



**AND**



**BakerRipley**

# **BUILDING A FOUNDATION FOR EQUITABLE DISASTER RESPONSE AND RECOVERY**

Presentation by

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# Who is Baker Ripley?

## The Problem:

- Houston faces floods, hurricanes, heat
- Vulnerable groups are hit hardest



## Partner Goal:

- Allocate resources fairly before, during, after disasters

## **Partner Need:**

- Interactive dashboard tracking community needs
- Combining disaster & community data
- Helping direct aid where it's needed most

## **Our Role:**

- Identified key risk variables
- Found data to help target resources effectively

# How did we do it?

- What is Risk?

- FEMA's National Disaster Risk Index (**NDRI**)

- $Risk = EAL \times (Social\ Vulnerability / Community\ Resilience)$

- FEMA 100/500yr Flood Plains – High Risk areas

- What is vulnerability?

- The CDC's Social Vulnerability Index (**SVI**)

- City of Houston Public Works Drainage Data

- What is preparedness?

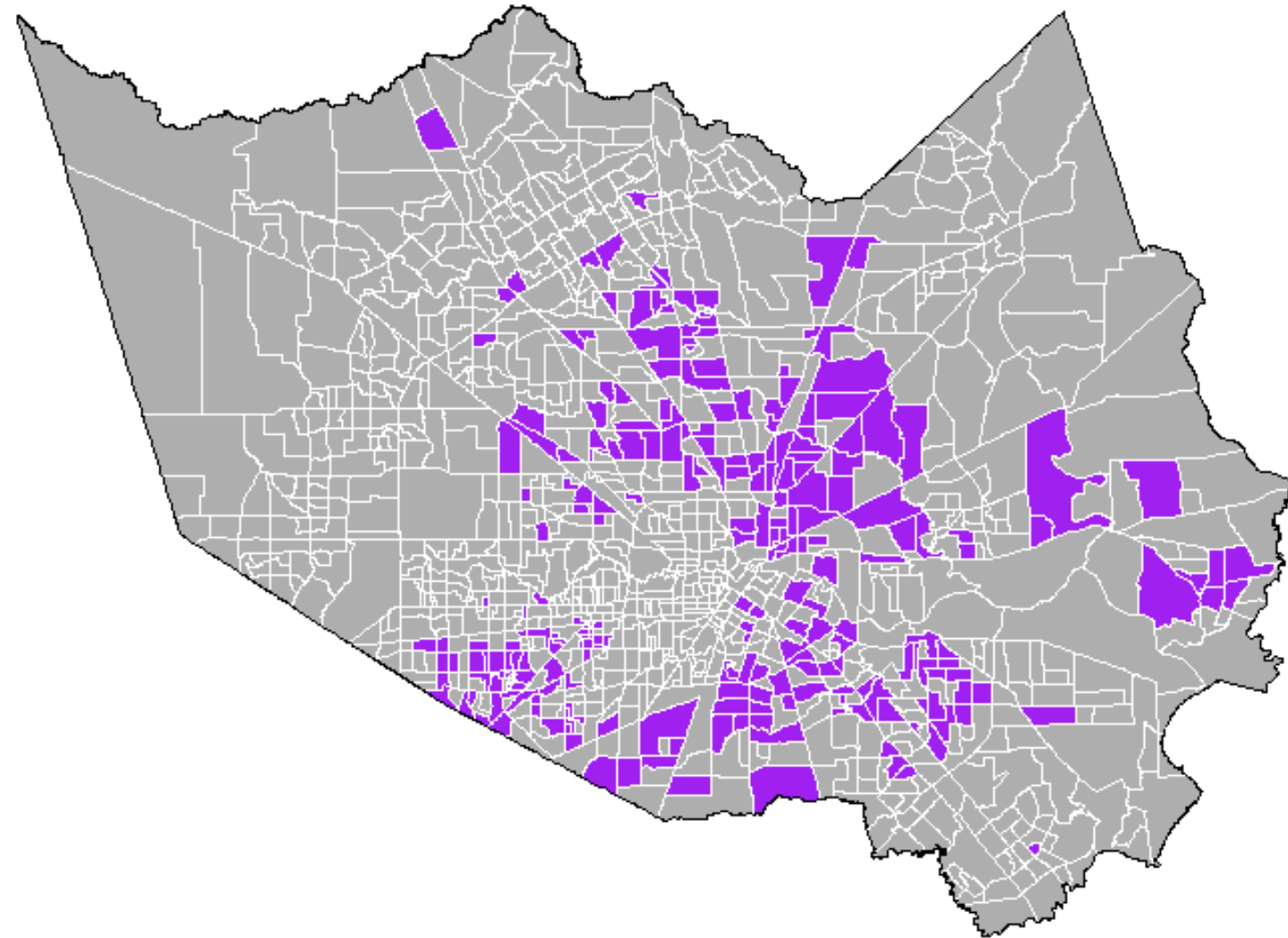
- Power Outage Risk Social Vulnerability index (**PO-RSVI**)

- Communications Capacity

- High SVI × low internet
- Tracts in SVI top quartile and above-median “no-internet”
- Comms barriers where vulnerability is highest.

## High Social Vulnerability and Low Internet Access

Tracts in Top 25% SVI & Above-Median Residents Without Internet



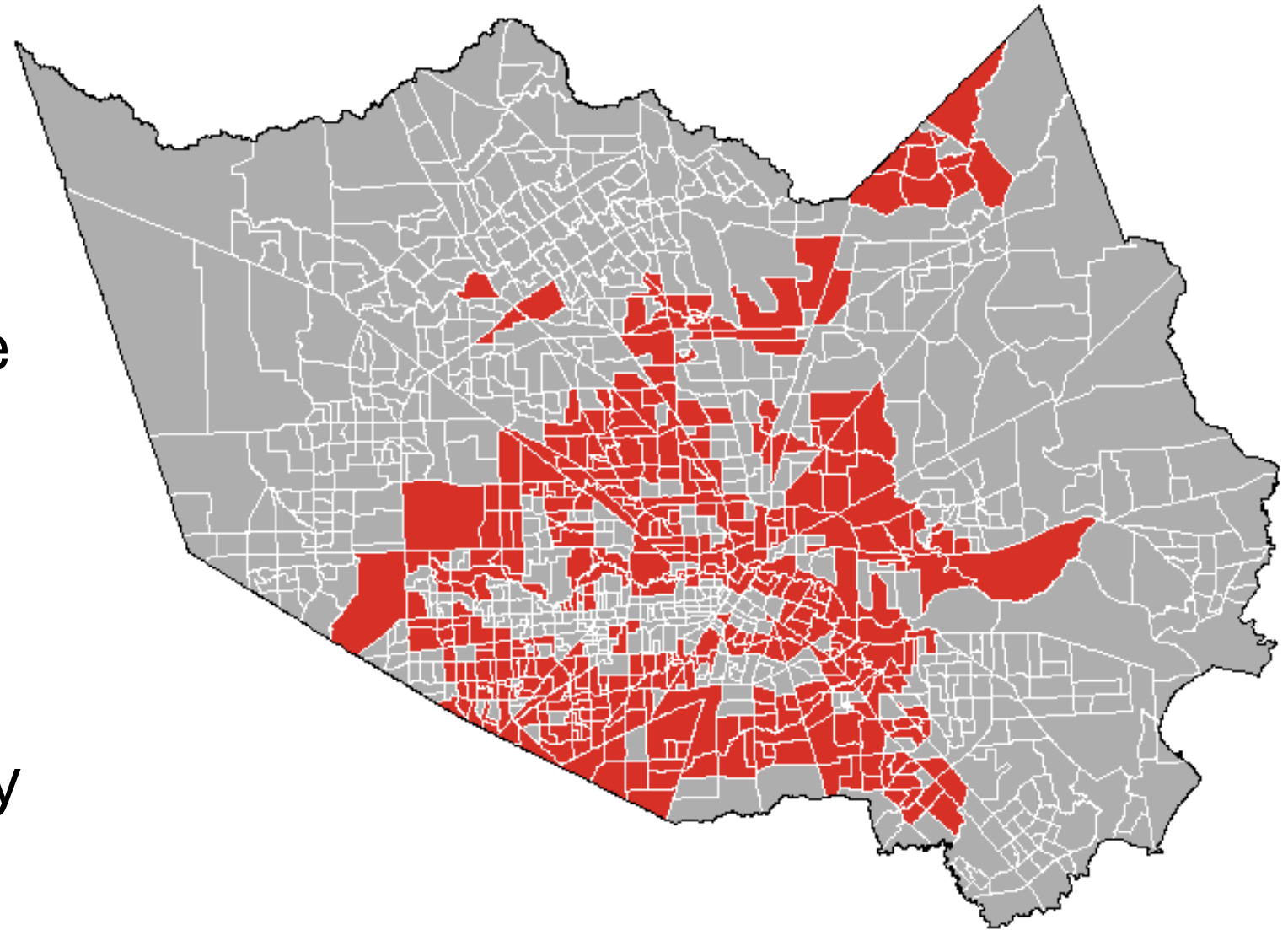
Other tracts High SVI & Low Internet

CDC SVI | ACS

## Census Tracts with Overlapping Flood Risk and Inadequate Drainage

Harris County

- Flood risk + weak drainage
- Flagged tracts of inadequate drainage + high risk flood zones
- Drainage data covers **Houston** only



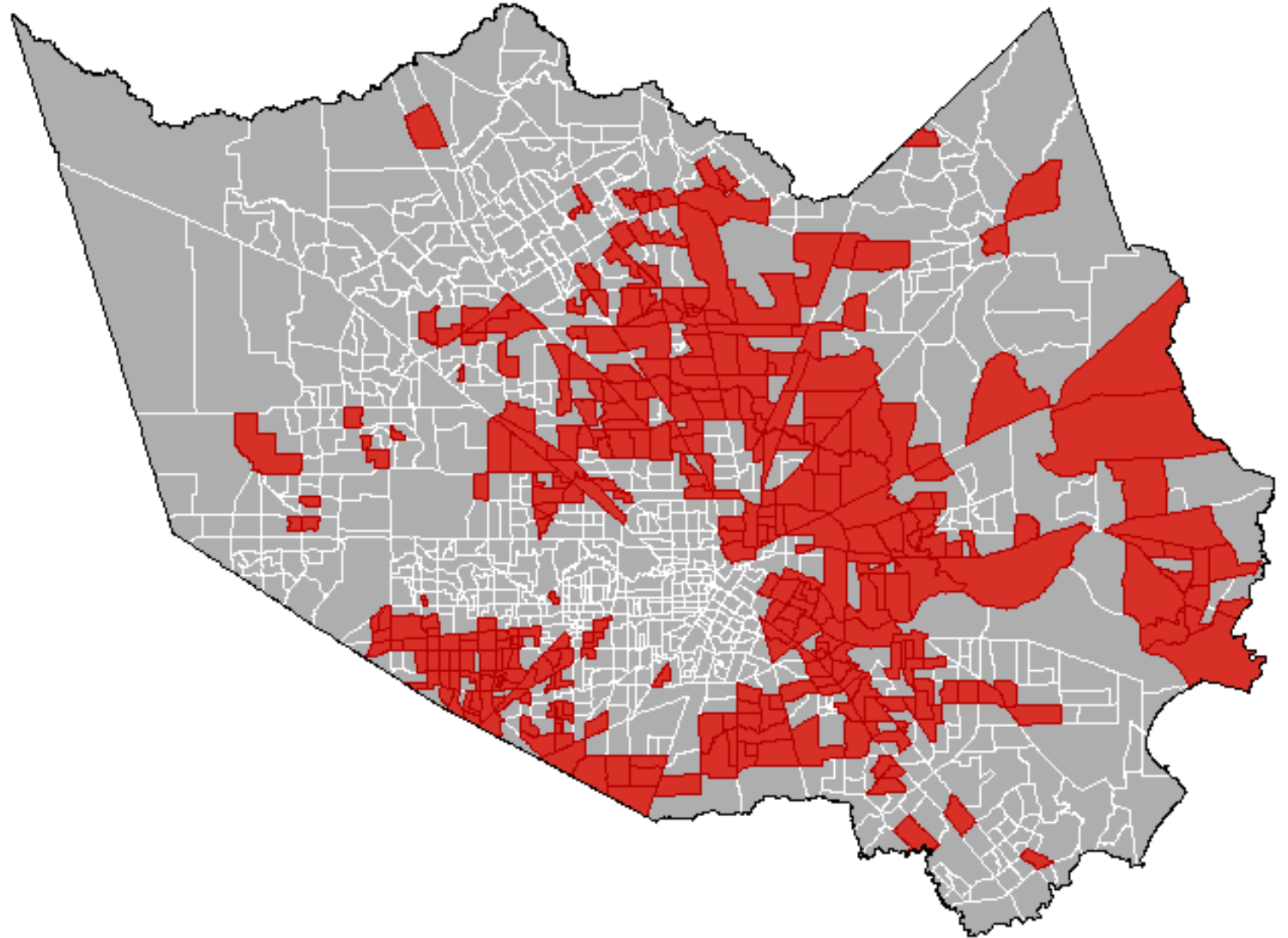
Other Tracts High Flood Risk & Inadequate Drainage

Flood Zones: FEMA NFHL | Drainage: Houston Public Works

# Overlap Between Low Income, Low Education and High Flood Risk

Harris County

- Power vulnerability
- Income  $\leq$  county median AND HS-or-less  $\geq$  county median
- Overlay FEMA high-risk flood zones
- PO-RSVI-informed proxy



# What to look for in the future?

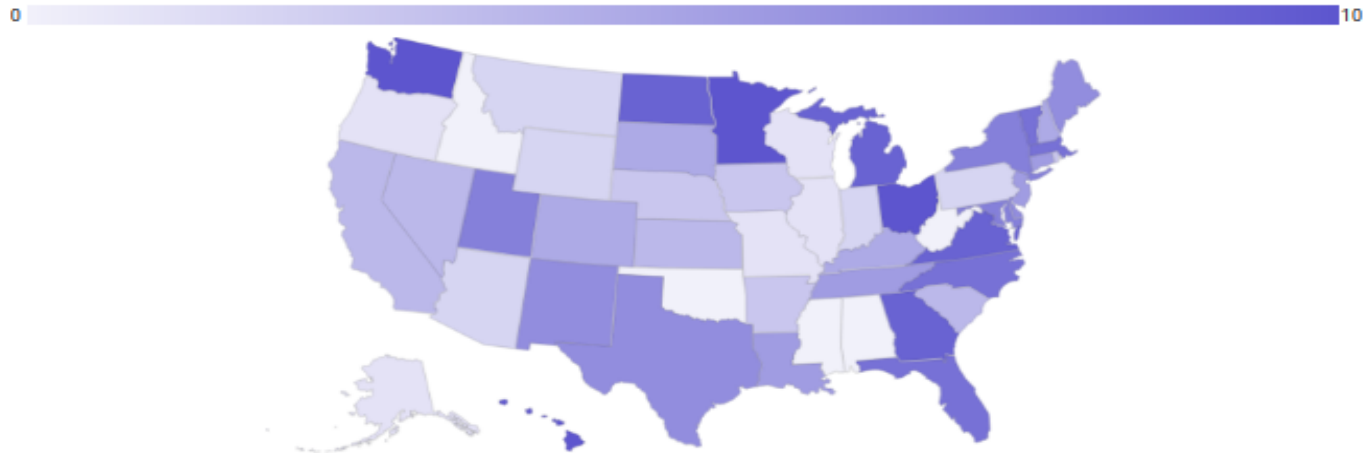
- **Energy Resilience surveys**
  - Proxies not as reliable and lack of data (for history of outage data)
  - Data collected for the Dashboard.
- **API key for FEMA claims**
  - Gaps in relief funding uptakes
- **Dashboard Wireframe**

Texas Census Tract Risk Map

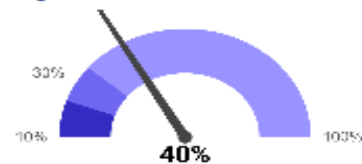
Risk Measure

Demographic Characteristic

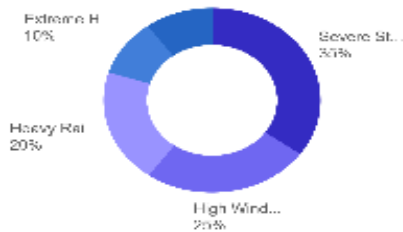
Weather Overlay



Flooding Risk



Key Word Search by Neighborhood



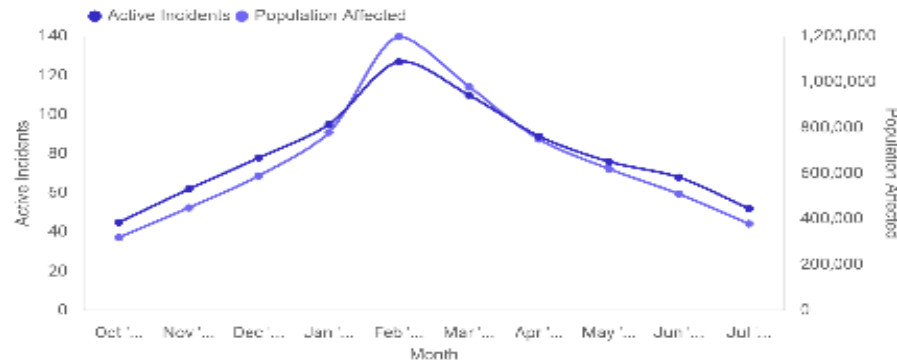
Tract-Level Risk Data

| Census Tract | Power Outage | Risk Score      | Population Impacted |
|--------------|--------------|-----------------|---------------------|
| 001          | Yes          | High (8.5)      | 320K                |
| 002          | Yes          | Very High (9.2) | 120K                |
| 003          | No           | High (8.1)      | 95K                 |
| 004          | Yes          | Moderate (6.3)  | 280K                |
| 005          | No           | High (7.0)      | 110K                |

Social Media Sentiment

|                      | Urgency | Empathy | Support | Information | Overall Sentiment |
|----------------------|---------|---------|---------|-------------|-------------------|
| Emergency Services   | 82      | 65      | 73      | 88          | 91                |
| Local Government     | 76      | 59      | 68      | 82          | 85                |
| Relief Organizations | 89      | 72      | 80      | 94          | 97                |
| Community Resources  | 71      | 54      | 62      | 77          | 79                |
| Media Coverage       | 68      | 52      | 60      | 75          | 77                |

Power Outage Events



# Conclusion

- **Summary**

- Problem – How do we drive equitable disaster recovery?
- Solution – Data driven dashboard
- Our Goal – locating variables essential to BR's mission

- **Deliverable (dashboard)**

- Key Variables: SVI, NDRI, PO-RSVI, and others
- Dashboard wireframe
- Additional variables to fill gaps: keyword search, social media sentiment, FEMA assistance claims

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