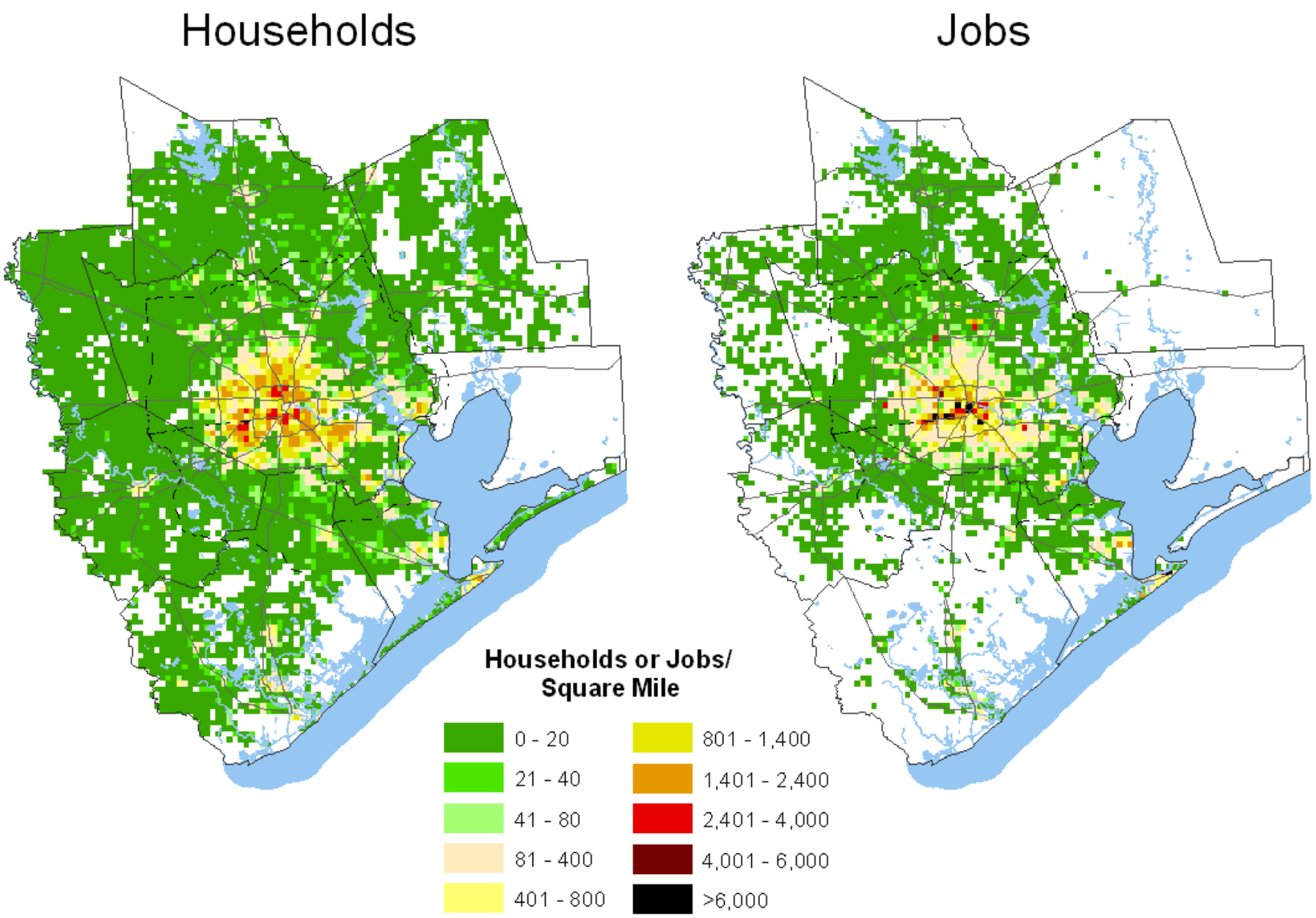
1970


Households
Jobs
Households or Jobs/
Square Mile
0 - 20
21 - 40
41 - 80
81 - 400
401 - 800
801 - 1,400
1,401 - 2,400
2,401 - 4,000
4,001 - 6,000
>6,000

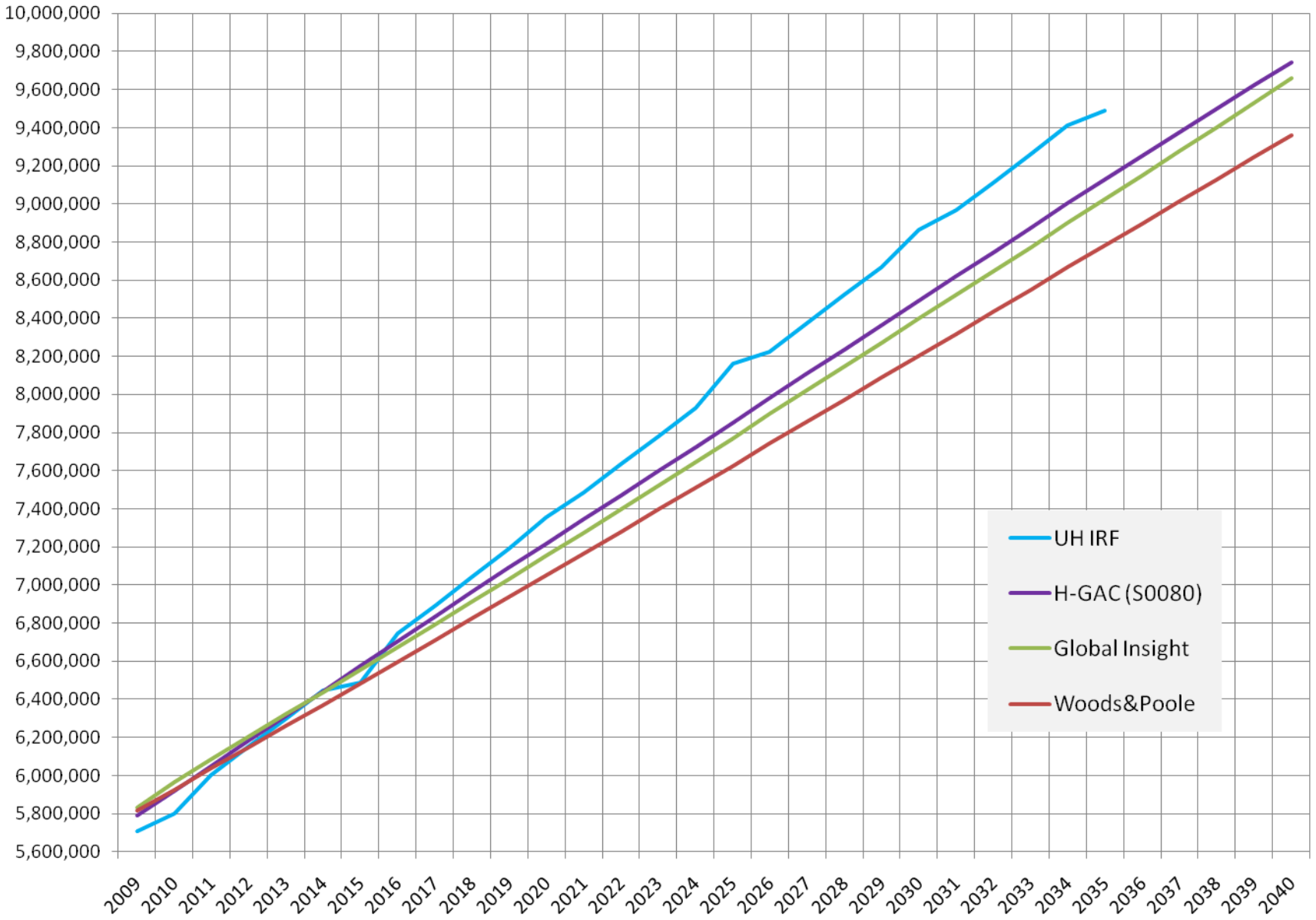
Overview

- Phase I: Predict annual change (through 2040) in population, households, and jobs in the region; predict demand for buildings
- Phase II: Package buildings into projects; predict which projects will occupy which parcels

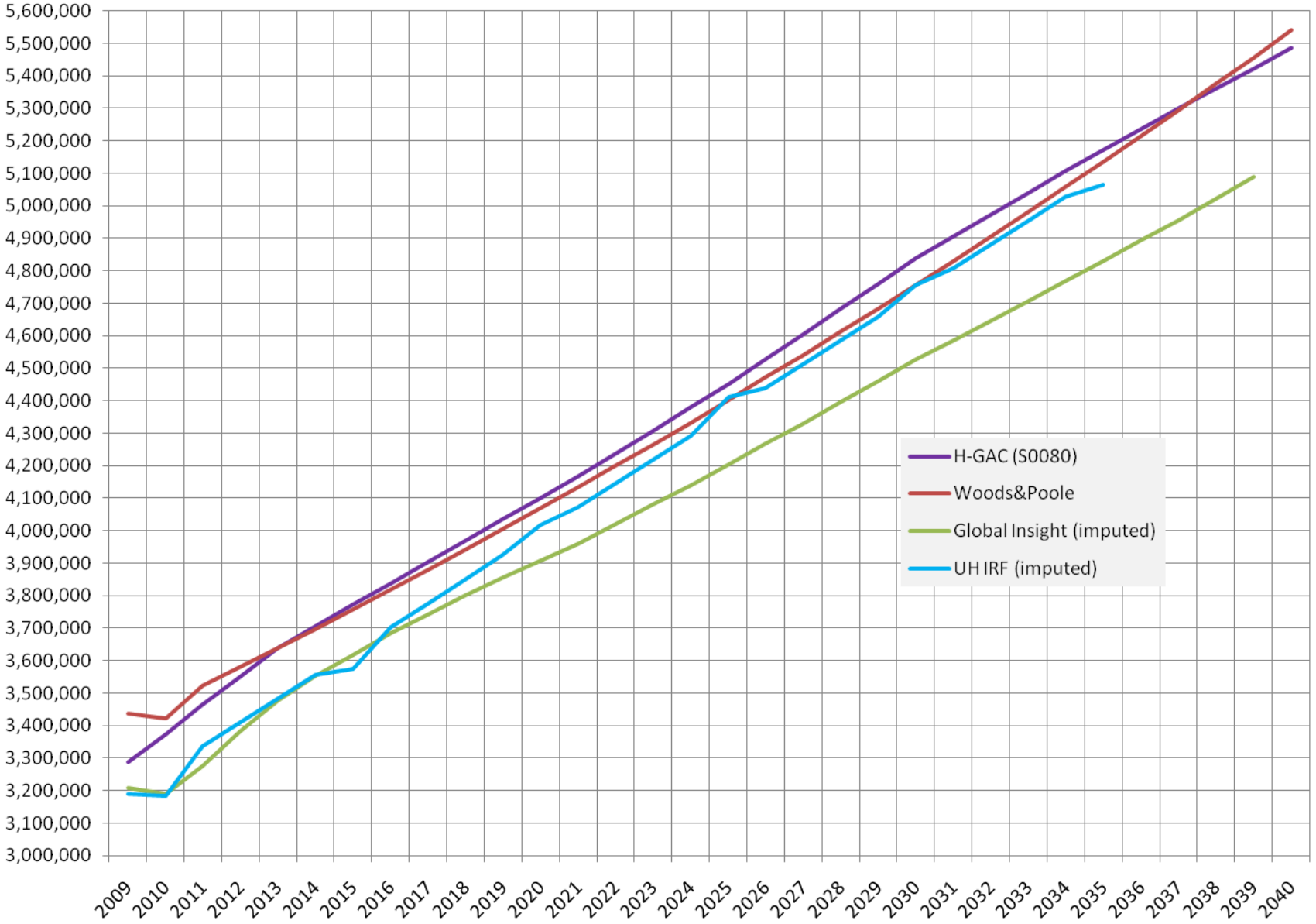
Our Modeling Creed

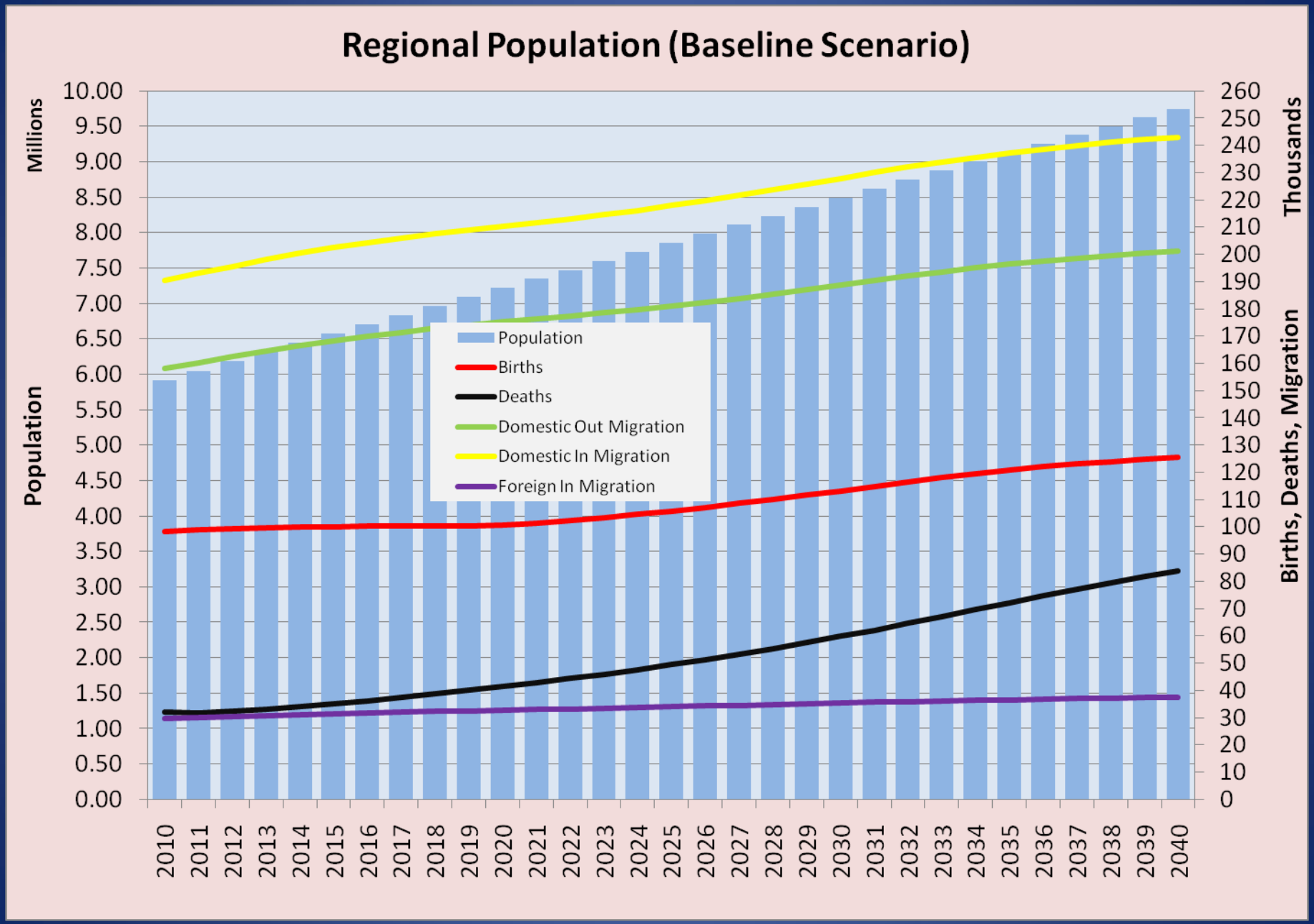
- We don’t pretend that we know what cannot be known
  - Formal assumptions (“what if’s”); scenarios
- We believe in disaggregation and simulation
- We are committed to total transparency
- We are not defensive about the results, but we will defend the integrity of our methods

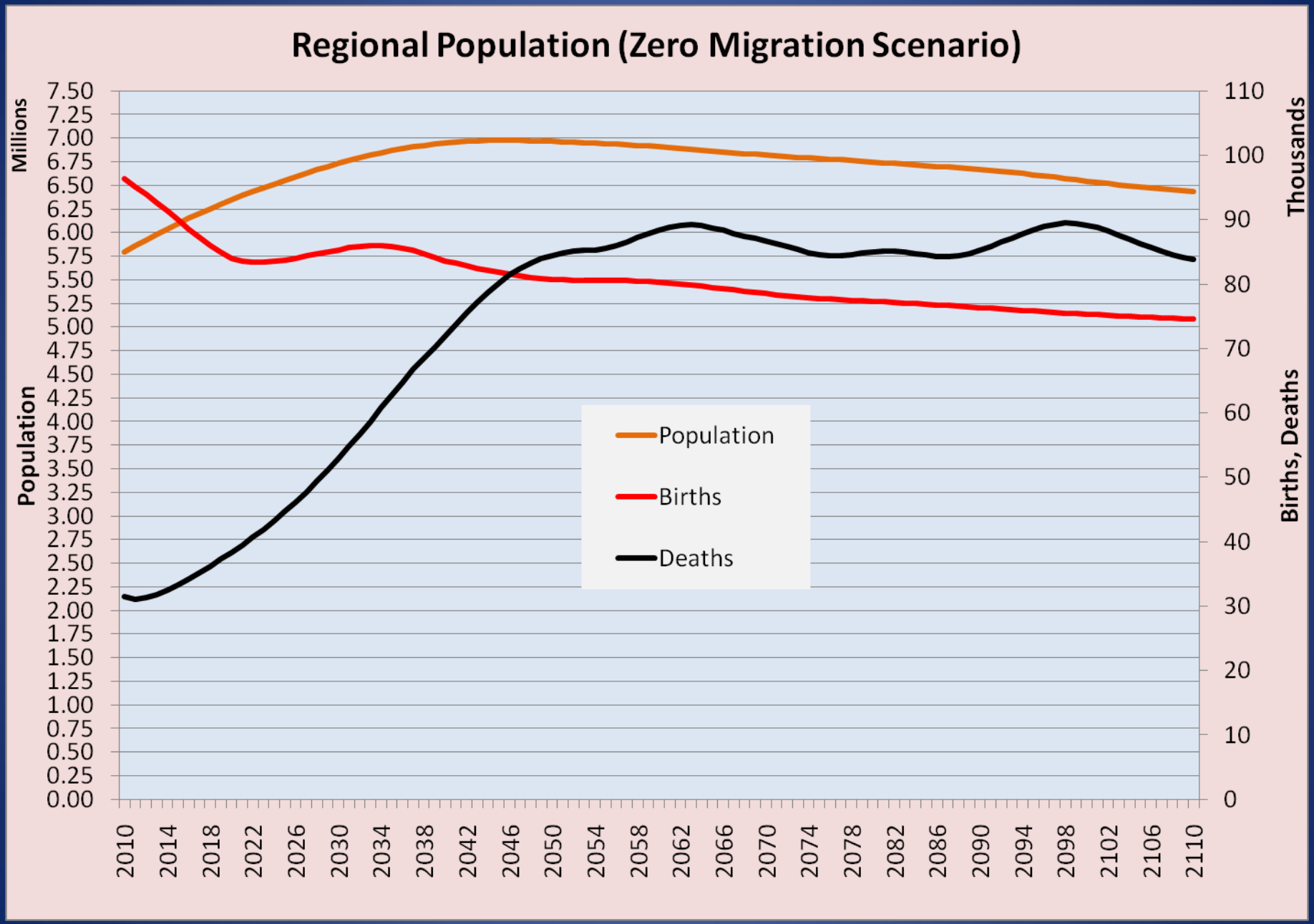
Population Forecasts



Total Jobs Forecasts




Regional Population (Baseline Scenario)
Millions
Population
10.00
9.50
9.00
8.50
8.00
7.50
7.00
6.50
6.00
5.50
5.00
4.50
4.00
3.50
3.00
2.50
2.00
1.50
1.00
0.50
0.00
Thousands
Births, Deaths, Migration
260
250
240
230
220
210
200
190
180
170
160
150
140
130
120
110
100
90
80
70
60
50
40
30
20
10
0
Population
Births
Deaths
Domestic Out Migration
Domestic In Migration
Foreign In Migration
2010
2011
2012
2013
2014
2015
2016
2017
2018
2019
2020
2021
2022
2023
2024
2025
2026
2027
2028
2029
2030
2031
2032
2033
2034
2035
2036
2037
2038
2039
2040


Regional Population (Zero Migration Scenario)
Millions
Population
7.50
7.25
7.00
6.75
6.50
6.25
6.00
5.75
5.50
5.25
5.00
4.75
4.50
4.25
4.00
3.75
3.50
3.25
3.00
2.75
2.50
2.25
2.00
1.75
1.50
1.25
1.00
0.75
0.50
0.25
0.00
Thousands
Births, Deaths
110
100
90
80
70
60
50
40
30
20
10
0
Population
Births
Deaths
2010
2014
2018
2022
2026
2030
2034
2038
2042
2046
2050
2054
2058
2062
2066
2070
2074
2078
2082
2086
2090
2094
2098
2102
2106
2110

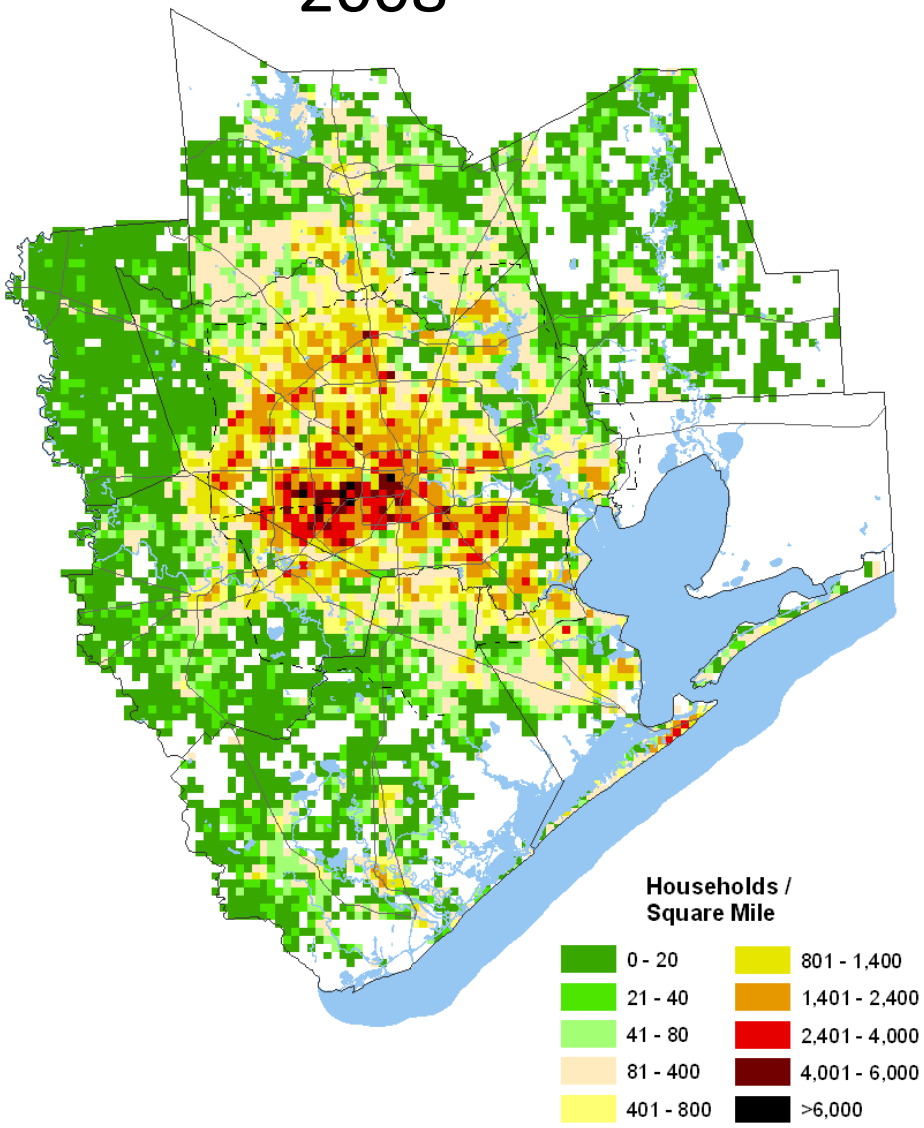
Most Important Points

- Inputs (data), Model Mechanics (rules), Outputs (“forecast”)
- Version 1.0 (first draft)
- Feedback from outputs to inputs and rules
- Constant revisions

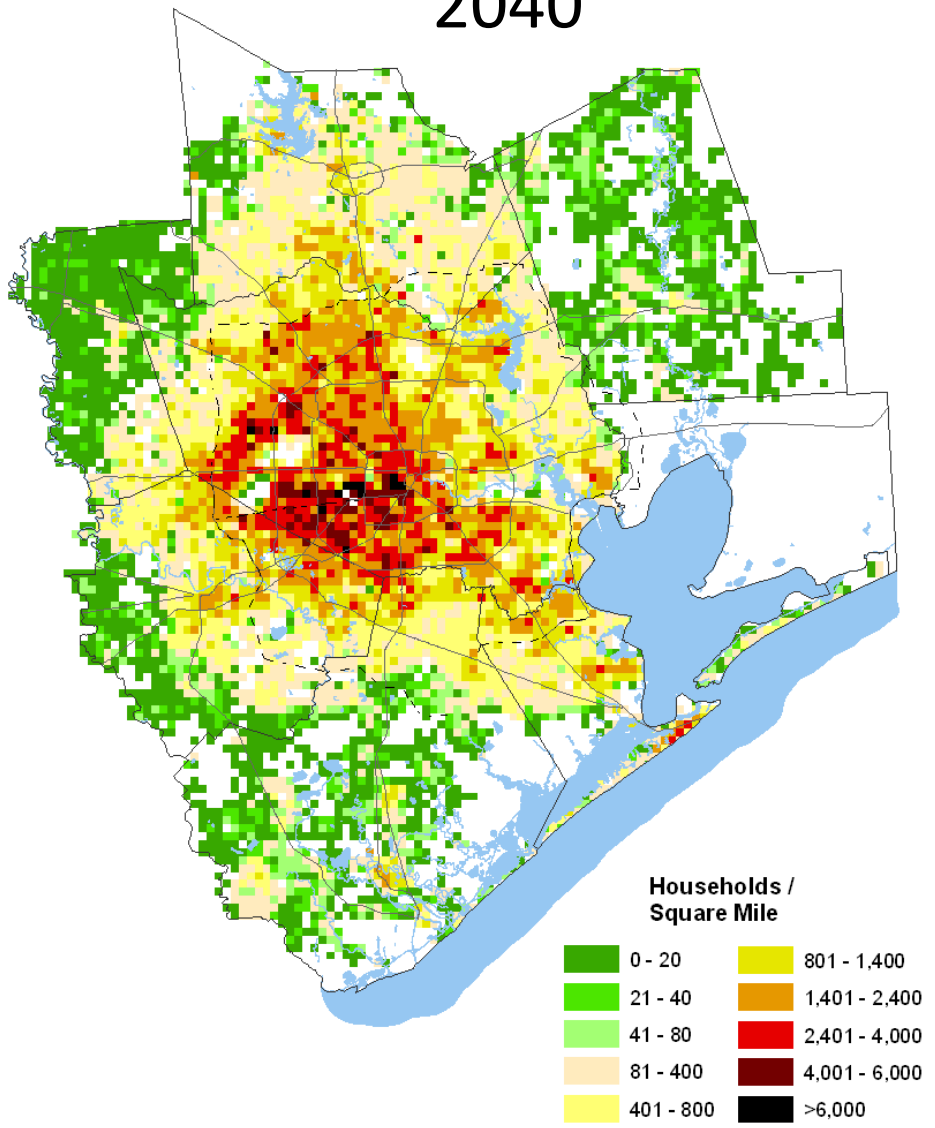
- Components
  - Existing land use (buildings)
  - Planned/announced projects
  - Model predictions
- www.h-gac.com
  - Community & Environmental
  - GIS Web Mapping Services
- www.h-gac.com/forecast
  - Sign up to receive updates

Households

2008

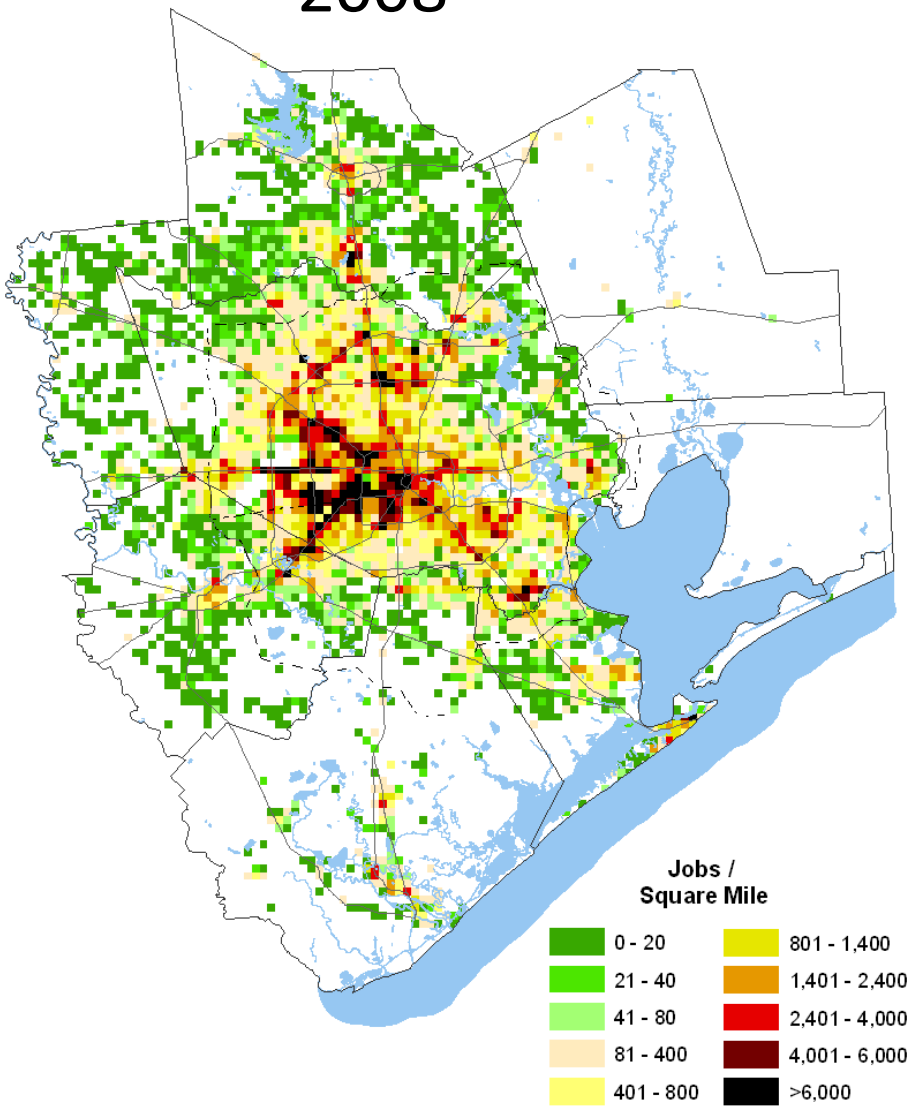


2040

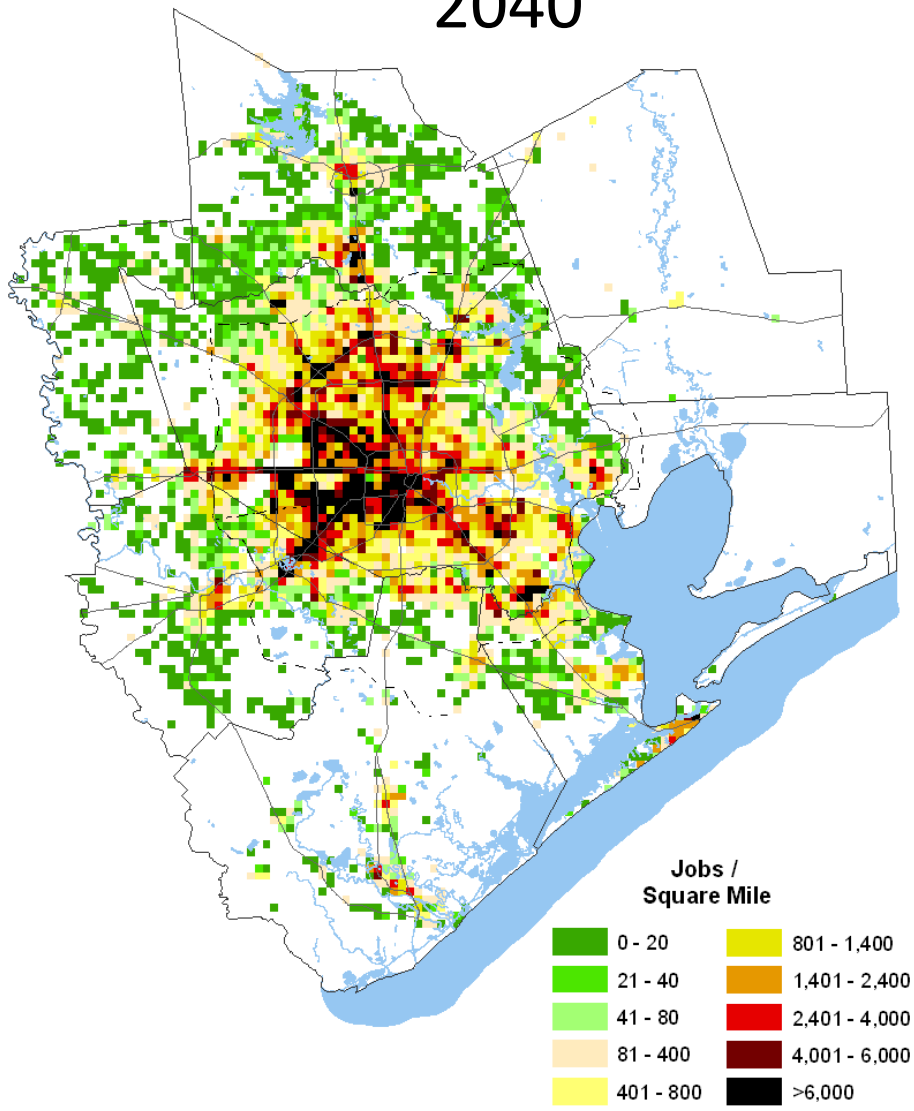


Jobs

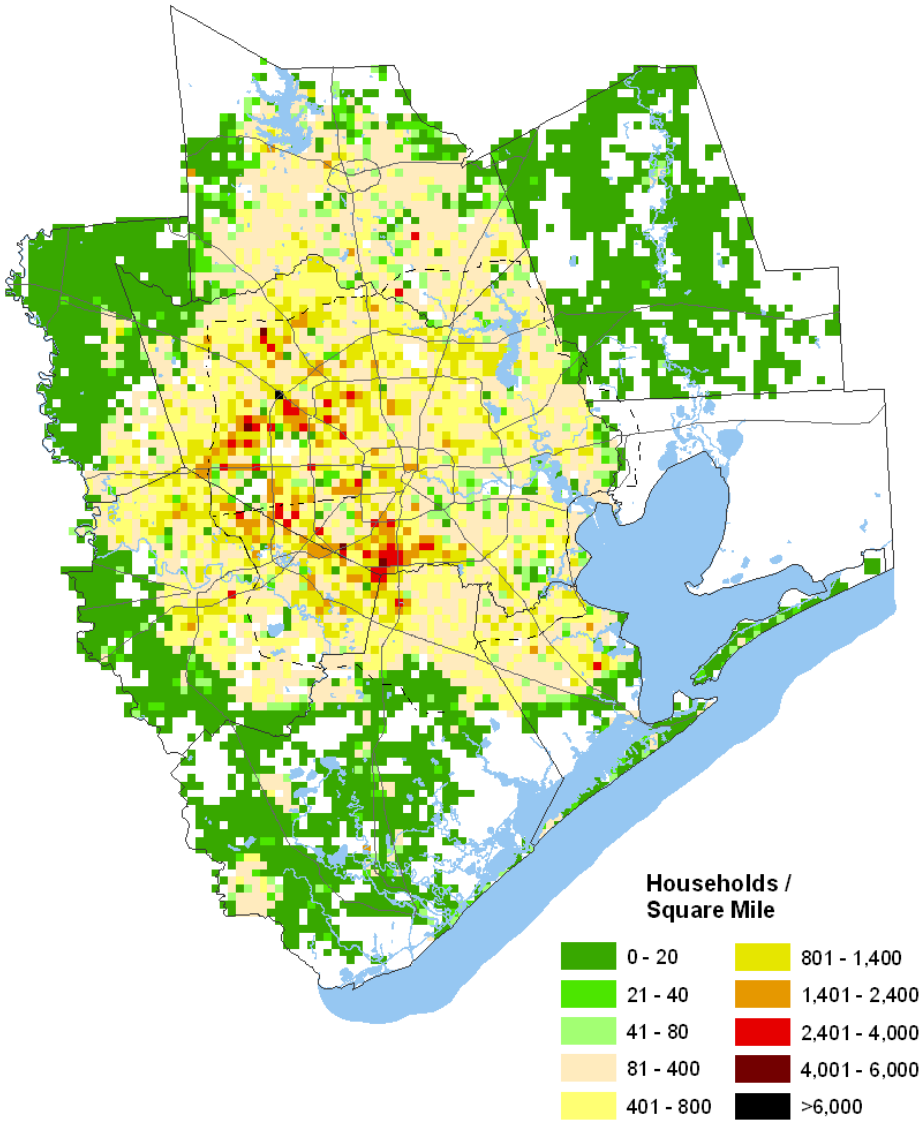
2008



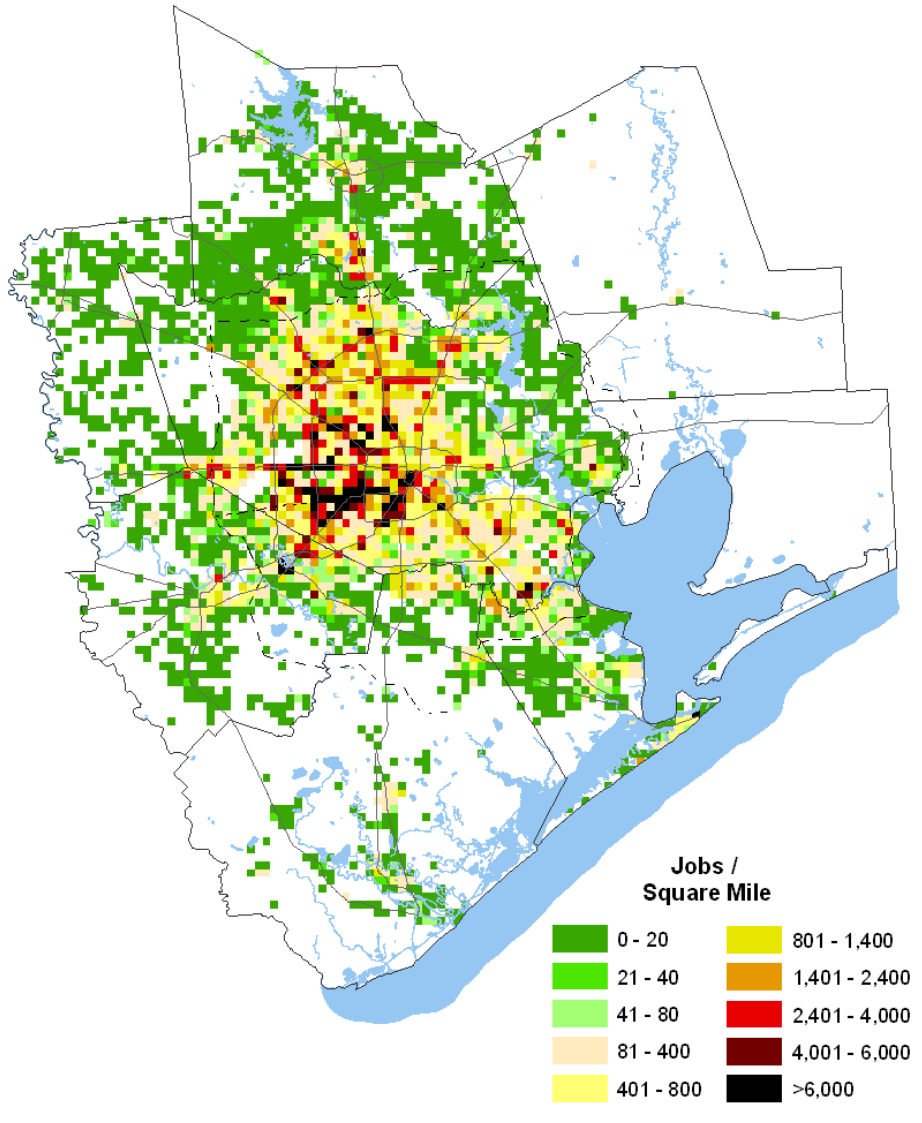
2040



Change in Households, 2008-2040



Change in Jobs, 2008-2040



Examples of Changes in Version 2.0

- Control the distribution of projects (e.g., SF subdivisions) by size
- Include future transportation networks

forecast@h-gac.com

- What do you want to know about the forecast?
- How do you want it sliced and diced?

Three Demographic Dynamics Models

1. Aggregate Population Evolution
   - Cohort-component with gross (in/out) migration
   - No path-dependence, No households
2. Disaggregate Population Evolution
   - Microsimulation of biological (aging, surviving, giving birth) and social (migration) events
   - No households
3. Disaggregate Household Evolution
   - Microsimulation of biological (aging, surviving, giving birth), social (marriage, divorce), and household (migration, relocation) events
   - Complete population and household structure and history!

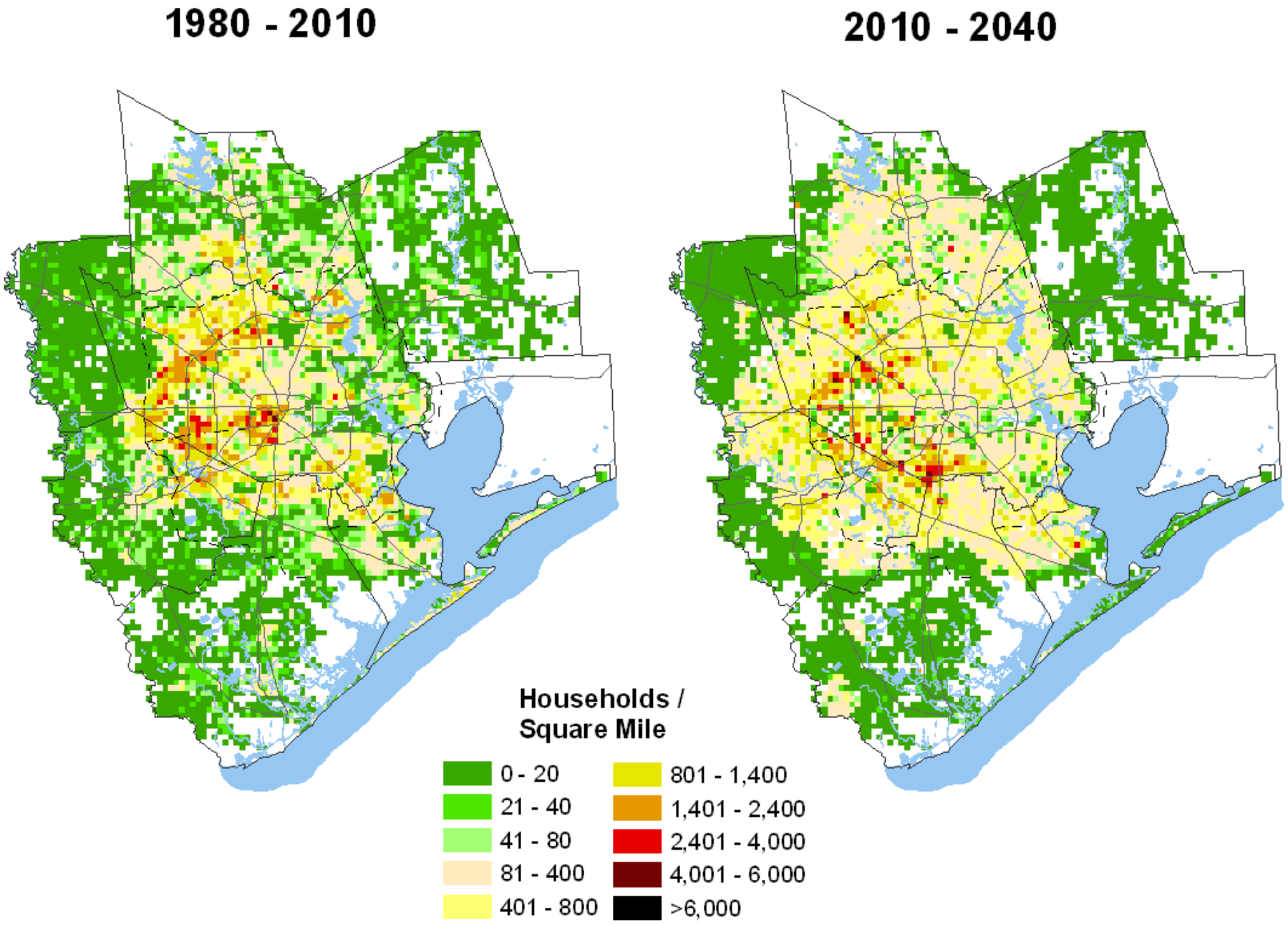
Land Use Forecast

- Parcels and Buildings
- Future Real Estate Projects
  - SF subdivisions
  - MF complexes
  - Office, Retail, Industrial/Warehouse Buildings
- The model predicts locations (parcels) for these projects

Population and Jobs

- Population → Labor Force → Workforce → Jobs → Jobs by sector (2-digit NAICS)

Change in Households



Change in Jobs