2018 NSF CYBER-PHYSICAL SYSTEMS PRINCIPAL INVESTIGATORS' MEETING

SMART LIVING PROJECT
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Building a Smart City Economy and Information Ecosystem to Motivate Pro-Social Transportation Behavior

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The Big Picture

Mobility Providers

- Incentives
- Pro-Social “rules”
  (e.g., reduce peak demand)

Travelers

- Realtime Information
- Incentives
- Better Quality of Life

- Realtime Information
- Marketplace for incentives
- User Preferences
- Historical Data
- Predictive Models

Local Businesses

- Incentives
- Redemption rules
  (e.g., no coupons before 5pm)

Employers

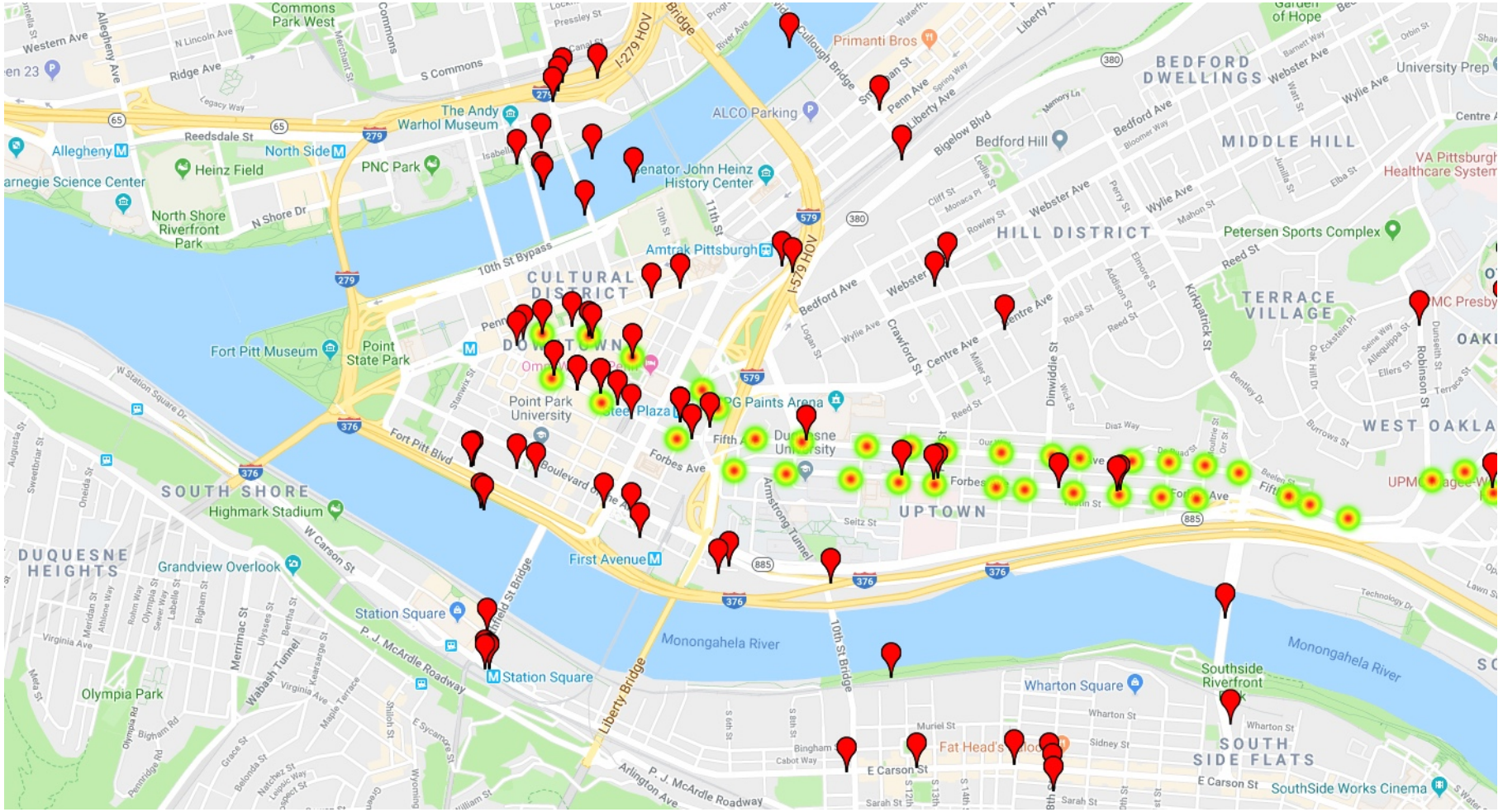
- Sustainability Incentives
- Redemption “rules”
  (e.g., verify carpooling)

Understanding Data

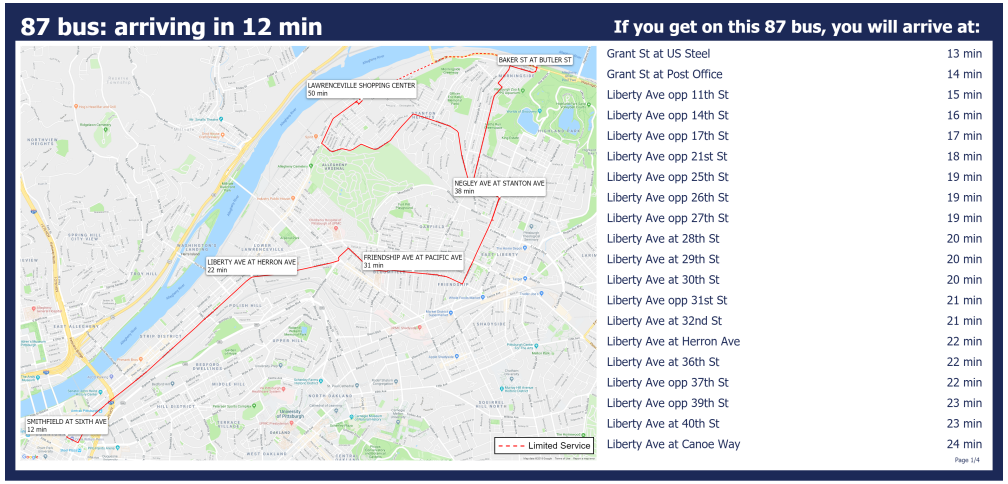
- Three types of transit data:
  - **public data** (e.g., bus schedules in GTFS format),
  - **historical data** (e.g., bus occupancy levels provided by the Port Authority), and
  - **real-time data** (e.g., bus arrival times).

- Main activities:
  - Characterizing transit supply
  - **Cleaning dirty data**
  - Developing predictive models for
    - **Bus load estimation**
    - **Arrival delay estimation**

Dirty Data Example



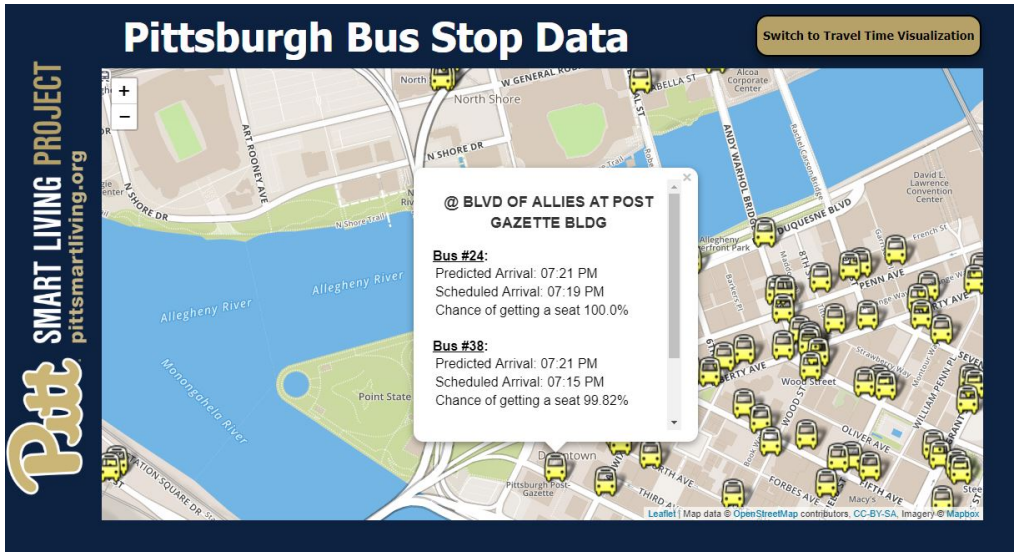
Design, Develop, & Deploy Infrastructure



Arrivals: · #39 now · #40 in 32 min · #44 in 44 min · #87 in 12 min ·

Experimental displays of real-time transit information, showing arrivals and destination information.

Interactive web sites to better explore and understand available data.



Understanding Human Behavior

- We performed a **lab experiment** (Fall 2018) and plan a **field experiment** (Spring 2019) to answer the following questions:
  - (1) How much money would a person need to delay his/her departure by 15 minutes? AND
  - (2) Will this amount be different if they pre-plan?

People

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(see poster or **https://pittsmartliving.org** for full list)