



sorenson **impact** center

investing • policy • innovation



**David Eccles  
School of Business**

THE UNIVERSITY OF UTAH

**Budgeting for Outcomes: Accomplish Your Goals**  
**Utah League of Cities and Towns Fall Conference**  
*September 2016*

# SORENSEN IMPACT CENTER

## WHO WE ARE

The Sorenson Impact Center is an applied academic institution at the University of Utah's David Eccles School of Business dedicated to catalyzing high impact programs, policies and investments. The Center works across sectors to develop and implement innovative and data-driven strategies to address difficult social and public health challenges.

The Center's work is performed across four broad pillars:

- ▲ Advising stakeholders on implementing **evidence-based policies and programs** aimed at measurably improving the lives of at-risk individuals and families;
- ▲ Facilitating **impact investment** in the US and abroad from foundations and home offices;
- ▲ Deploying **venture capital** on catalytic impact investment opportunities in the US and abroad; and
- ▲ **Academic** research, publication, and teaching in the areas of social impact and entrepreneurship.

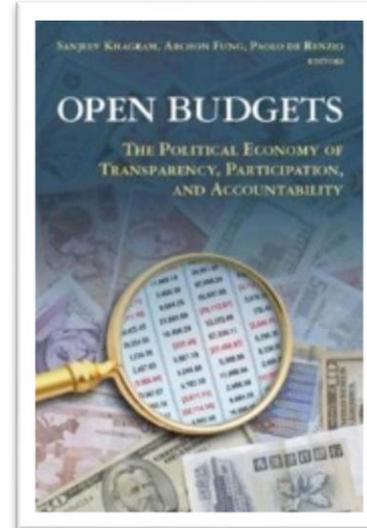
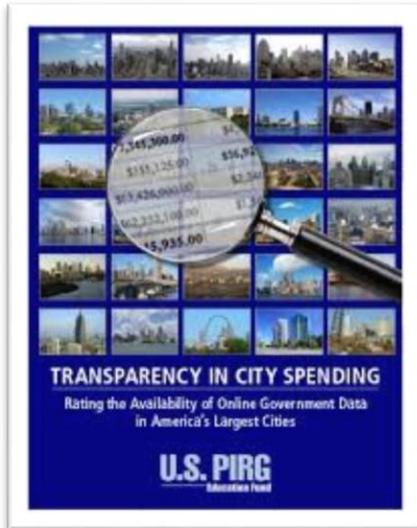


# WHY TRANSPARENT BUDGETING MATTERS

- Taxpayers trust you with their hard earned money. They deserve to know what you've accomplished with the money they provide.
- Transparency Tips:
  - Public Budget Meetings
  - De-Mystify the Numbers
  - Narrative Description of Budget
  - Numbers and Narrative Posted on Website
  - Quarterly Budget Updates on Council Agenda
  - Honest Discussions – Cut Rhetoric
  - **FOCUS ON OUTCOMES**



# TRANSPARENCY IS NOT A FAD



# DO IT – DON'T JUST SAY IT

- Become a **quality-focused** organization – **outcome oriented** and continuous improvement based top to bottom
- Be creative and test **new ideas**
- Do not be afraid to educate the public about the **cost of services**

## ASK YOURSELF:

- ✓ Do we have realistic short, medium and long term goals – or do we just try to get from one budget year to the next?
- ✓ Do we talk about who we are serving and how well we are doing?
- ✓ Are our dollars spent on the most effective programs? How do we know?



# GOVERNMENT HISTORY OF FOCUS ON DATA

## GOOD AT MEASURING OUTPUTS

### OUTPUT MEASURE

### INDICATOR TYPE

Number of people who received job training per year

Efficiency

Number of mothers who received pre-natal care/ quarter

Efficiency

Cycle time from referral to treatment in mental health

Service Quality

Cost per jail bed per day

Unit Cost

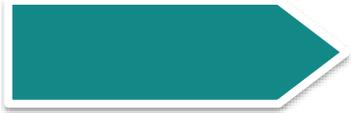
Average homeless families/individual/case worker

Service Quality



# SHIFT DATA TO FOCUS ON OUTCOMES

## ADVANTAGES



Budget policy discussions focus on what is accomplished rather than how much is spent



Creates a culture of continuous improvement throughout the organization



Forces government to think about systems, not just programs



Provides a higher level of public accountability



# FOCUS ON OUTCOME DATA

## OUTPUT MEASURE

## OUTCOME GOAL

Increase in number of months people are employed after receiving training

Decrease unemployment rate

Decrease in percentage of low birth-weight babies

Decrease infant mortality rate

Decrease rate of readmission to acute care within 30, 60 and 180 days

Improve the mental health of the community

Increase rate of diversion from jail for non serious offenders; decrease recidivism rate

Eliminate overcrowding in jail/need for more jail beds

Decrease rate of readmission to homeless facility within 30, 60 and 180 days

End chronic homelessness



# BUDGETING FOR OUTCOMES

- ▲ Budgeting for Outcomes is a type of performance-based budgeting
- ▲ Pay for Success provides an opportunity to actually budget for outcomes

## PERFORMANCE BUDGETING:

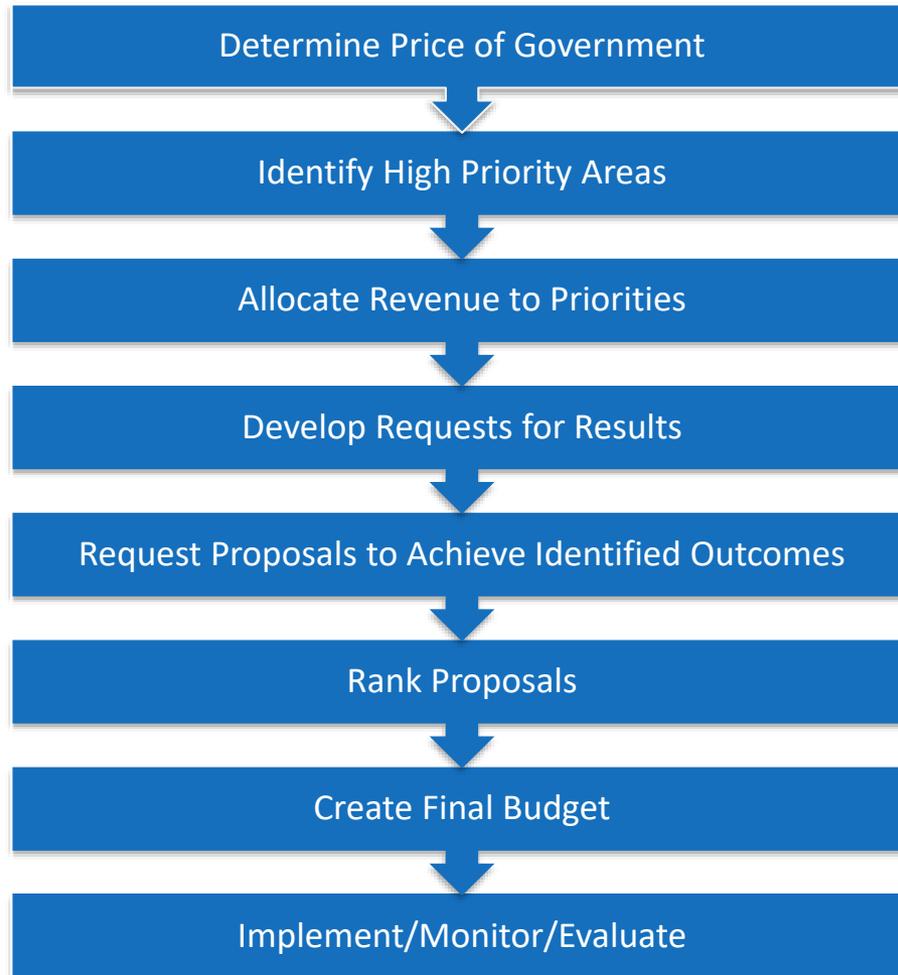
*“Similar to program budgeting, this budgeting approach also uses programs or activities as budget units, and presents information on program goals and performance. This budget system places emphasis on incorporating program performance information into the budget development and appropriations process, and **allocating resources to achieve measurable results.**”*

## OUTCOME MEASURE:

This is a measure of the result associated with a program or service. Outcome measures can be short- or long-term results that can be directly linked to a government program or service. Examples include the percentage of students reading at grade level, air quality, or the traffic fatality rate. **Outcome measures are often the most desirable measures but the most difficult to use and analyze, as major system outcomes are generally derived from a variety of services, products and activities, and isolating the root cause of change is often challenging.**



# 8 STEPS FOR OUTCOME BASED BUDGET



\*See process map for priority driven budget.

GFOA, 2012



# OUTCOME BASED BUDGET

**GOAL:** Shift thought from what we are spending to what we are buying

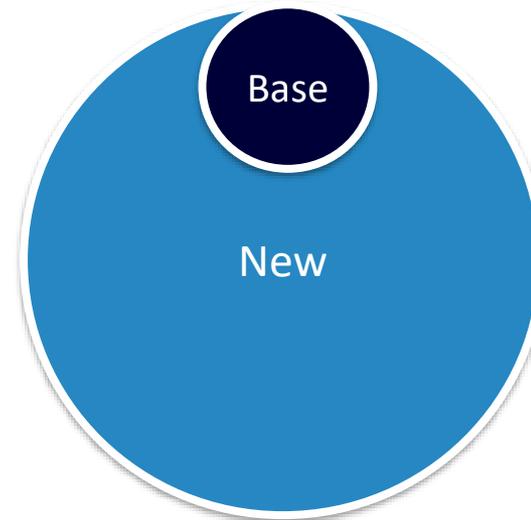
**PRESENTLY:** 95% of all spending decisions are based on what we did last year

*Focus tends to only be on the new money*

**FUNDING**



**FOCUS**



# OUTCOME BUDGETING LESSONS LEARNED

- ▲ High level engagement is required
- ▲ Budget office full buy-in is required
- ▲ Agencies must see real value
- ▲ Do NOT use this as a budget cutting tool or a staff reduction tool
- ▲ Agencies must build knowledge base and capacity for their data & results
- ▲ Build in protection that allows agencies to benefit from innovation
- ▲ Statutory framework *may* help ensure continuity
- ▲ Careful selection of measures is required to ensure they are meaningful
- ▲ Integration of performance data into communication pieces increases the opportunities for successful use of performance information
- ▲ Outcomes-based budgeting is a tool – not a cure all
- ▲ System must remain flexible



# GOV'T HISTORY OF PERFORMANCE-BASED BUDGETING

- **1870's:** Performance budgeting introduced in reaction to local government abuses
- **1950:** Budget Accounting and Procedures Act; agency leads to provide budget performance data
- **1950's:** President's Bureau of Budget; performance measures used for efficiency and effectiveness
- **1960-2000:** More than fifty countries follow the US lead in performance based budgeting
- **1960's:** Planning, Programming, Budget System (PPBS)
- **1970's:** Management by Objectives (MBO) and Zero-Based Budgeting (ZBB)
- **1980's:** Top Down and Fixed Ceiling Budgeting
- **1990's:** Performance data goes public; prior to that it was internal data
- **1990's:** State and Local governments start to experiment with Performance Budgeting and Total Quality Management
- **1993:** Government Performance and Results Act (GPRA); agencies to use performance managing tasks – including goal setting, measuring results, and reporting progress
- **1994:** Government Management and Results Act (GMRA); extends provisions across federal gov't
- **1994:** OMB Circular A-11 Revision; program funding justified by performance metrics and goals
- **1996-2000:** Federal agencies mandated to use outcomes-based performance metrics in budgeting
- **2002:** Performance Assessment Rating Tool (PART); OMB develops and integrates performance measurement but not performance budgeting per se
- **2010:** OMB issued 128 High Priority Performance Goals (HPPG)
- **2012:** New York City Social Impact Bond issued (first Pay for Success transaction)



# PAY FOR SUCCESS AS A BREAKTHROUGH

- **Running government like a business:** PFS demands increased rigor around outcome measures – investors must have confidence since the measures will trigger repayment
- **Thinking beyond budget silos:** PFS requires a systems view and a system-wide focus on accountability (remember accountability vs. profitability)
- **Budgeting beyond one year:** PFS requires looking beyond the current budget year – usually 5-7 year view
- ***Linking program revenue to outcome!!!***



# CENTER-DEVELOPED TOOLS

- Cost/Benefit Analysis Tool: **THINK**
- 5-year budget model planning tool: **PLAN**
- Activity- based Cost Accounting tool: **DO**

## Five Year Financial Projection Model

Produced For: Government of the United States Virgin Islands

Inputs Last Updated:



<u>Section Name</u>	<u>Tab Name</u>	<u>Tab Color</u>	<u>Description</u>
I. Instructions			
	Instructions		This tab provides general instructions for using and updating the model.
I. Inputs			
	Inputs		This tab captures the inputs necessary to generate revenue and expense projections. Data entered on this tab will flow through the remainder of the model.
II. Reports			
	Summary Dashboard		Displays high-level summary outputs based on user inputs.
	Revenue and Expenses		A detailed display of annual revenue and expense projections, per year.
	Monthly Cash Flow		Monthly detail of actual and forecasted cash flows through the end of fiscal year 2017.
	Fund Balance		Calculated annual fund balance based on revenue and expense projections.



# RECENT GOVERNMENT ENGAGEMENTS

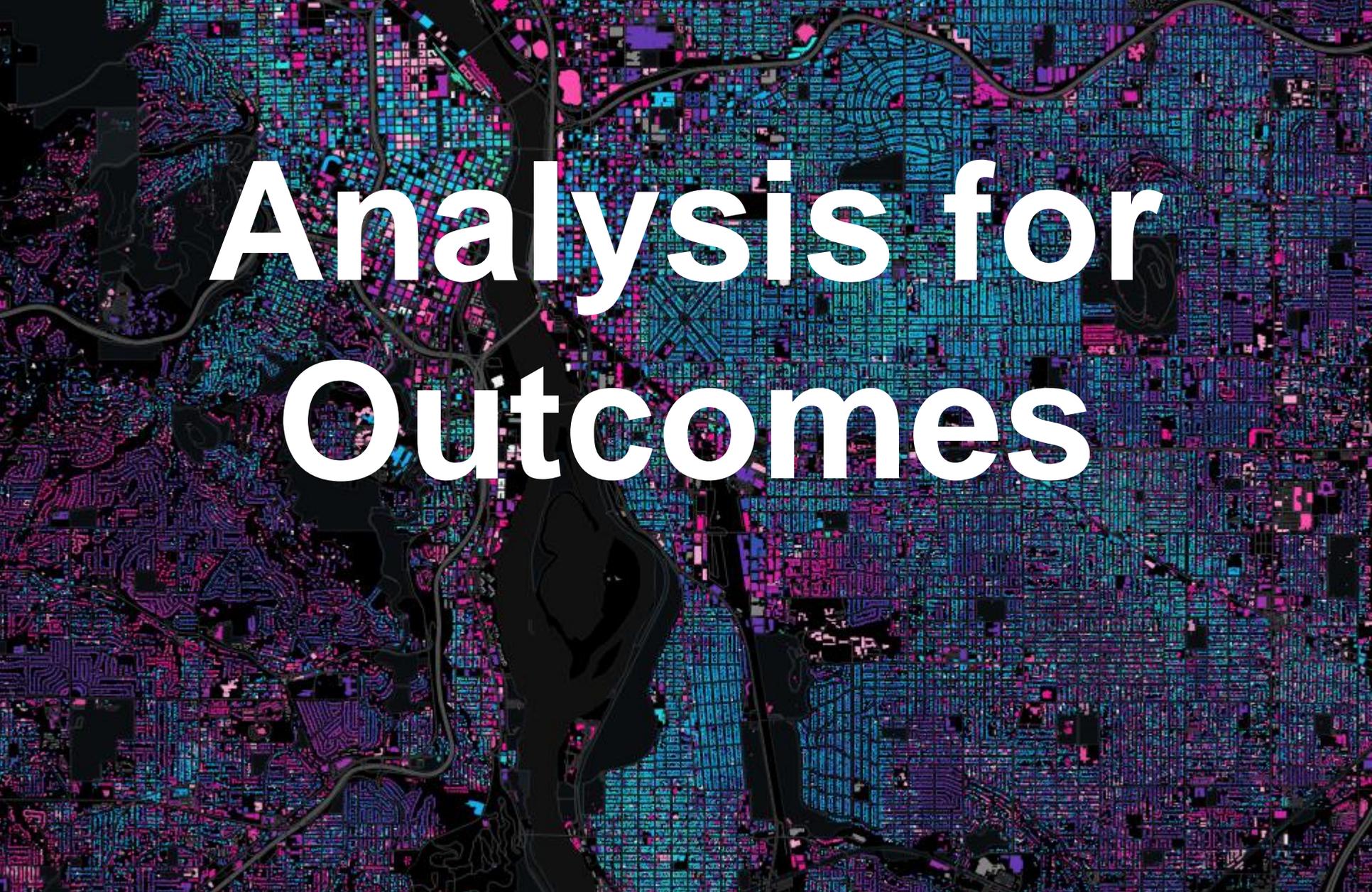
- ▲ Salt Lake Valley Law Enforcement Service Area
- ▲ United States Virgin Islands Budget Office
- ▲ United States Virgin Islands Finance Office
- ▲ Pima County, Arizona
- ▲ Salt Lake County, Utah
- ▲ Boise, Idaho
- ▲ Missoula County, Montana
- ▲ Las Vegas, Nevada
- ▲ State of Colorado
- ▲ State of Utah



# CASE STUDY – SOMMERVILLE, MA

▲ Daniel Hadley, Data Scientist





# Analysis for Outcomes

September 2016  
[danielphadley.com](http://danielphadley.com)

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# What I thought of government



What I discovered ...

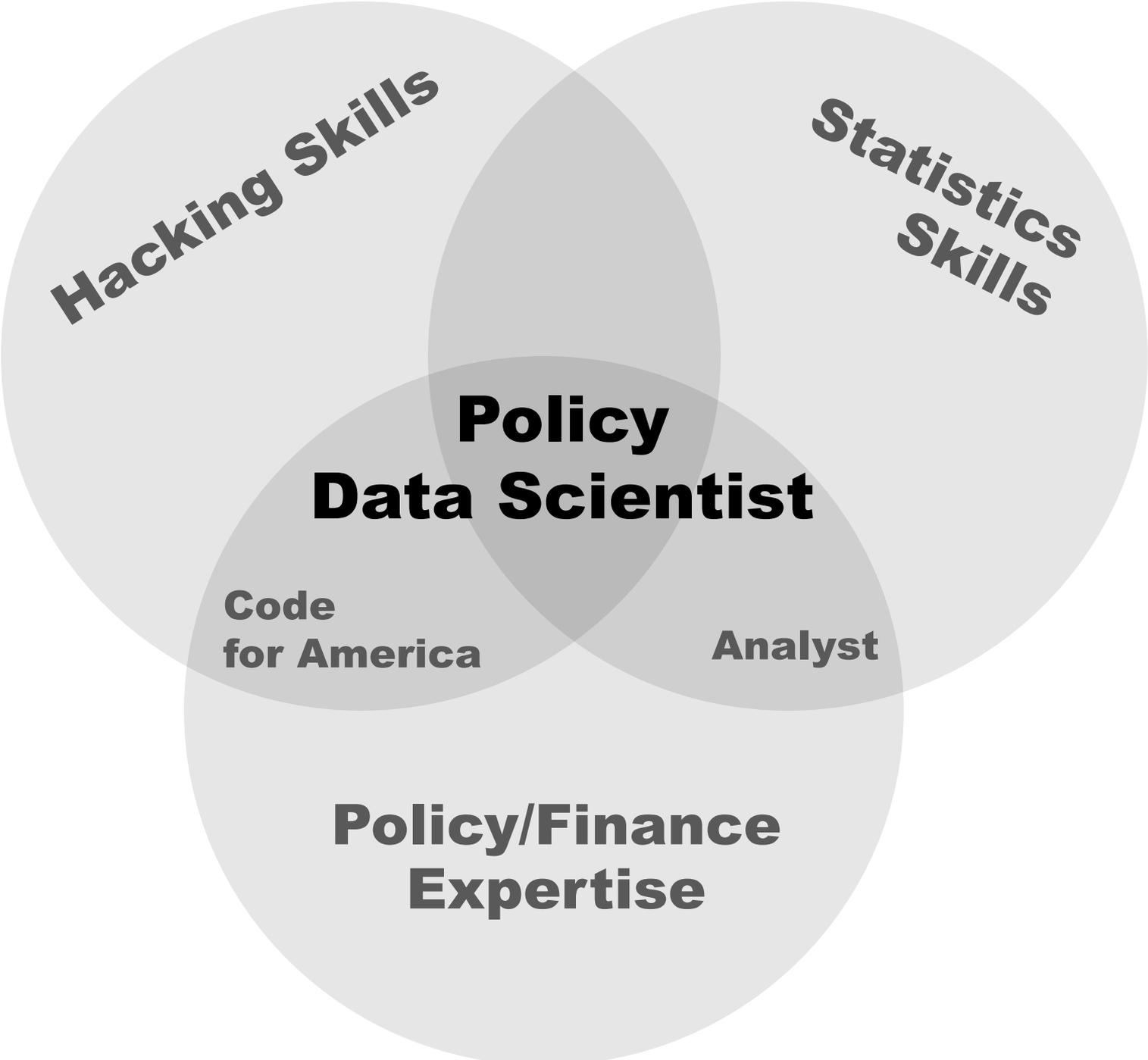
“Government is More Data-Driven Than Most Companies”

–DJ Patil

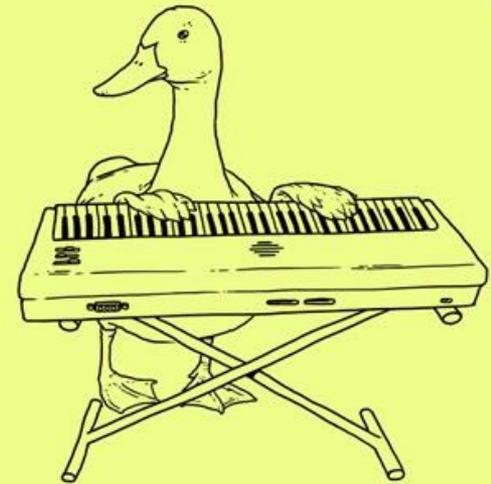


# SomerStat

- Accurate, timely intelligence
- Rapid deployment
- Effective tactics
- Relentless follow-up and assessment



# The Policy Data Scientist



# + Press

## What the Mayor of Somerville Can Do With His Smartphone

– Next City

## A Medium-Size City's Approach to Data

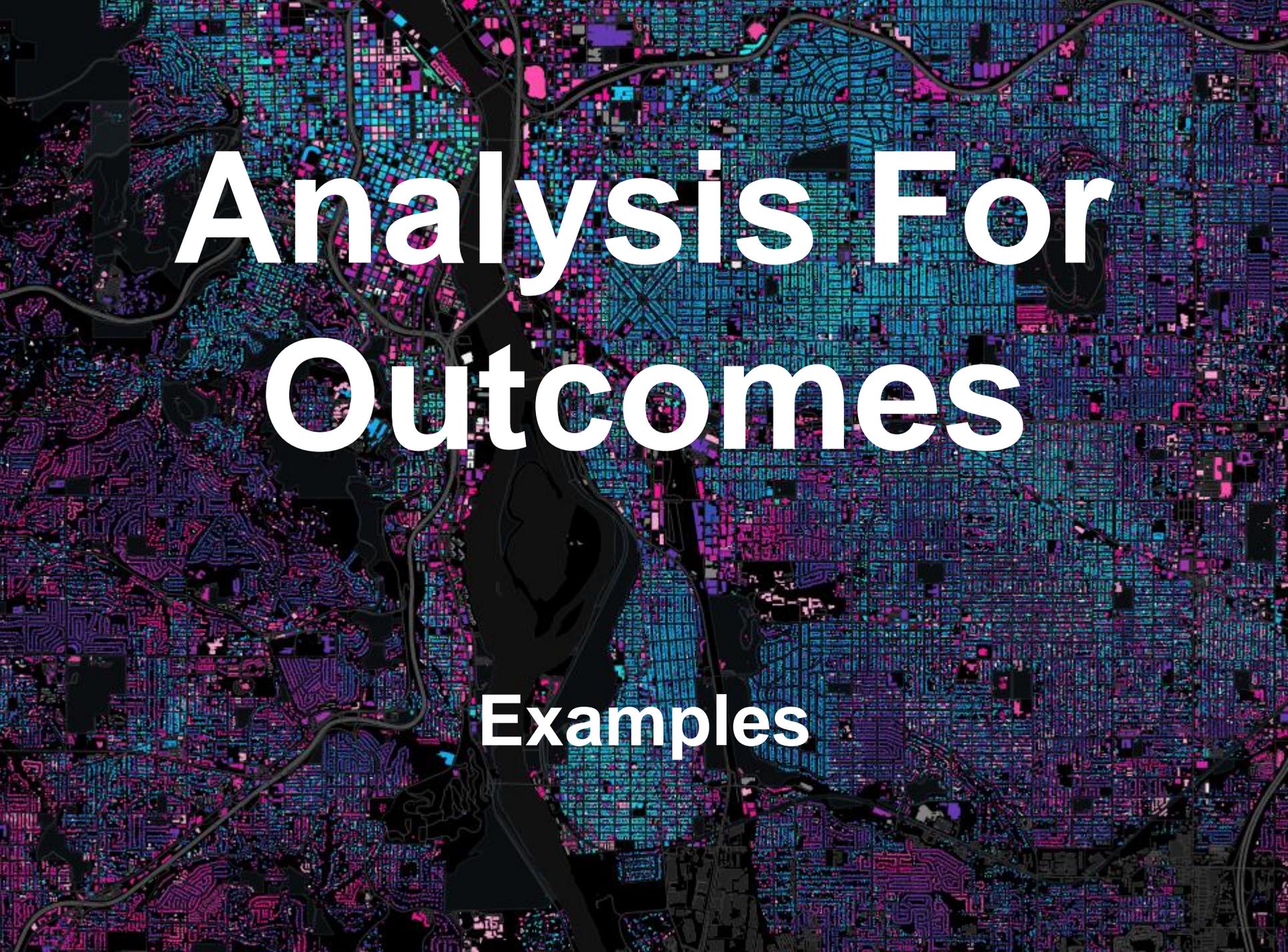
- Route Fifty

# + Press

**This City Used Big Data to Beat a Big Rat Problem** – Next City

**How Happy Are You? A Census Wants to Know**

– New York Times

An aerial photograph of a city grid, overlaid with a complex, colorful pattern of blue, purple, and pink. The pattern appears to be a data visualization or a stylized map overlay. The text is centered over the image.

# Analysis For Outcomes

Examples

# Example: Somerville BnE

## Data using machine learning

Predicted vs. Actual Locations of Real BnEs

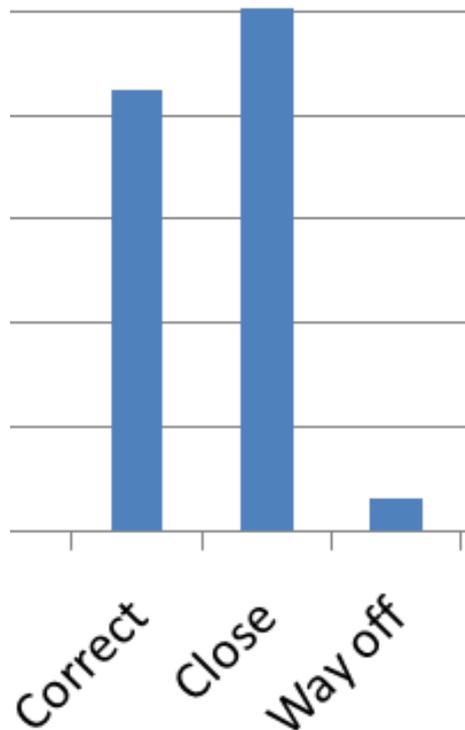
	w1	w2	w3	w4	w5	w6	w7
w1	156	0	0	6	0	0	0
w2	43	128	9	13	0	1	0
w3	17	68	8	7	2	0	0
w4	105	40	7	7	1	0	0
w5	0	71	8	0	0	0	0
w6	1	35	1	2	0	62	10
w7	0	3	0	0	0	53	12
Sum	322	345	33	35	3	116	22
Correct	48%	37%	24%	20%	0%	53%	55%



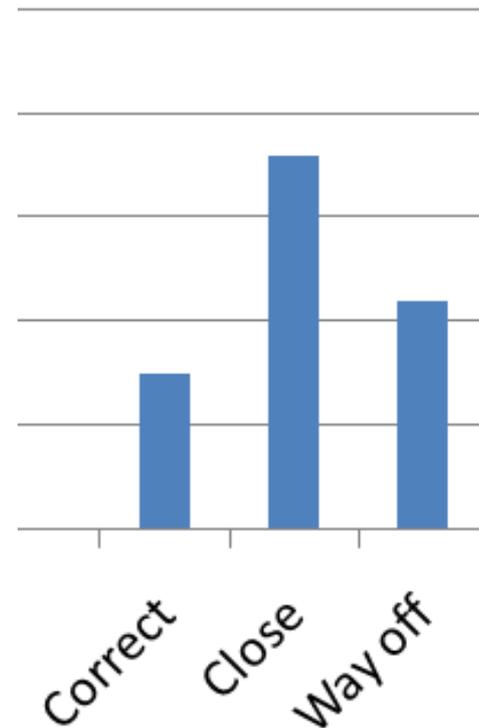
# Results

- In preliminary tests, randomForest did almost **3x** better than a traditional data-based estimation

## randomForest



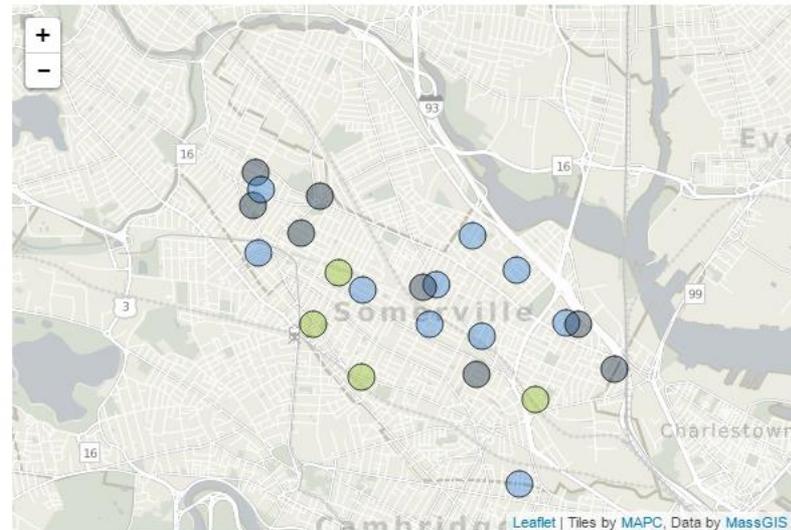
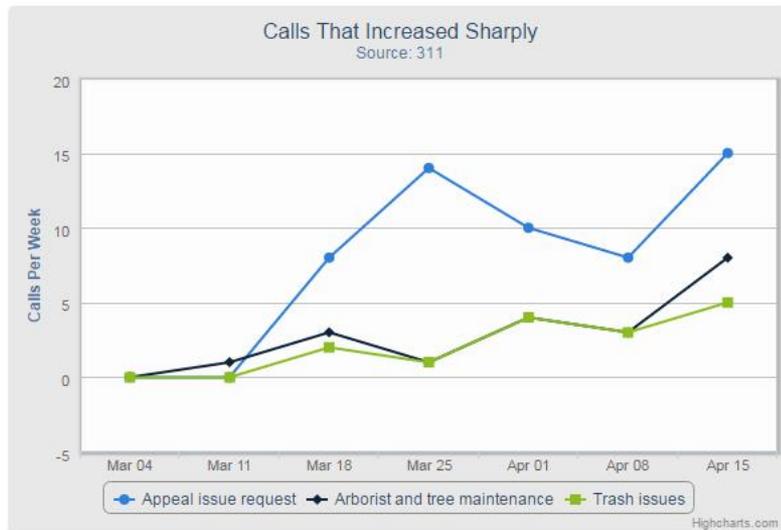
## Hot-spot



# E.g., Daily Dashboard

## Significant Calls

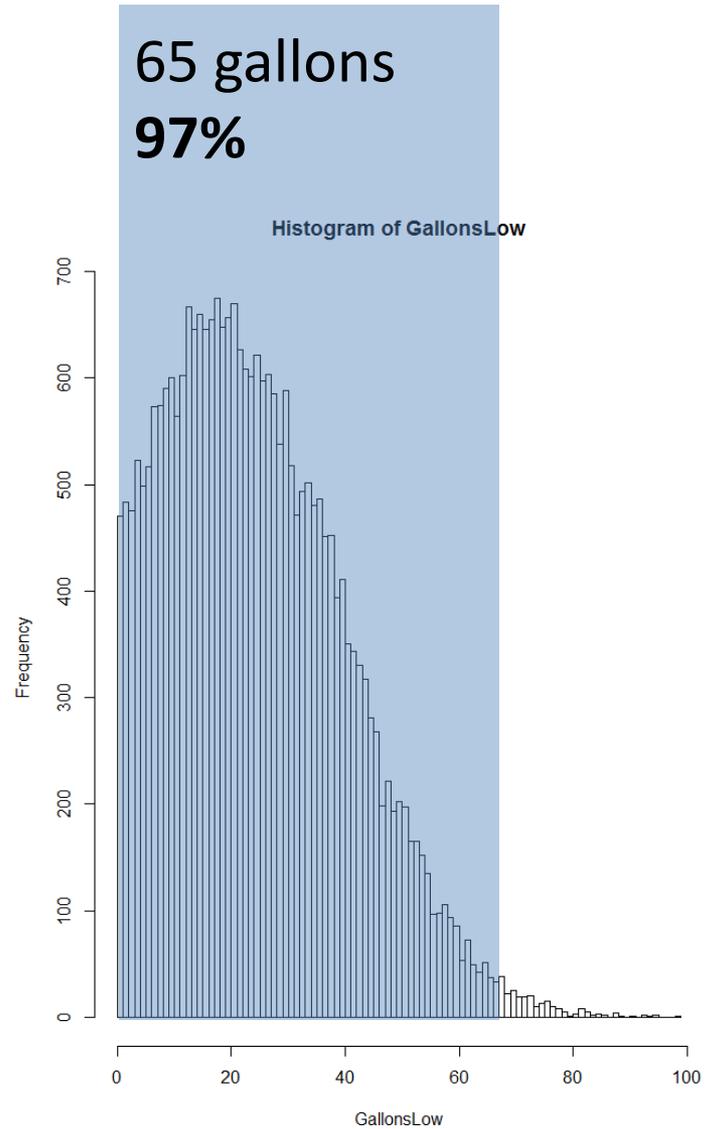
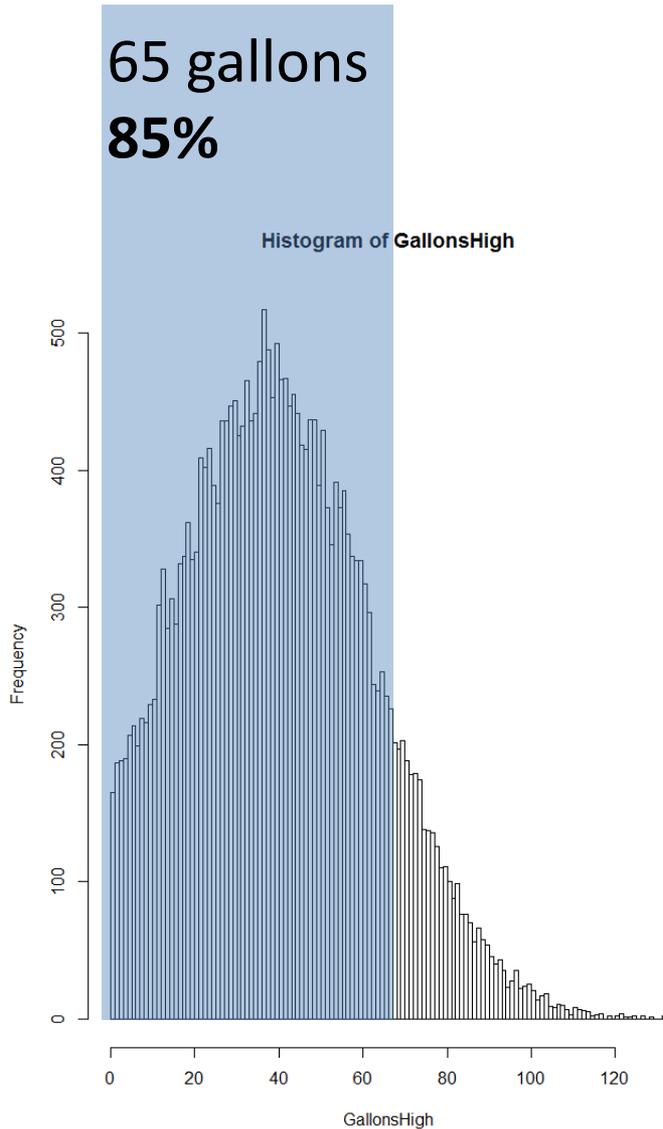
The chart above usually contains many of the same call types, which is why we track calls that increase more than average. During the last seven days, there was an increase in calls for **Appeal issue request**, **Arborist and tree maintenance**, and **Trash issues**. This chart shows calls of those types for the last 120 days, while the map shows their location for the last week. Often, spatial clusters indicate that DPW is calling in the work orders and closing them pro-actively.



Drilling down, we can see the proportion of **closed** work orders to **open** ones for these specific calls. This accounts for all work orders from the time we switched to the new 311 system in July '15 to yesterday (which means that some may have already been closed). We also see the amount of time these calls usually stay open by calculating the median hours open.

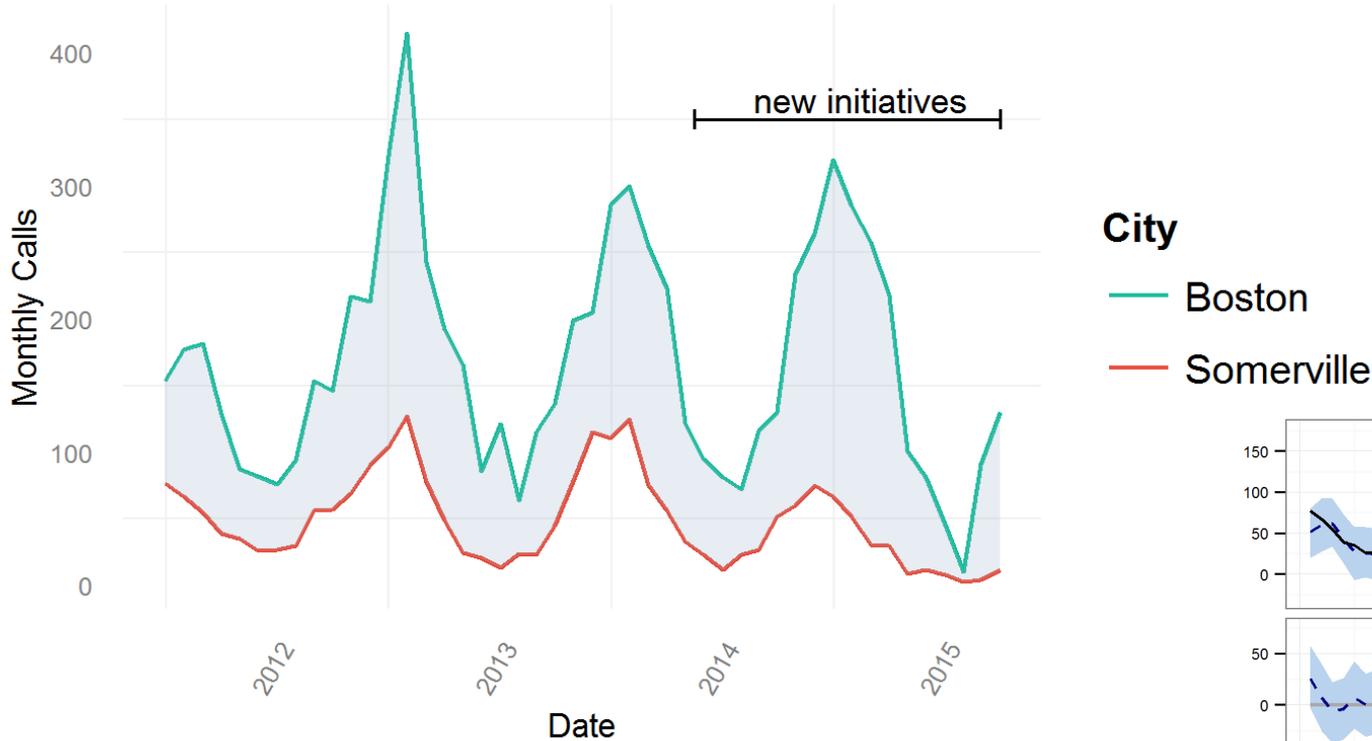


# E.g., Solid Waste Disposal

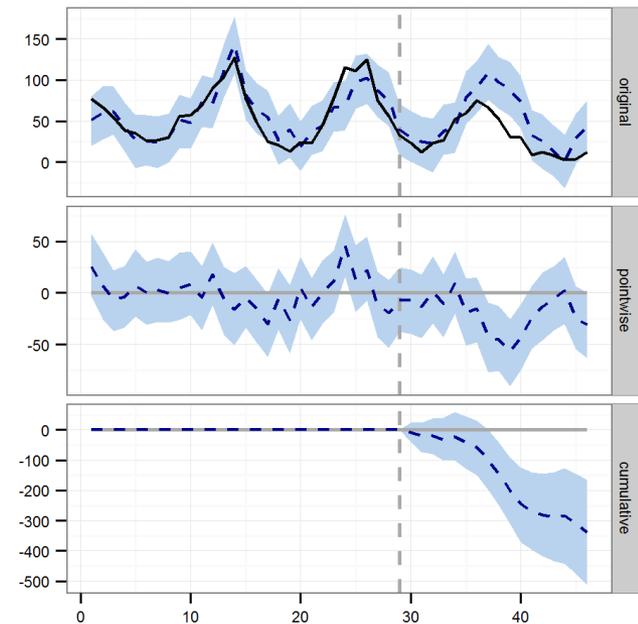


# E.g., Fighting Rats

## Calls to 311 About Rats

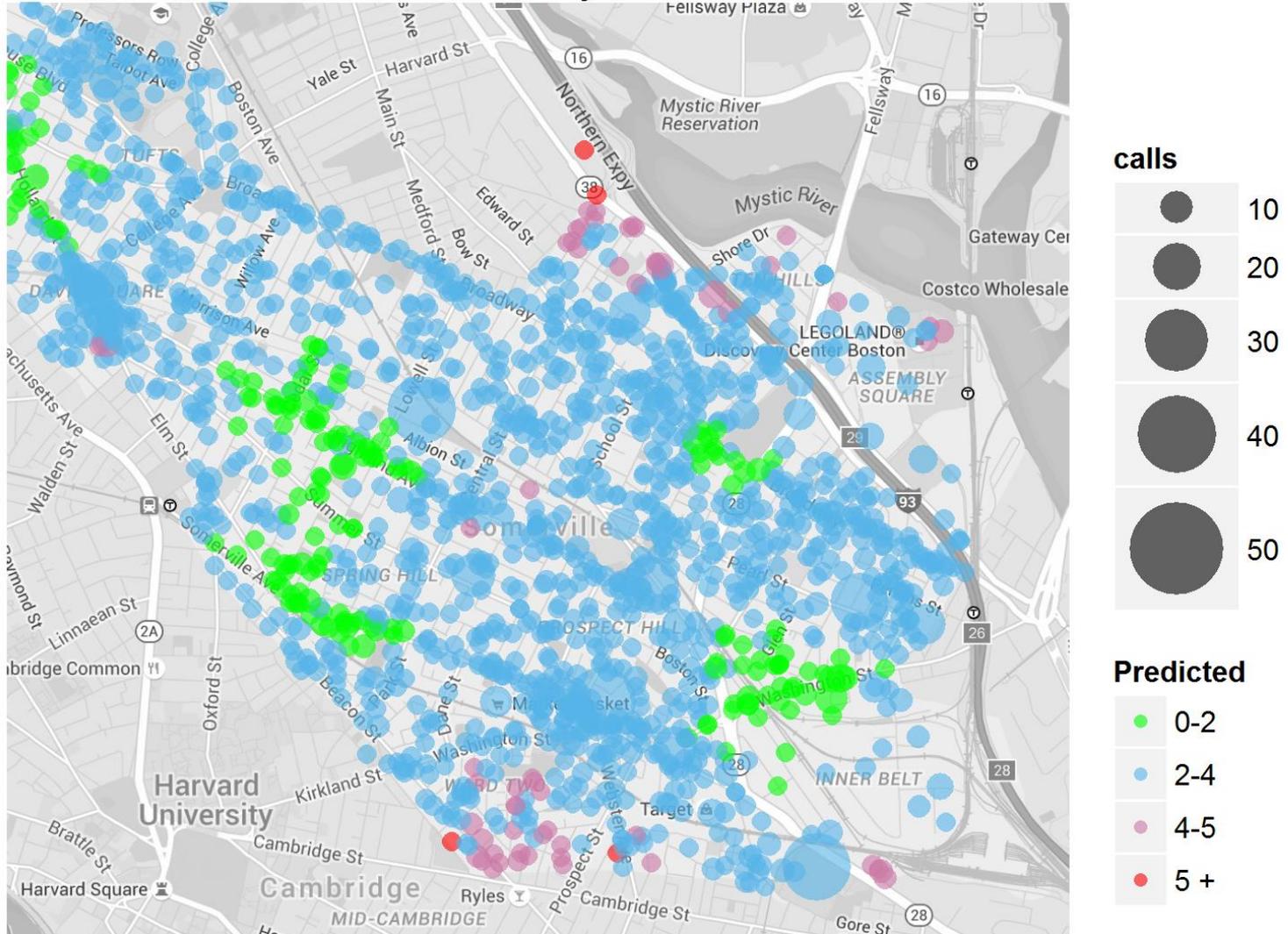


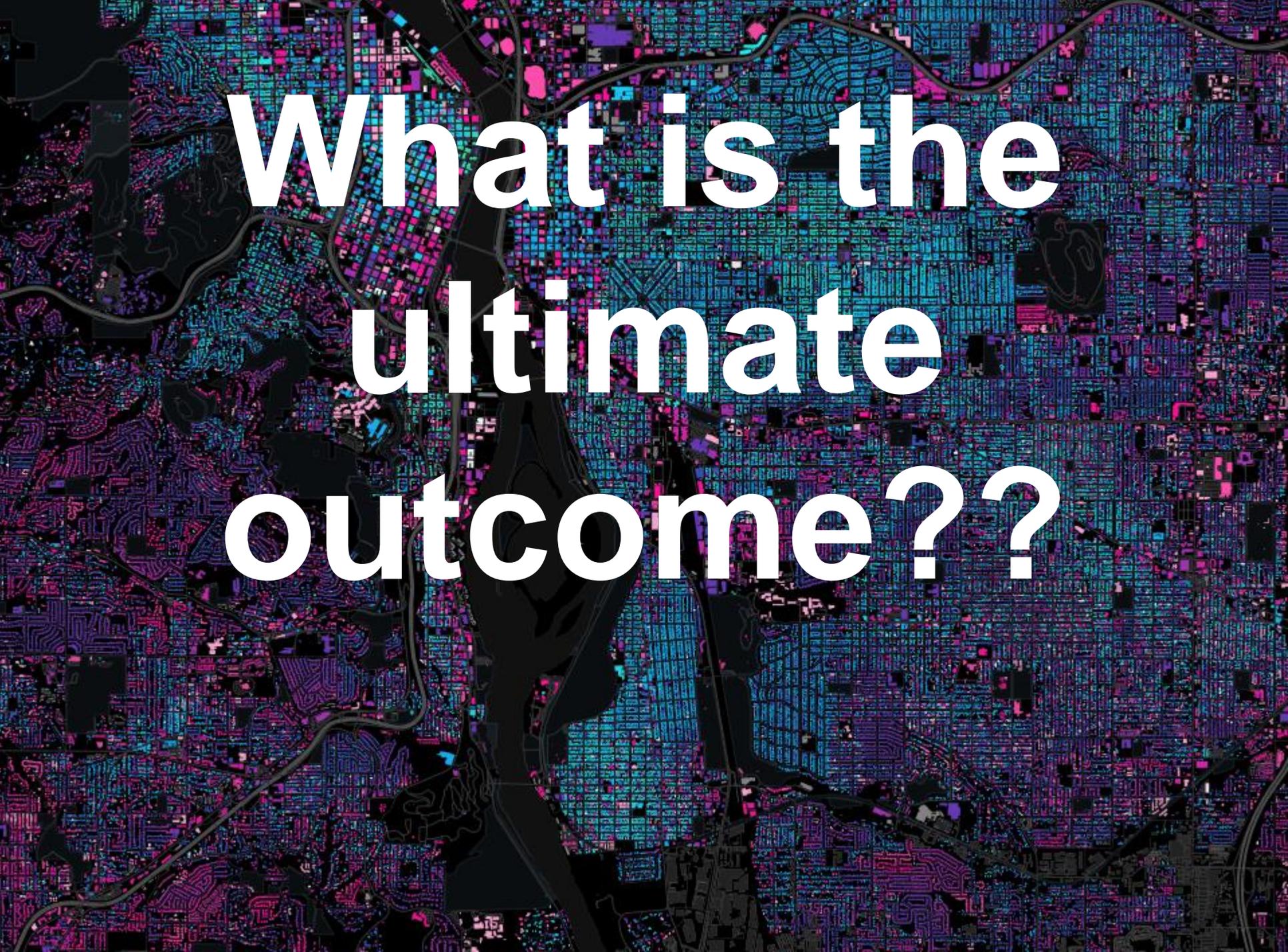
During the post-intervention period, the response variable had an average value of approx. 41. By contrast, in the absence of an intervention, we would have expected an average response of 63. The 95% interval of this counterfactual prediction is [52, 74]. Subtracting this prediction from the observed response yields an estimate of the causal effect the intervention had on the response variable. This effect is -22 with a 95% interval of [-33, -11].



# E.g., Fighting Fires

Predicted Time from Joy/Wash and Lowell



An aerial photograph of a city at night, showing a dense grid of streets and buildings illuminated with vibrant colors like blue, purple, and pink. The lights create a complex, textured pattern across the urban landscape.

**What is the  
ultimate  
outcome??**

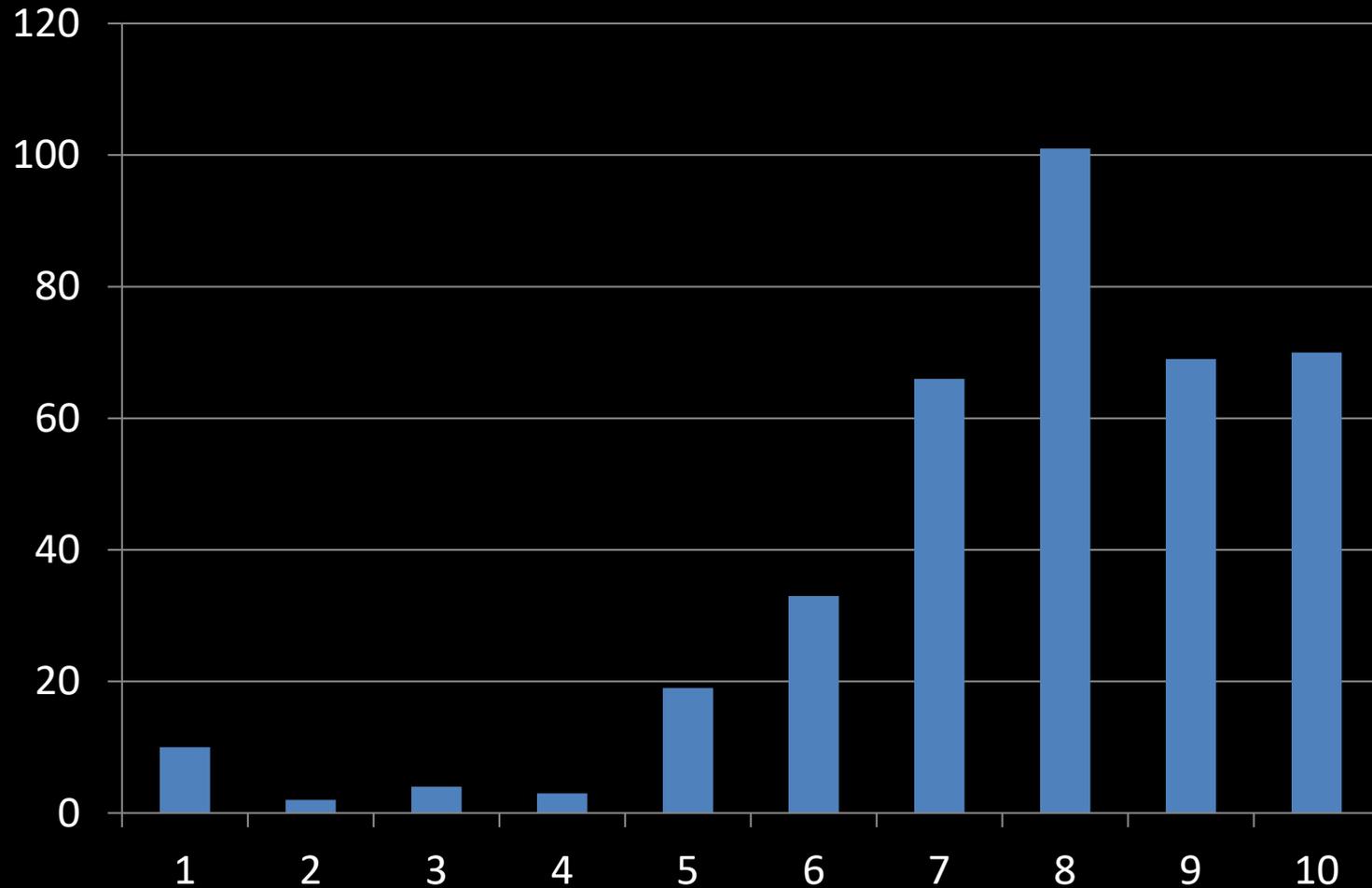
“Social policies are always meant to promote things that promote happiness, so how could it be a bad idea to measure directly the very thing you are trying to maximize?”

Daniel Gilbert



# Happiness

2013 & 2015



Mean = 7.5, Standard Deviation = 1.93



An aerial photograph of a city, likely New Orleans, showing a dense grid of buildings and a prominent river (the Mississippi River) winding through the center. The buildings are rendered in various colors, including shades of blue, purple, and pink, which might represent different data points or categories. The river is dark and occupies a significant portion of the lower half of the image. The overall scene is a complex urban landscape.

**Questions ?**

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