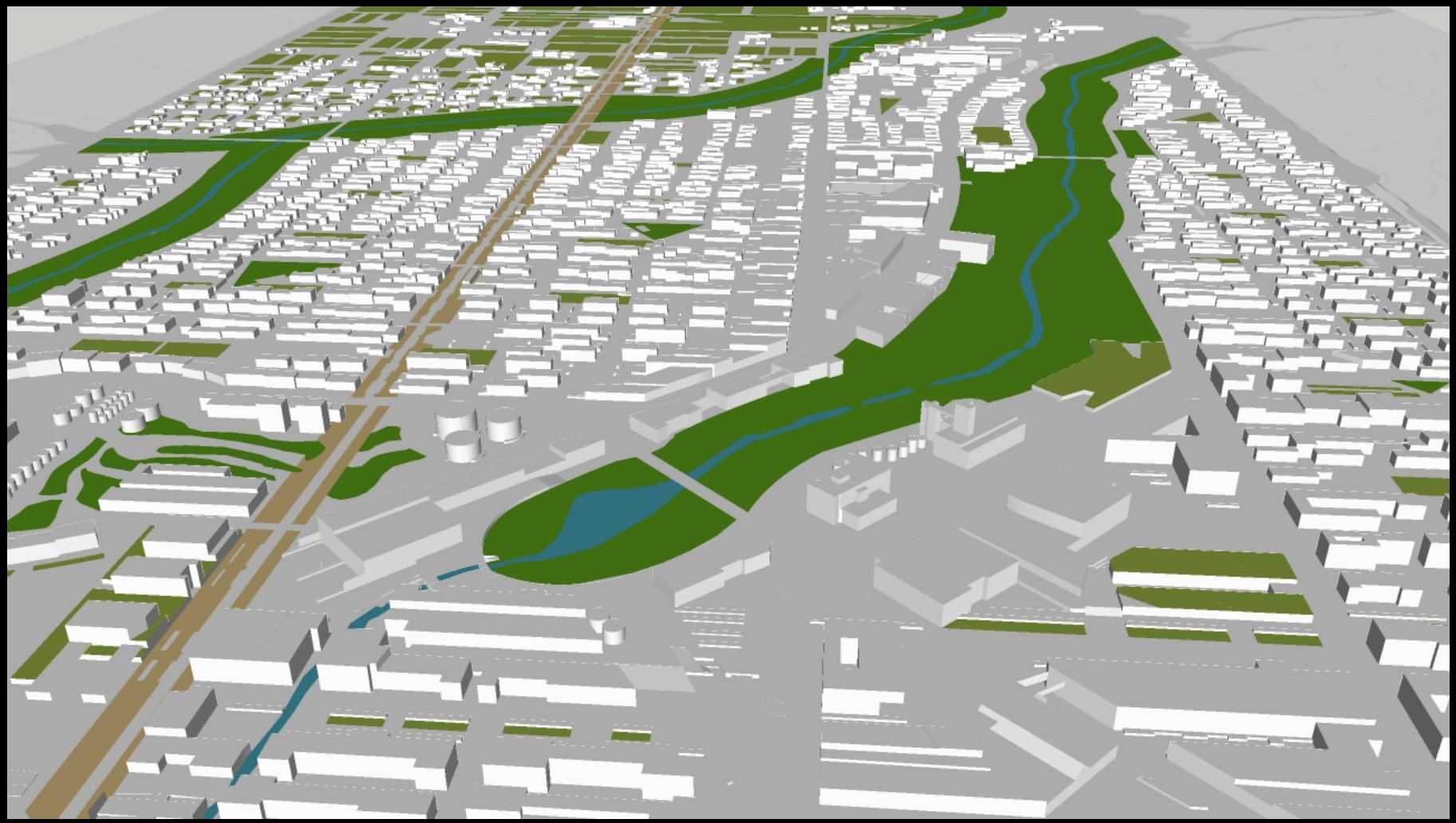
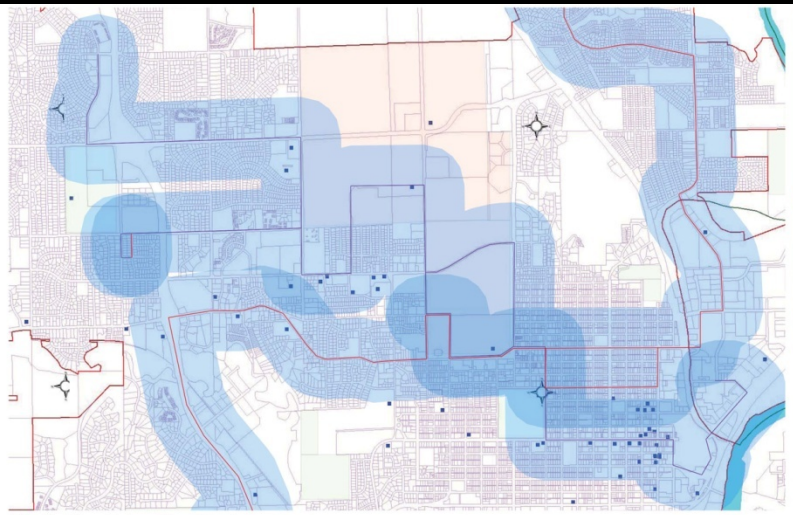


Retrofitting Manhattan's North End
(Toward a Mixed-Use Urban Village)

Garage Apartments, Backhouses and Granny Flats

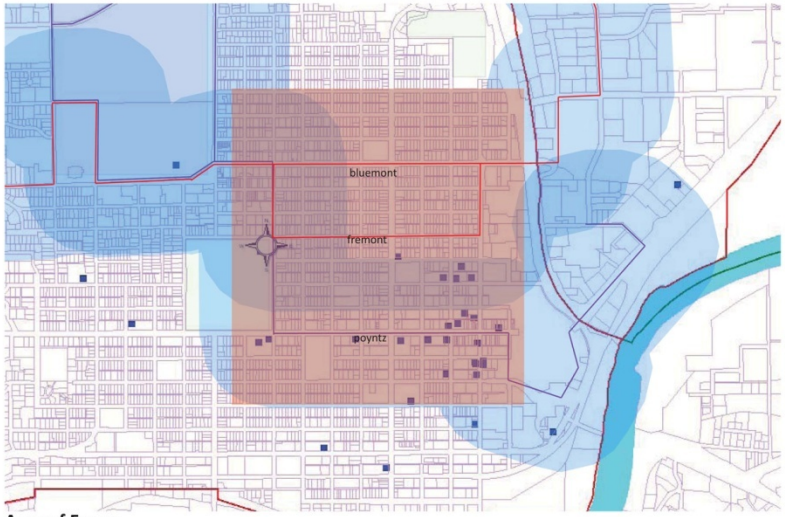
Creating more affordable and diverse housing options in Manhattan’s older neighborhoods

Site Selection

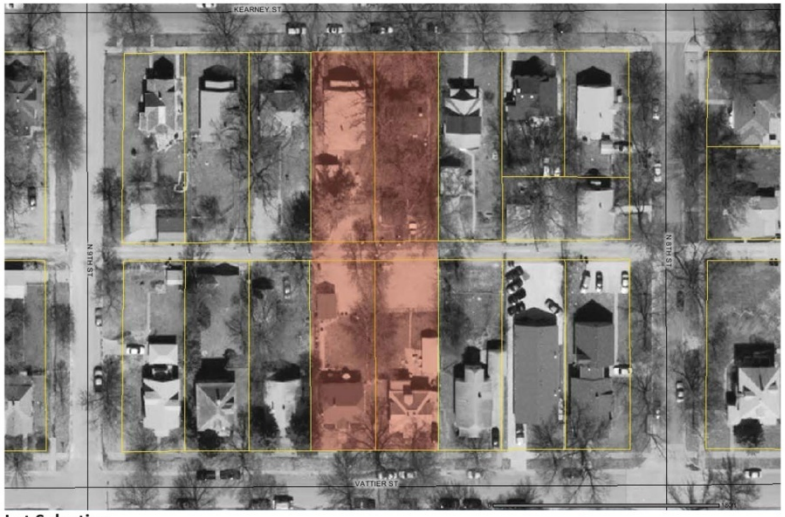


Manhattan Future Bus Routes
blue outline = 5 minute walking radius (1/4 mile)

Site Study
The Block of Kearney to Vattier and 9th to 8th



Area of Focus
From Manhattan to 3rd St and Thurston to Colorado

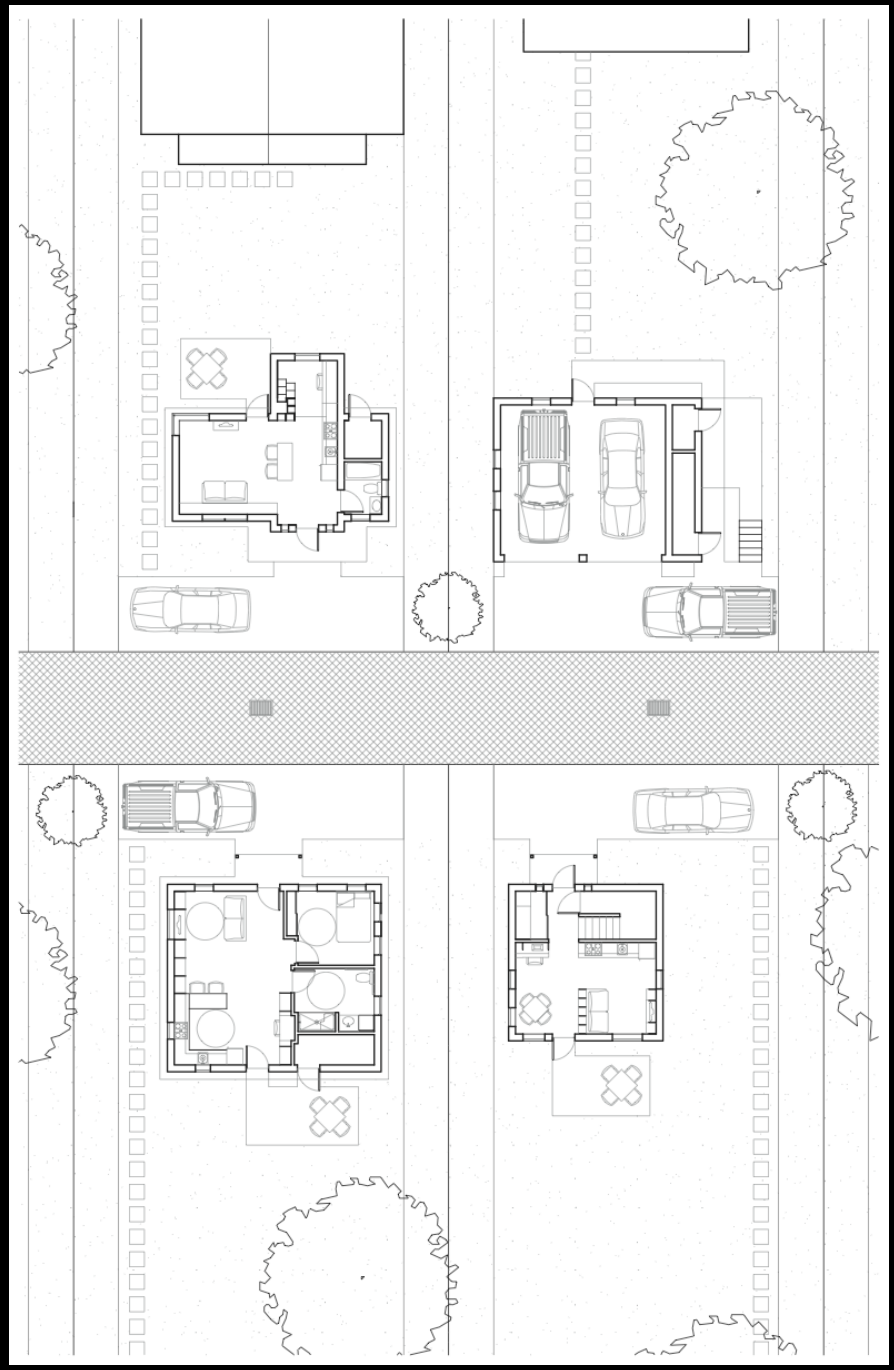


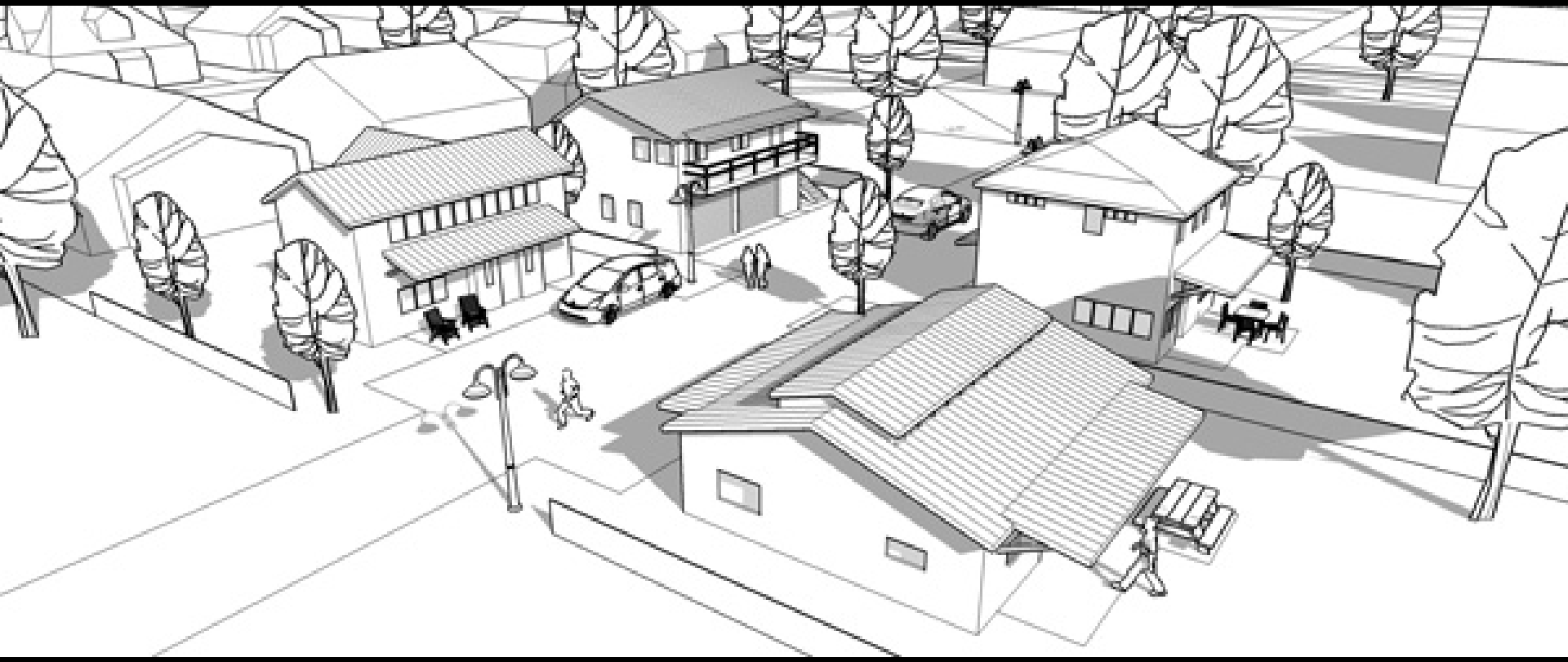
Lot Selection
Lots choose for: average lot size, varying house sizes,heights, depth in lot, etc.

LANEWAY Housing

Arch 807 _ Alex Bartelsmeyer

A System of Simple Compact Net Zero Energy Backhouse Designs to fit Every Situation





Alleys Become Green” Residential Laneways