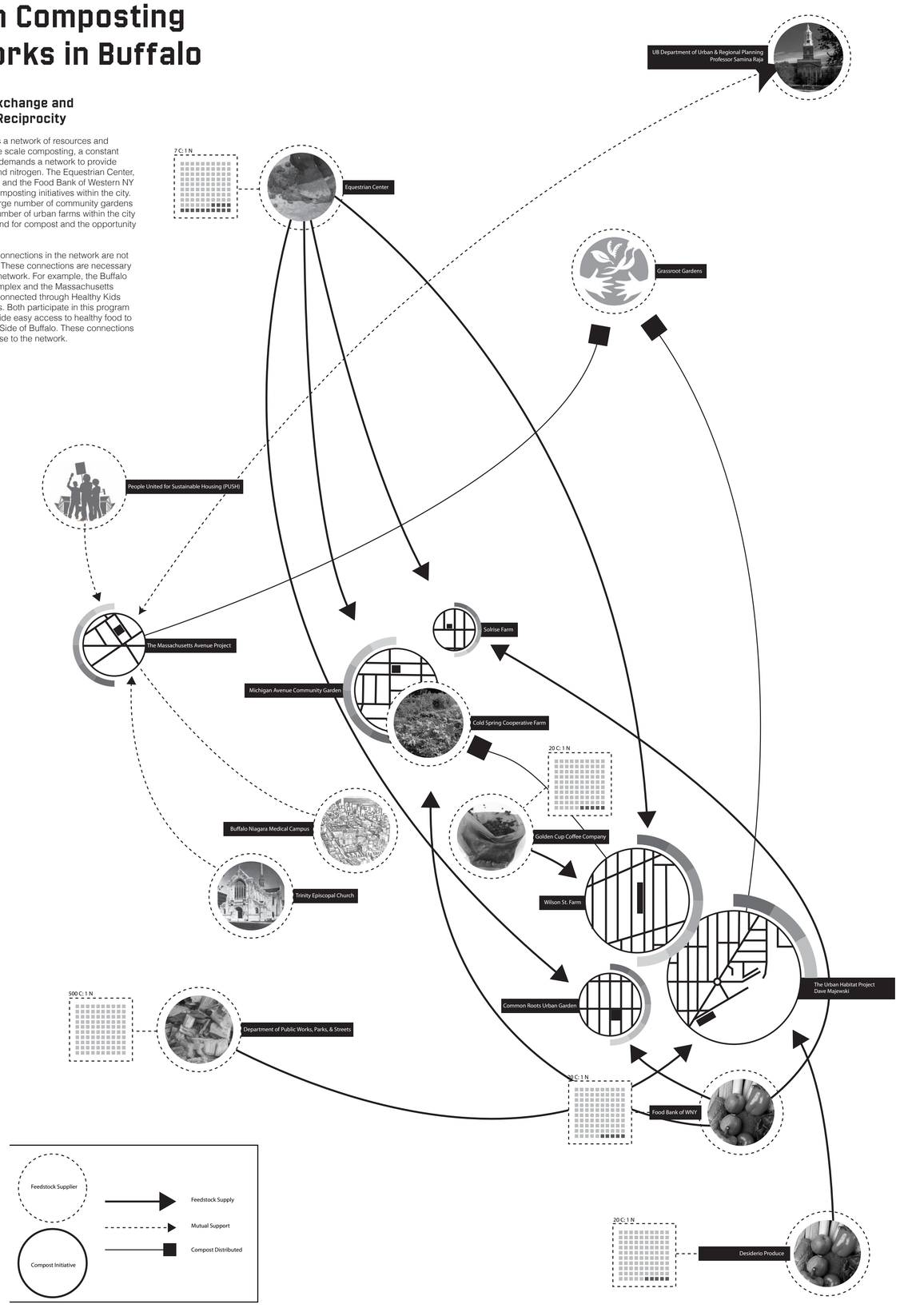
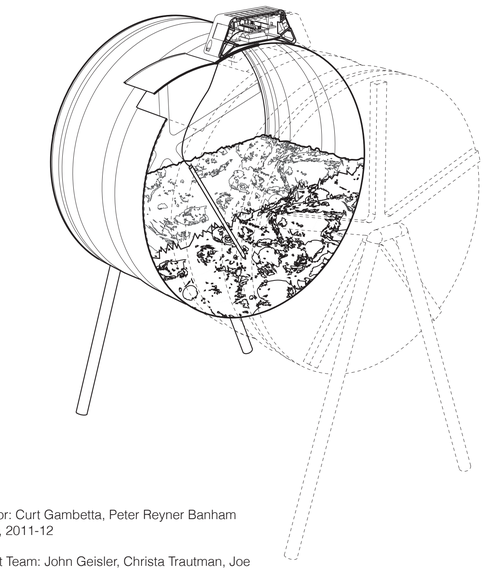
Urban Composting Networks in Buffalo

Feedstock, Exchange and Institutional Reciprocity

Composting requires a network of resources and distribution. For large scale composting, a constant source of feedstock demands a network to provide sources of carbon and nitrogen. The Equestrian Center, Desiderio's produce, and the Food Bank of Western NY all fuel grassroots composting initiatives within the city. Consequently, the large number of community gardens and a burgeoning number of urban farms within the city also provide a demand for compost and the opportunity for expansion.

Furthermore, many connections in the network are not material exchanges. These connections are necessary for the vitality of the network. For example, the Buffalo Niagara Medical Complex and the Massachusetts Avenue Project are connected through Healthy Kids Healthy Communities. Both participate in this program whose aim is to provide easy access to healthy food to families on the West Side of Buffalo. These connections give a greater purpose to the network.





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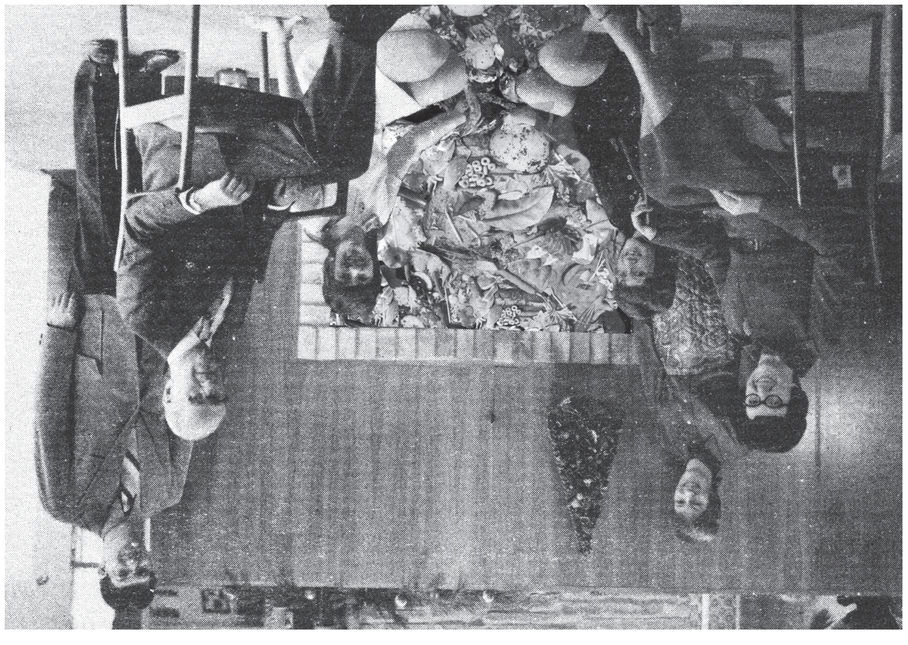
Assembly Manual: Networked Urban Composting

Domesticating Compost

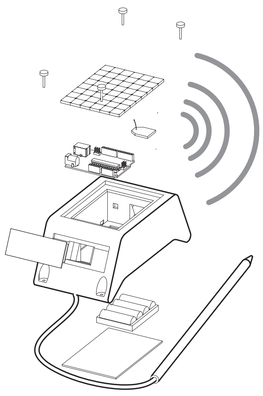
The recovery of biological nutrients involves a wide range of boundaries that seek to contain and manage biological waste. In a typical residential environment, this is accomplished in two ways. The first and easiest is to place the waste inside a new boundary, the trash bag, thus separating it from interior living space. Alternatively, the biological nutrients are placed outside the home in compost bin. Even outside the home, most people would prefer to have biological waste off their property when it begins to accumulate. At each level, the probability that the biological nutrients escape the boundary in which they have been placed and return to the nutrient cycle is reduced.

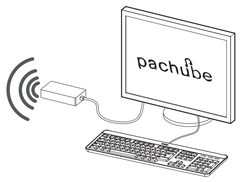
The object most associated with Biological Nutrients is the compost bin. This project links the individual, private act of bin composting with a potential new economy of urban compost exchange. At the level of the site, the probe communicates heat levels through an RGB LED. Simultaneously, the probe transmits the information to a website that describes a topography of compost generation in the city, allowing backyard composting to participate in a larger community of exchange.



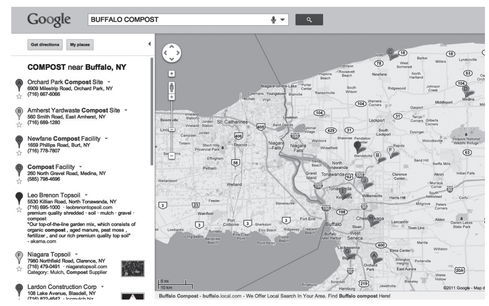
RIGHT: Gather Round! The notion of the family compost pile replacing the central fire place in a suburban home reveals the potential power of networked compost. By posing the activity of individual compost piles, an example is set for the community. Increased awareness fosters increased exchange of compost and knowledge about composting. As the community develops the need for centralized compost centers is replaced by a distributed network of individual containers.

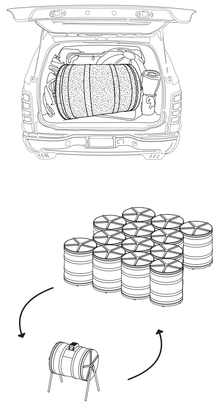
Assembly: Networked Urban Composting





```
if ( !ds. search (addr)) {
    //no more sensors on chain, reset search
  ds.  reset_search   ();
    return  -1000;
}

if   ( OneWire :: crc8 ( addr, 7) != addr[7]) {
    Serial .println ("CRC is not valid!"     );
    return  -1000;
}

if ( addr[0] != 0x10 && addr[0] != 0x28) {
    Serial .print ("Device is not recognized"      );
    return  -1000;
}

ds. reset ();
ds. select (addr);
ds. write (0x44,1);  // start conversion, with parasite p

byte present = ds.   reset ();
ds. select (addr);
ds. write (0xBE);   // Read Scratchpad
for (int i = 0; i < 9; i++) {    // we need 9 bytes
  data[i] = ds.    read ();
}
ds. reset_search   ();

byte MSB = data[1];
byte LSB = data[0];

float  tempRead = ((MSB << 8) | LSB);        //using two's
float  TemperatureSum = tempRead / 16;
```





DIY Device

The compost monitor is constructed from simple off the shelf components. This lowers barriers to entry into the composting such as the cost of bins. An individual user can, with a bit of online research, assemble their own unit from a kit of parts. The cost of pre-constructed kits is also lowered by using simple, easy to purchase components.

Open Source Code

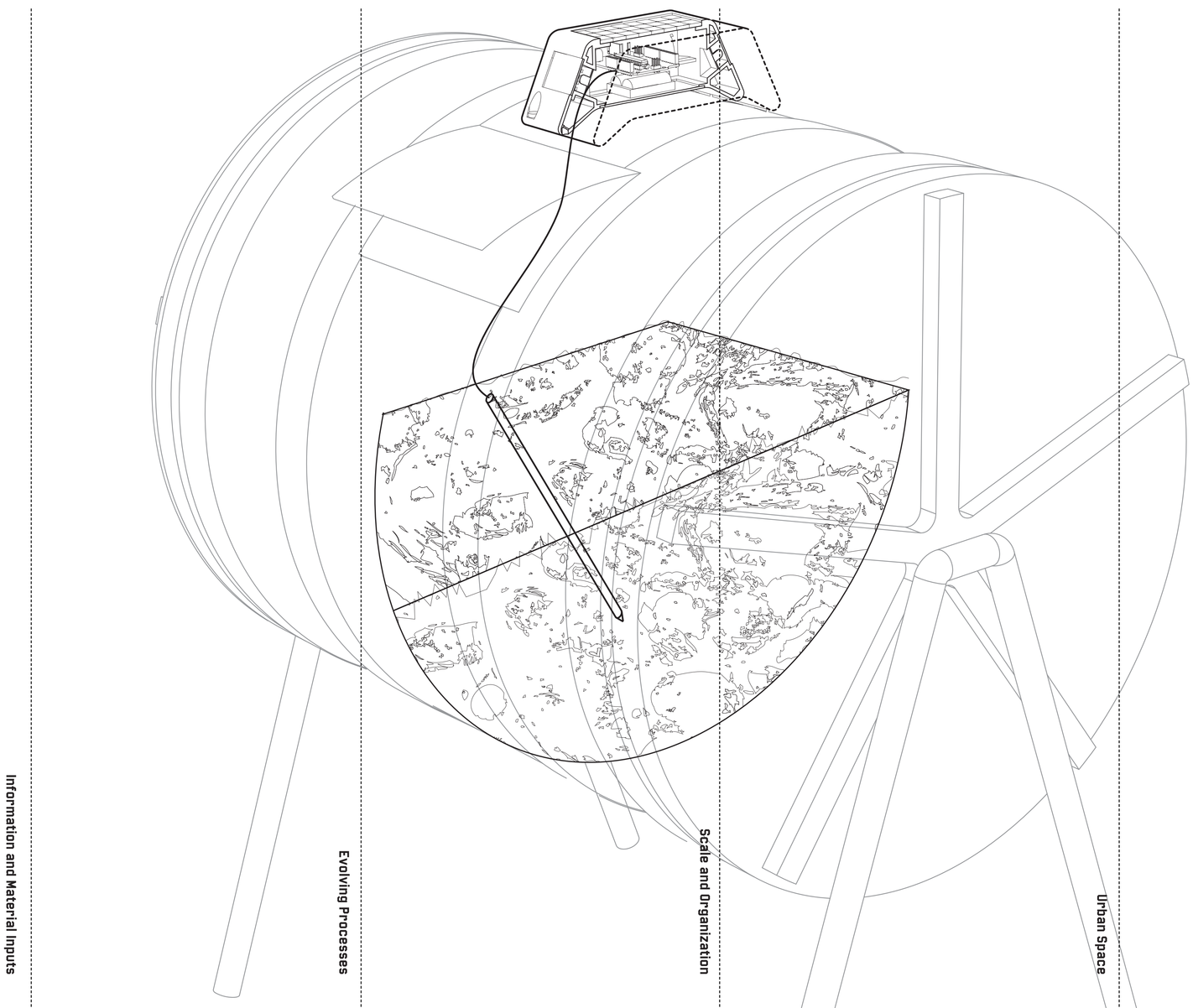
With the hardware in place, open source code is a must. Cost is reduced and bugs are easily discovered and fixed due to an active user group which updates and troubleshoots this code regularly. The user community can tweak the software for local conditions. The community of users in effect owns and maintains the software.

Compost Network

Local networks of users emerge at the intersection of internet communities and user supplied transportation. Each local region of composting is determined by the volume of composting in the area and activity of individual users. Active users living near each other will create smaller constellations of compost exchange and consumption, creating a new topography of urban life.

Local Exchange

The adoption of small easy-to-transport bins enables users within the local community to easily exchange compost. This also has the potential to substitute a peer to peer sharing network for a centralized hub and spoke network. For instance, rather than having to drop off or pick up from a singular location, indivual bins can be exchanged between adjacent locations.

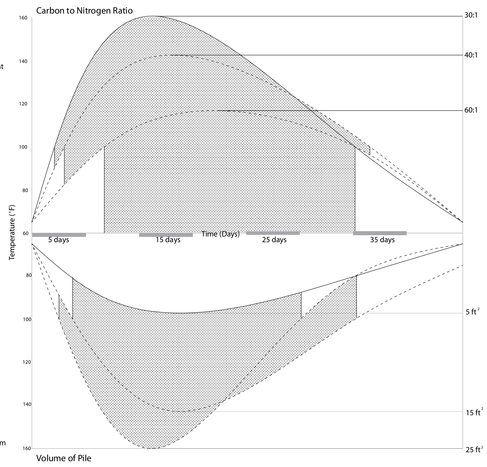


Time, Scale and Thermophilic Thresholds

Thermophilic Phase
Between 110 and 160 degrees F, Thermophilic micro-organisms dominate. The mesophilic micro-organisms either die or become dormant above 110 degrees F. Thermophilic bacteria produce enough heat to kill pathogens and weed seeds.

Odor
An odor signifies an imbalance of carbon and nitrogen in the pile. Keeping your compost at a ratio of 30:1 will prevent any odors. Your neighbors will thank you!

Scale
Urban settings limit the scale of composting. Large piles, although more efficient, can be seen as eye sores for neighbors and overwhelm the composters yard.



Size and Use

Composting occurs in many scales, from the backyard compost bin to large scale windrow composting. Different scales implicate different patterns of ownership, access and use. For instance, large scale composting initiatives require centralized locations and a significant amount of capital investment. Added up, individual backyard composting comprises a similar volume of composting as these larger scale operations, but distributes its social, economic and environmental consequences through a wider network of participants, which includes both compost producers and consumers.

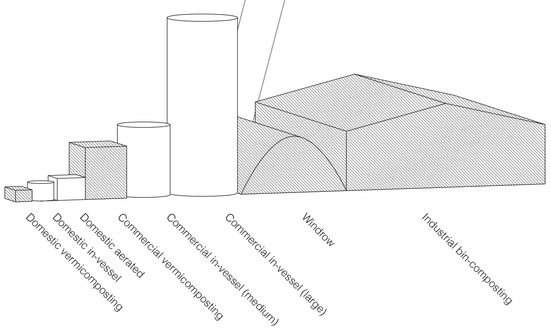


Diagram: relative scale of composting typologies

Compost and Urban Space

Compost becomes a problem when it causes an unpleasant smell or attracts rodents. In other words, compost is felt and present when it is sensed as a nuisance. For larger compost initiatives an unpleasant smell can violate city code, much of which inherits 19th and 20th century notions of sanitized urban space. As a result, the city may demand disposal of the compost, and a permanent end to the initiative. Simple precautions such as keeping compost enclosed properly, and a balanced ratio of carbon and nitrogen can eliminate the risks that composting presents. Decentralizing composting allows for smaller scale, more affordable methods of composting that can mitigate these negative impacts of composting while avoiding the kind of investment it takes to control these side effects at a larger scale.

Like many city codes, the Buffalo Code reaffirms the status of composting as a nuisance:

§ 216-44. Special provisions regarding vegetative yard waste.

[Amended 9-17-1996, effective 9-18-1996]
Nothing in this article shall be construed as preventing any person from utilizing vegetative yard waste for compost, mulch or other agricultural, horticultural, forestry, gardening or landscaping purposes, provided that such vegetative yard waste is stored in a receptacle which shall be covered in such a fashion so as to eliminate the possibility of divergence by wind or soaking by rain or snow or accessibility to animals or pests. "