

# Jackson Analytics Training



GovEx

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# Agenda

## 1. Introduction

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# Agenda

1. Introduction
2. Comparing Cities

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# Agenda

1. Introduction
2. Comparing Cities
3. Data Skills

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# Agenda

1. Introduction
2. Comparing Cities
3. Data Skills
4. Communicating Results

# Introduction

Thanks to

The City of Jackson

What Works Cities

Bloomberg Philanthropies



# Introduction

## Performance Analytics

- JackStats



# Introduction

## Performance Analytics

- JackStats

## Open Data

- Data portal



# Introduction

## Performance Analytics

- JackStats

## Open Data

- Data portal

## Analytics Kickstart

- “Compared to Jackson”



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# The Challenge

- Jackson, MS faces significant fiscal and budgetary constraints, so building an evidence base for finding operational efficiencies is a key service delivery challenge.
- Can GovEx collaborate with Jackson to build an intelligence layer and interactive analytics tool?
- Can that tool and underlying data help the city evaluate the size and relative proportion of its budget and workforce compared to peer cities?
- Can the tool be used to identify opportunities to align Jackson's service delivery with budget expenditures common in other comparable places?

# Compared to Jackson

- ✓ Fully Interactive Web-Based Tool
- ✓ Access to normalized underlying data
- ✓ Completely documented methodology
- ✓ Collaborative training on utilization and next steps

Compared to Jackson

Introduction Methodology Spending per Capita Full Time Employees Department Spending Program Spending Public Works Spending Link >



**What Works Cities** | Bloomberg Philanthropies

**JOHNS HOPKINS UNIVERSITY** | **GovEx**

The City of Jackson is leveraging data and evidence to improve decision making as we confront significant fiscal, budgetary and service delivery challenges. To identify opportunities for greater efficiency, the city partnered with Johns Hopkins University's Center for Government Excellence to build this interactive tool comparing peer cities to Jackson.

Compared to Jackson helps city residents, employees and leaders make collaborative resource decisions based on intelligence gathered from a network of comparable U.S. cities. The evidence base behind those decisions is presented in a manner that increases public engagement, understanding and support.

The cities featured in this comparison tool were selected by using a model that groups similar cities based on demographic, economic, geographic data from the U.S. Census.

The visualizations show budget, population, and full time employee totals from 2015. The budget and full time employee figures were compiled from each city's online resources. The population figures are based on 2015 U.S. Census estimates.

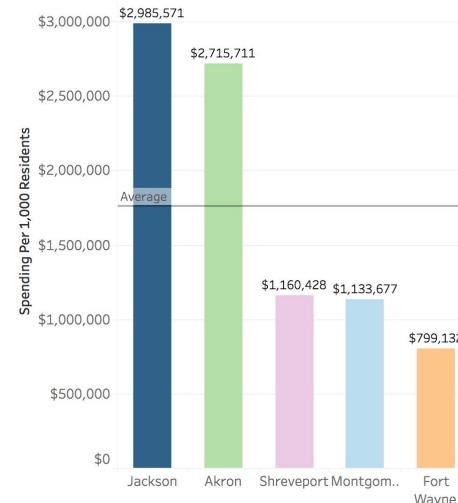
The data and documentation for this entire project can be accessed at <https://github.com/govex/Jackson>

# Compared to Jackson

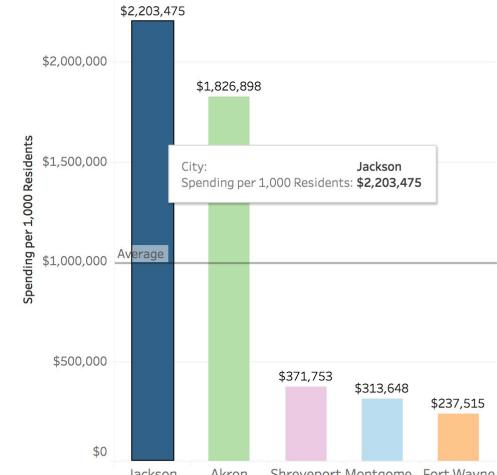
- Insights

- Jackson spends **more** than its peers
- Higher spending is driven by operations more than personnel

Total Spending per 1,000 Residents

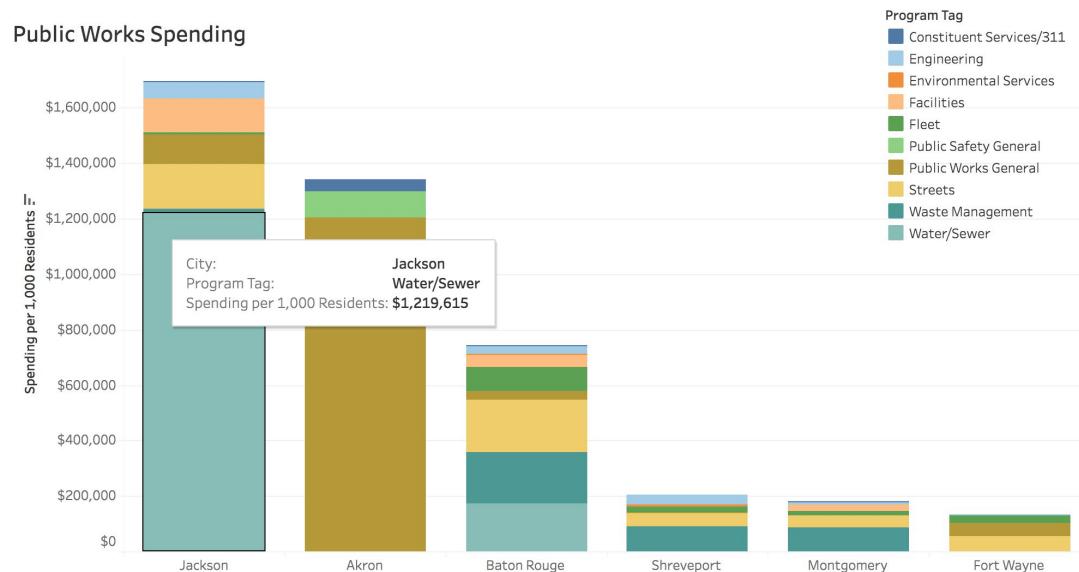


Operations Spending per 1,000 Residents



# Compared to Jackson

- Insights about Operations
  - Public Works spending is the **highest** among all cities



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# Quick Demo

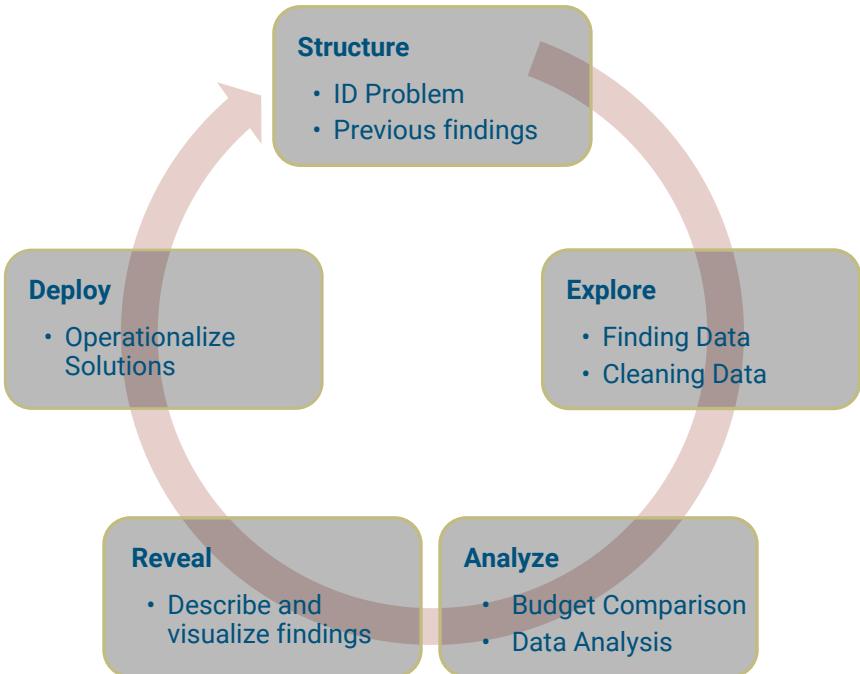
Compared to Jackson

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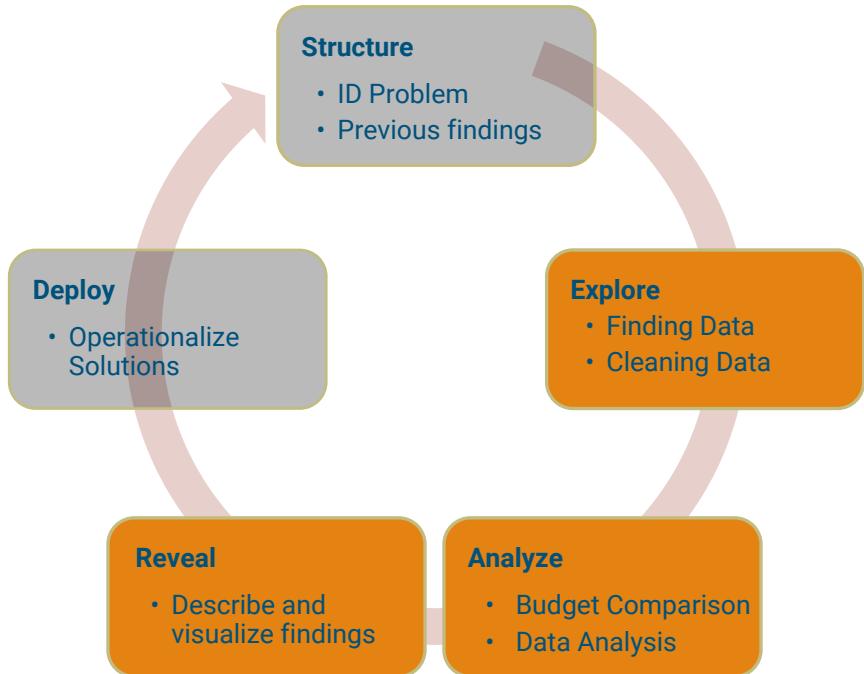
# Before We Dive In

Questions about the key findings?

# Analytics Kickstart

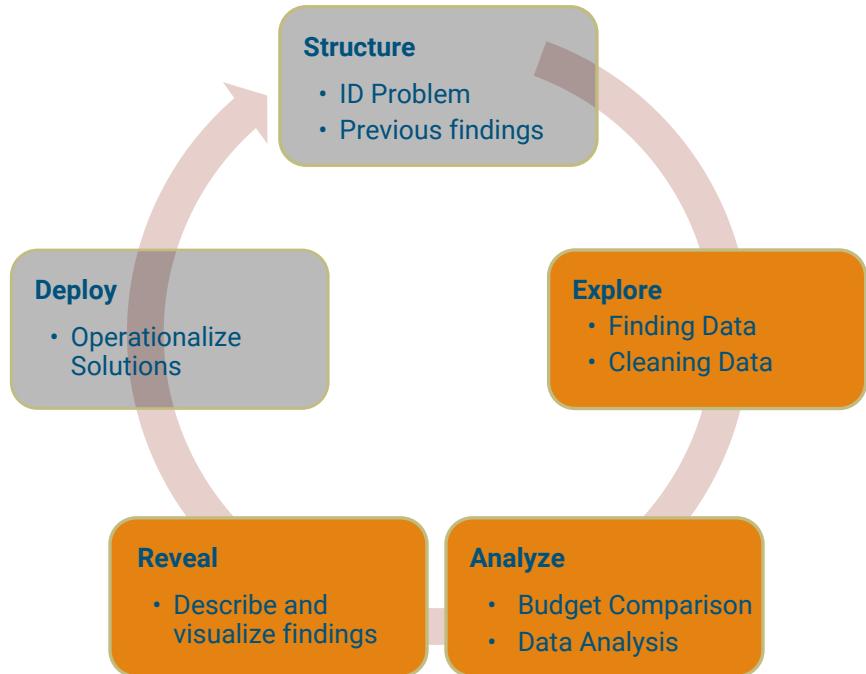


# Analytics Kickstart



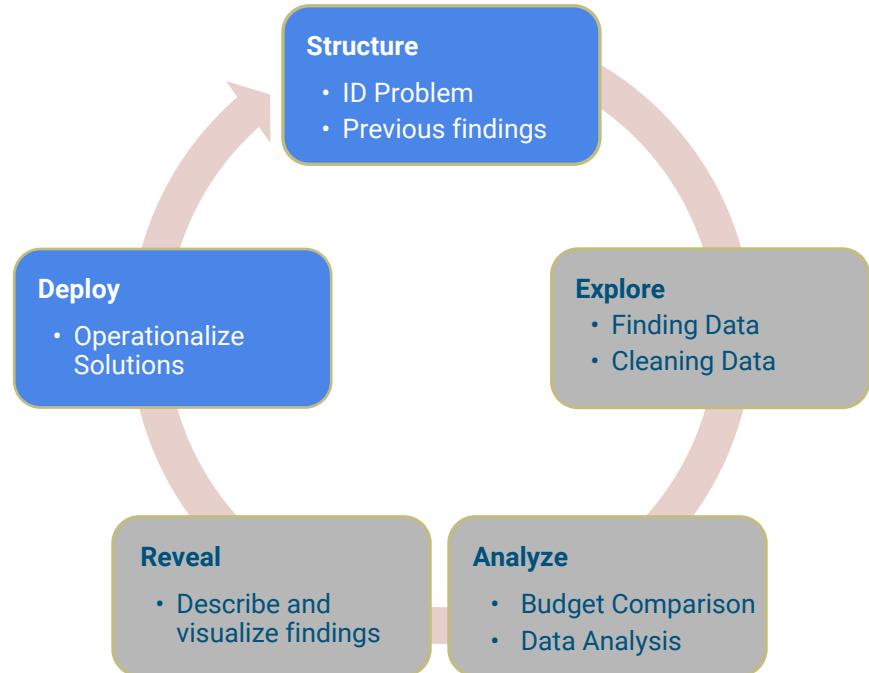
# Analytics Kickstart

- Explore
  - Finding Data
  - Cleaning Data
- Analyze
  - Comparing Budgets
- Reveal
  - Visualizing and communicating findings



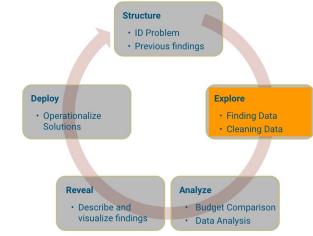
# Analytics Kickstart

- Structure
  - Citywide Priorities
- Deploy
  - Operational changes



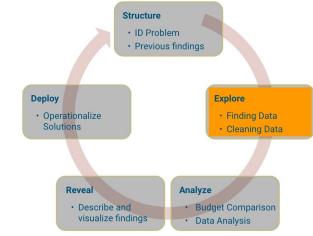
# Analytics Kickstart

- Finding Data
  - Open data portals
  - City budget documents



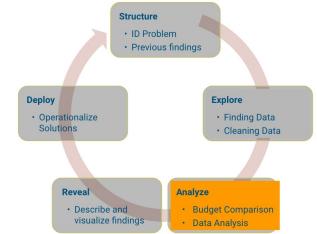
# Analytics Kickstart

- Finding Data
  - Open data portals
  - City budget documents
- Cleaning data
  - Understanding dataset structure
  - Standardizing variables



# Analytics Kickstart

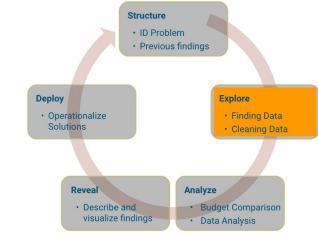
- **Finding Data**
  - Open data portals
  - City budget documents
- **Cleaning data**
  - Understanding dataset structure
  - Standardizing variables
- **Analyzing data**
  - Cluster model
  - Comparing budgets



# Finding Data

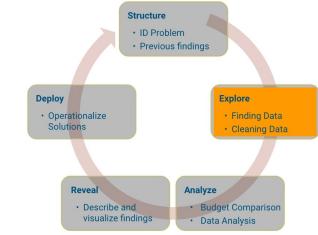
**What do you need?**

**Where is it?**



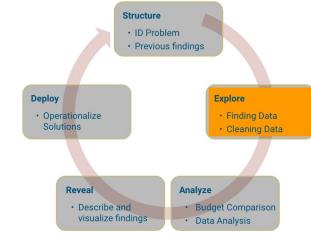
# Finding Data

- **What** information is needed to answer the question, and is this information available?
  - Finding existing data is the best situation
  - Sometimes joining data from different sources is required
  - Collect new data? Only if it's required



# Finding Data

- **What** information is needed to answer the question, and is this information available?
  - Finding existing data is the best situation
  - Sometimes joining data from different sources is required
  - Collect new data? Only if it's required
- **Where** is the data (or similar data) available?
  - Your computer
  - Shared server
  - Open Data portal
  - State or county server
  - US Census Bureau



# Finding Data

- [Jackson Open Data Portal](#)
  - 32 datasets
- U.S. Census Bureau
  - [Factfinder](#)
- City websites
  - [Budget data](#)



# U.S. Census Bureau

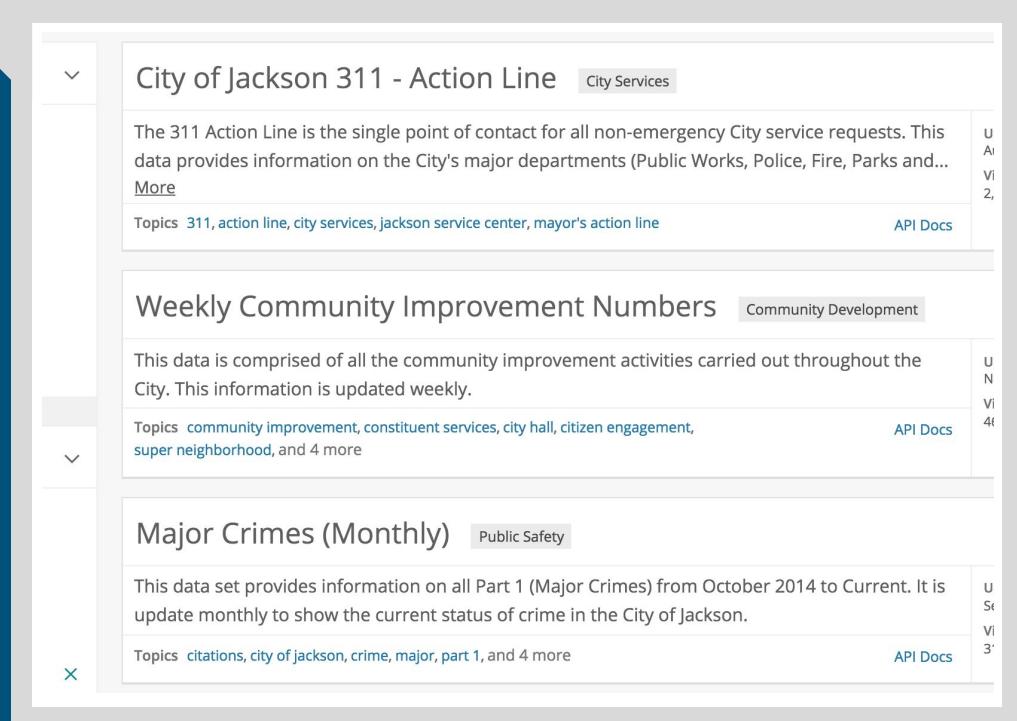
- Data
  - Demographic
  - Economic
- Access
  - Web interface
  - Application Programming Interface

The screenshot shows a search results page for "JACKSON CITY, MISSISSIPPI". The top navigation bar includes "ALL TOPICS" with a dropdown arrow, a magnifying glass icon labeled "= Browse more datasets", and the search term "JACKSON CITY, MISSISSIPPI". Below this, a blue header bar says "PEOPLE". The main content area is divided into sections: "Population" and "Age and Sex".

Category	Dataset	Value
Population	Population estimates, July 1, 2015, (V2015)	170,674
	Population estimates base, April 1, 2010, (V2015)	173,593
	Population, percent change - April 1, 2010 (estimates base) to July 1, 2015, (V2015)	-1.7%
	Population, Census, April 1, 2010	173,514
Age and Sex	Persons under 5 years, percent, July 1, 2015, (V2015)	X
	Persons under 5 years, percent, April 1, 2010	7.8%
	Persons under 18 years, percent, July 1, 2015, (V2015)	X
	Persons under 18 years, percent, April 1, 2010	27.4%
	Persons 65 years and over, percent, July 1, 2015, (V2015)	X
	Persons 65 years and over, percent, April 1, 2010	10.0%

# Open Data Portal

- Data
  - Jackson's records
- Access
  - Web interface
  - Application Programming Interface
  - Built-in graphing/analysis features



The screenshot displays three data sets listed vertically on the portal:

- City of Jackson 311 - Action Line** (City Services)  
The 311 Action Line is the single point of contact for all non-emergency City service requests. This data provides information on the City's major departments (Public Works, Police, Fire, Parks and... [More](#))  
Topics: [311](#), [action line](#), [city services](#), [jackson service center](#), [mayor's action line](#) [API Docs](#)
- Weekly Community Improvement Numbers** (Community Development)  
This data is comprised of all the community improvement activities carried out throughout the City. This information is updated weekly.  
Topics: [community improvement](#), [constituent services](#), [city hall](#), [citizen engagement](#), [super neighborhood](#), and 4 more [API Docs](#)
- Major Crimes (Monthly)** (Public Safety)  
This data set provides information on all Part 1 (Major Crimes) from October 2014 to Current. It is update monthly to show the current status of crime in the City of Jackson.  
Topics: [citations](#), [city of jackson](#), [crime](#), [major](#), [part 1](#), and 4 more [API Docs](#)

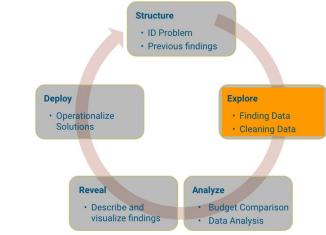
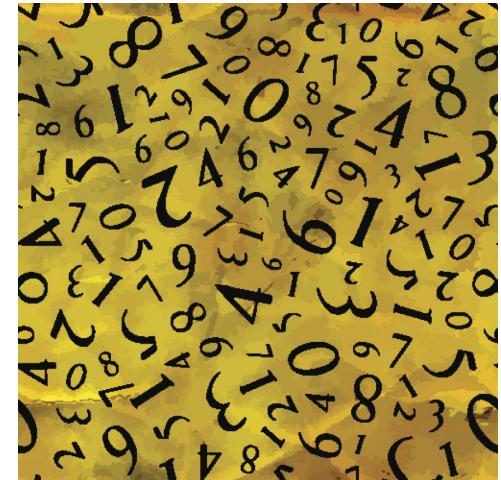
# Budget Data

- Data
  - Yearly revenues and expenditures
- Access
  - Some budget portals
  - PDF

Expenditure Account	PRIOR YR 15 ACTUALS	ADOPTED BUDGET FY16	FINAL BUDGET FY16
ADMINISTRATION			
GENERAL FUND			
FINANCE			
Fcn 040      OFFICE OF THE DIRECTOR-ADMIN	386,961	435,848	473,
Div 411      FINANCE	1,745,607	1,843,349	1,883,
RECORDS MANAGEMENT			
RECORDS MGT - ADMINISTRATION			
PERSONAL SERVICES			
1 412106111      SALARIES	62,867	62,718	62,
1 412106114      OVERTIME	88		
1 412106131      FICA TAXES	3,709	3,889	3,
1 412106132      GROUP INSURANCE	2,349	4,560	4,
1 412106133      EMPLOYERS PENSION	9,911	9,878	9,
1 412106136      MEDICARE TAX PAYME	867	909	
1 412106138      REDUCTION - AVG. V		3,870-	3,
Grp 610      PERSONAL SERVICES	79,791	78,084	78,

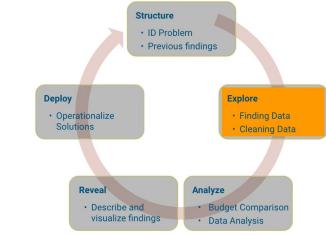
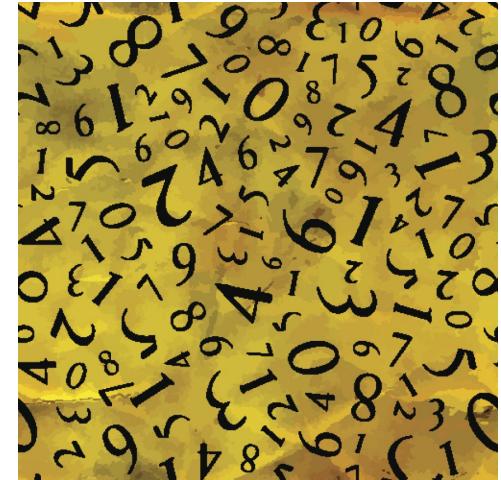
# Why Clean Data?

- To eliminate or minimize unnecessary **time** and resource **cost**



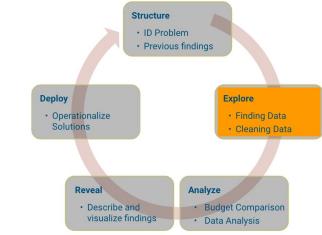
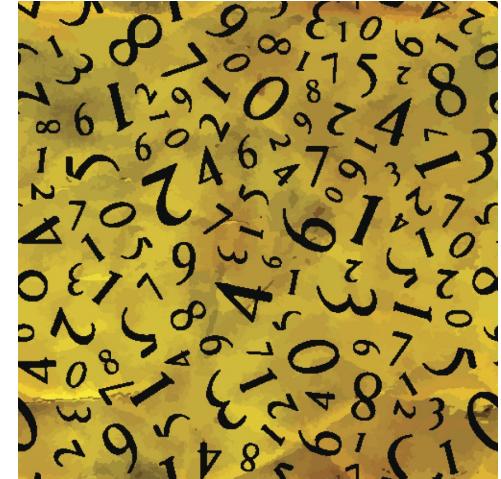
# Why Clean Data?

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- To ensure data **consistency**

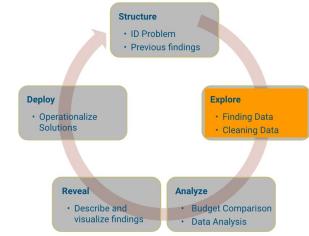


# Why Clean Data?

- To eliminate or minimize unnecessary **time** and resource **cost**
- To ensure data **consistency**
- To enhance understanding and **meaningful insights** from the data



# Why Clean Data?



## I Quant NY

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Quantitative Analysis of NYC Open Data: Every data set that the city releases tells a story. This blog is all about telling those stories, one data set at a time.

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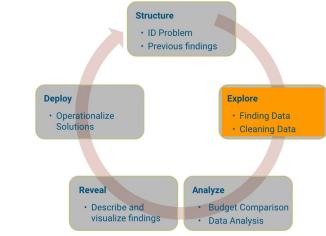
JULY 15, 2016

## Open Data Reveals \$791 Million Error in Newly Adopted NYC Budget

The headline in a recent NYC [press release](#) caught my eye: “**MAYOR AND CITY COUNCIL LAUNCH SEARCHABLE OPEN BUDGET FOR NEW YORK CITY**”. I was pretty excited. As mentioned in my [talk](#) on Ted, NYC has entombed this data in PDFs for years, making it basically impossible to analyze and understand what is going on. But for the first time, we can actually do things like look at the top spending for each agency. This is a big deal.

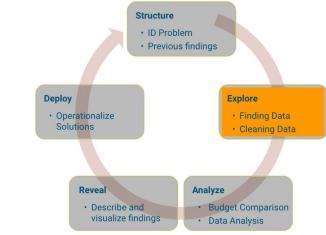
# Cleaning Data

- Understanding the data you're looking at
  - Is this a department or a program?



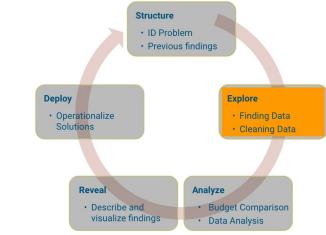
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- Understanding the data you're looking at
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  - Is this a budgeted or actual amount?



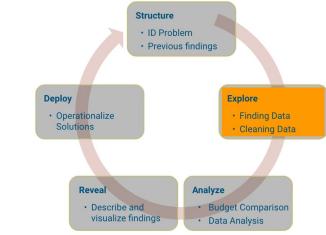
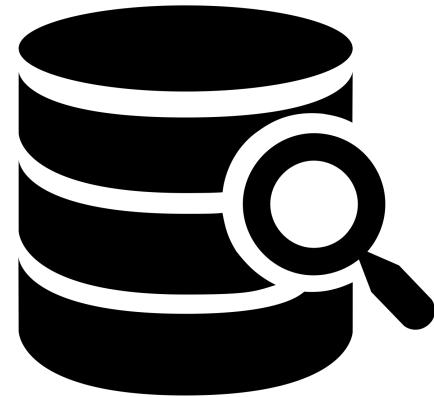
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- Understanding the data you're looking at
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  - Is this a budgeted or actual amount?
  - Is this operations or personnel?



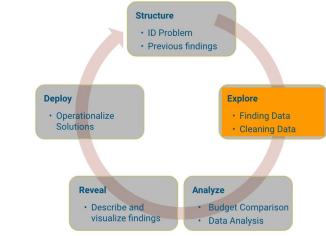
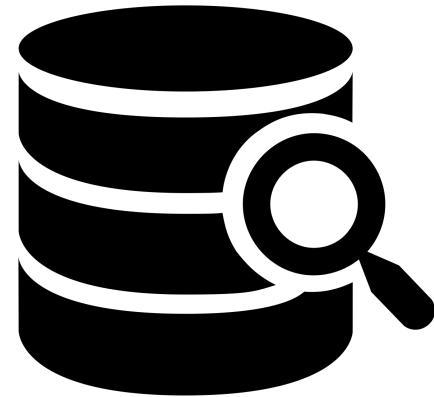
# Cleaning Data

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  - Is this operations or personnel?
  - Is this a specific location or an intersection?



# Cleaning Data

- Understanding the data you're looking at
  - Is this a department or a program?
  - Is this a budgeted or actual amount?
  - Is this operations or personnel?
  - Is this a specific location or an intersection?
  - Is this just a city or does it include the county?



# Cleaning Data

Incorrect

	A	B	C	D	E	F	G	H	I	J
1	Tableau Reshaping									
2	Sample Report									
3	2/9/2010									
4										
5										
6										
7										
8										
9										
10										
11										
12										
13										
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	Grand Total		1754	63	3.30%	56	\$11,020,180	\$1,052,407	-14%	\$11,072,587.00

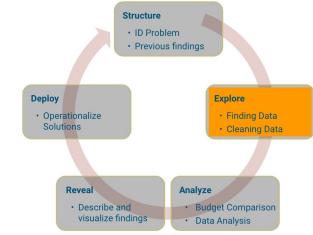
Correct

	A	B	C	D	E	F	G	H	I	J	K
1	Region	Group	ID Number	Mailed	Responded	Response Rate	# of New Accounts	Current Household Balance	Change in Balances	% Change in Balances	New Account Balance
2	East	A	1001	59	1	16.9%	1	\$2,269,314	(\$207,326)	-8%	\$160,612.00
3	East	A	1001	66	2	3.0%	4	\$1,880,533	\$165,561	10%	\$78,944.00
4	East	A	1003	55	1	18.2%	1	\$2,425,743	(\$375,908)	-13%	\$354,235.00
5	East	A	1004	56	2	3.57%	2	\$16,730,821	(\$4,541,020)	-21%	\$63,208.00
6	East	B	1005	168	3	1.79%	5	\$5,038,407	(\$315,558)	-14%	\$11,960.00
7	East	C	1006	82	5	6.10%	5	\$2,389,399	\$103,972	-5%	\$789,047.00
8	East	C	1007	90	5	5.56%	5	\$3,186,964	(\$326,907)	-3%	\$1453,269.00
9	East	C	1008	79	2	2.53%	2	\$2,838,031	(\$575,330)	-17%	\$130,491.00
10	East	D	1009	75	3	4.00%	3	\$1,428,805	(\$14,209)	-1%	\$235,164.00
11	East	D	1010	69	5	7.25%	6	\$1,710,499	\$41,575	-2%	\$157,442.00
12	East	D	1011	79	3	3.80%	4	\$1,358,527	\$34,001	-3%	\$92,021.00
13	West	A	1001	126	2	1.59%	5	\$12,171,434	\$188,440	-8%	\$12,359,874.00
14	West	A	1001	123	9	7.32%	10	\$19,575,457	\$15,123	10%	\$19,590,586.00
15	West	A	1003	163	10	6.13%	2	\$14,019,192	\$3,406	-13%	\$14,022,598.00
16	West	A	1004	219	3	13.7%	1	\$7,829,874	\$72,680	-21%	\$7,902,554.00
17	West	B	1005	87	4	4.60%	10	\$2,822,361	\$96,426	-14%	\$2,918,787.00
18	West	C	1006	179	5	2.79%	3	\$13,487,320	\$192,905	-5%	\$13,680,225.00
19	West	C	1007	87	5	5.75%	5	\$2,160,866	\$168,703	-3%	\$2,329,563.00
20	West	C	1008	82	5	6.10%	2	\$8,859,273	(\$12,778)	-17%	\$8,846,495.00
21	West	D	1009	200	5	2.50%	1	\$1,157,1973	(\$4,513)	-1%	\$1,156,746.00
22	West	D	1010	180	6	3.33%	10	\$19,396,108	\$103,140	-2%	\$19,499,248.00
23	West	D	1011	135	6	4.44%	5	\$5,004,086	\$31,464	-3%	\$5,035,550.00
24	Central	A	1011	171	5	2.92%	5	\$10,414,570	\$161,936	-3%	\$10,506,266.00
25	Central	A	1012	239	3	1.26%	4	\$4,426,418	\$28,851	97%	\$4,455,263.00
26	Central	A	1013	137	3	2.18%	5	\$14,527,150	\$191,328	197%	\$14,718,478.00
27	Central	A	1014	69	2	2.30%	5	\$9,603,142	\$192,871	297%	\$9,796,013.00
28	Central	B	1015	190	2	1.05%	10	\$6,335,228	\$65,948	397%	\$6,401,176.00
29	Central	C	1016	189	1	0.53%	3	\$1,476,368	(\$8,395)	497%	\$1,467,973.00
30	Central	C	1017	166	1	0.60%	3	\$16,972,527	\$7,376	597%	\$16,973,903.00
31	Central	C	1018	62	3	4.84%	9	\$6,419,181	\$72,770	697%	\$6,491,951.00
32	Central	D	1019	213	5	2.35%	1	\$9,142,091	\$103,105	797%	\$9,245,196.00
33	Central	D	1020	197	8	4.06%	4	\$17,953,916	\$185,237	897%	\$18,145,153.00
34	Central	D	1021	58	3	5.17%	3	\$7,725,291	\$102,193	997%	\$7,827,484.00
35											



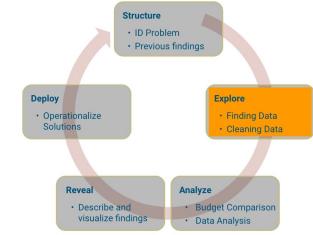
# Cleaning Data

- **Rows**
  - Should describe the most basic unit of what a dataset is about



# Cleaning Data

- **Rows**
  - Should describe the most basic unit of what a dataset is about
    - Individual person



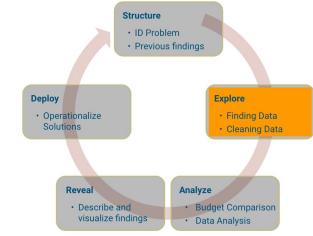
# Cleaning Data

- **Rows**
  - Should describe the most basic unit of what a dataset is about
    - Individual person
    - Individual place



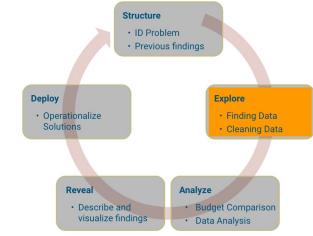
# Cleaning Data

- **Rows**
  - Should describe the most basic unit of what a dataset is about
    - Individual person
    - Individual place
    - Individual thing



# Cleaning Data

- **Rows**
  - Should describe the most basic unit of what a dataset is about
    - Individual person
    - Individual place
    - Individual thing
- **Columns**



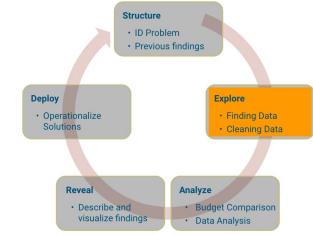
# Cleaning Data

- **Rows**

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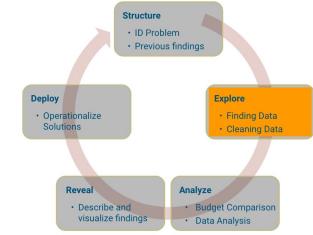
- **Columns**

- Should describe a single characteristic about an individual observation



# Cleaning Data

- **Rows**
  - Should describe the most basic unit of what a dataset is about
    - Individual person
    - Individual place
    - Individual thing
- **Columns**
  - Should describe a single characteristic about an individual observation
    - Category



# Cleaning Data

- **Rows**

- Should describe the most basic unit of what a dataset is about
  - Individual person
  - Individual place
  - Individual thing

- **Columns**

- Should describe a single characteristic about an individual observation
  - Category
  - Time



# Cleaning Data

- **Rows**

- Should describe the most basic unit of what a dataset is about
  - Individual person
  - Individual place
  - Individual thing

- **Columns**

- Should describe a single characteristic about an individual observation
  - Category
  - Time
  - Amount



# Budget Data

Observation	City	Department	Year	Tag	Amount
Expense 1	Jackson	Public Works	2015	Water	\$5,000,000
Expense 2	Jackson	Public Works	2015	Water	\$4,000,000
Expense 3	Jackson	Public Works	2015	Water	\$3,000,000
Expense 4	Akron	Finance	2015	Salary	\$2,000,000
Expense 5	Akron	Finance	2015	Salary	\$1,000,000



# Budget Data

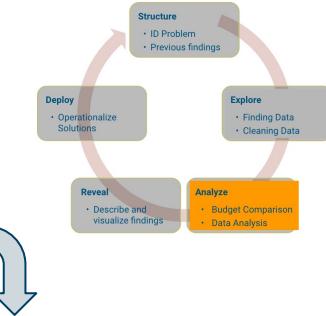


Rows  
↳

Observation	City	Department	Year	Tag	Amount
Expense 1	Jackson	Public Works	2015	Water	\$5,000,000
Expense 2	Jackson	Public Works	2015	Water	\$4,000,000
Expense 3	Jackson	Public Works	2015	Water	\$3,000,000
Expense 4	Akron	Finance	2015	Salary	\$2,000,000
Expense 5	Akron	Finance	2015	Salary	\$1,000,000

# Budget Data

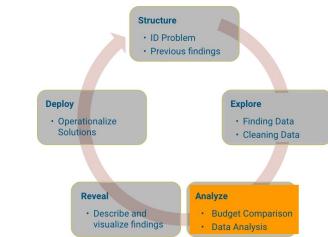
Columns



Observation	City	Department	Year	Tag	Amount
Expense 1	Jackson	Public Works	2015	Water	\$5,000,000
Expense 2	Jackson	Public Works	2015	Water	\$4,000,000
Expense 3	Jackson	Public Works	2015	Water	\$3,000,000
Expense 4	Akron	Finance	2015	Salary	\$2,000,000
Expense 5	Akron	Finance	2015	Salary	\$1,000,000

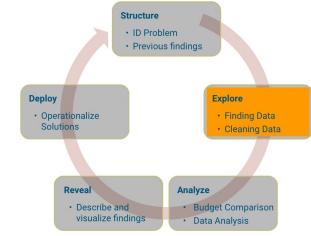
# Budget Data

Observation	City	Department	Year	Tag	Amount
Expense 1	Jackson	Public Works	2015	Water	\$5,000,000
Expense 2	Jackson	Public Works	2015	Water	\$4,000,000
Expense 3	Jackson	Public Works	2015	Water	\$3,000,000
Expense 4	Akron	Finance	2015	Salary	\$2,000,000
Expense 5	Akron	Finance	2015	Salary	\$1,000,000



Values





# Common Data Errors

- Missing Values

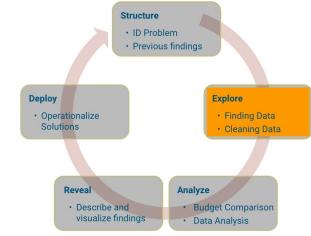
	X	Y
1	North	.05
2	South	.3
3	NA	.25
4	North	.4
5	NA	.7



# Common Data Errors

- Missing Values
- Spelling Errors

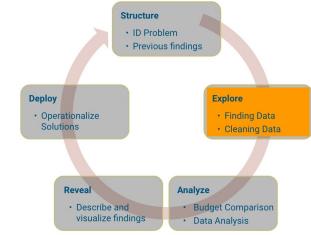
	X	Y
1	North	.05
2	South	.3
3	West	.25
4	North	.4
5	W	.7



# Common Data Errors

- Missing Values
- Spelling Errors
- **Duplicates**

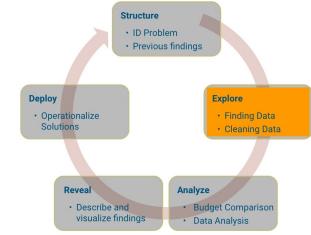
	X	Y
1	North	.05
2	South	.3
3	NA	.25
3	NA	.25
4	North	.4
5	NA	.7



# Common Data Errors

- Missing Values
- Spelling Errors
- Duplicates
- Outliers

	X	Y
1	North	.05
2	South	.3
3	West	.25
4	North	<b>999999</b>
5	West	.7



# Common Data Errors

- Missing Values
- Spelling Errors
- Duplicates
- Outliers
- Inconsistent measurements

	X	Y	Z
1	North	.05	miles
2	South	.3	miles
3	West	.25	miles
4	North	.4	km
5	West	.7	km

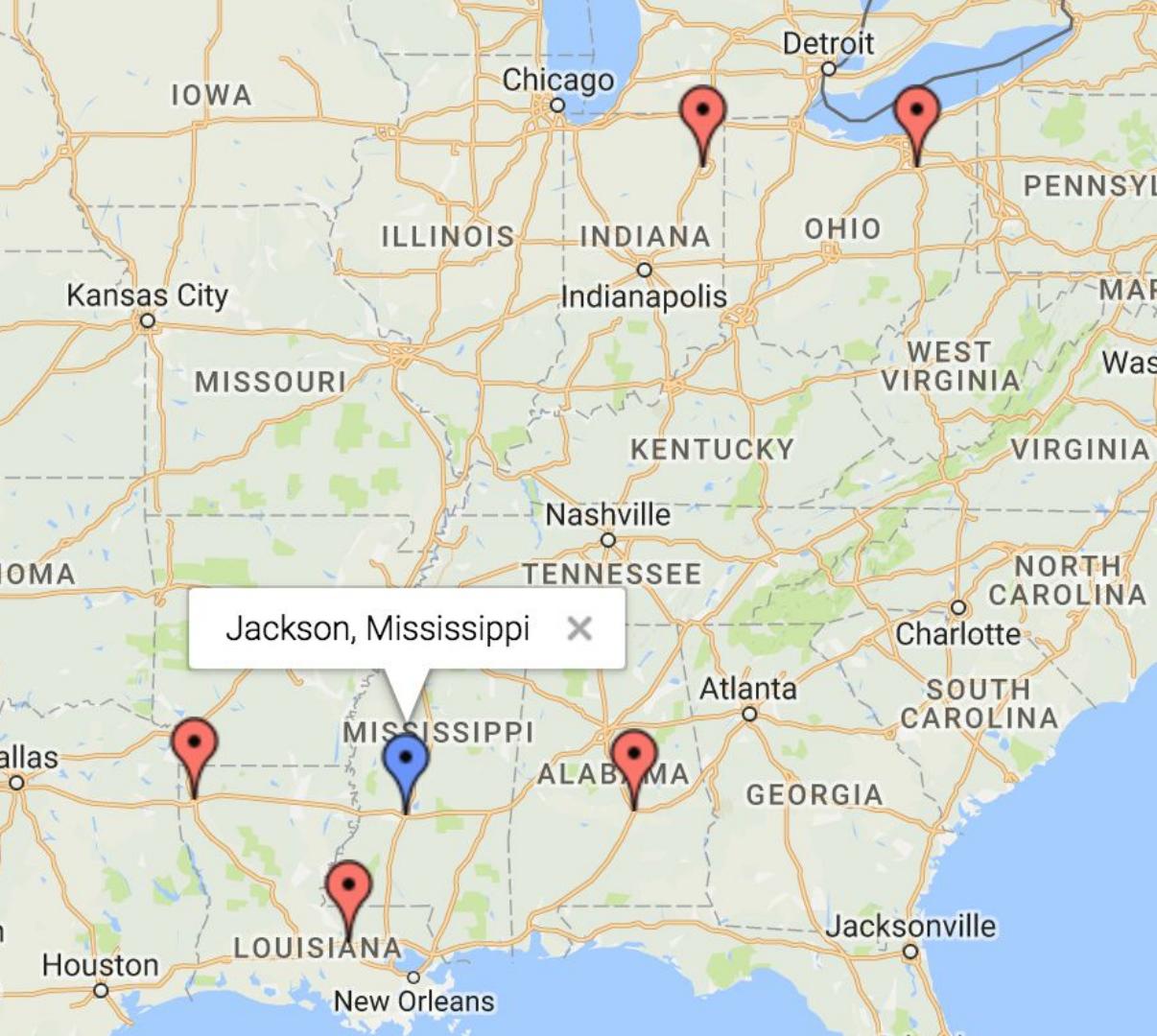
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# Break

- 5 minutes

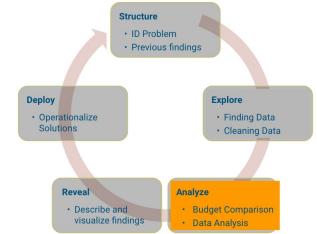
# Comparison Cities

- Akron, OH
- Baton Rouge, LA
- Fort Wayne, IN
- Jackson, MS
- Montgomery, AL
- Shreveport, LA



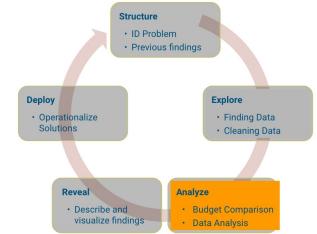
# Comparing Cities

- There are many ways to pick cities for comparison



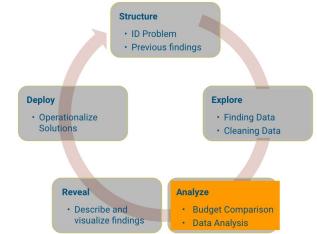
# Comparing Cities

- There are many ways to pick cities for comparison
  - Region



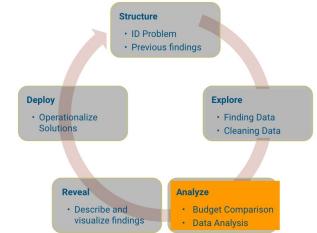
# Comparing Cities

- There are many ways to pick cities for comparison
  - Region
  - State



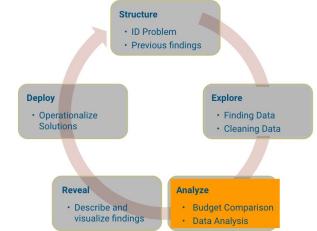
# Comparing Cities

- There are many ways to pick cities for comparison
  - Region
  - State
  - Population size



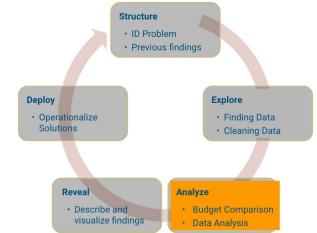
# Comparing Cities

- There are many ways to pick cities for comparison
  - Region
  - State
  - Population size
  - History



# Comparing Cities

- There are many ways to pick cities for comparison
  - Region
  - State
  - Population size
  - History
  - Algorithmic clustering



# Comparing Cities

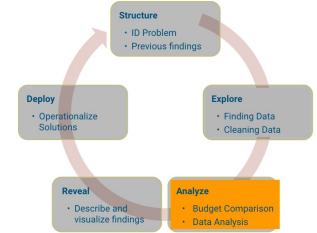
- There are many ways to pick cities for comparison
  - Region
  - State
  - Population size
  - History
  - Algorithmic clustering

*“Finding an exact “twin” is a mirage - as soon as you find a good comparison, you realize there is more complexity to take into account.”*

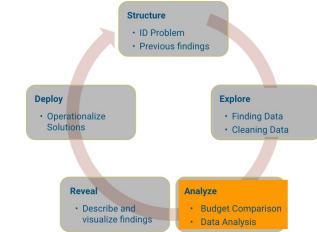


# Cluster Model

- 286 mid-sized cities
- Which cities are grouped with Jackson?



# Cluster Model



## Variables

- More influence
  - 2013 population
  - 2013 population growth
  - Land area
  - Population density
- Less influence
  - Median income
  - Geographic region
  - State capital (Yes/No)
  - Percentage of population nonwhite
  - Percentage of population in poverty

# Cluster Model



## Variables

- More influence
  - 2013 population
  - 2013 population growth
  - Land area
  - Population density
- Less influence
  - Median income
  - Geographic region
  - State capital (Yes/No)
  - Percentage of population nonwhite
  - Percentage of population in poverty

## Size and Shape

# Cluster Model

## Variables

- More influence
  - 2013 population
  - 2013 population growth
  - Land area
  - Population density
- Less influence
  - Median income
  - Geographic region
  - State capital (Yes/No)
  - Percentage of population nonwhite
  - Percentage of population in poverty

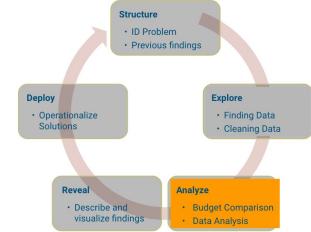
**Size and Shape**

**People and Place**



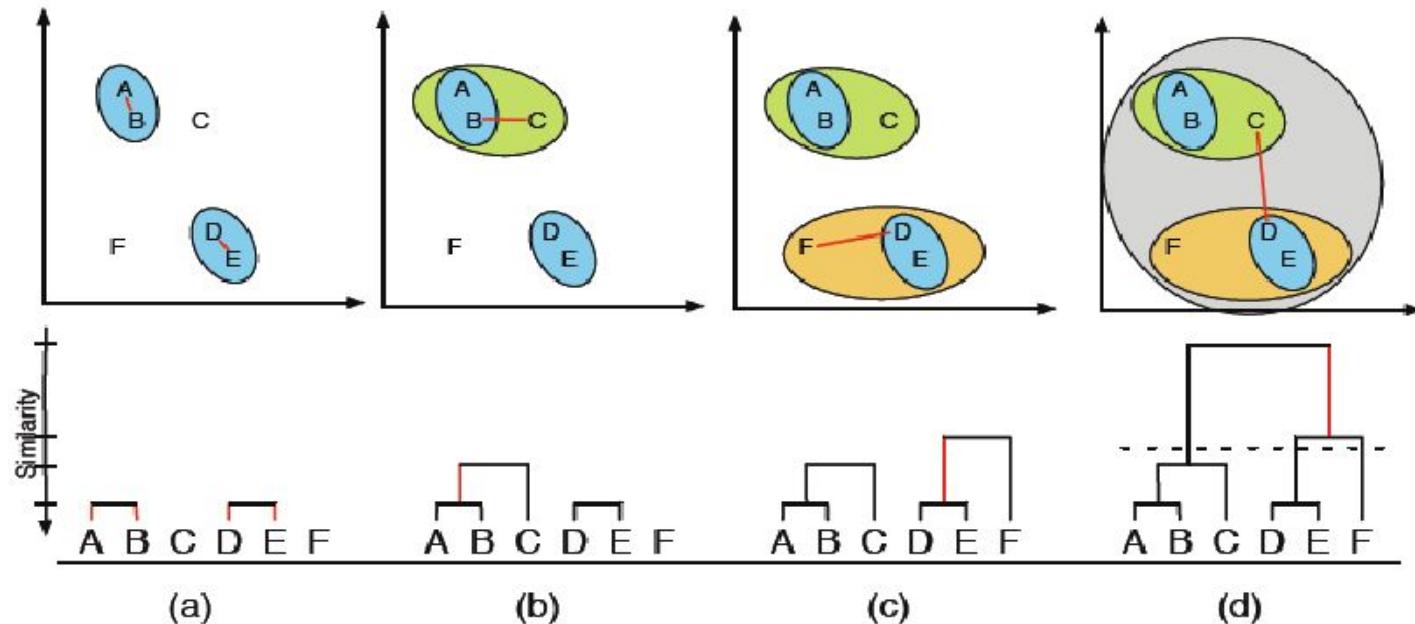
# Cluster Model

- **Doesn't Include**
  - Number of employees
  - Budget expenditures
  - Household size
  - Etc.



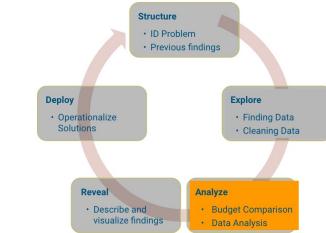
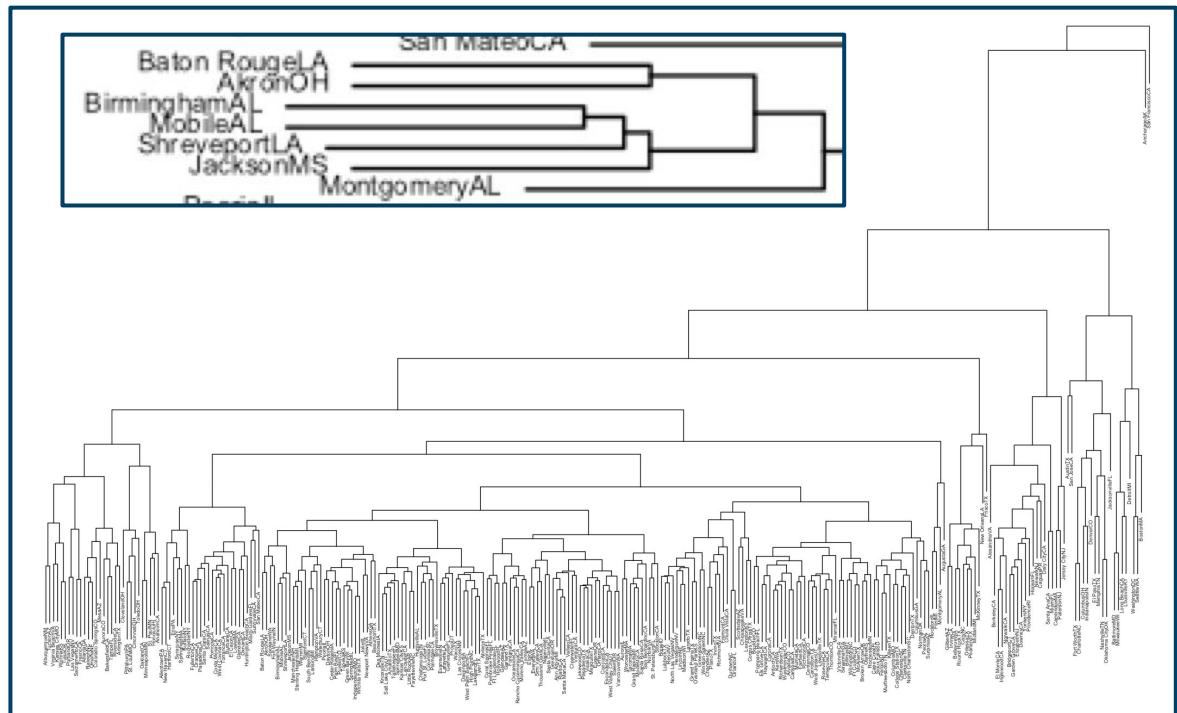
# Cluster Model

**Example: Hierarchical Agglomerative Clustering**



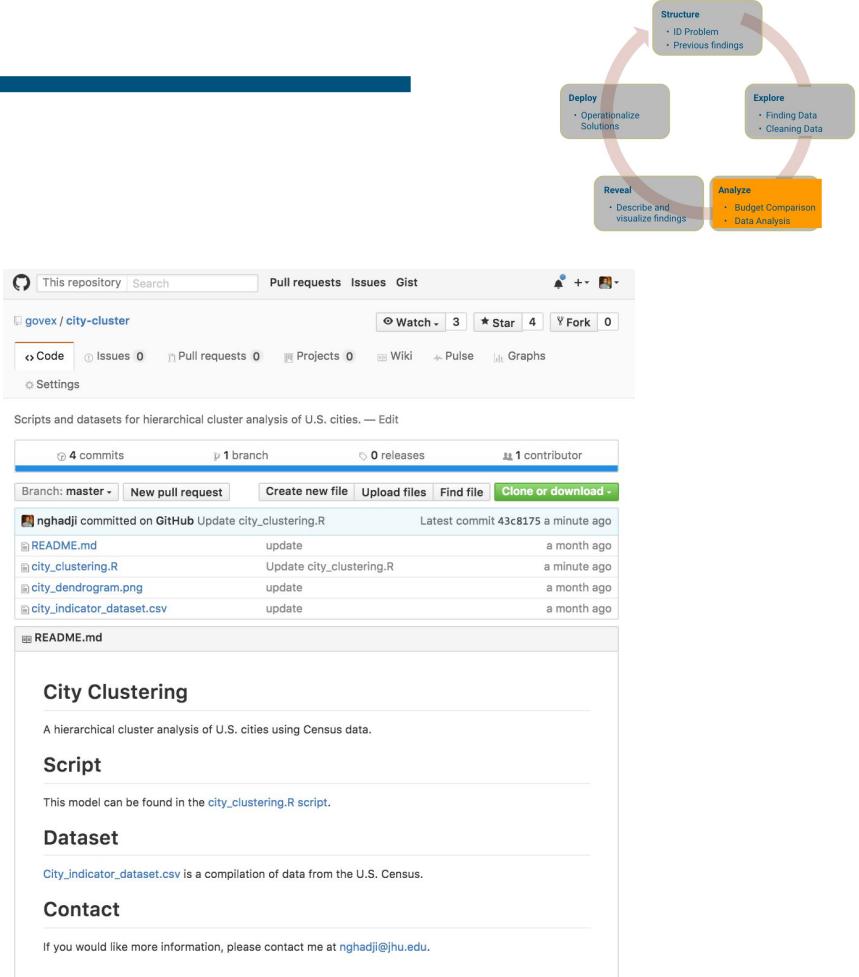
# Cluster Model

- Cities that are on the same “branch” are more similar than cities on different branches



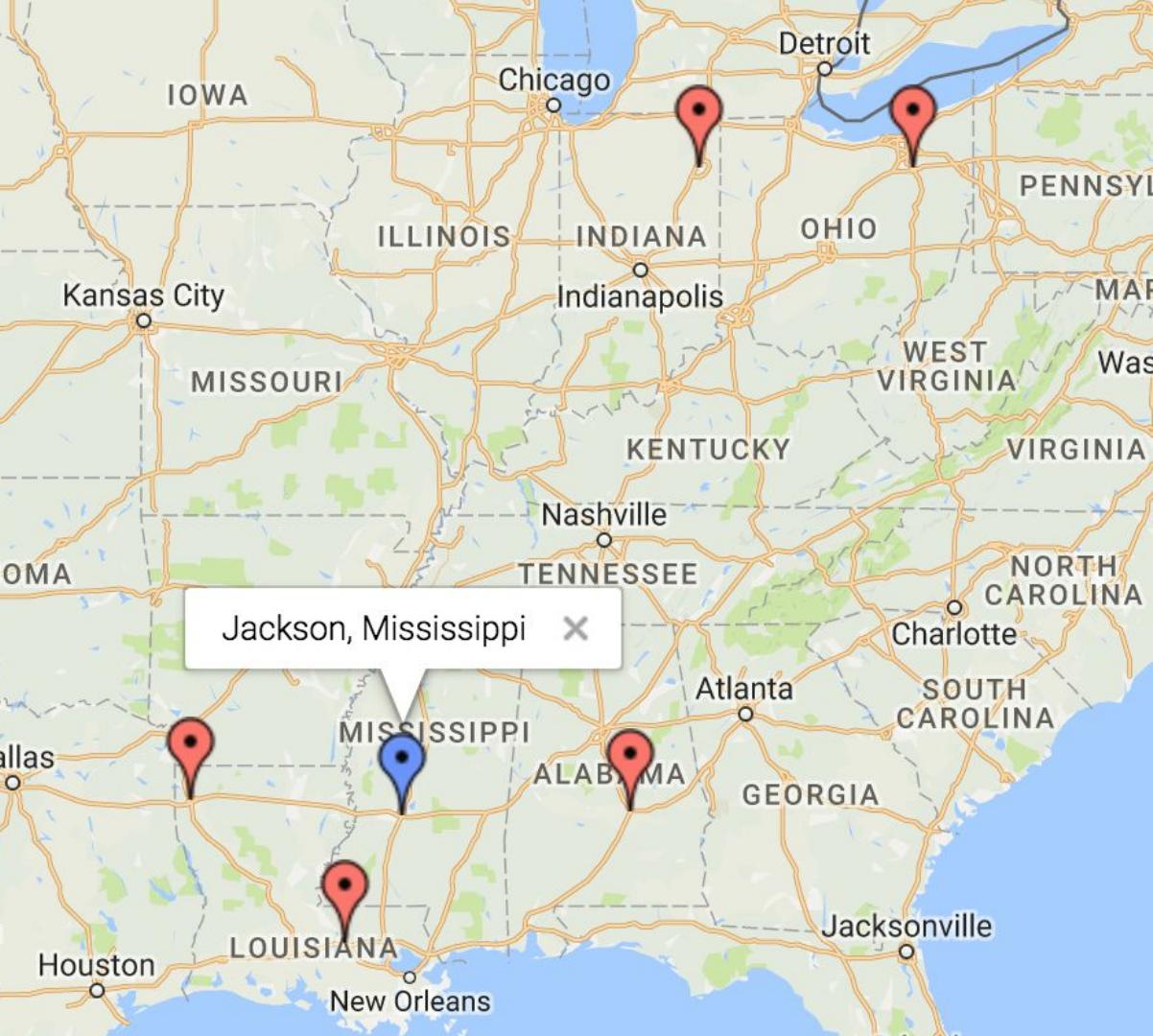
# Cluster Model

- The code and data for this model are on GitHub
- Free and open for anyone to tweak according to their needs



# Comparison Cities

- Akron, OH
- Baton Rouge, LA
- Fort Wayne, IN
- Jackson, MS
- Montgomery, AL
- Shreveport, LA



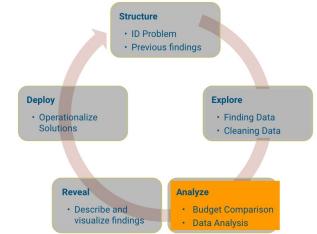
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# Break

- Next section
  - Finding, cleaning, and analyzing data

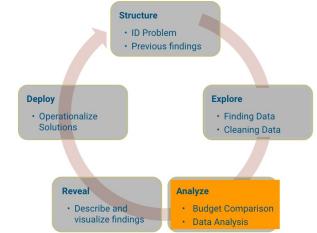
# Analyzing Data

- Pivot Table Exercise



# Analyzing Data

- Pivot Table Exercise
  - We'll answer the following questions



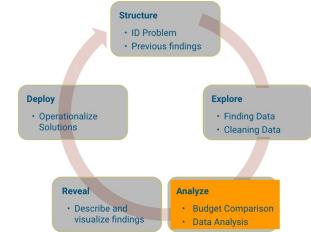
# Analyzing Data

- Pivot Table Exercise
  - We'll answer the following questions
    - Which department in Jackson spent the most?



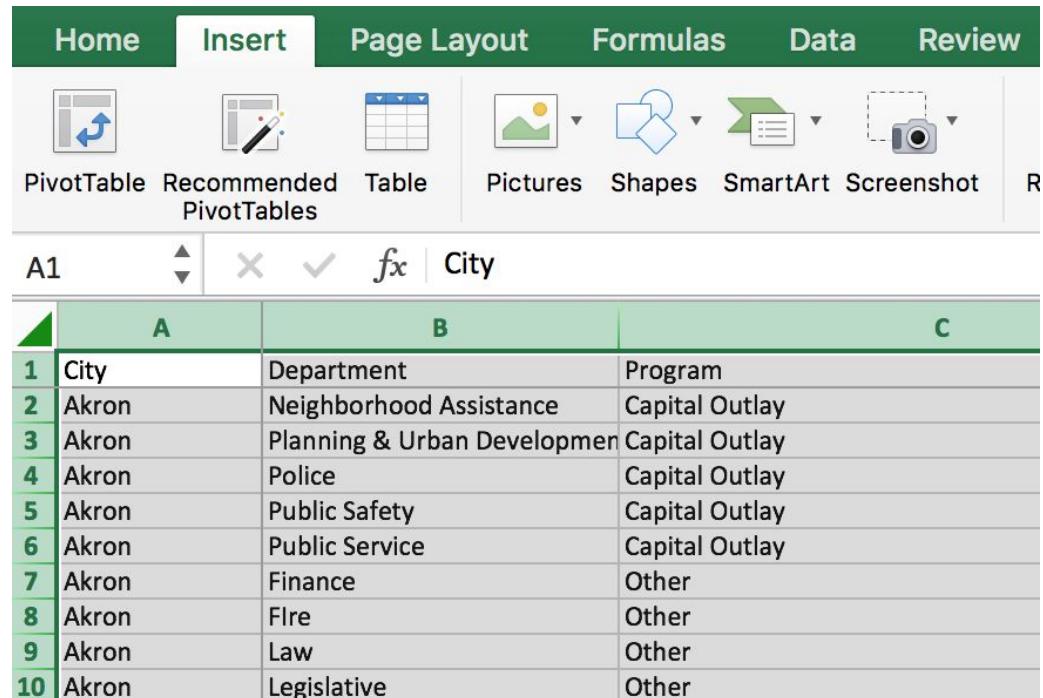
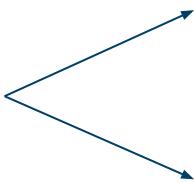
# Analyzing Data

- Pivot Table Exercise
  - We'll answer the following questions
    - Which department in Jackson spent the most?
    - What are the top 10 spending items in that department?

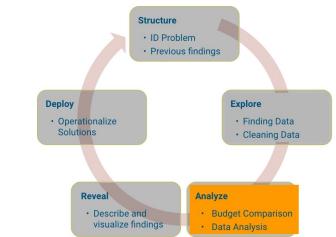


# Analyzing Data

- Select all data
- Insert Pivot Table
- Click “OK”

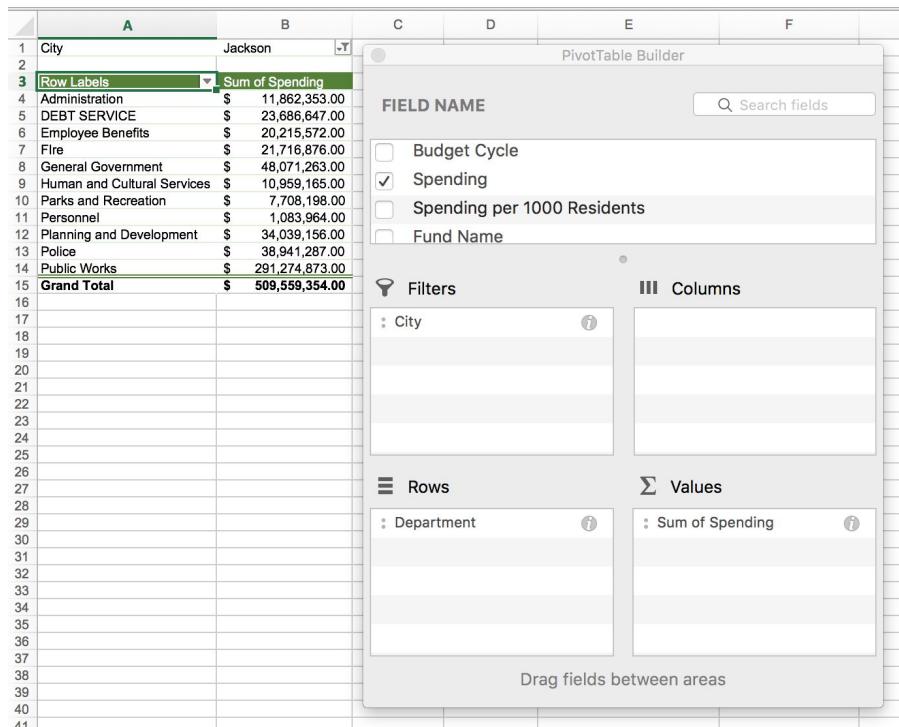


	A	B	C
1	City	Department	Program
2	Akron	Neighborhood Assistance	Capital Outlay
3	Akron	Planning & Urban Development	Capital Outlay
4	Akron	Police	Capital Outlay
5	Akron	Public Safety	Capital Outlay
6	Akron	Public Service	Capital Outlay
7	Akron	Finance	Other
8	Akron	Fire	Other
9	Akron	Law	Other
10	Akron	Legislative	Other



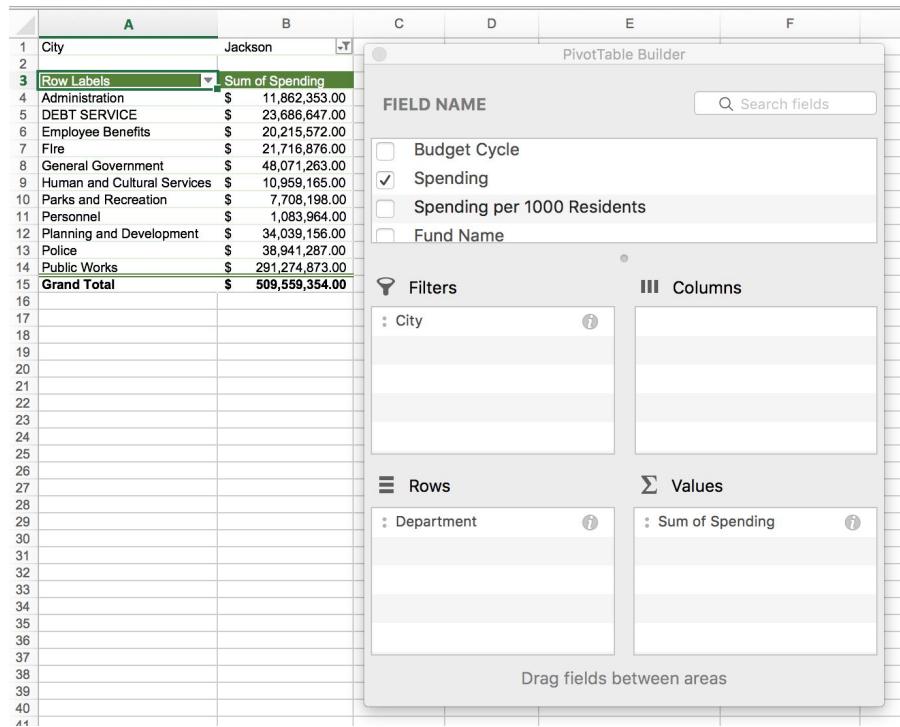
# Analyzing Data

- Which department in Jackson spent the most?



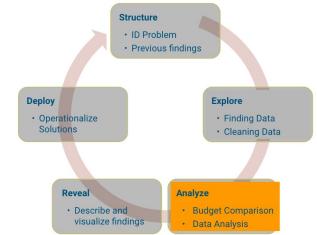
# Analyzing Data

- Which department in Jackson spent the most?
  - Public Works
  - \$291,274,873



# Analyzing Data

- Top 10 items in Public Works?



# Analyzing Data

- Top 10 items in Public Works?

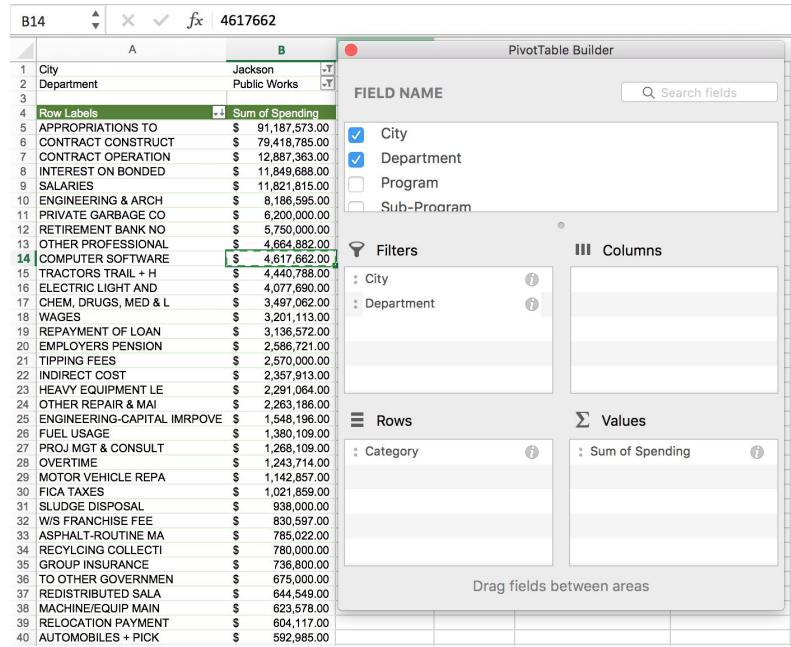
Screenshot of a Microsoft Excel PivotTable Builder dialog box showing the top 10 items in Public Works by spending.

Category	Sum of Spending
CITY	\$ 91,187,573.00
DEPARTMENT	\$ 79,416,785.00
CONTRACT CONSTRUCT	\$ 12,887,363.00
INTEREST ON BONDED SALARIES	\$ 11,849,688.00
ENGINEERING & ARCH	\$ 8,186,595.00
PRIVATE GARBAGE CO	\$ 6,200,000.00
RETIREMENT BANK NO	\$ 5,750,000.00
OTHER PROFESSIONAL COMPUTER SOFTWARE	\$ 4,664,882.00
TRACTORS TRAIL + H	\$ 4,617,662.00
ELECTRIC LIGHT AND CHEM, DRUGS, MED & L	\$ 4,440,788.00
WAGES REPAYMENT OF LOAN EMPLOYERS PENSION	\$ 4,077,690.00
TIPPING FEES INDIRECT COST	\$ 3,497,062.00
HEAVY EQUIPMENT LE OTHER REPAIR & MAI	\$ 3,201,113.00
ENGINEERING-CAPITAL IMPROVE FUEL USAGE	\$ 2,586,721.00
OVERTIME MOTOR VEHICLE REPA	\$ 2,570,000.00
INDIRECT COST	\$ 2,357,913.00
HEAVY EQUIPMENT LE OTHER REPAIR & MAI	\$ 2,291,064.00
ENGINEERING-CAPITAL IMPROVE FUEL USAGE	\$ 2,263,186.00
PROJ MGT & CONSULT OVERTIME	\$ 1,548,196.00
MOTOR VEHICLE REPA FICA TAXES	\$ 1,380,109.00
SLUDGE DISPOSAL WIS FRANCHISE FEE	\$ 1,268,109.00
ASPHALT-ROUTINE MA RECYCLING COLLECTI	\$ 1,243,714.00
GROUP INSURANCE TO OTHER GOVERNMENT	\$ 1,142,857.00
REDISTRIBUTED SALA MACHINE/EQUIP MAIN	\$ 1,021,859.00
RELOCATION PAYMENT AUTOMOBILES + PICK	\$ 938,000.00
	\$ 830,597.00
	\$ 785,022.00
	\$ 780,000.00
	\$ 736,800.00
	\$ 675,000.00
	\$ 644,549.00
	\$ 623,578.00
	\$ 604,117.00
	\$ 592,985.00



# Analyzing Data

- Top 10 items in Public Works?

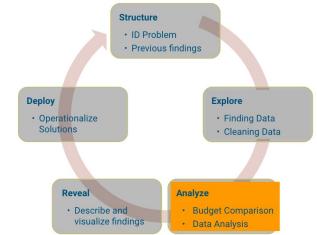


1. Appropriations to	\$91,187,573.00
2. Contract Construct	\$79,418,785.00
3. Contract Operation	\$12,887,363.00
4. Interest on Bonded	\$11,849,688.00
5. Salaries	\$11,821,815.00
6. Engineering & Arch	\$8,186,595.00
7. Private Garbage Co	\$6,200,000.00
8. Retirement Bank NO	\$5,750,000.00
9. Other Professional	\$4,664,882.00
10. Computer Software	\$4,617,662.00



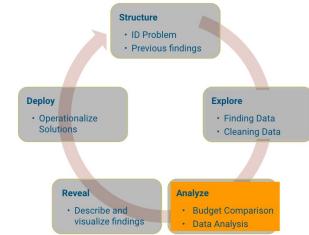
# Analyzing Data

- Top 10 items in Public Works?



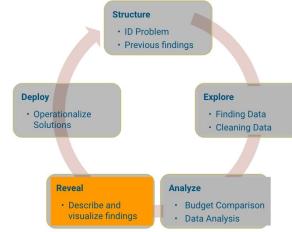
# Analyzing Data

- Top 10 items in Public Works?



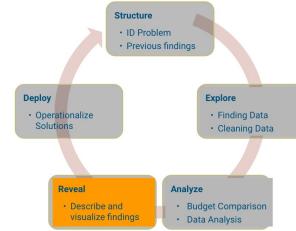
# Compared to Jackson

- We can rank spending inside Jackson's departments



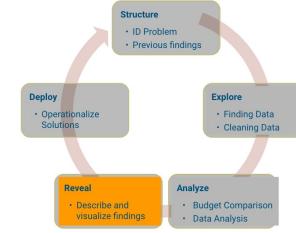
# Compared to Jackson

- We can rank spending **inside** Jackson's departments
- But we can't compare between other cities without **normalized variables**



# Compared to Jackson

- **Solution**
  - Tag each expense to a “department category.”
  - Creates a common variable so “Public Works” means the same thing across cities
  - Normalize spending per 1,000 residents



# Tag System

Department Tag	Program Tag(s)
Administration	Administration General Executive Human Resources Legislative Public Affairs Legal Clerk/Records
Court	Family Court Juvenile Services Municipal Court Public Defender
Economic Development	Economic Development General
Finance	Finance General Budget Controller Debt Service Insurance Miscellaneous Purchasing Retirement Transfers
Health & Human Services	Education Health (includes Animal Control, Coroner) Housing Human Services
Information Technology	IT General Telecommunications
Other	Audit/Investigations

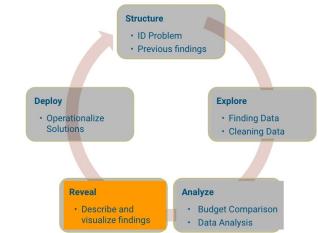
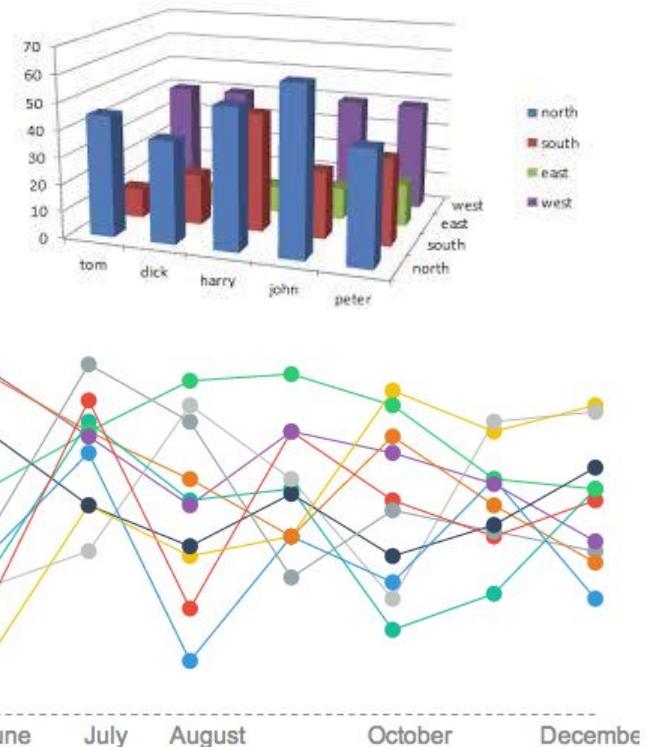
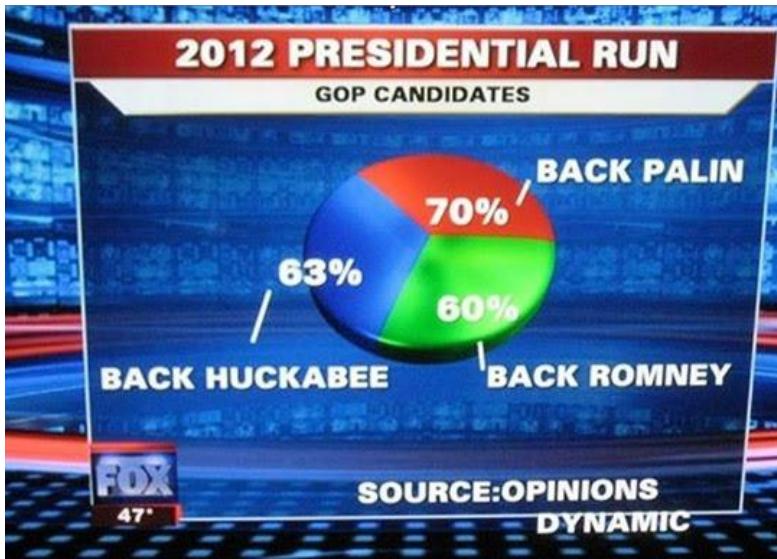
	Library Miscellaneous Voting
Parks & Recreation	Parks and Recreation General Convention Center Events Museum Zoo
Planning	Planning General Historic Preservation Permits Zoning
Public Safety	Public Safety General Code Enforcement Emergency Management Police Fire EMS
Public Works	Public Works General Constituent Services/311 Engineering Environmental Services Facilities Fleet Streets Waste Management Water/Sewer
Transportation	Transportation General Airport Parking Traffic



# Visualization Tools

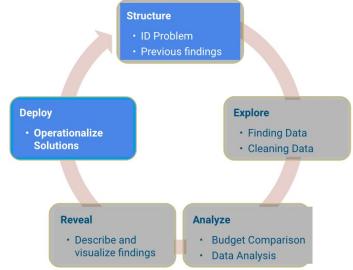


# Bad Chart Examples



# Your Turn

- How can Jackson use this information to take action on your key operational challenge: doing more with less?



# Thank You

