InFood

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Proposal to tackle food insecurity along with providing hotspot to further digital inclusively in the City of Philadelphia.

Food insecurity in Philadelphia 21%
17% of trash sent to the landfill is wasted food

Food insecurity based on FAO

Uncertainty regarding ability to obtain food	Compromising on food quality and variety	Reducing food quantity, skipping meals	No food for a day or more

Food Security to Mild Food Insecurity　　　**Moderate Food Insecurity**　　　**Severe Food Insecurity**

"Don't let the digital divide become 'the new face of inequality': UN"
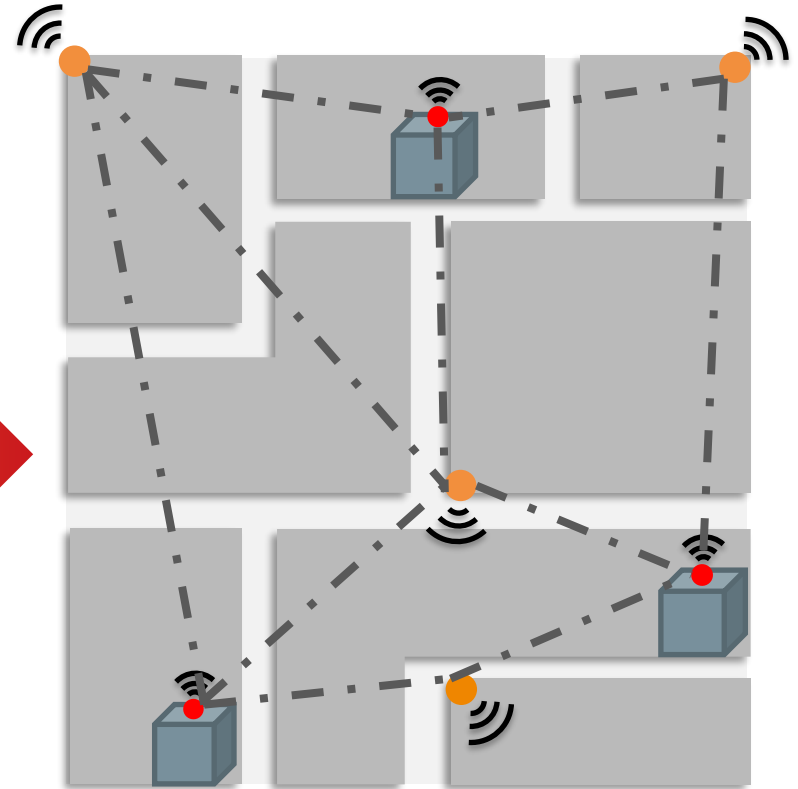
Conceptually on a neighbourhood scale
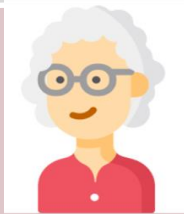
ERIK
Age: 41yrs.

Education:
Highschool

Background
Homeless

Needs
Meals regularly and govt programs for the homeless

Suzan
Age: 69 yrs.

Education
School dropout

Background
Living alone

Needs:
Community engagement

MAX
Age: 13 yrs.

Education
8th Grade

Background
Household with no consistent income

Needs
Wholesome meals

Miriam
Age: 39 yrs.

Education
Grad

Background
Income < $20000 and single mother

Needs
Internet to look up govt. programs & meals for 2

Trey
Age: 23 yrs.

Education
Attending community college

Background
Doing part time jobs and studying

Needs
Access to internet to apply to jobs
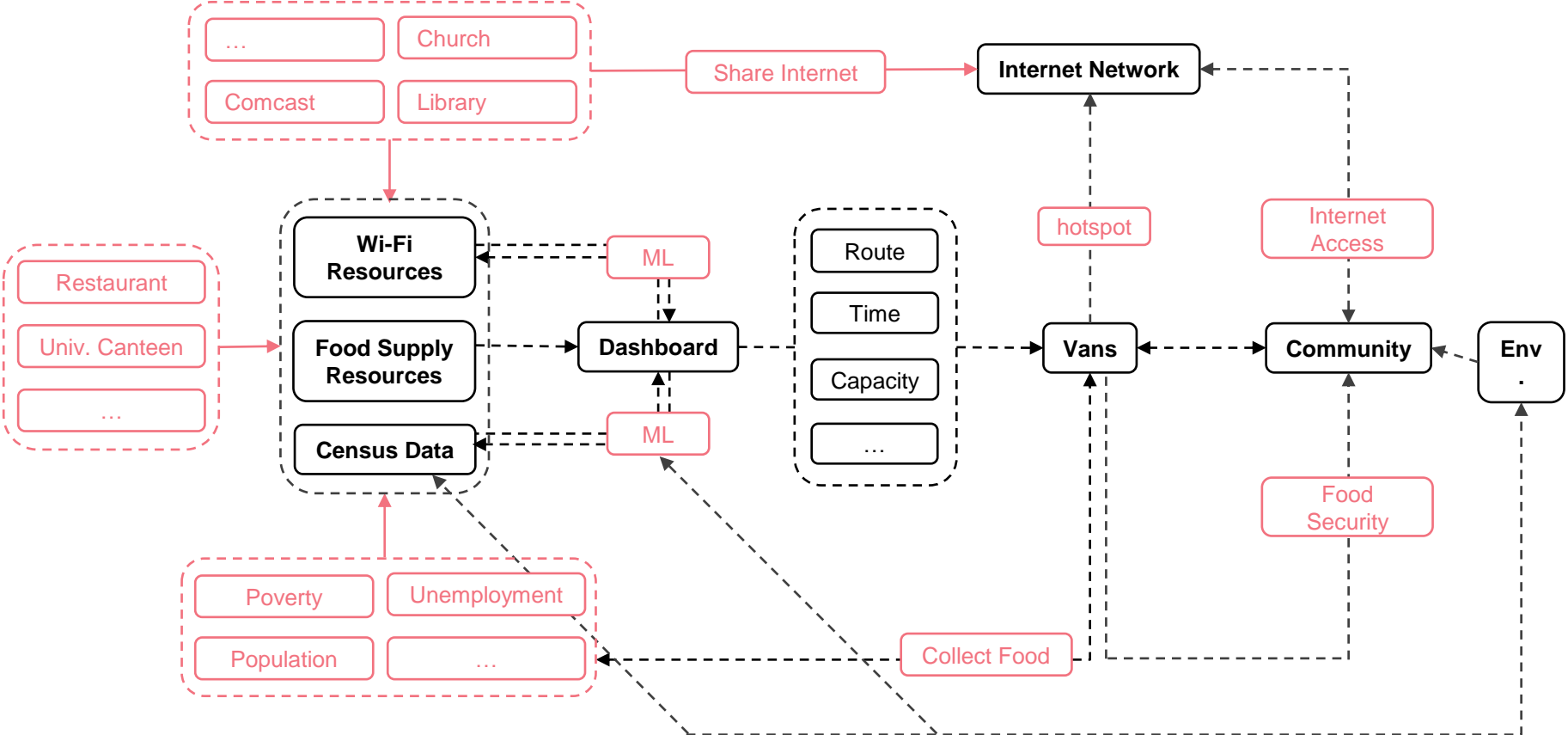
Household of 4
Mother, Father And 2 kids in K-12

Background:
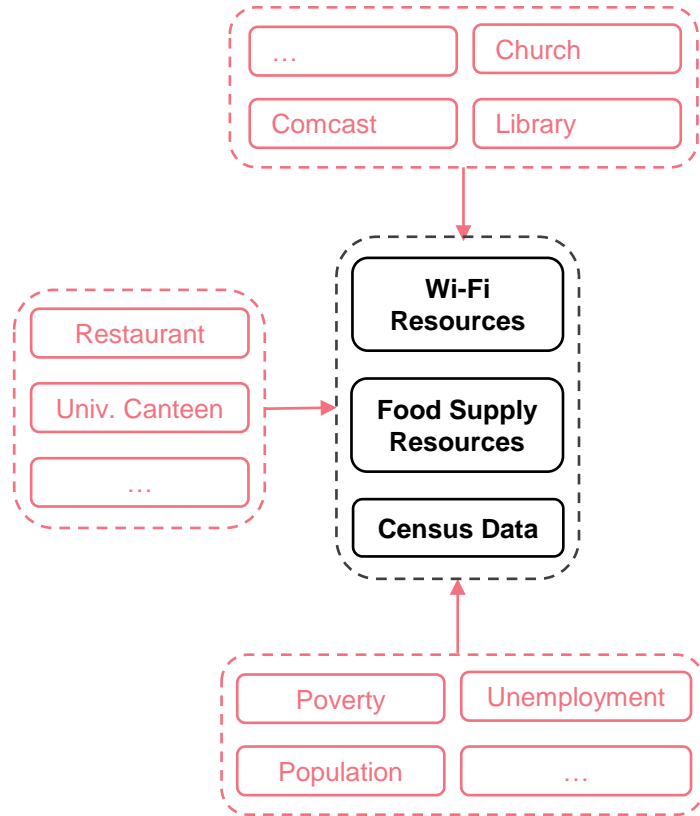Household income < $30000, one of the parent lost job recently

Needs:
Regularly meals Internet to apply for jobs

Workflow

Workflow

Step 1. Data Collection & Machine Learning
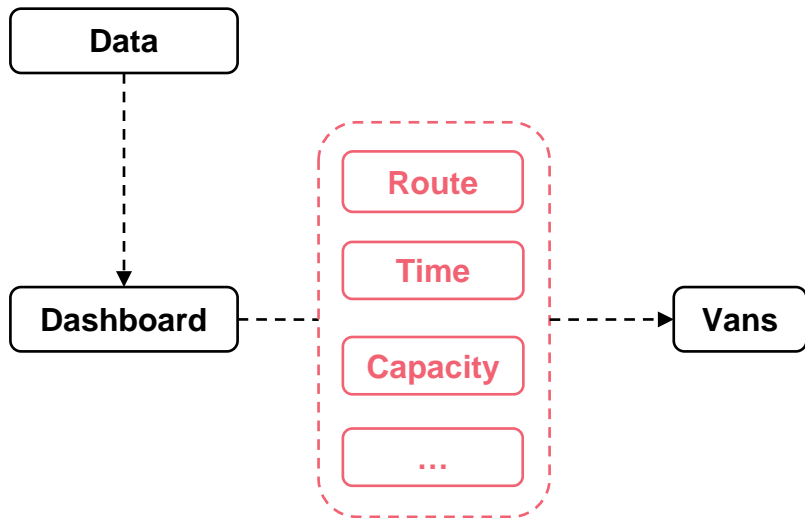
Wi-Fi Resources
Where needs more Internet coverage

Food Supply Resources
Where and When to collect the food

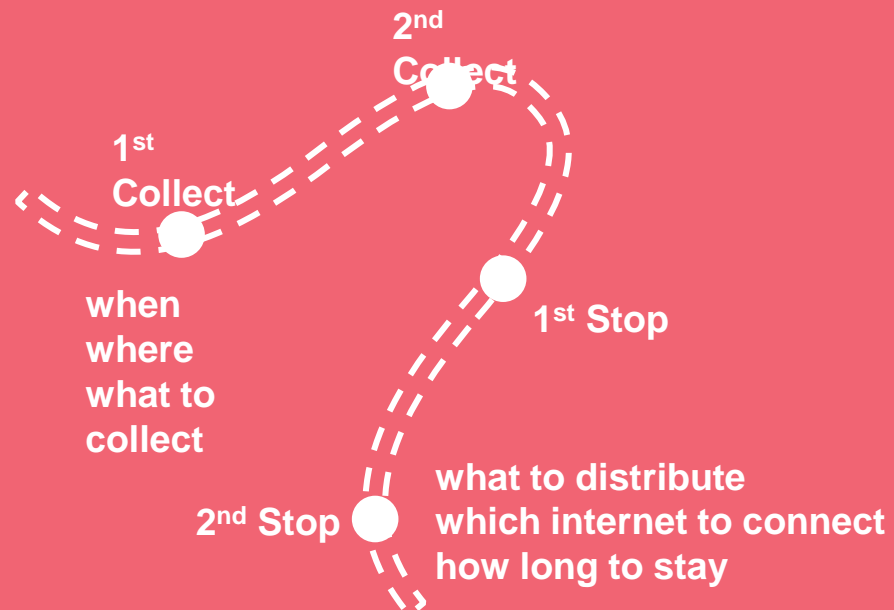**Census**
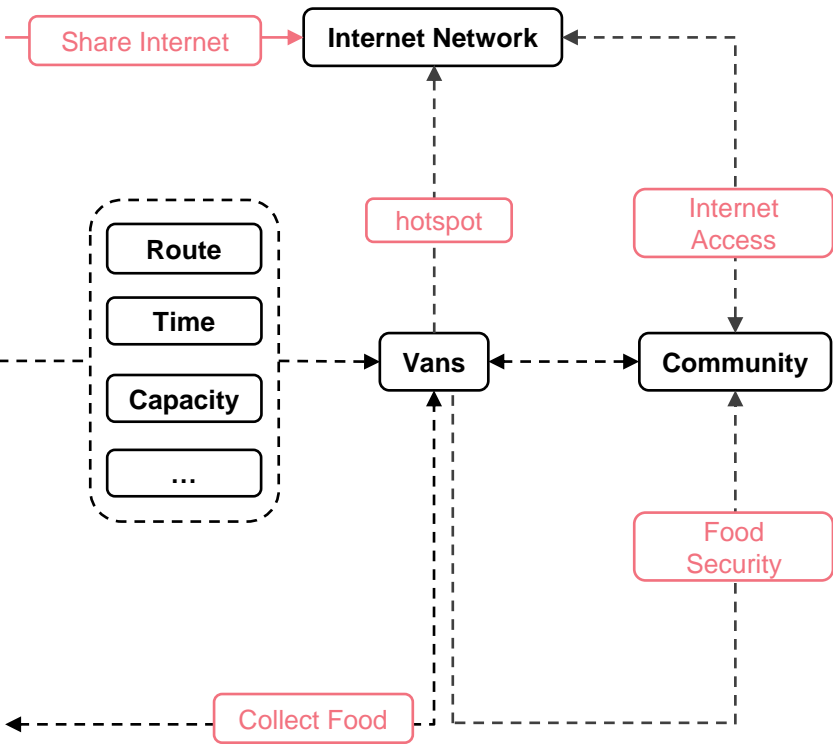Where to send

Workflow

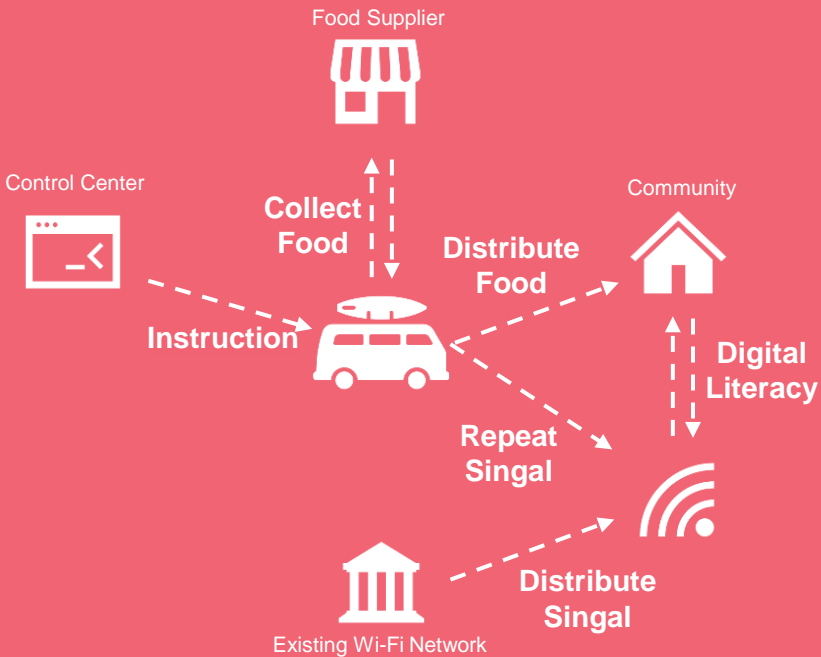Step 2. Route Optimization

Data

Dashboard → Route / Time / Capacity / ... → Vans

1st Collect
2nd Collect
1st Stop
2nd Stop

when where what to collect

what to distribute
which internet to connect
how long to stay

Workflow

Step 3. Operation

Left diagram labels: Share Internet, Internet Network, Route, Time, Capacity, ..., hotspot, Internet Access, Vans, Community, Food Security, Collect Food

Right diagram labels: Food Supplier, Control Center, Collect Food, Distribute Food, Community, Instruction, Digital Literacy, Repeat Singal, Distribute Singal, Existing Wi-Fi Network

Resilience & Digital Literacy

Fixed Station

Van

Van

Van

Fixed Station

Fixed Station

Van

Change

Population Change

Area Development

Improved Internet

Improved Food Security

Nature Disaster

... ...

Adaption

In each community
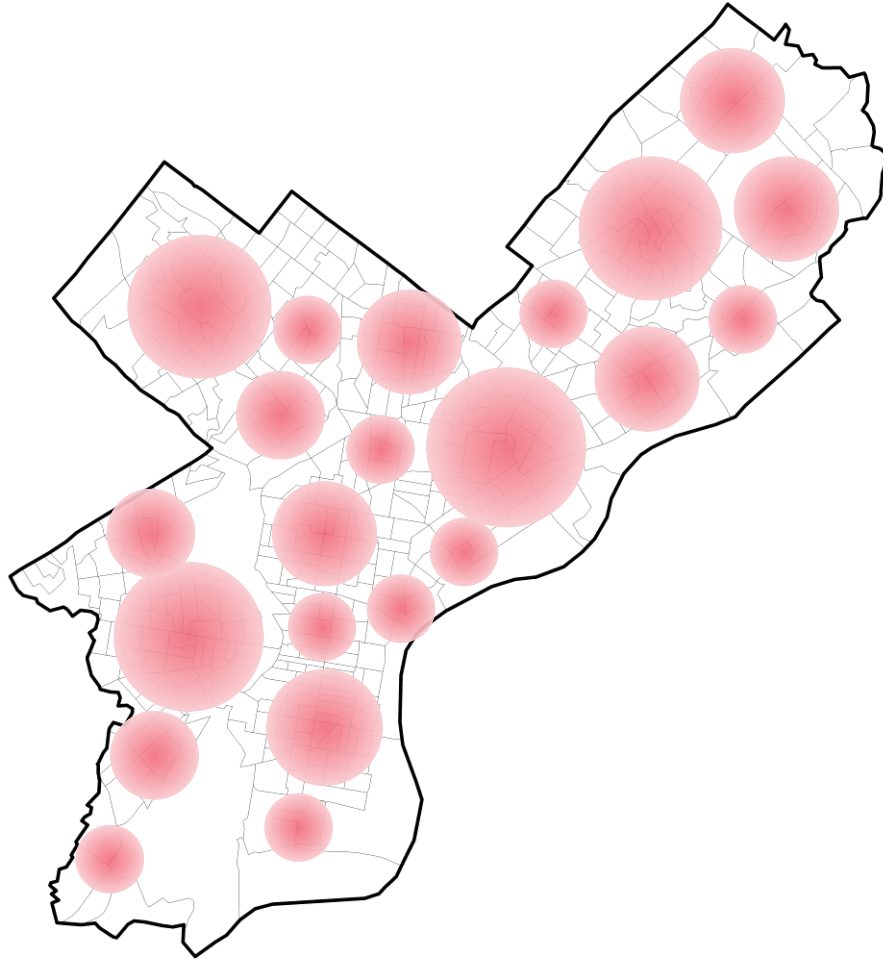
Resilience & Digital Literacy

Through the flexible and resident community level network in the previous slide, the project will covert most area of Philly, provide basic internet access to those people in need.
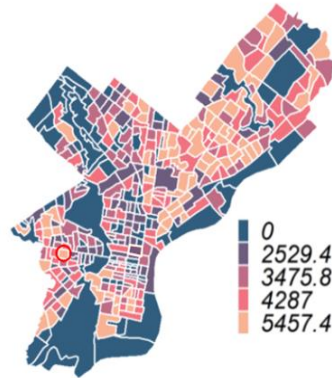
The process will improve people's awareness toward smart Philly and improve people's digital literacy. In this way to help the proceed of smart city process in Philly.
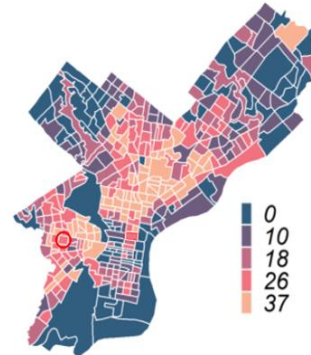
In the future

is the reproducible unit

Site location

13134.56
28123.6
38371.6
51431.8
67320.6
NA
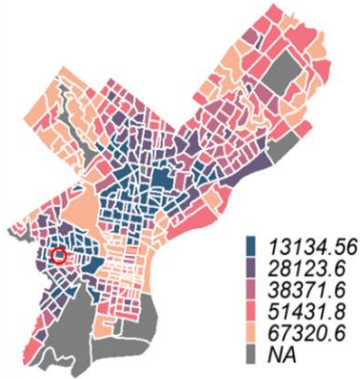
Map of median household income

0
2529.4
3475.8
4287
5457.4

Map of total population

0
10
18
26
37

Map of percentage of poverty

Income

$17,039
Per capita income

about **three-fifths** of the amount in Philadelphia: $27,924

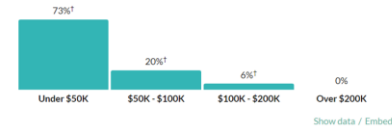about **three-fifths** of the amount in Philadelphia County: $27,924

$33,429
Median household income

about **three-quarters** of the amount in Philadelphia: $45,927

about **three-quarters** of the amount in Philadelphia County: $45,927

Household Income

73%†

20%†

6%†

0%

Under $50K $50K - $100K $100K - $200K   Over $200K

Show data / Embed

Poverty

35.6%
Persons below poverty line

about **1.5 times** the rate in Philadelphia: 24.3%

about **1.5 times** the rate in Philadelphia County: 24.3%

Children (Under 18)

Poverty
55%†

■ Poverty
■ Non-poverty

Show data / Embed

Seniors (65 and over)

Poverty
11%†

■ Poverty
■ Non-poverty

Show data / Embed
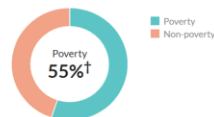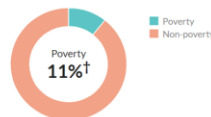
Testbed: Census tract 85, bounded by Market Street, South 50th Street, Pine Street and South 55th Street.

https://censusreporter.org/profiles/14000US42101008102-census-tract-8102-philadelphia-pa/

Poverty and restaurants resources map

Accessible hotspots in the area.

High Poverty

Restaurants per Block Group

Restaurants
- 70 – 174
- 20 – 70
- 5 – 20
- 1 – 5

Outdoor Accessible Hotspots

Legend

Outdoor Accessible Hotspots
- Free Library
- KEYSPOT
- LinkPHL Kiosk
- Philadelphia School District
- Other

Outdoor Accessible Hotspots - Commercial
- Comcast Outdoor
- Verizon

Find address or place
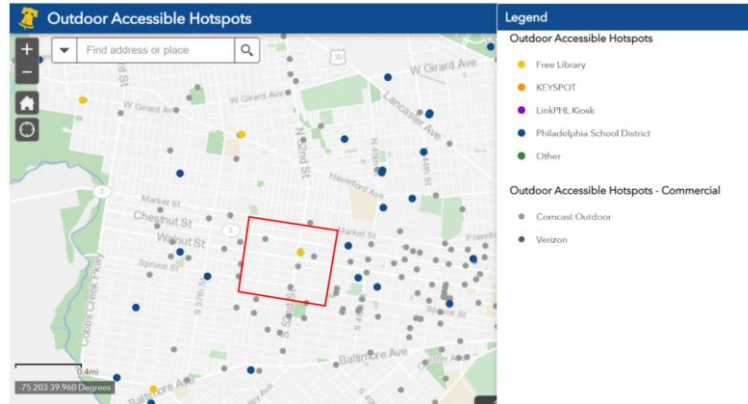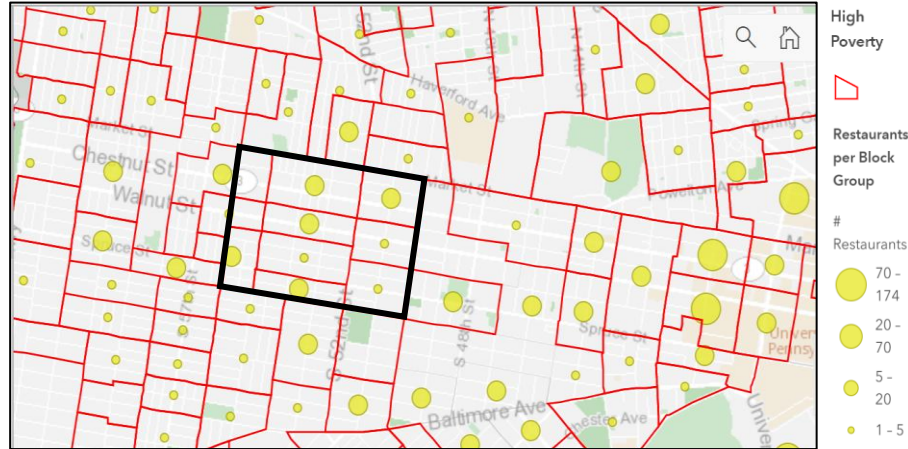
Site location

When we choose study site (testbed):

demand

Surrounding areas

Testbed

- Population
- Poverty
- Existing restaurants
- …

supply

Test bed resources & stations potential location

resources distribution

	testing area
◯	food suppliers
✝	church
▨	existing parking lot
◼	free hot spot
●	commercial hot spot
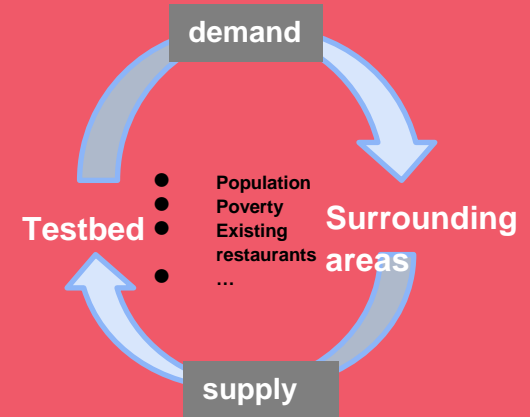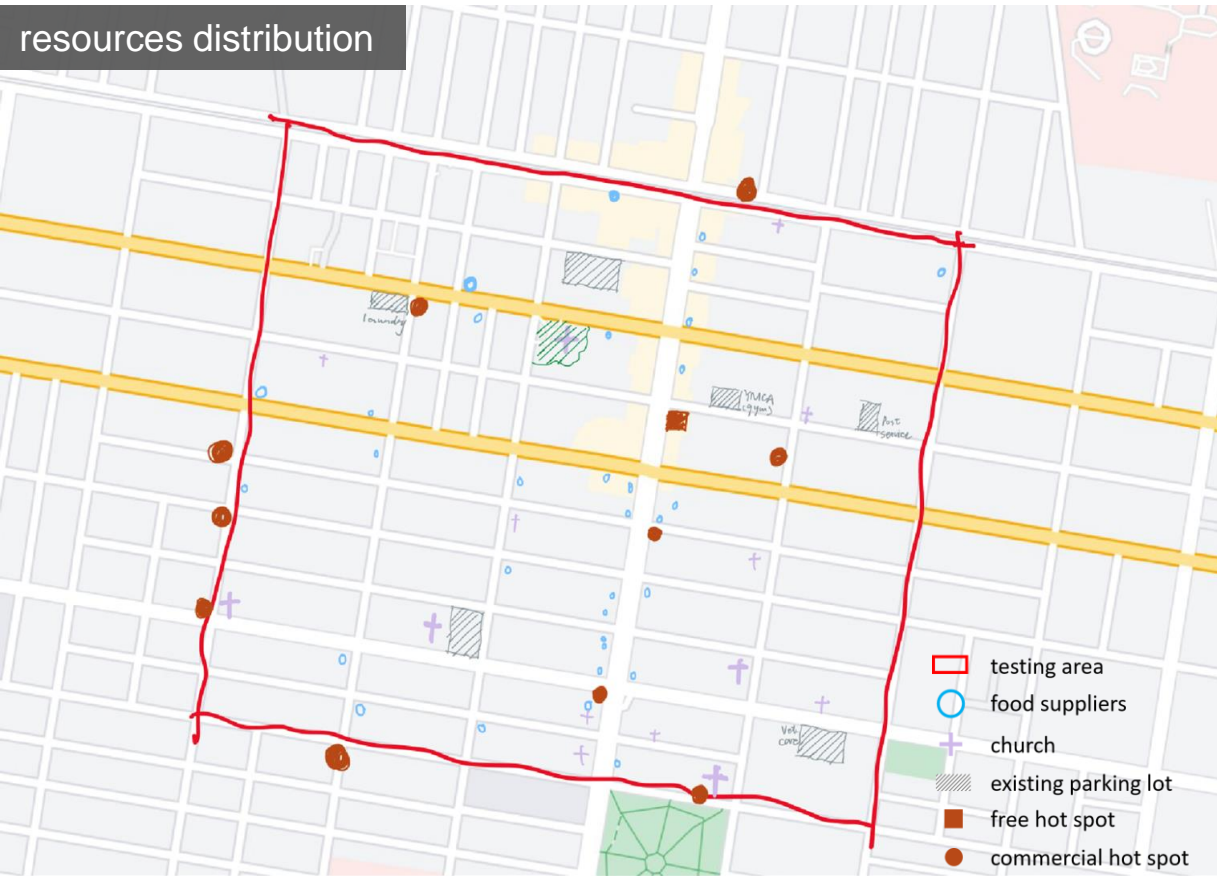
Use **algorithm** to select appropriate locations for our mobile station and fix station based on some **indicators**:

- Existing resources (churches, parking lots, hot spots…)
- Traffic
- Population and poverty in each block
- Operating routine of each restaurant, grocery store, cafe, dining hall…
- …

Goal:
- ➢ Easy for everyone in this area to get to;
- ➢ Have enough daily supply;
- ➢ Dynamic system (mobile stations will change based on the prediction of demand.)

Test bed resources & stations potential location

food-Internet station
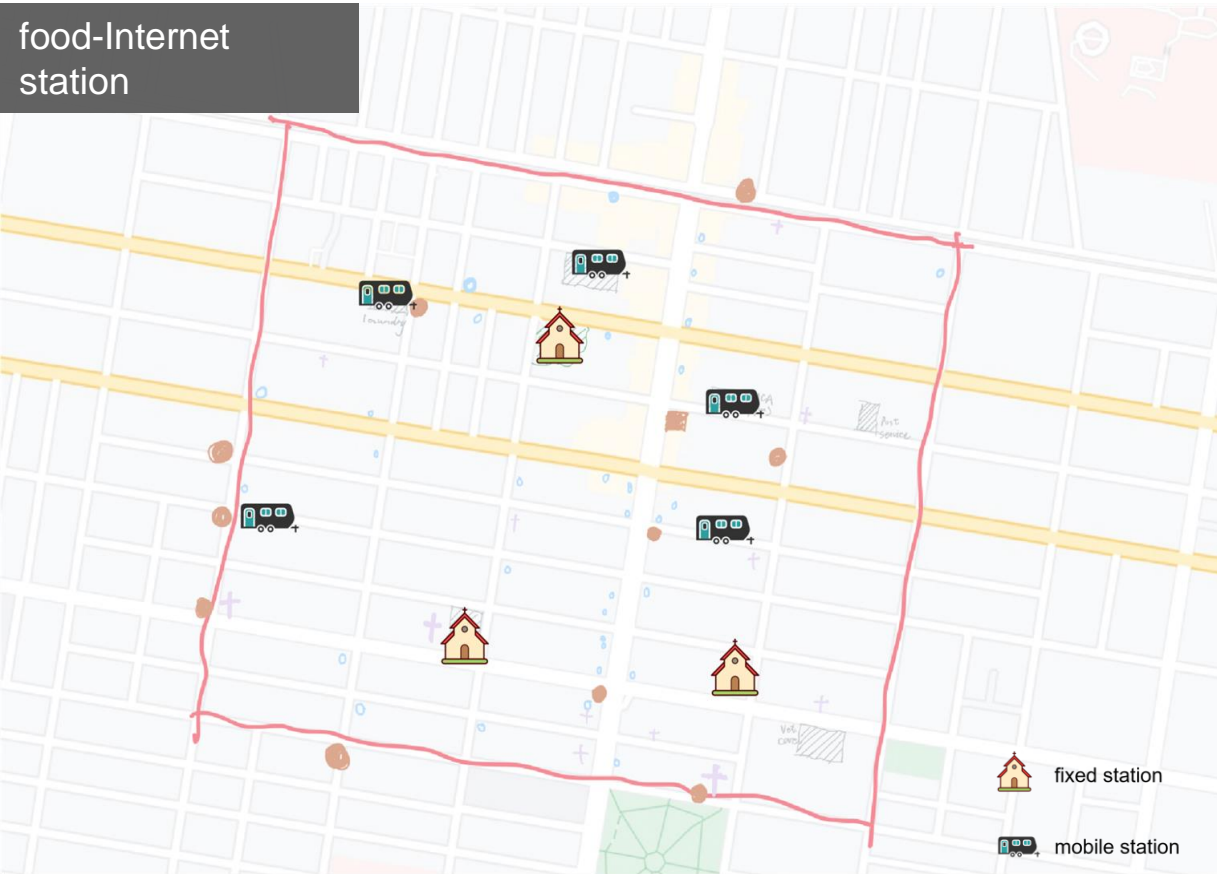
Fixed station:
Accommodation, better be at the center of the area.

Mobile station:
Take advantage of commercial hot spots;

Better located at the existing parking lots -- have enough space for operating.

fixed station

mobile station

Dashboard

Dashboard

Dashboard

Find out what you can do for smart food grid!

TOTAL MEALS DISTRIUTED OVER TIME

Join as suppliers, funding or individual volunteer

Join us | **Our partners** | **Area**

Make a donation

NOTIFICATIONS

Clifford Hale · Sent you a message
Hallo bro anak wes piro sakki? wes kuliah urung?...
2 hours ago

Donor #1 · Sent you a coin
Donor #1 just donated!
+$50 · make a donation
3 hours ago

Restaurant #1
Restaurant #1 joined the grid and will provide sandwiches
↗ +39.69% · about it
3 hours ago

Danny Jacobs · from food truck #1
Good food!
2 hours ago · find the truck

See All

- Dashboard
- Map
- Messages
- Program
- Account Setting

6.500 ●Restaurant ●CAFE ●Grocery Store

$7.357
$6.987
$3.43

6.000
5.500
5.000
4500
4000
3500
3000
2500
2000

11/2021 12/2021 01/2022 02/2022 03/2022 04/2022 05/2022 06/2022 07/2022 08/2022

Find a food truck / Hotspot

Click for more details about food availability and Internet access

Suppliers

⚙ | Download CSV ⬇ | Export ⬆

Name	Status	Operator	Location	Food	Start Date
Sweetgreen	Waiting for pick up	Darrell Williamson	3925 Walnut St	Salad, fresh vegetables, fruits	03/03/21 22:43
United by Blue	Delivered	Dustin Wilson	3421 Walnut St	drinks, dessert	04/30/21 10:03
Mr Hook Fish & Chicken	Preparing	Jerome Simmmons	206 S 52nd St	seafood	01/28/21 14:11

suppliers' real time status

Dashboard

Infood

Map
Find out what you can do for smart food grid!

- Dashboard
- Map
- Messages
- Program
- Account Setting

Search for nearest station and all the information you need!

1

MOUNT ZION
UNITED HOLY
CHURCH

Emergency Kitchen,
Food Cupboard

4110 Haverford
Avenue
Philadelphia PA 19104
United States
More info

0.4 mi   Directions

2

FOOD TRUCK 019

Food and free WiFi
5:10 PM - 8:00PM

4110 Haverford
Avenue
Philadelphia PA 19104
United States
More info

0.4 mi   Directions

3

PEOPLE'S
EMERGENCY
CENTER

Food Cupboard

325 N. 39th St.
Philadelphia PA 19104
United States
More info

0.5 mi   Directions

Pixelz Warrios

**Timeline
Indicators
Key Partners**

2 weeks

Market Survey

Food rescue sources an organisations

Secondary

Health and safety of food
Trust and awareness
Quality of the network

1 week

Location

Digital inequity and food insecurity variables

1 month

Key partners

Restaurants
Café's
Penn Dining
Supermarkets
Food distributers
Comcast
Churches
Community centres
Parking lots

1 month

Dashboard

Data Collection

Algorithms

Algorithms to predict demand and indicators

Food collection
Resources
Users
Location matrices

On going process

Awareness

Digital circulation, posters and flyers in public spaces

On going process

Execution

Data collection for indicators

Indicators

1. Food insecurity
2. K-12 users
3. Utilisation of mobile v/s stationary stations
4. Utilisation of Govt. programs