

DATA ACADEMY

FROM THE OFFICE OF PERFORMANCE MANAGEMENT



CITY OF KANSAS CITY, MO

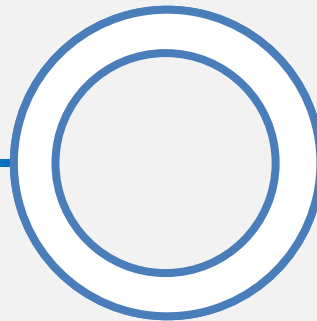
The Data Analysis Process

PREPARE



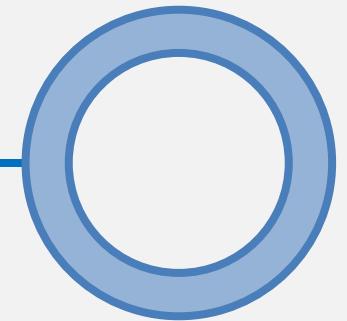
- **Develop A Question**
- **Collect Data**
- **Clean Data**

ANALYZE



- **Analyze Data**
- **Interpret Results**

ACT



- **Present Results**
- **Integrate Into Decision-Making**

Since the last class, how have you applied these concepts to your own work?



Agenda

1 Telling a Story with Data

- Know Your Story
- Find Your Visual
- Communication Mechanisms

2 Effective Visuals

- “Your Charts Suck”
- Presentation Design

3 Frameworks for Data-Driven Improvement

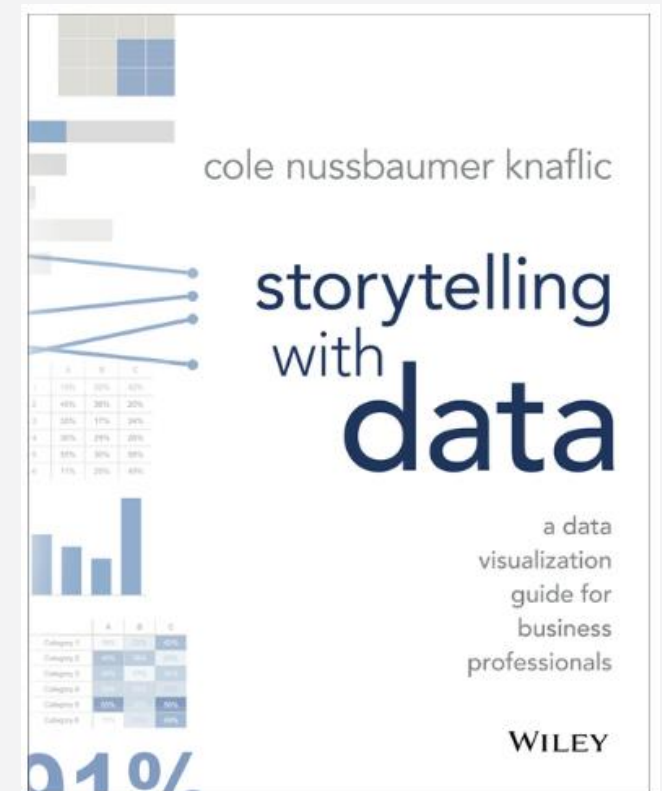
- What’s a Framework?
- How to Improve Your Frameworks
- “PerformanceStat”



TELLING A STORY WITH DATA

Major Resource: Storytelling with Data

- Blog (storytellingwithdata.com) and a book from previous manager at Google, Cole Nussbaumer Knaflic





Figuring Out Your Story

1) AUDIENCE

To whom are you telling it?

2) STORY

What is the story you are telling with your data?

3) VISUAL + COMMUNICATION METHOD

How can you best tell it?



The “Who”

Quick brainstorm: who are audiences that you engage with?

Ways in which audiences differ from one another:

- Background/experience with the topic
- Level and type of technical understanding
- Level and type of interest
- **Type of action that they can take**



The “What”

What information are you trying to convey from your data, and to what end for your audience?

Or:

What is the point of this chart?

Frequent Problems in Figuring Out the “What”

I’ve done a lot of analysis, but am **not sure yet what the story is.**

- You are still in the “exploratory analysis” phase
- Come back when you have explanatory analysis

I don’t need to figure out the story because I always create the same set of charts.

- Option 1: You have already set your story
- Option 2: Your charts are currently operating without a story
- Either way, a conscious focus on the story will help you improve

It’s not my job to decide what the story is. That’s above my pay grade.

- YES, IT IS! You are the subject matter expert for your data, which means it is your responsibility to convey it in a meaningful way
- Telling a story does not mean overstepping your bounds

The “Who” and the “What” in Practice

What is the story of the 2016 ElevateKC Employee Survey results?

City Manager

- The City’s overall progress since 2014
- Citywide trends across departments
- Departmental outliers (positive/negative) to be aware of
- Strategic areas in need of attention
- Benchmarking (comparison to other cities)

Department Directors/Deputies

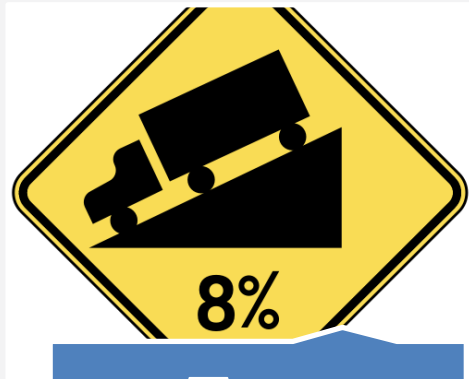
- My department’s progress compared to 2014
- My department’s progress compared to other departments
- My department’s levels compared to other departments
- Topic area outliers (positive/negative to be aware of)

Cross-Functional Work Groups

- Progress in strategic areas compared to 2014
- Topic area outliers (positive/negative) to be aware of
- Benchmarking (comparison to other cities)
- Reach of survey and participation rate
- Knowledge base of employees for programs

The “How” – Selecting a Visual

A handful of visuals will serve almost all of your needs:



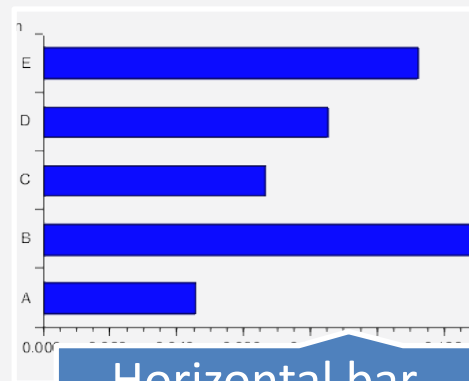
Text

Month	Employed, in 000	Unemployed
June	1,704	773,369
July	1,706	769,340
August	1,706	757,243
September	1,705	748,549
October	1,713	741,362
November	1,717	739,044
December	1,719	741,906
January	1,716	753,949
February	1,716	759,942
March	1,716	766,500
April	1,716	761,878
May	1,715	753,846
June	1,714	745,910

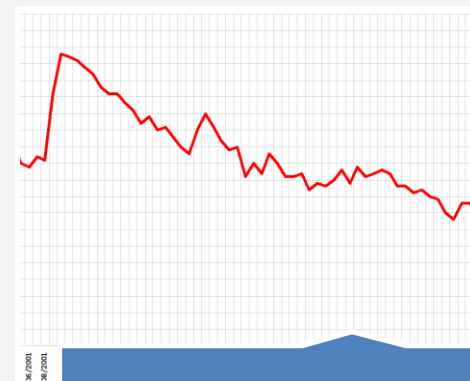
Table



Vertical bar graph
(column)



Horizontal bar
graph



Line graph

Text: When and Why to Use

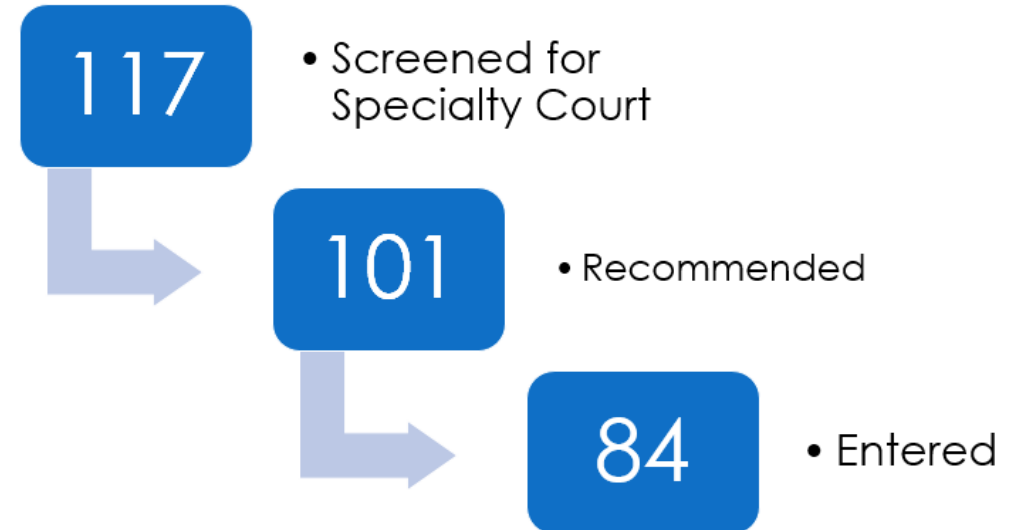
What is it good for?

- When you have only a few numbers to work with
- When your point can be summarized easily with one number

From 11.1.16 Public Safety KCStat

Specialty Court Volume

From May 01, 2016 to present:



Text-Based Visual Example

Tool: Visme, simple design software used by our office

Other tools/resources:

- SmartArt in Powerpoint
- City Communications staff or other design professionals

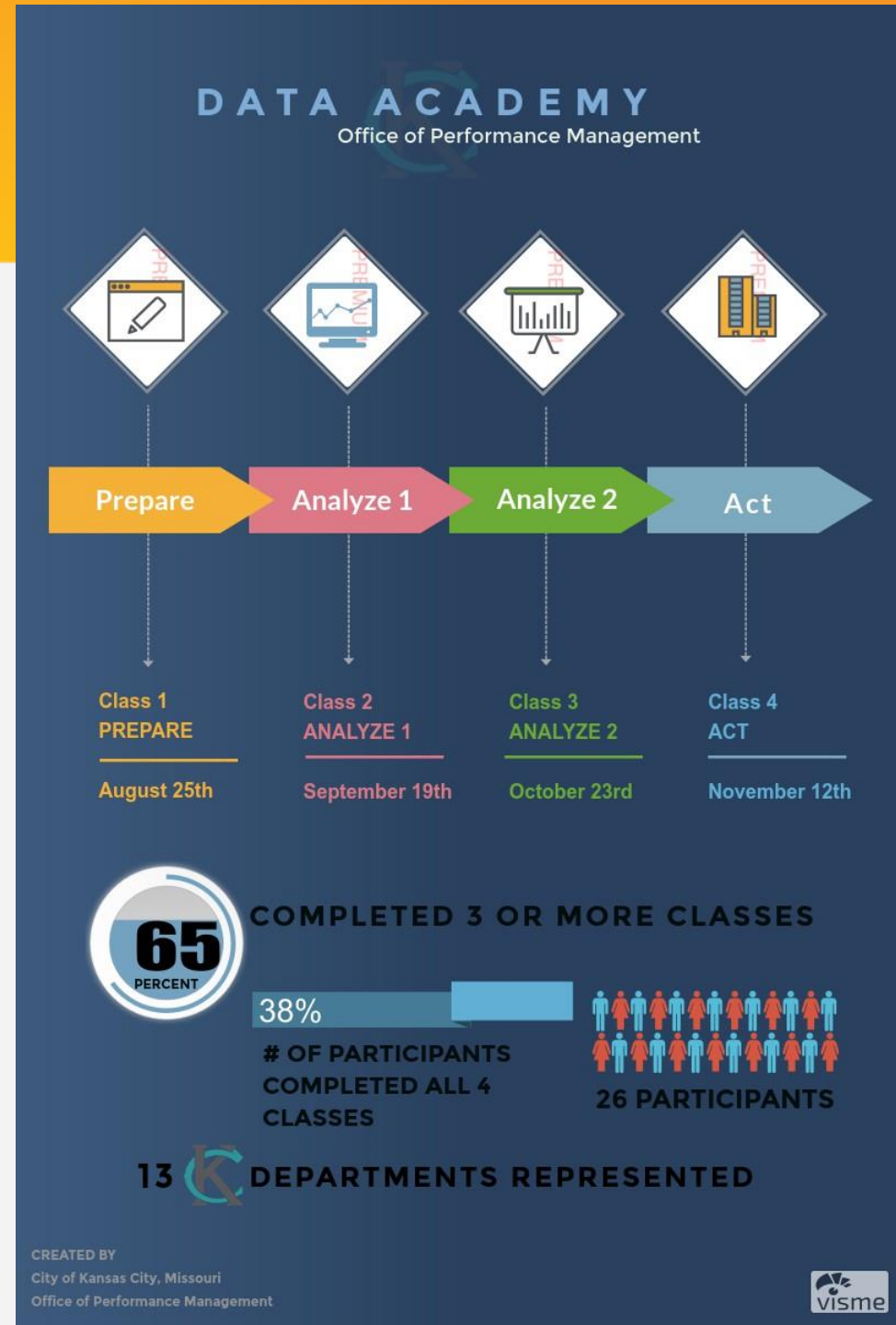


Table: When and Why to Use

What is it good for?

- Non-numerical presentations of data
- Mixed audiences who each want to see different elements within the data
- Presenting multiple units of measure
- Can shade for visual cues

From 11.1.16 Public Safety KCStat

Citizen Satisfaction with Efforts to Prevent Crime by Demographic Groups

Descriptors:	More Likely to be Satisfied	More Likely to be Dissatisfied
Own vs. Rent	Owners	Renters
Dwelling Type	Single Family	
Race/Ethnicity	White	Black/African American, Other
Household Income	30k-60K, 60K-100K, 100K+	Under 30K
Age	65+	18-24, 25-34, 35-44, 45-54, 55-64
Gender		Male
Council District	1 ST , 2 ND	3 RD , 4 TH , 5 TH
Have you Contacted 311?		Yes

Source: Citizen Survey FY2016

Example of Table with Shading

Infrastructure: Priorities by Council District

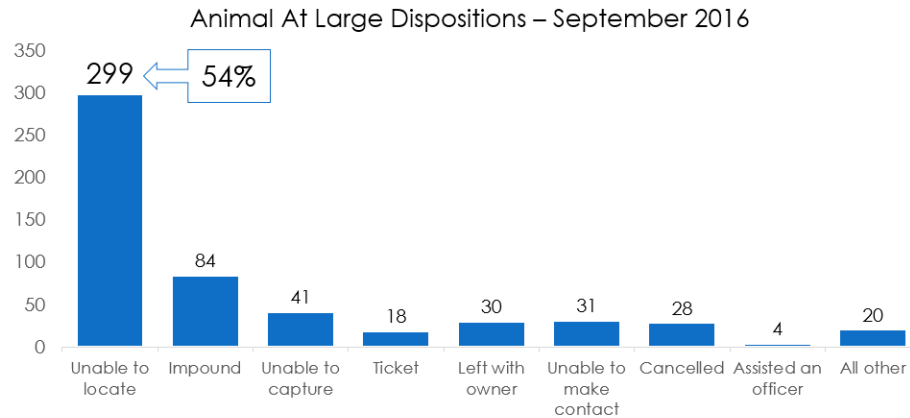
Question	Citywide	D1	D2	D3	D4	D5	D6
Maintenance of city streets	1	1	1	1	1	1	1
Condition of sidewalks in the city	2	4	3	4	2	5	2
Snow removal on residential streets	3	2	2	5	6	4	6
Maintenance of streets in your neighborhood	4	3	5	3	5	2	5
Condition of sidewalks in your neighborhood	5	5	4	2	4	3	3
On street bike infrastructure	6	6	6	6	3	7	4
Accessibility of streets/infrastructure for people with disabilities	7	8	9	7	7	6	7
Snow removal on major city streets	8	7	7	9	8	8	8
Adequacy of city street lighting	9	9	8	8	9	9	9
Maintenance of traffic signs & signals	10	10	10	10	10	10	10

Vertical Bar Graph (Column Chart): When and Why to Use

What is it good for?

- Time series
- Ranking
- Part to whole
- Distribution
- Comparison of nominal values
- Stacked column can show categories within categories, or as proportions (100% stacked)
- Virtually everything!

Outcomes for Animal At Large Calls

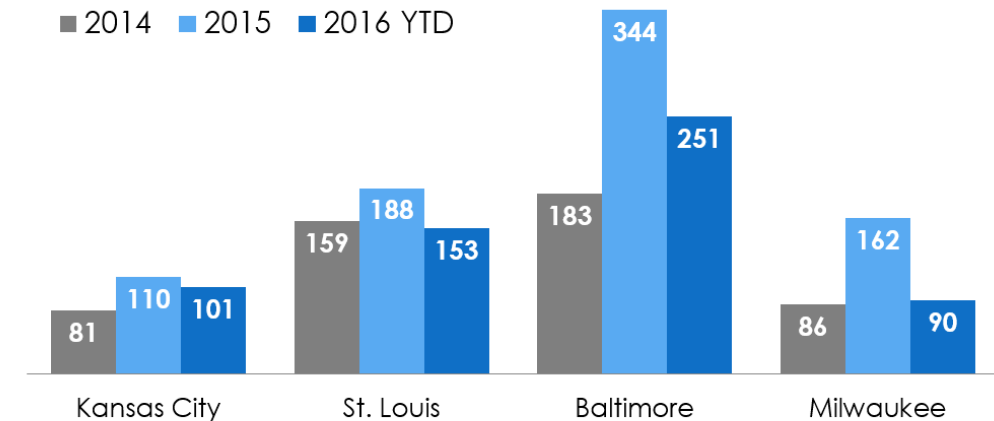


Source: KCPD (Tiberon System)

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*From 11.1.16
Public Safety
KCStat*

KCMO Homicide Comparison with Other Cities

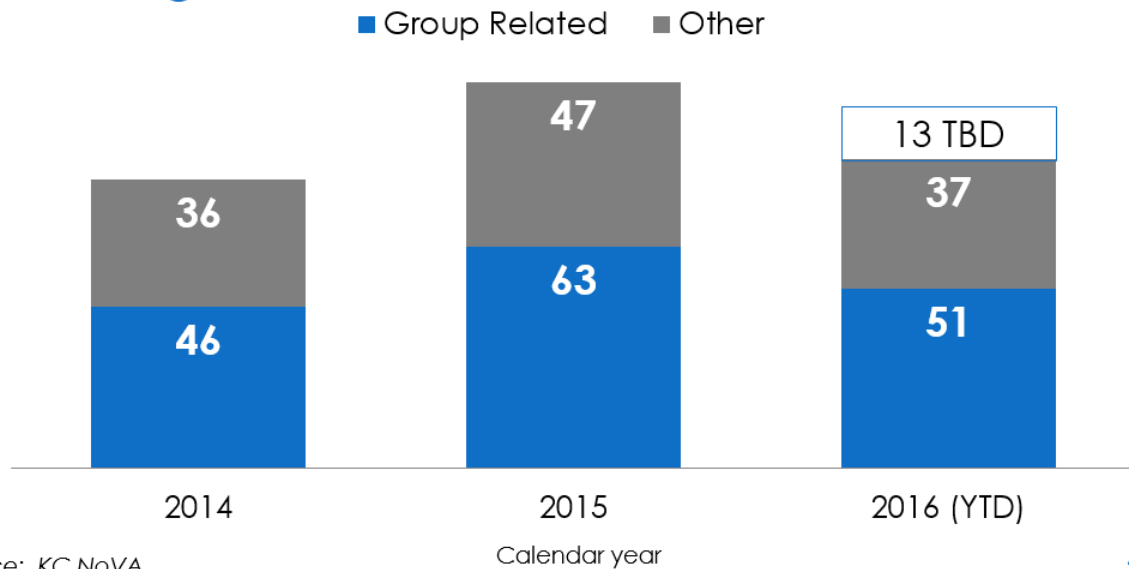


Source: KC NoVA

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Examples of Vertical Stacked Bar Charts

Homicides due to Group Related Violence

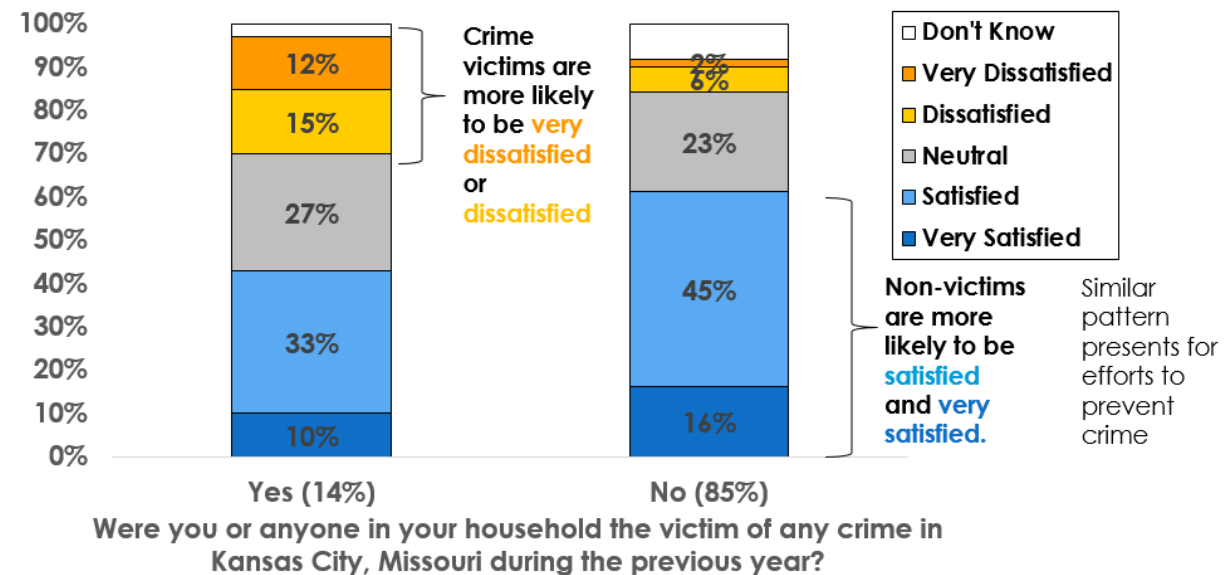


Source: KC NoVA

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From 11.1.16 Public Safety KCStat

Satisfaction with Effectiveness of Police Protection by Victims/Non-Victims of Crime



Source: Citizen Survey FY2016

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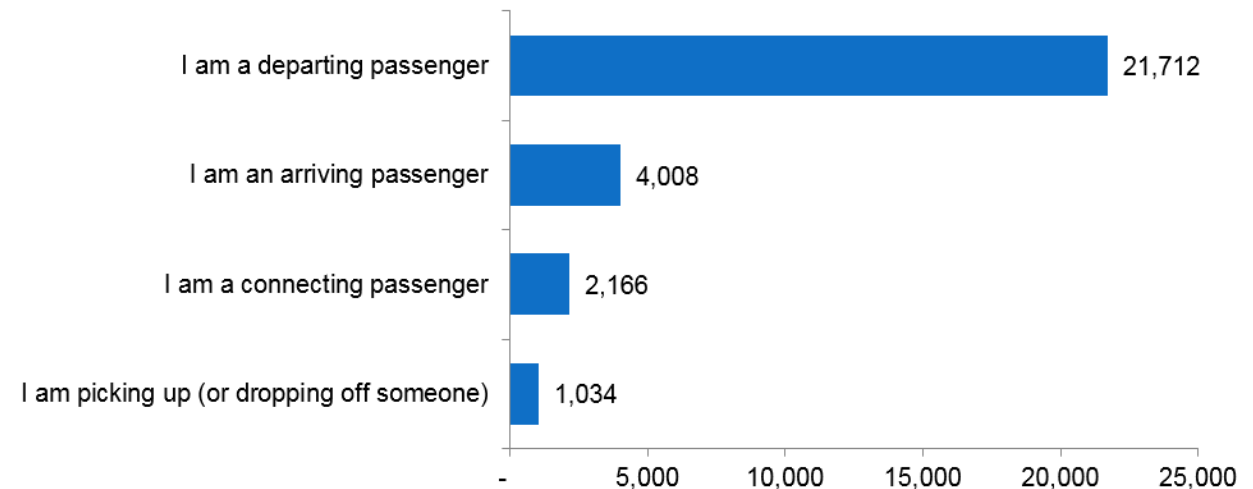
Horizontal Bar Graph (Bar Chart): When and Why to Use

What is it good for?

- Charts where labels are very long
- Ranking
- Part to whole
- Distribution
- Comparison of nominal values
- Stacked bar can show categories within categories, or as proportions (100% stacked)
- Almost as much as the vertical bar chart!

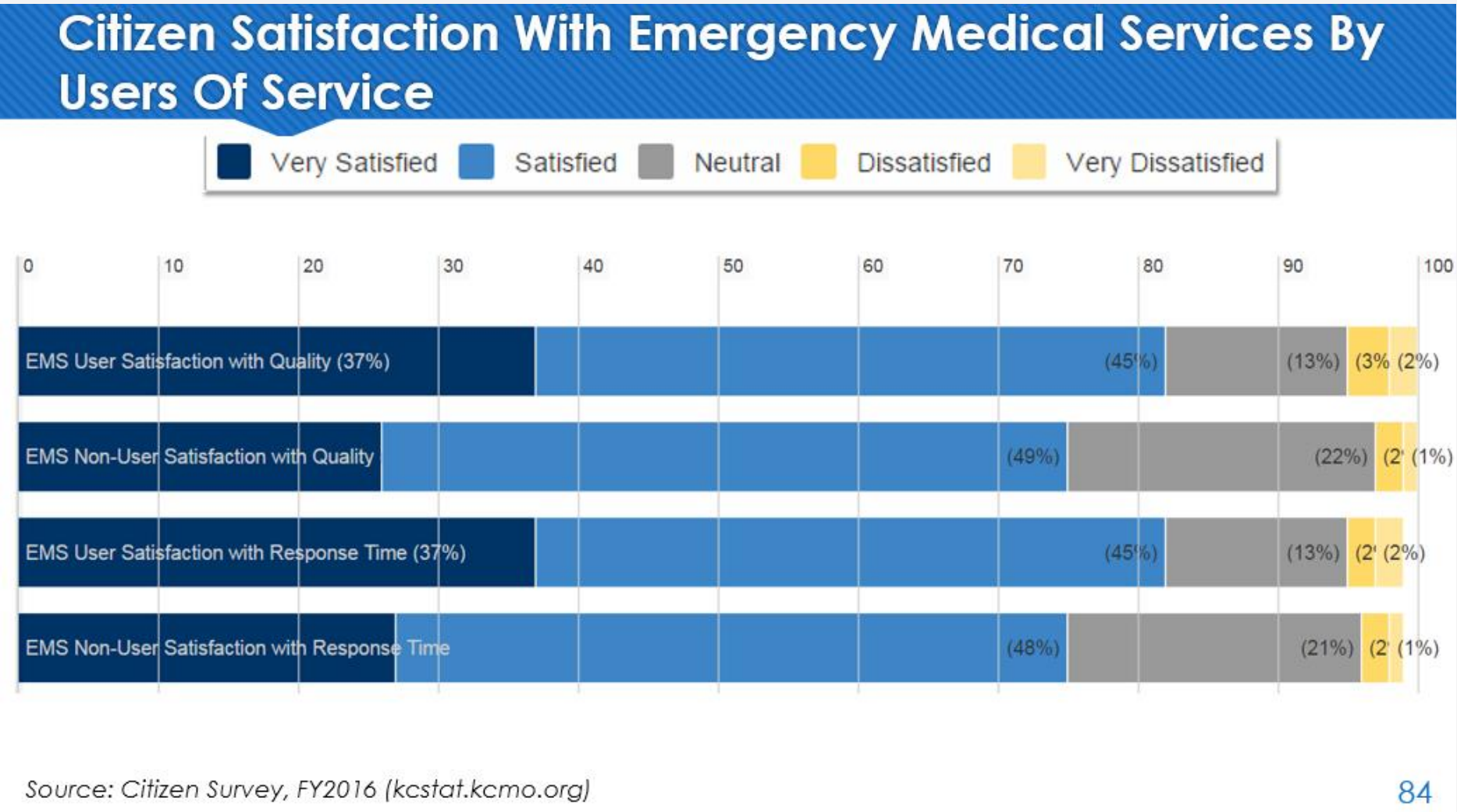
From 10.4.16 Planning, Zoning, and ED KCStat

Reason for Being at Airport



Source: Aviation Department

Example of Horizontal Stacked Bar Chart



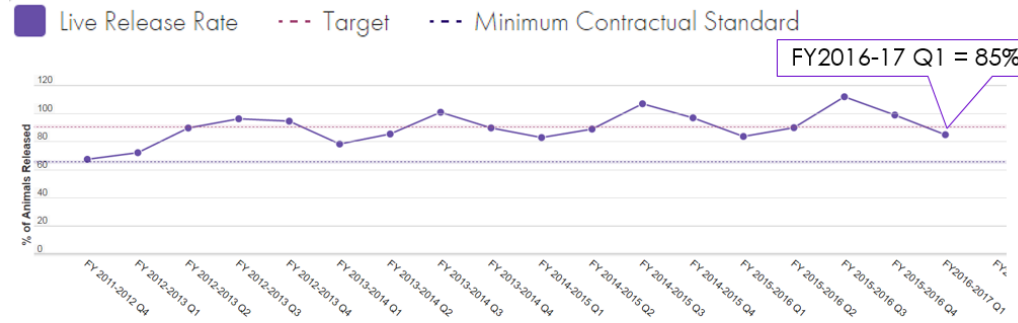
Line Graph: When and Why to Use

What is it good for?

- Time series
- Time series comparison between categories
- Comparing to a target

Animal Shelter Live Release Rate

KC Pet Project Goal = 90%
Contract Goal = 65%

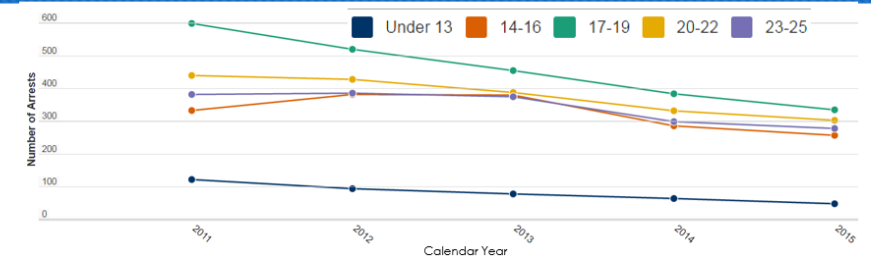


Source: Animal Health and Public Safety Division monthly report

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*From 11.1.16
Public Safety
KCStat*

Crimes Against Property by Youth (Arrested Offenders)

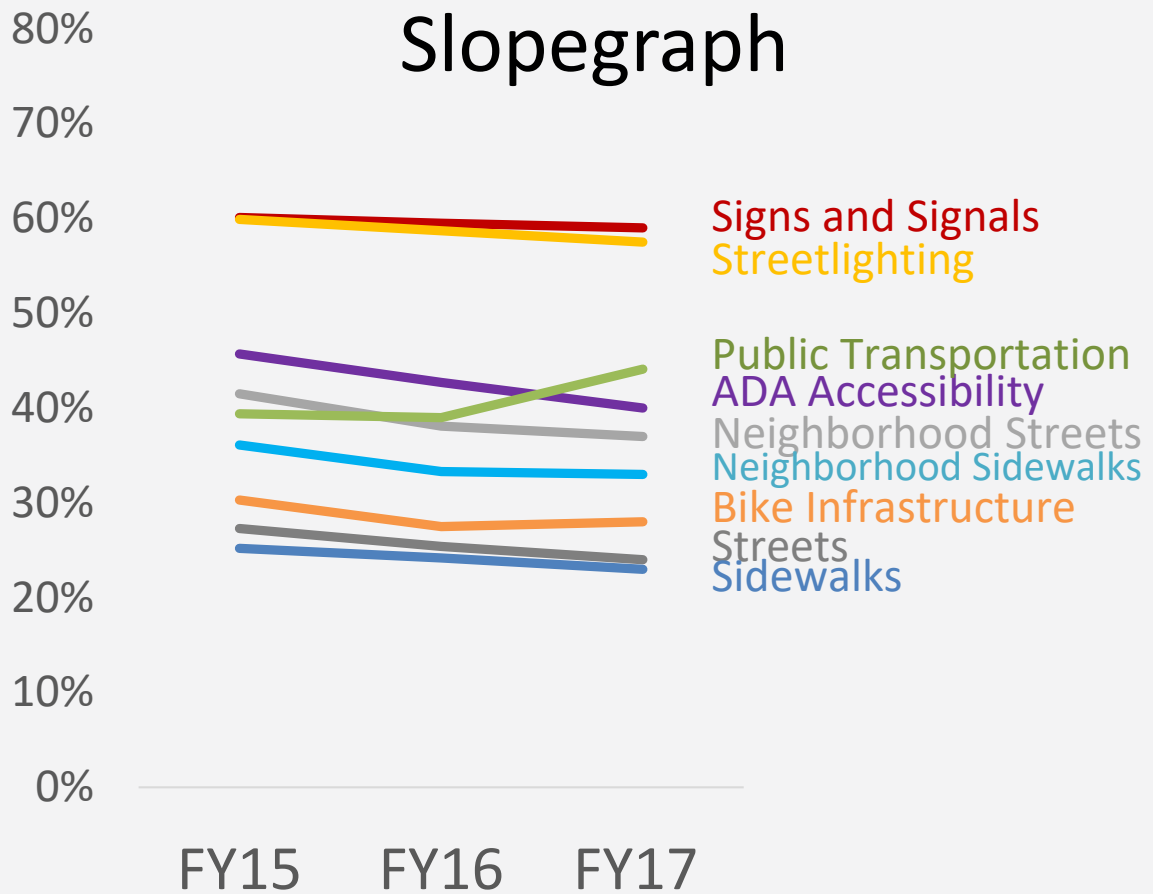


Age Group	2015 (Jan - Oct 2015)	2016 (Jan - Oct 2015)	% Change
Under 13	40	48	20%
14-16	201	178	-11%
17-19	269	271	1%
20-22	247	210	-15%
23-25	210	190	-10%
TOTAL	967	897	-7%

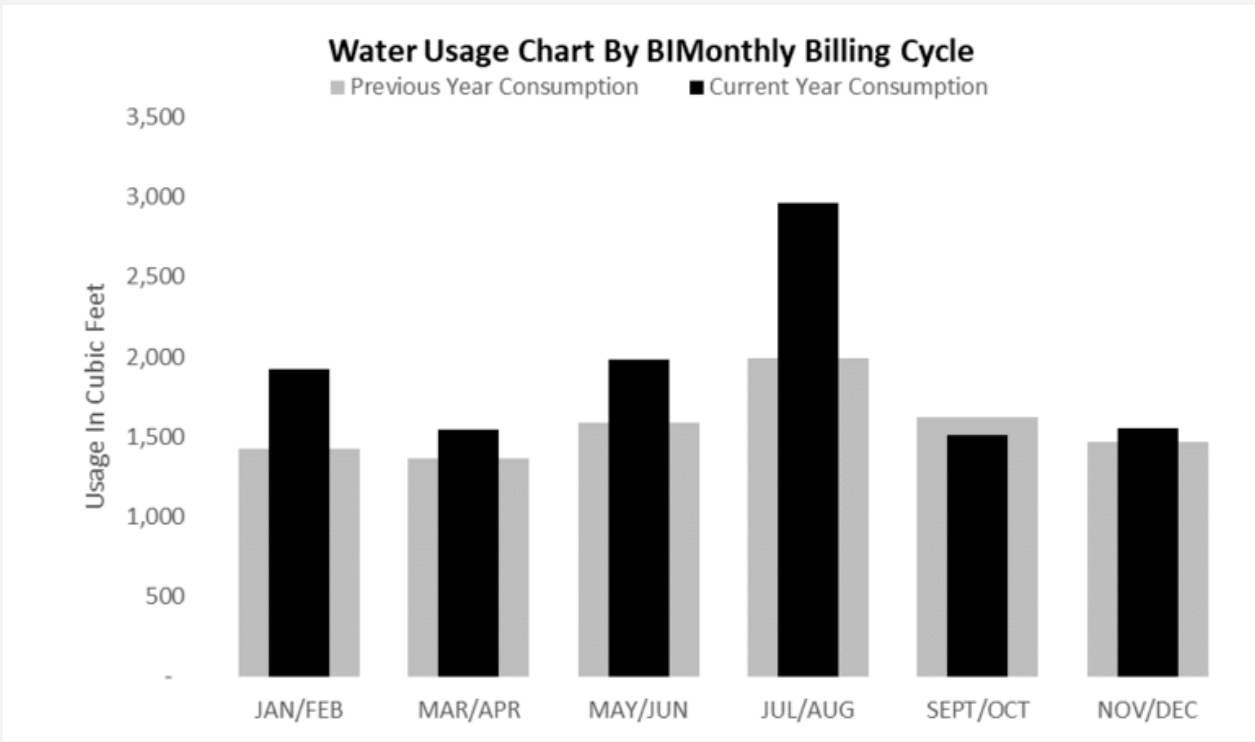
Source: KCPD

Other Visuals

Slopegraph



Bullet Graph



From 9.18.17 Infrastructure and Transportation KStat

<http://www.storytellingwithdata.com/blog/2017/5/2/5/the-bullet-graph>



Visuals to avoid

- Pie charts
- Donut charts
- 3-D charts
- Anything that is too complicated for your audience to understand

But Why?

All of these visuals rely on the human brain to interpret arcs or angles that are harder for them to handle.

The “How”: Selecting a Communication Method

- **Powerpoint** presentations are the most flexible and easy to create charts within, while also including other context, and can easily be shared.
- **Word** documents are good if you need a great deal of text narrative surrounding your visuals
- **Excel** spreadsheets can be difficult because it is tough to provide a flow or direction to the narrative
- As a rule of thumb, **assume that your document or presentation will need to stand on its own**, without you there
 - This requires attention to the level of detail: too much will overwhelm the story, but not enough will lose the story
 - One option: annotate slides

Affordable Housing At Risk in Next Five Years

1,140 units of affordable housing are expiring in the next five years in the Downtown area. This represents a 41% decline from the 2,759 units that are currently affordable, assuming no new units are added.

