

FOOD

The Agricultural Sector (NOT including transportation) is responsible for close to 10% of all greenhouse gas emissions (half from soil management including chemical fertilizer, a third from livestock - mostly cattle - methane emissions, and most of the rest from manure management).

In addition, the American food system is highly resource intensive, exploitive of workers in all food sectors, extremely inequitable in distribution, highly dependent on fossil-fuel based transportation, harmful to soil life and biodiversity, heavily focused on unhealthy packaged and processed foods, economically precarious, and dangerously susceptible to climate impacts such as insects, diseases, weather disasters, etc. due to centralization.

Climate action in the Food Sector means small, distributed garden plots based on diverse permaculture techniques close to and fully integrated with population centers. These techniques include:

- Using yards and vacant lots within cities and neighborhoods to grow food
- Multiple individuals, families, and organizations involved in growing and distributing food
- A mixture of vegetable plants, bushes, and trees on each plot to form plant guilds for production, culturally appropriate and high-quality food, shade, and biodiversity.
- Community-wide composting programs and sites
- Seed and plant exchanges
- Reliable and economical water sources
- Organic methods (compost, row cover, natural sprays, companion planting, rotations, mulch, human labor)
- Shared hand tools

MAKE:

Infographic? Garden scene backdrop

Compost center with bins and buckets

Fruit trees

Berry bushes

Vegetable plants

Seed exchange site

Humans

Hydrant

Sign for vacant lot

Garden for households

Hand tools

TRANSPORTATION

Motor vehicle traffic is smelly, noisy, and pollutes the air and water. The transportation sector accounts for 26% of greenhouse gas emissions (mostly carbon dioxide).

Designing cities for cars makes them even hotter (known as “urban heat islands”). This is due primarily to the amount of asphalt and concrete used for roads and parking, and to the lack of tree cover where roads and parking lots dominate space.

Driving is also expensive and dangerous both to passengers and pedestrians. The average family spends 20% of all income on cars. In addition, over 4.5 million people are injured in and by automobiles each year and more than 40,000 people die. The leading cause of traffic fatalities is aggressive driving. The annual cost of motor vehicle crashes to society is over \$350 billion.

Climate action in the transportation sector means both reducing the number of cars through climate-informed urban design and creating efficient public transportation options. These techniques include:

- Pop-up or “15-minute” neighborhoods (equal access to core services and opportunities that meet basic needs within a short walk or bike ride from home.) Includes essential retail (grocery, pharmacy), diverse housing options, temporary and multi-purpose commercial spaces (i.e. pop-up city offices/administrative hub, work spaces, skill trades, barter center, wellness center).
- Bike or scooter rental
- EV car share and charging
- Bus stop (research shows that the wait for public transportation should be 10 minutes or less for riders to rate the system favorably!)
- Metro stops
- Seating
- Shade
- Designated bike/pedestrian thoroughfares
- Water
- Adaptive reuse of underused or vacant properties
- Schools and daycare + bike bus and school travel planning
- Community spaces
- Outdoor markets and cafes for active street levels
- “Meanwhile” uses for public gathering, sports, events, music, etc.

MAKE:

Cityscape backdrop

Bus stop

Bike bus stop

EV car share

Bike or scooter rental

Bike path

Benches

Trees and planters

Signage for grocery, pharmacy, cafe, wellness (dental, eyes, medical), admin center (licenses, taxes, post office, etc.)

Skill share center

Common work space (wifi, library catalog, work/trade listing)

School/day care

Drinking fountain

ENERGY

Energy generation (30%) and commercial and residential energy use and waste (12%) account for 42% of all greenhouse gas emissions. While individuals and even communities have little agency regarding the burning of fossil fuels at power plants or the manufacturing of high emissions products such as steel, concrete, and plastic, they CAN address energy use and waste through reduced consumption (particularly of fossil fuel-based plastics), alternate power sources, conservation, and efficiency. Techniques to achieve these goals include:

- Insulation
- Passive solar heating and lighting
- High efficiency HVAC systems based on heat pumps and electricity
- Rooftop or ground array solar energy
- Efficiency, low leakage, state-of-the-art refrigerants, and centralized refrigeration
- Waste reduction including recycling and composting
- Multi-family residential buildings with energy-efficient space-usage and design
- High efficiency electric appliances to replace gas

MAKE:

Cooperative multi-family residences backdrop

Community kitchen

Heat pump

Community cooling station (+ fan rental)

Community food share/barter market/reuse center (signage for all)

Community laundry

Rooftop solar panels

Ground array solar farm

Solar powered movement sensor outdoor lighting

Thermostat (with markings for heating and cooling limits)

BIODIVERSITY

Nearly 50% of all species are declining in number and as many as 2000 species are presently going extinct each year. That rate - 14% - is expected to double if 1.5 degrees Celsius of global warming is exceeded (it already has been.)

While none of the most endangered species are in North America, healthy ecosystems (including biodiversity) are the most important tool for carbon mitigation and thus climate change. Climate action consists of both reducing climate effects in the near term and contributing to climate resilience in the longer term by increasing biodiversity with plant biomass, habitat, healthy soil, and clean water. Techniques to achieve these goals include:

- Massive tree planting
- Composting
- Organic agriculture
- Converting roads, parking lots, and vacant lots into mini-forests
- Plant guilds
- Reducing air and water pollution
- Creating habitat
- Removing invasive species
- Restoring native species and habitats
- Controlling waste (mostly plastic)
- Reducing light pollution

MAKE:

Three guilds with -

Native trees (Black oak, Swamp oak, Hickory, Sweet gum, Hackberry, Elm, Willow, Cottonwood, Sycamore, Silver maple, Box elder, Hornbeam)

Native shrubs (Buckeye, Serviceberry, Dogwood, Redbud, Ilex (holly), Viburnum dentatum (arrowwood), Spicebush, Sumac, Hazelnut, Amorpha, Aronia, Paw paw, Cephalanthus (button bush), Itea virginica)

Native plants:

Amsonia
Aquilegia (columbine)
Asclepias (milkweed)
Symphyotrichum
Aster
Baptisia
Campanula
Chelone
Coreopsis

Echinacea
Eupatorium
Helianthemum
Heliopsis
Heuchera
Hypericum
Iris (blue flag/yellow flag)
Lilium
Lobelia
Mertensia
Monarda
Phlox
Polemonium
Pontederia
Rudbeckia
Salvia
Scutellaria
Pakera
Senna
Silphium
Thalia
Tradescantia
verbena/vervain
Veronia

Animals

Mammals might include deer, fox, rabbits, squirrels, coyotes, possum, raccoons, groundhogs, mice, voles, shrews, bats, etc.

Birds might include bald eagles, hummingbirds, osprey, ducks, bluebirds, cardinals, robins, bluejays, song sparrows, wrens, etc., etc., etc. !

Insects might include dragonflies, beetles, butterflies, grasshoppers, praying mantids, ladybugs, etc., etc., etc. !

Amphibians and reptiles may include frogs, toads, salamanders, and a variety of snakes

RIVER RESTORATION

Floodplains (land areas adjacent to rivers that, in the past, naturally adapted to changing water levels) have mainly disappeared in cities, creating serious problems with flooding, water quality, and biodiversity which will only become more urgent as the climate changes. By covering floodplains with buildings, roads, and parking lots, urban environments have prevented them from performing their essential role in ecosystems which include fish and amphibian spawning and rearing habitat, other food-web productivity, water filtration, flood mitigation beyond the zone, groundwater recharge, naturally shifting landscapes, soil building, habitat cooling, and human recreation.

River restoration as a climate resilience strategy involves recreating floodplains. Techniques to achieve this goal include removing human obstructions and reestablishing native ecosystems such as marshlands and forested islands.

MAKE:

Marsh plants for mini-forests and wet/dry prairie (see lists of plants above).

Habitat and infrastructure options such as:

- Wood duck houses
- Bat houses
- Bluebird houses
- Osprey platforms
- Boardwalk
- Boat launch and pier