

The Economic Impact of Gig Networks

Sudip Bhattacharjee

Associate Professor

School of Business, University of Connecticut

sbhattacharjee@business.uconn.edu

Moving Towards A Gigabit State:

***Planning and Financing Municipal Ultra-High-Speed Internet Fiber Networks
Through Public-Private Partnerships***

Yale School of Management

May 04, 2015

Does broadband lead to economic development?

YES

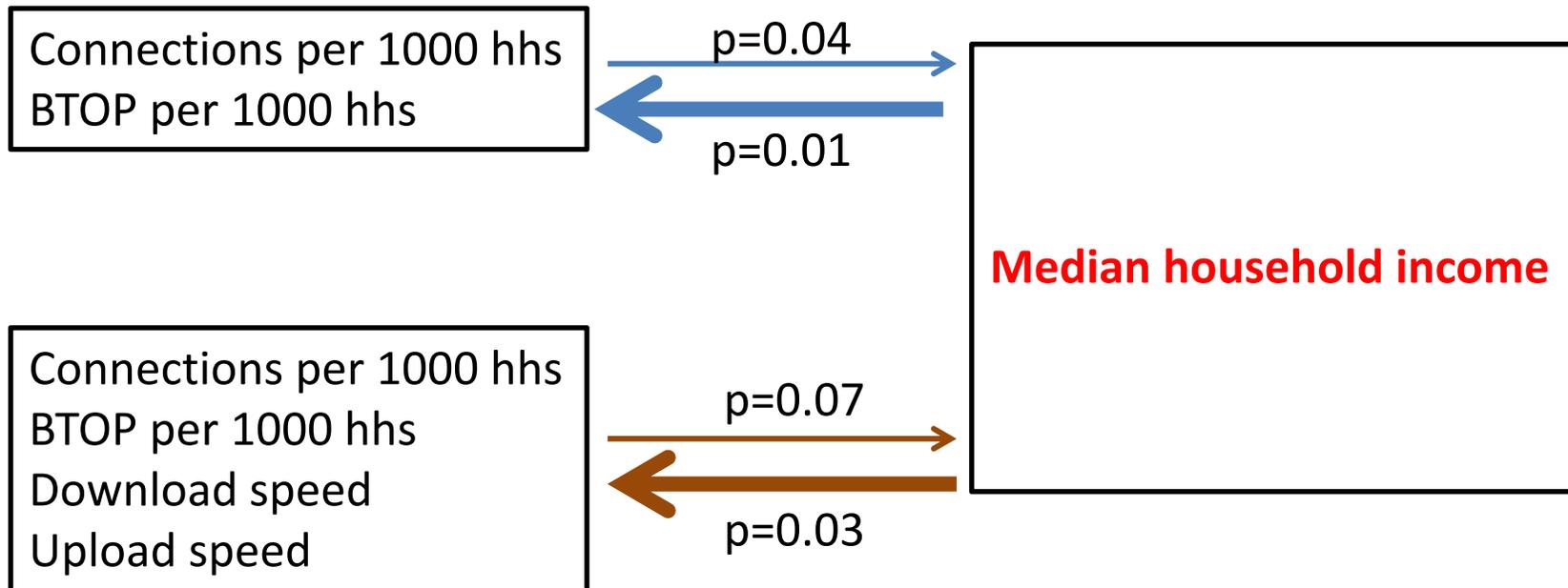
NO

Really?

Broadband follows income

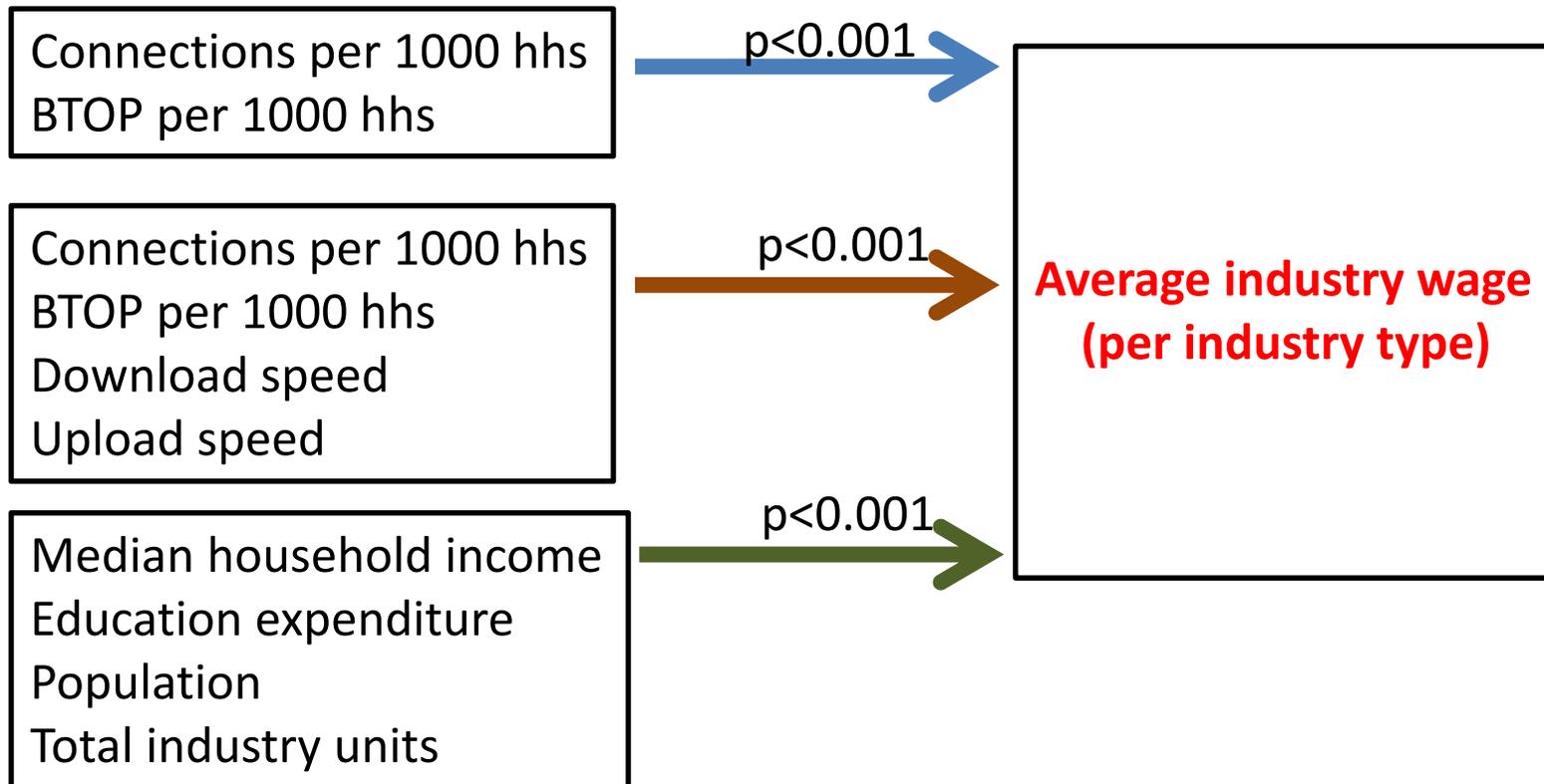
- 5 years data from 169 CT towns (2009-2013)
 - **Median household income**
 - Connections per 1000 hhs
 - BTOP per 1000 hhs
 - Download speed
 - Upload speed

Causality tests (CT data)



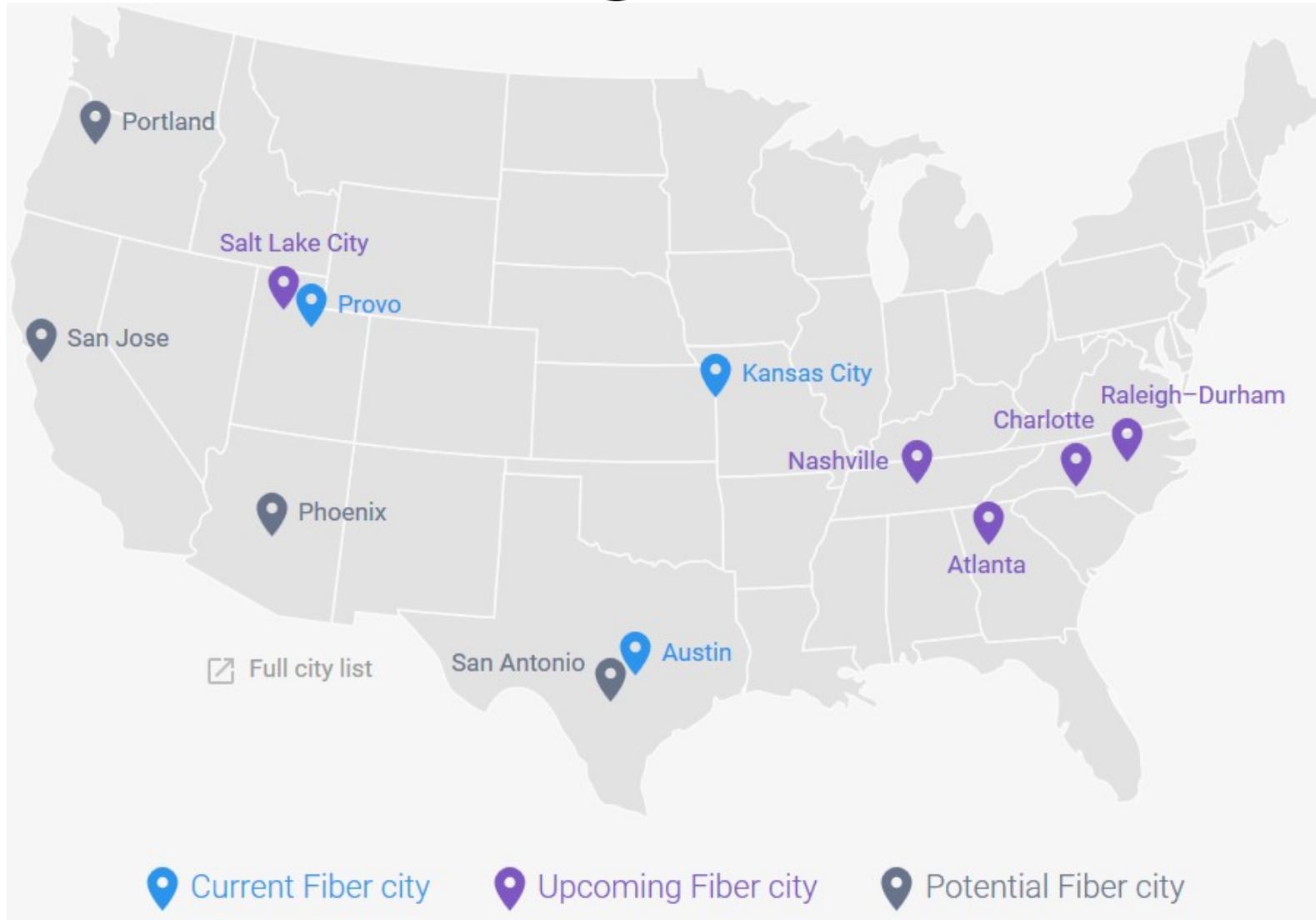
Household income leads to more connections and faster download/upload speed

High wages rely on good broadband speeds

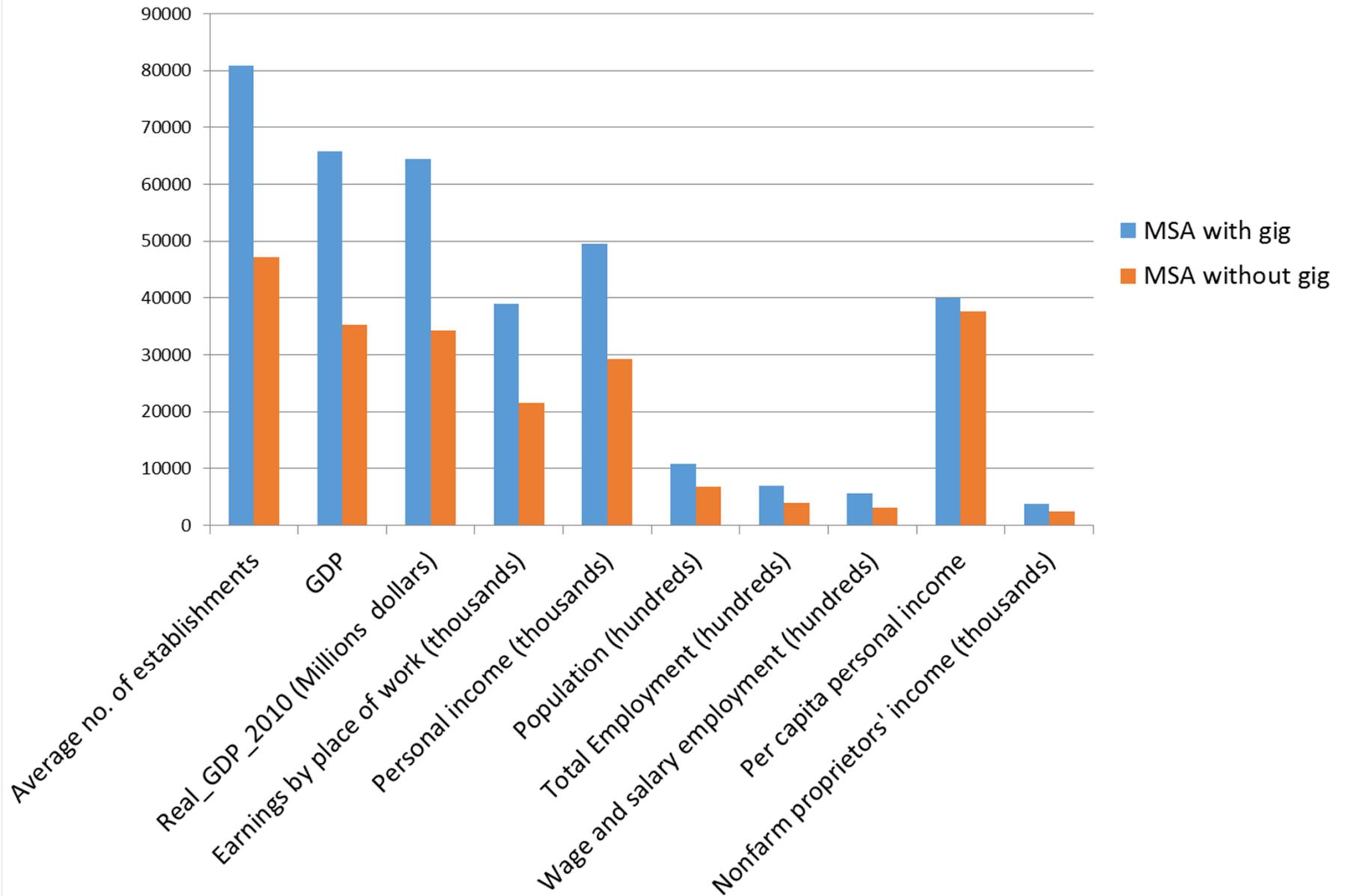


So that is the good news!!

Google Fiber



Demographic and economic comparison of gig MSA vs. no gig MSA

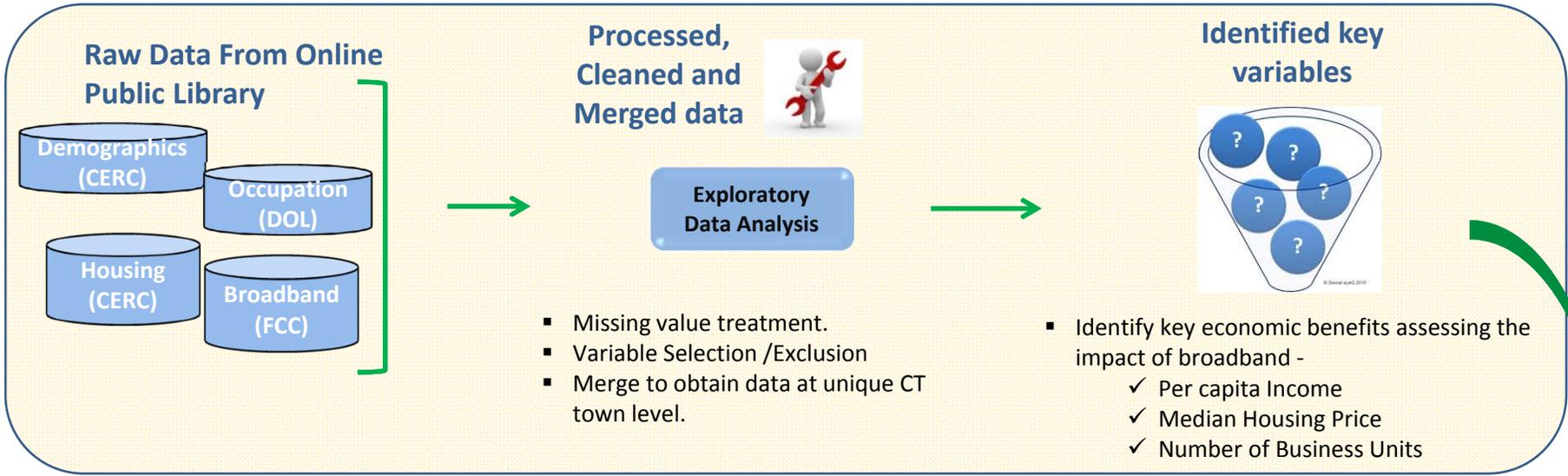


How can we identify CT towns?

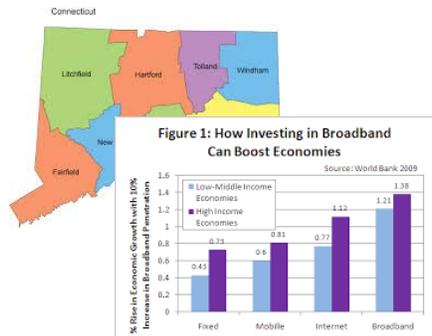
- Data driven analysis
 - UConn students in Masters in Business Analytics and Project Mgmt
 - msbapm.uconn.edu
 - Semester long capstone project
 - 4 teams of 5 members each
- Demographic, economic, geographic data
- Results are a composite of several teams

Solution Framework

70-80% of work effort



Summary of Model Output for Business Use



Grouping and Ranking of Towns based on benefit

Town	Education	Crime	Economy	Cost	Leisure	Total
Wilton	1	1	1	20	9	32
Canton	3	2	5	18	3	31
Old Saybrook	5	7	2	19	1	24
Groton	4	4	5	33	7	36
New Fairfield	6	3	3	16	11	29
Orange	2	12	6	17	4	41
Cheshire	13	19	7	12	2	44
Southington	7	5	9	14	8	45
Greenfield	9	13	11	11	4	38
E. Hampton	8	6	15	8	15	52
N. Stratford	14	14	10	9	10	54
Oxford	12	9	4	15	15	54
Canaan	10	15	12	10	14	41
Stafford	11	9	17	7	17	61
Windsor Locks	19	17	15	3	11	46
Derby	20	20	18	3	3	64
Galesville	16	14	14	2	20	46
Plymouth	15	16	19	4	16	70
E. Windsor	18	19	14	6	13	70
Windsor	17	10	20	1	10	78

Analytical Models to estimate economic benefit for CT towns



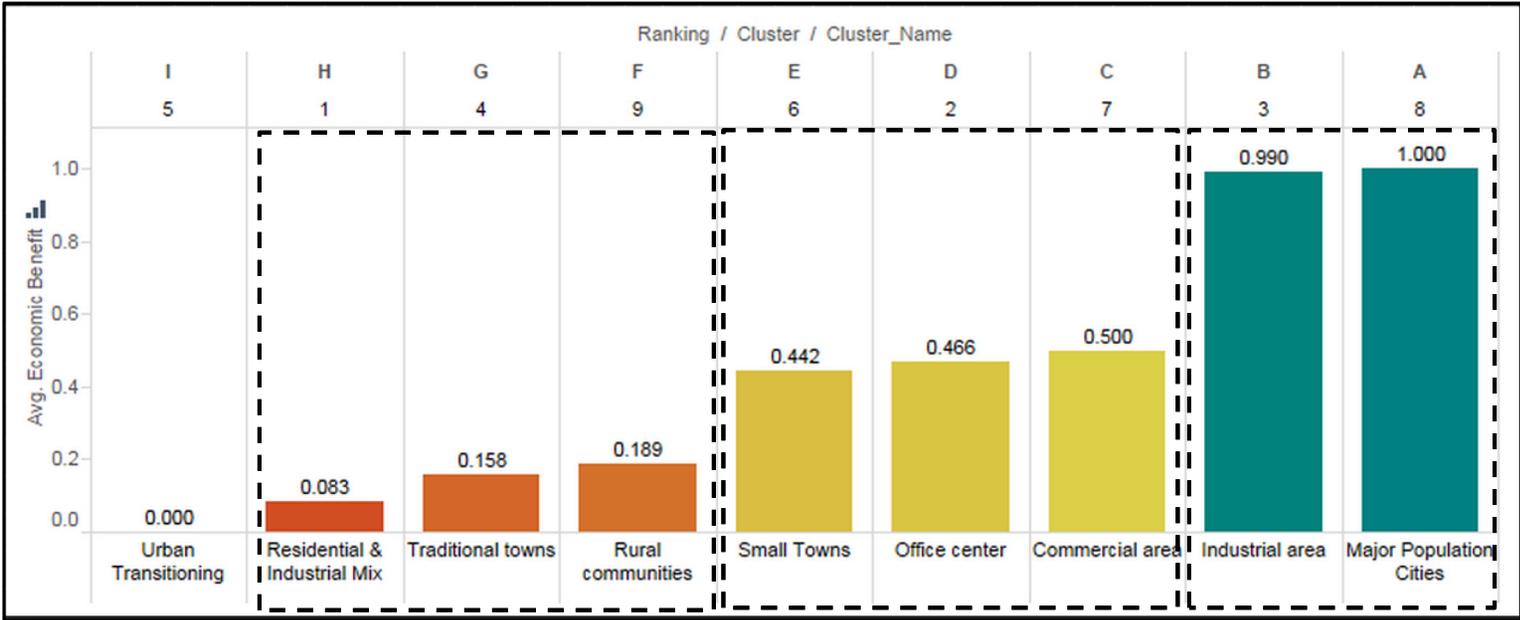
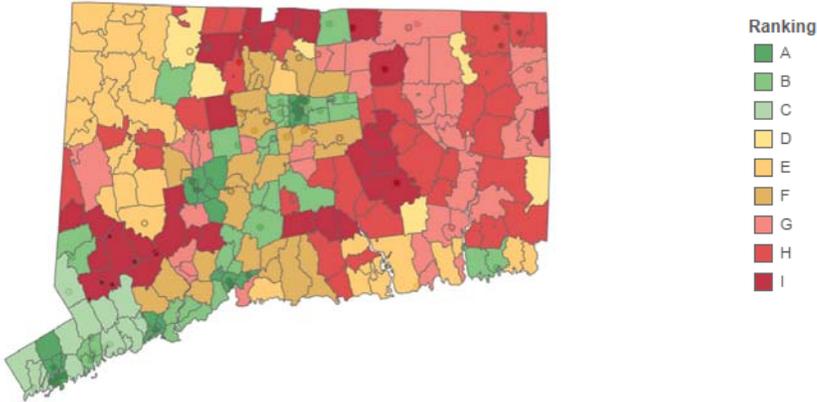
Data challenges

- Disparate sources
 - FCC, US Census Bureau, Connecticut Economic Resources Center (CERC), US Dept of Labor, VisitCT.org, broadbandnow.com, CT Dept. of Housing, CT Dept. of Public Health, others
- Data matching/integration issues
 - Census block, tract, zip code, town
- Missing data
 - FCC: Broadband providers: **1, 4, 5, 6, 7, 8, 9, 10, ...**
 - Price of broadband

Impact of broadband

- Five years after each 1 Mbps increase in internet speed (up to 60Mbps) results in the following average economic gains:
 - Unemployment rate drops by .08%
 - Bachelor degree rate increases by .42%
 - Median household income increases by \$570
 - Average home value increases by \$3,200
 - Assisted housing unit decreases by 200

Cluster economic benefit rankings



Town Rankings

Rank all 169 CT towns by their likelihood to attract new business activity

Data used: Cluster economic index, CERC's town level data, CERC's listings of office space and land available as of 4/10/15, economic stimulus zones as of 4/10/15, locally available business development assistance office, and town and regional area attractions as compiled by CT office of Tourism as of 4/6/15.

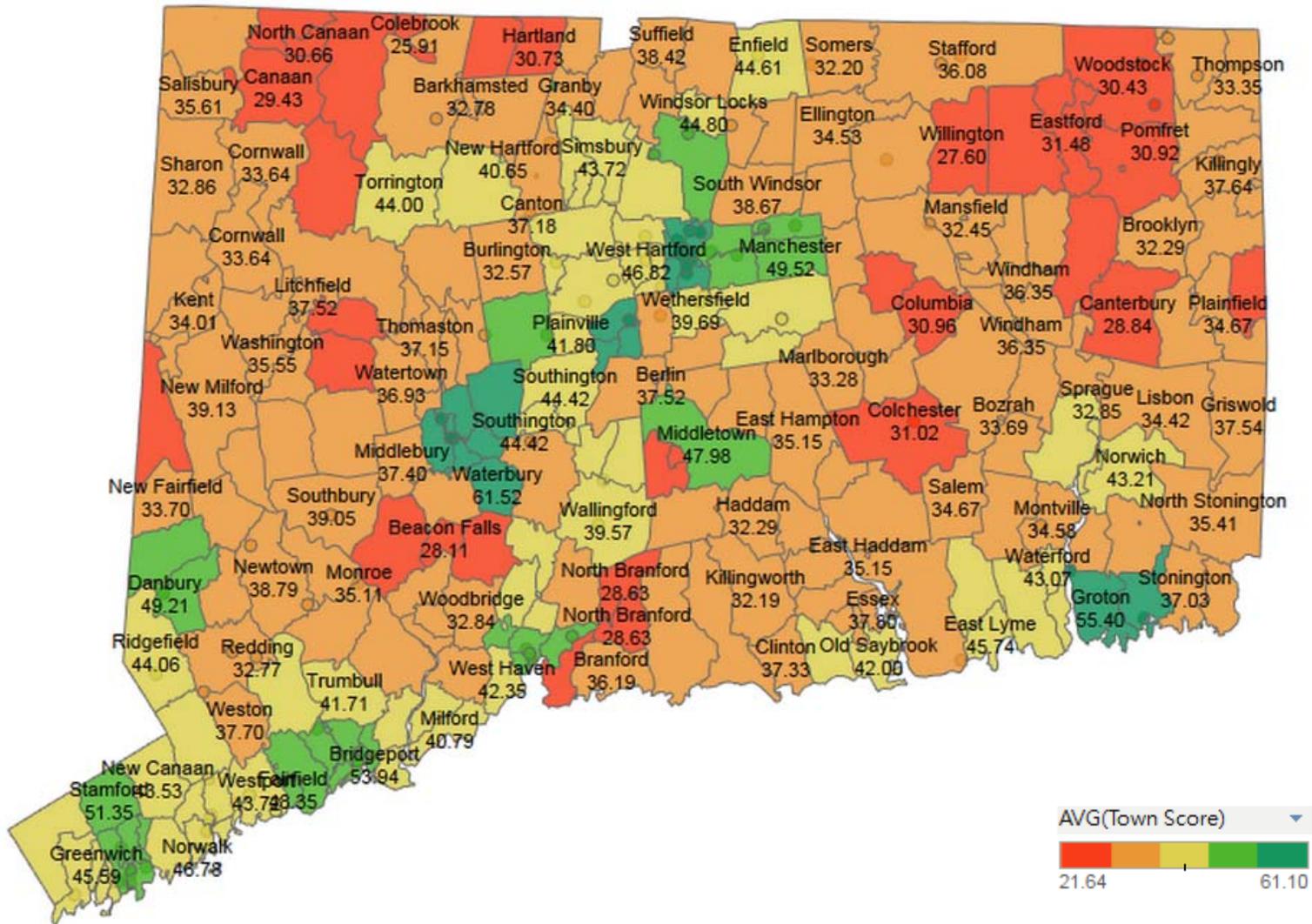
Analytic Methods employed: Stepwise regression, correlation analysis, and subjective weighting of the final set of factors/variables.

Results of Top 10

Business climate rank	Town	Town Ranking Score	Cluster Number	Cluster Economic Benefit Score
1	Hartford	62.99	8	1
2	Waterbury	61.52	8	1
3	New Britain	57.48	3	0.99
4	Groton	55.40	3	0.99
5	New Haven	54.39	8	1
6	Bridgeport	53.94	8	1
7	Stamford	51.35	8	1
8	East Hartford	51.08	3	0.99
9	Bristol	50.43	3	0.99
10	Manchester	49.52	3	0.99

Results for Town Rankings

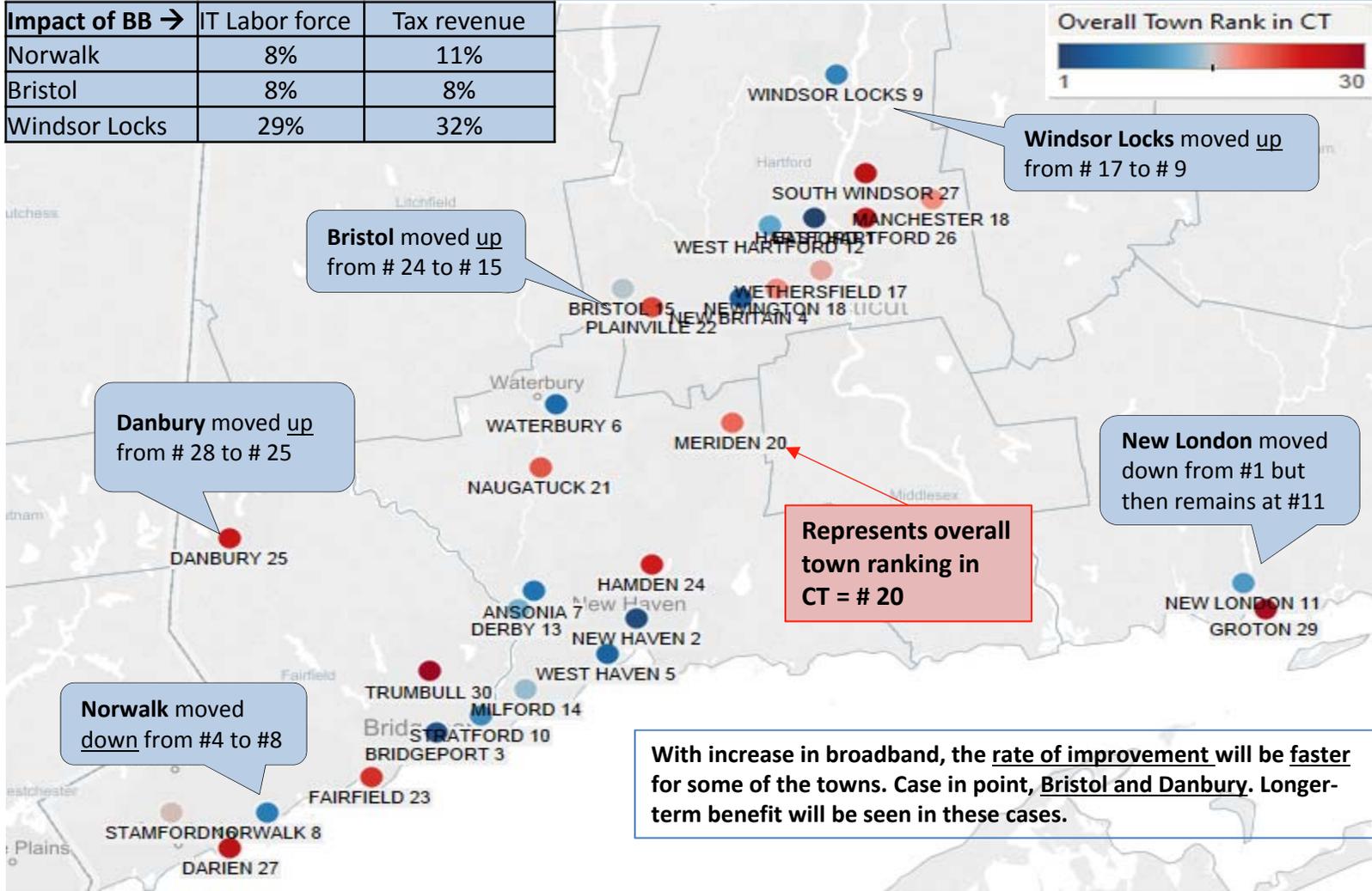
https://public.tableau.com/profile/chengping.huang#!/vizhome/CT_GIG/Comparision



Top 30 Towns – Case 50→100 Mbps

When increasing Broadband speed (Down/Up) from 50/10 to 100/25 Mbps

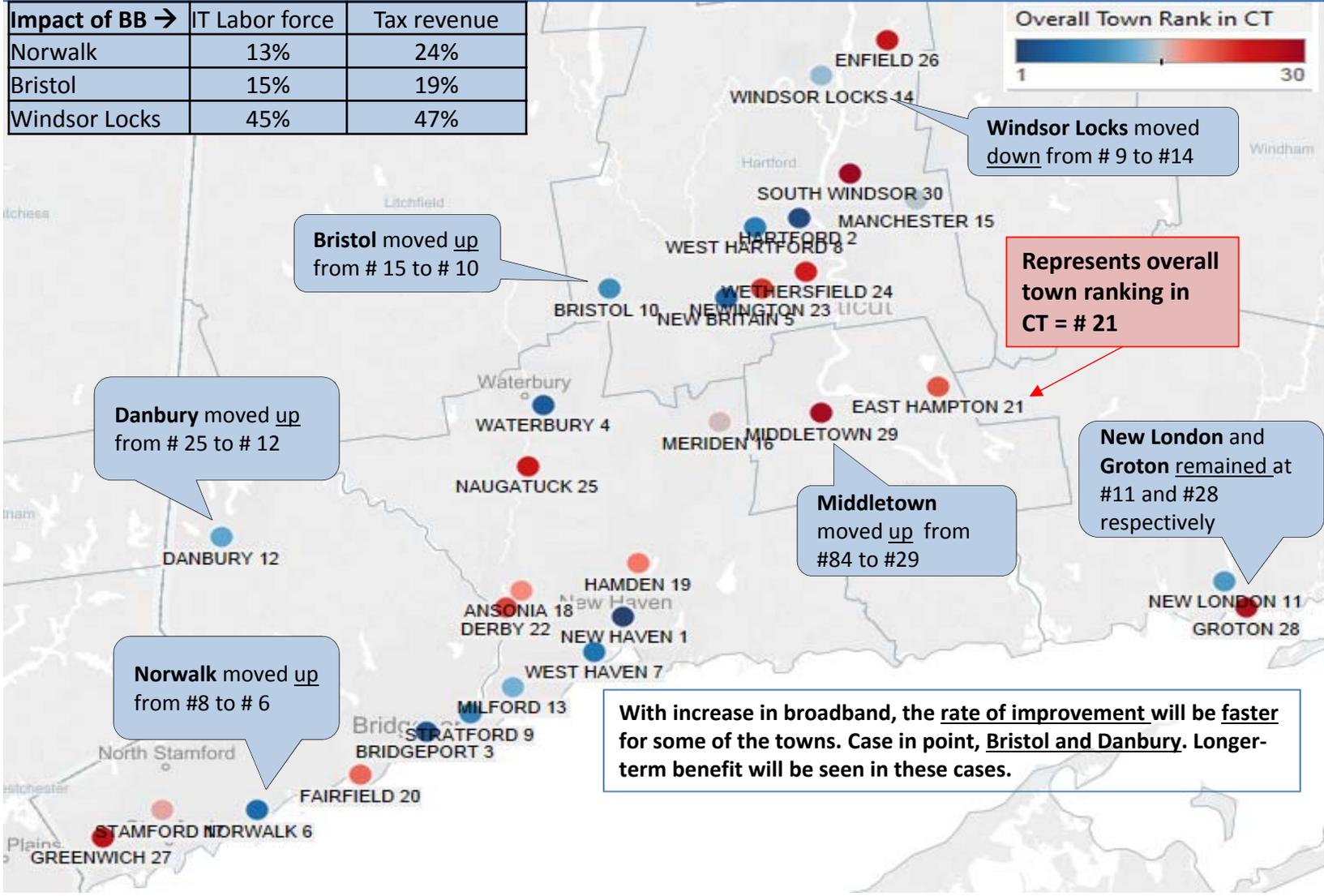
Impact of BB →	IT Labor force	Tax revenue
Norwalk	8%	11%
Bristol	8%	8%
Windsor Locks	29%	32%



Top 30 Towns – Case 100→200 Mbps

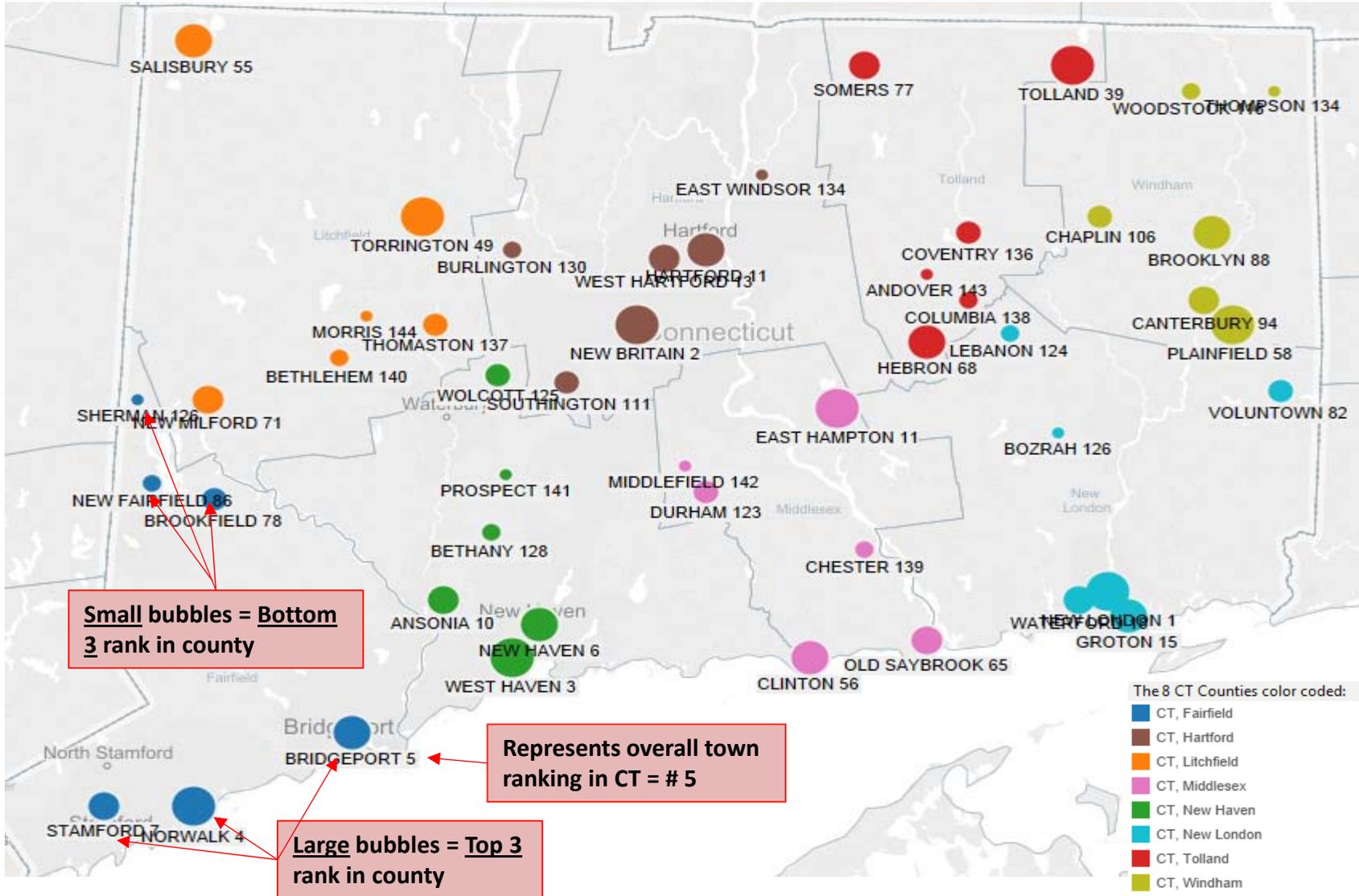
When increasing Broadband speed (Down/Up) from 100/25 to 200/50 Mbps

Impact of BB →	IT Labor force	Tax revenue
Norwalk	13%	24%
Bristol	15%	19%
Windsor Locks	45%	47%



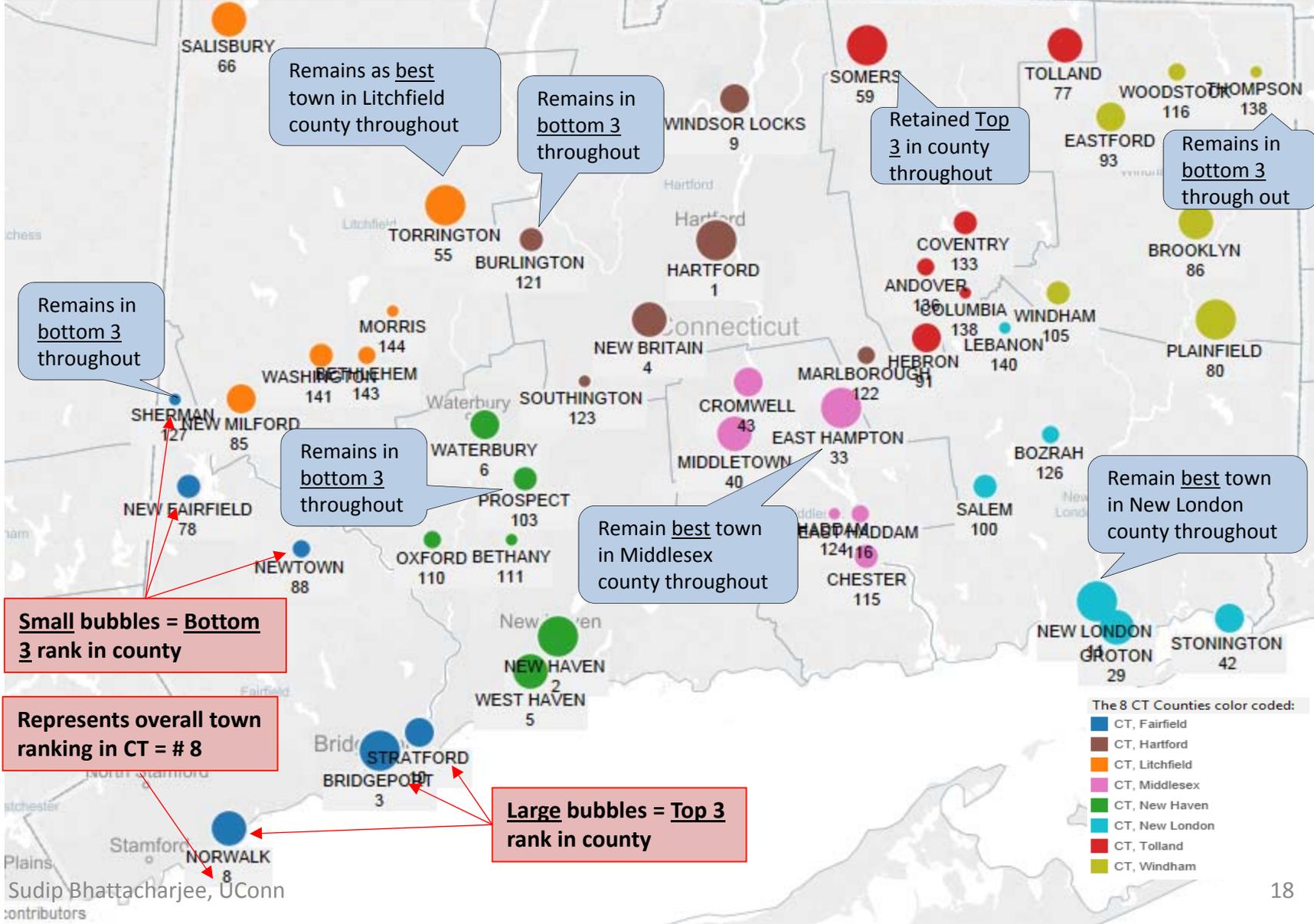
Top 3 / Bottom 3 Towns by County – Case 10→50 Mbps

When increasing Broadband speed (Down/Up) from 10/2 to 50/10 Mbps



Top 3 / Bottom 3 Towns by County – Case 50→100 Mbps

When increasing Broadband speed (Down/Up) from 50/10 to 100/25 Mbps



Top 3/Bottom 3 Towns by County – Case 100→200 Mbps

When increasing Broadband speed (Down/Up) from 100/25 to 200/50 Mbps

