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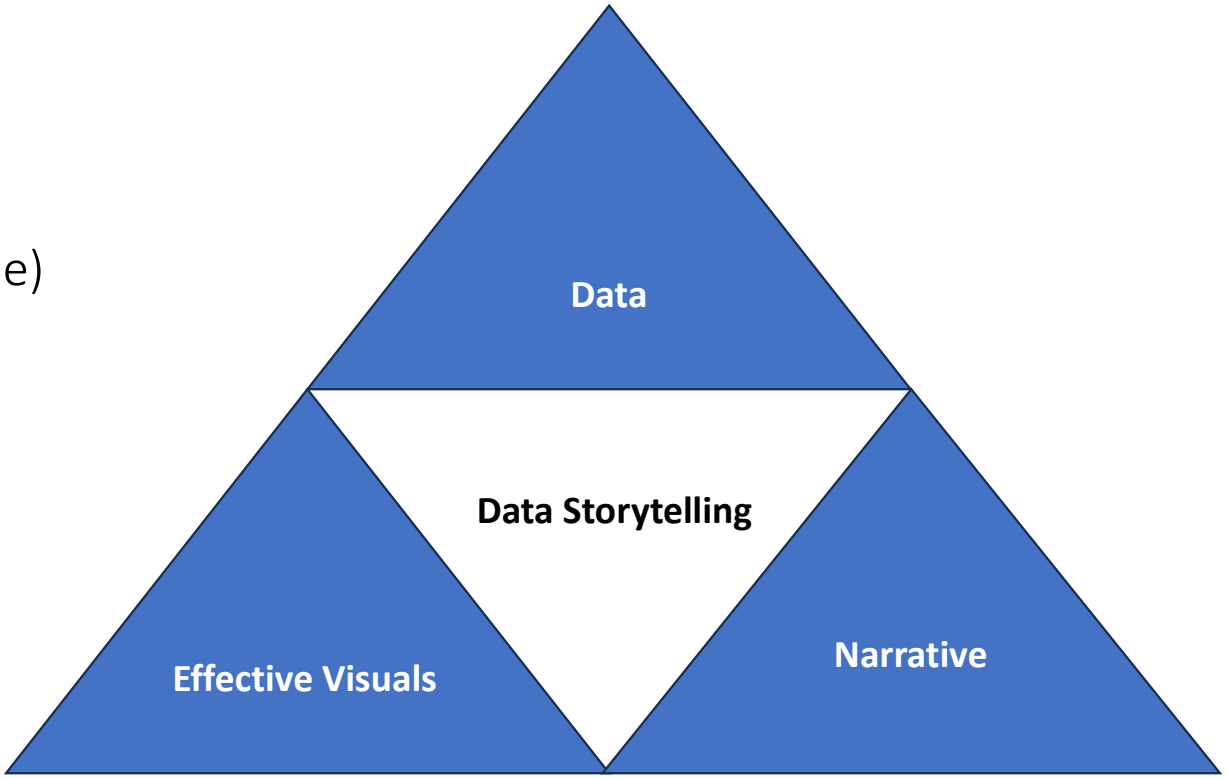
Data Visualization and Storytelling

What makes a good data story

Good Data (relevance/credible)
Effective Visuals
Narrative



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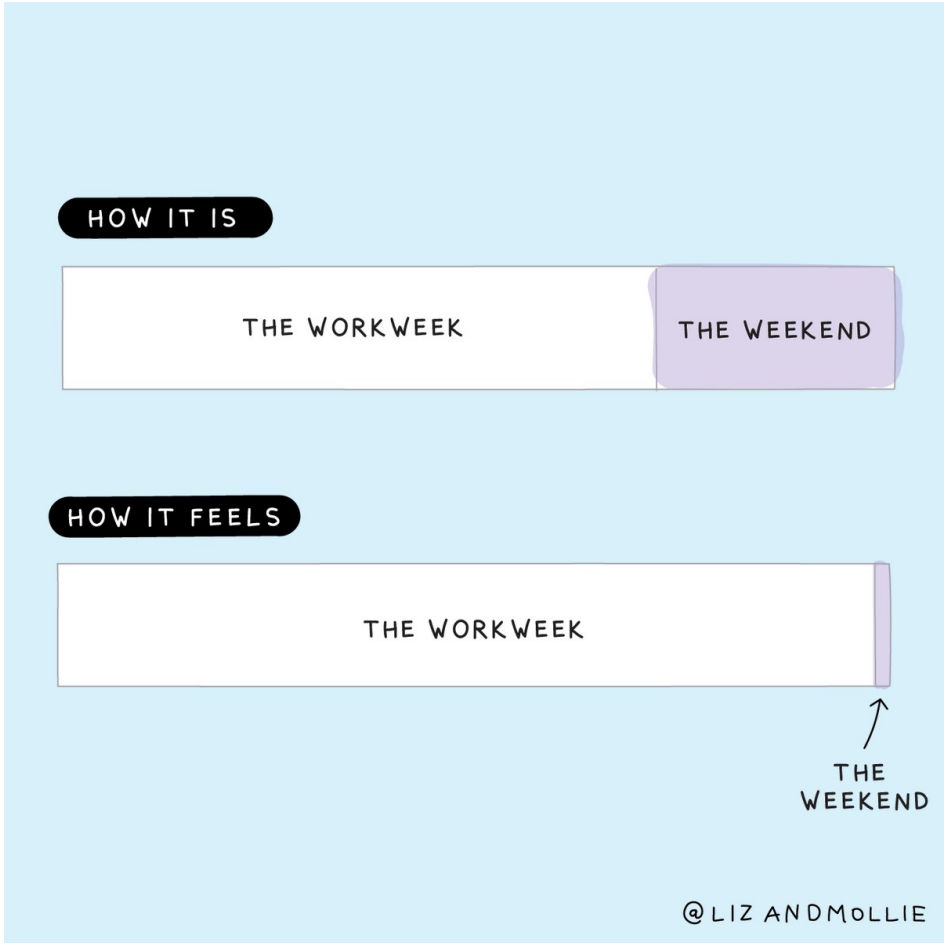

Source: Alyssa Fowers

Data & Presentation

Who is your Audience

Delivering Research Effectively

Visualization Pitfalls/Tips

Tools/Resources

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Who is Data Audience

Site Selectors
Media
Economic Developers
Workforce Board
Academic Researchers
Elected Officials
Teachers
Businesses
Lawyers
Students
Consultants
Graphic Designer
Marketing Department
Other Government Agencies

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Different Perspectives

Consider:
Understand audience bias
Accuracy vs. Timeliness
Confidentiality
Customer service focus
Explain economic concepts without jargon

Data & story reinforce one another
Help support or disprove with relevant examples

Trying to create visually appealing, well designed, audience focused and credible research – Positive for everyone

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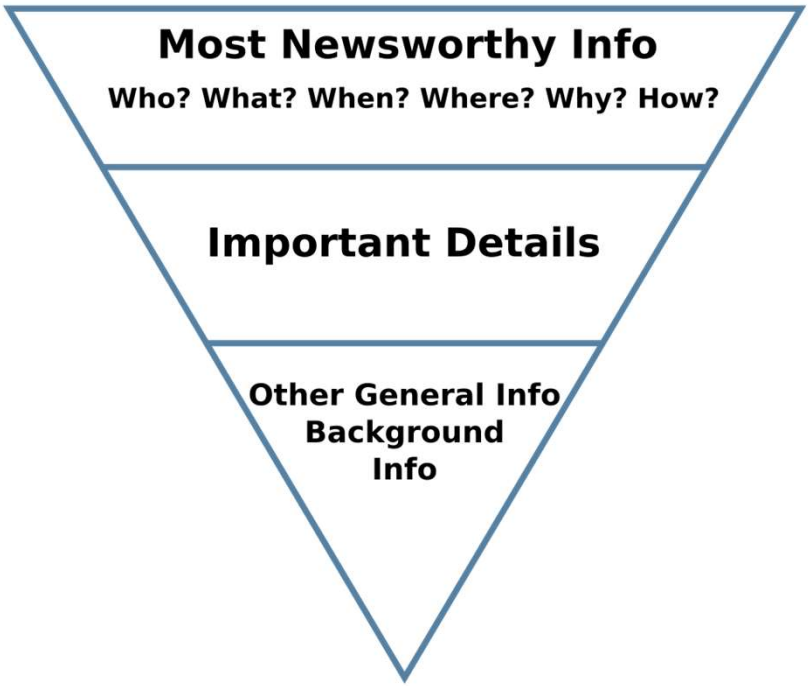
Data Storytelling forms

The Inverted Pyramid

Summary news lead or bottom-line up front



Source: https://en.wikipedia.org/wiki/Inverted_pyramid_(journalism)

Presenting Data and Information

Who is your Audience

Delivering Research Effectively

Visualization Pitfalls/Tips

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Research and Analysis Process

Develop an agreed upon set of facts (data) from which to make decisions or inform (persuade) i.e. tell story

1. Identify relevant data

    Do you understand the question/context
    Leading Data, Current, Lagging
    Data often needs context – Comparison with state

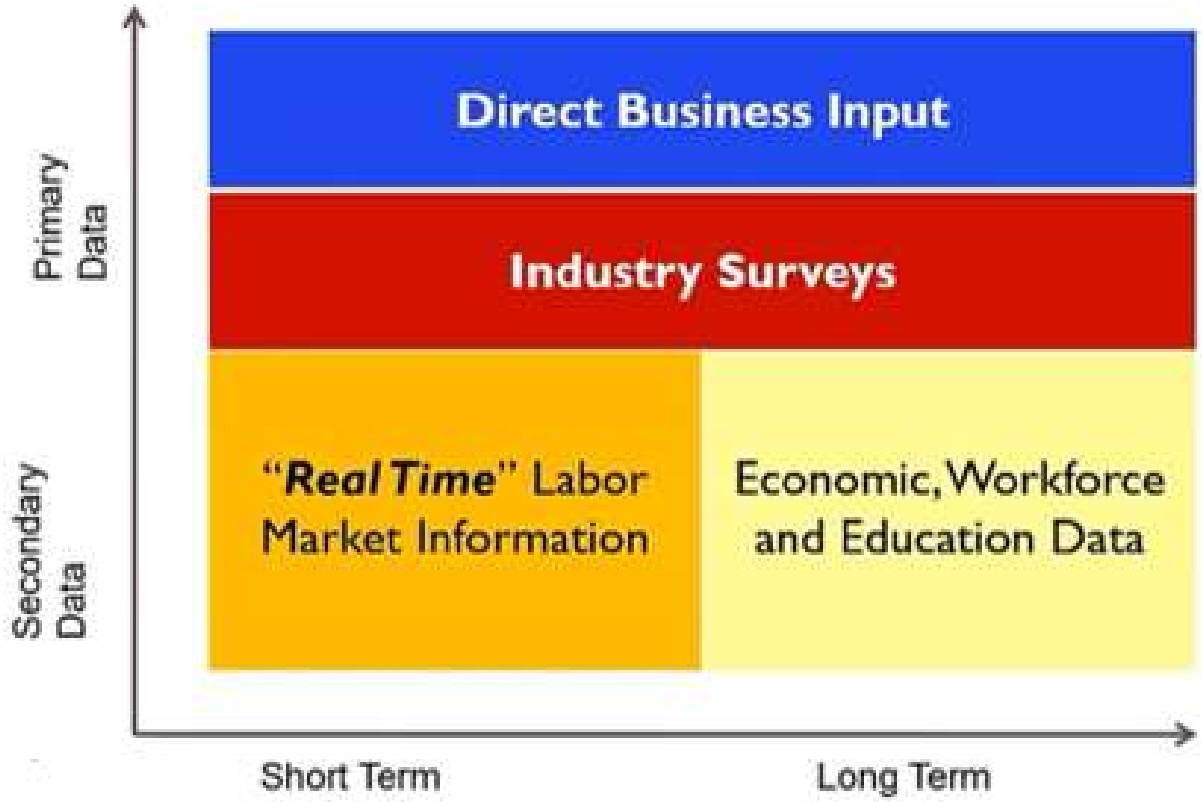
2. Interpreting and validating data

    Can you get data for appropriate geography or time period or group

3. Explaining Data

    Do you see patterns or key points?

Multiple Data Sources



Source: LMI

Lack of Data Standardization and Consistency

- Utilize a consistent data source whenever feasible to develop time-series analyses.
- Provide training to personnel on statistical methodologies.
- Refrain from employing non-standard or unfamiliar data sources for frequently requested data points.
- Enable comparisons with similar jurisdictions through standardized metrics and sources.
- Offer detailed information on sources, methodologies, definitions, and metrics utilized.
- When encountering disparities among multiple sources, present the range of data.

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Geographic Mismatch

- Supplement federal and state data with locally collected data
- Fill in missing data by interpolating from comparable geographic units.
- Cross-check data whenever feasible.

Datedness

- Subscribe to receive notifications of data releases from prominent federal and state statistical agencies.
- Establish a schedule for routine data collection and updates.
- Inform users that a referenced source is the most current available, even if the source itself is dated.

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Explaining Research

Lots of time on analysis but people only see final product

Need to explain (Tell a Story)

Why is it relevant or important

What does it say
What does it not say

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Resource (Analysis)

StatsAmerica http://www.statsamerica.org/ provides actionable data for economic developers to use in site requests, development metrics, grant writing and strategic planning.

DataUSA https://datausa.io/ Explore, map, compare, and download U.S. data

Census Reporter https://censusreporter.org/ provides useful facts about every place in America

Headwaters Economics https://headwaterseconomics.org/ Customize and download socioeconomic reports for U.S. communities, counties, and states

Colorado Labor Market Information Gateway
https://www.colmigateway.com/vosnet/lmi/default.aspx?plang=E

Colorado Demographer https://demography.dola.colorado.gov/

Colorado information marketplace https://data.colorado.gov/

St Louis FED – FRED https://fred.stlouisfed.org/ Download, graph, and track 824,000 US and international time series from 114 sources.

IPUMS (Integrated Public Use Microdata Series) IPUMS USA collects, preserves and harmonizes U.S. census microdata and provides easy access to this data with enhanced documentation.
https://usa.ipums.org/usa/

Presenting Data and Information

Who is your Audience

Delivering Research Effectively

Visualization Pitfalls/Tips

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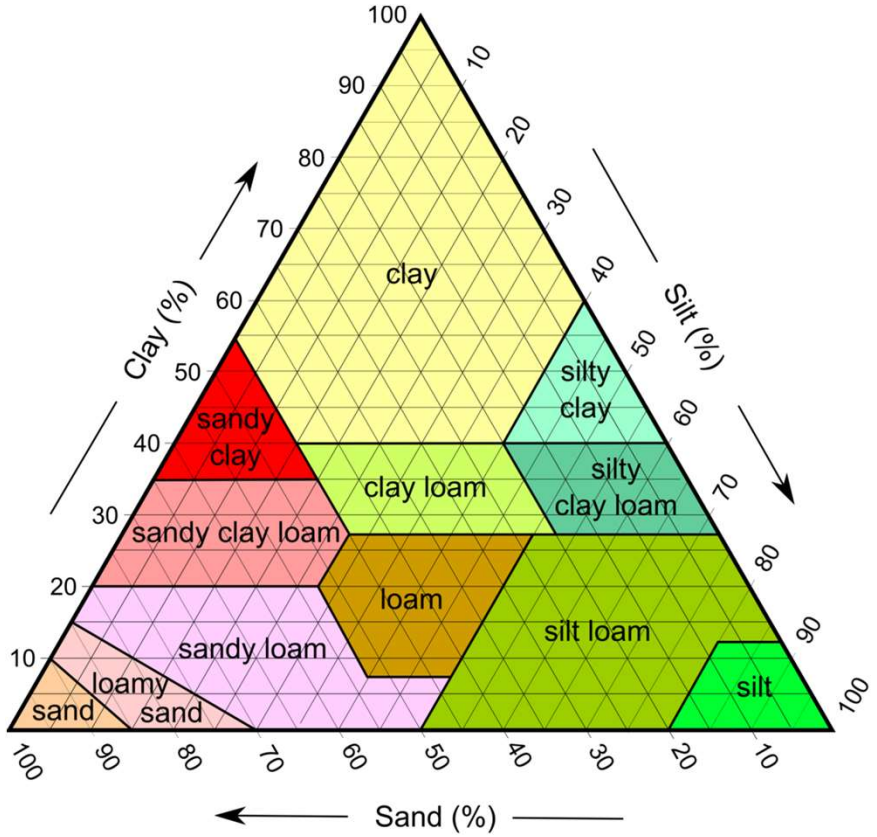
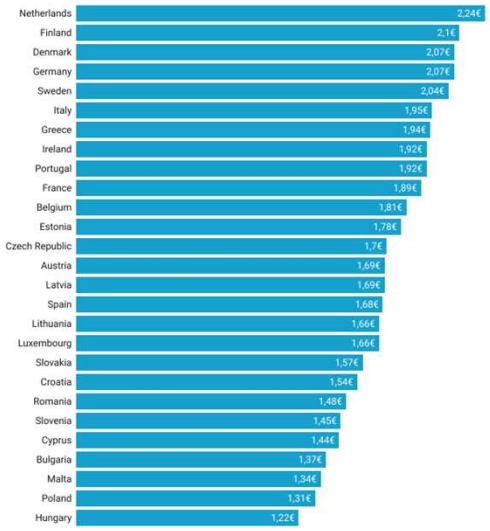
Choosing charts: the audience

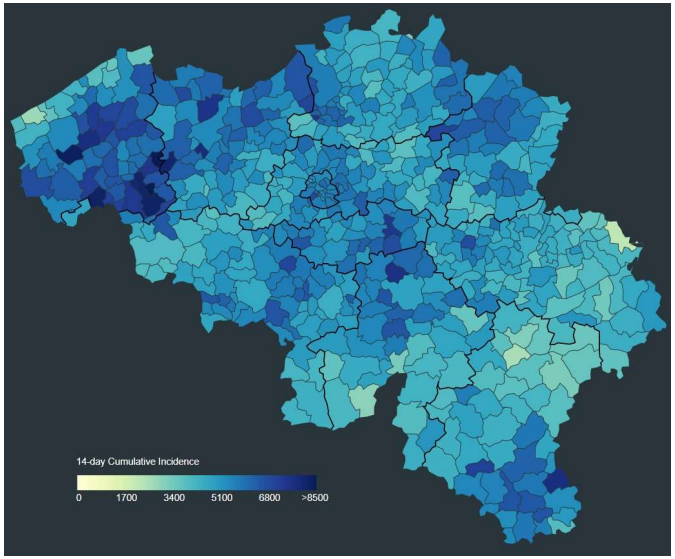


Source: usda/usda-soil-maps

Choosing charts: data types

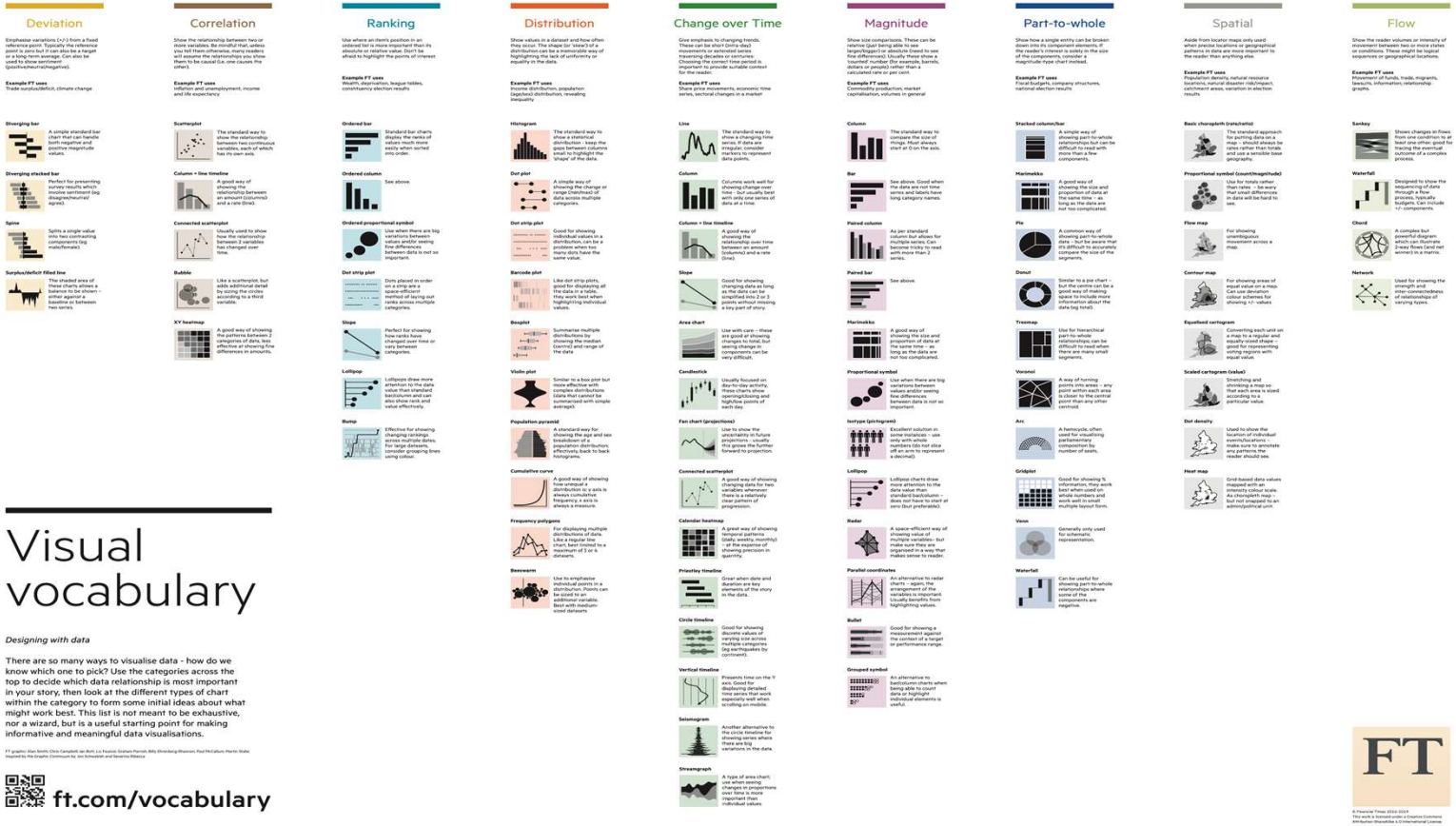
Data Types: Categoric, Numerical, relational, times-series, map



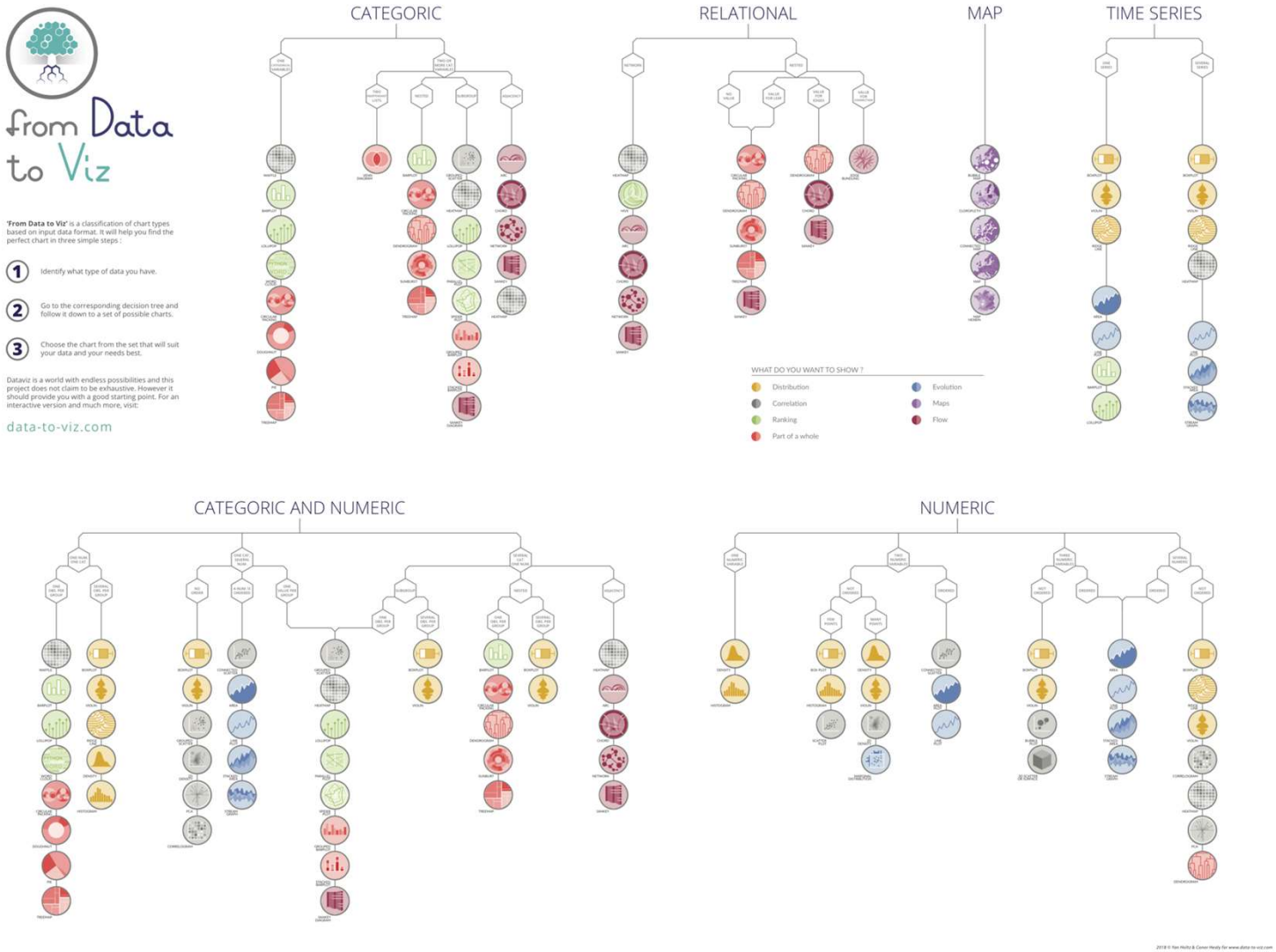


Source: Maarten Lambrechts, CC-BY 4.0; Mathias Leroy

Resource (Charts)



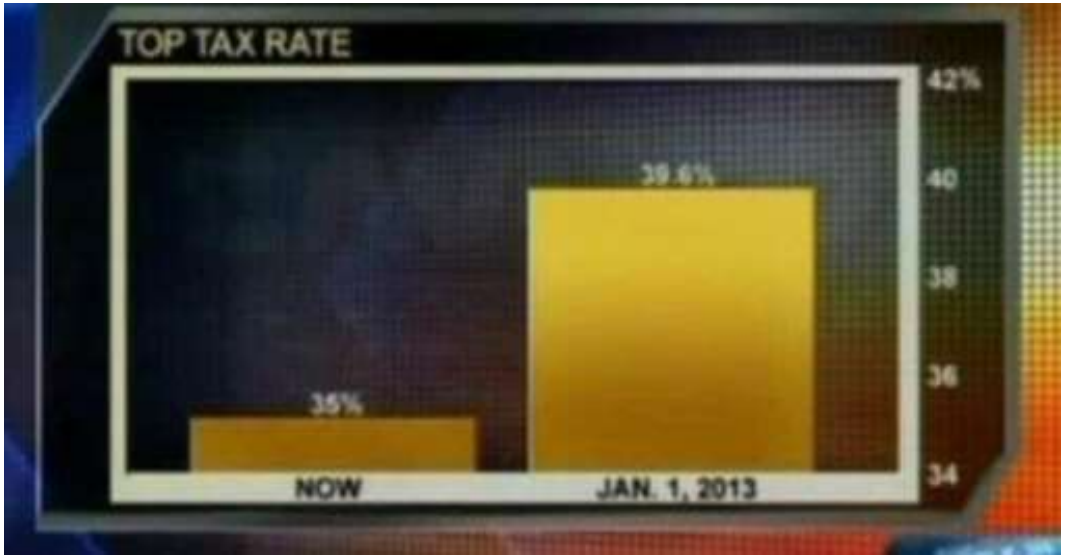
Source: https://www.ft.com/content/c7bb24c9-964d-479f-ba24-03a2b2df6e85

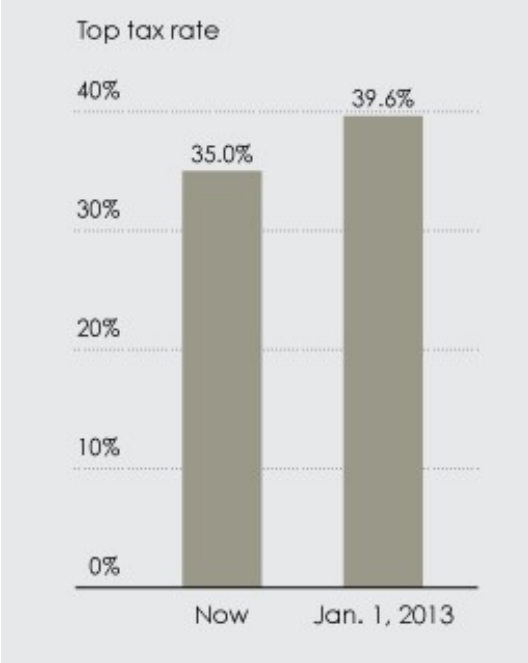


Source: https://www.data-to-viz.com/#explore

Example Pitfall Scaling

Y-axis used on line/bar charts should always start at zero

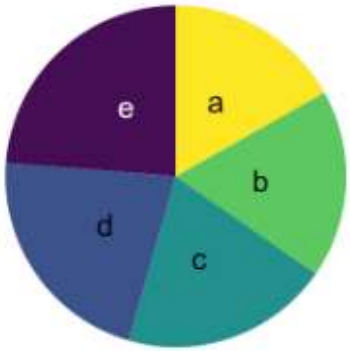


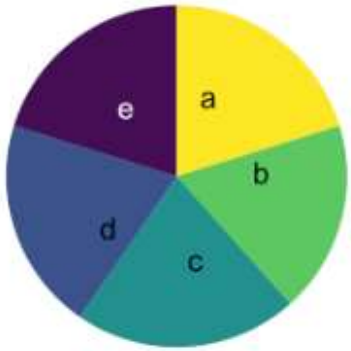


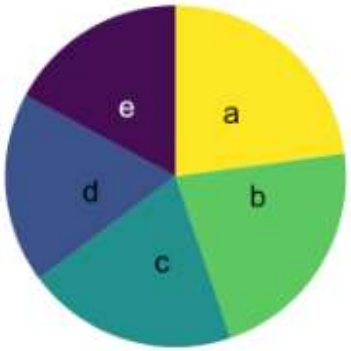
Source: https://www.lrs.org/2020/06/10/visualizing-data-manipulating-the-y-axis/

Example Pitfall Pie Charts

Pie charts must be avoided

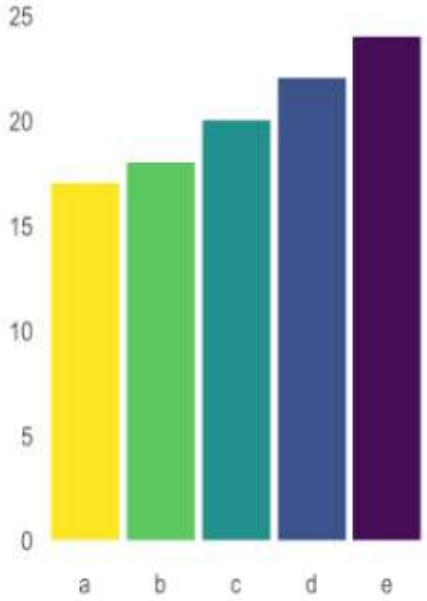


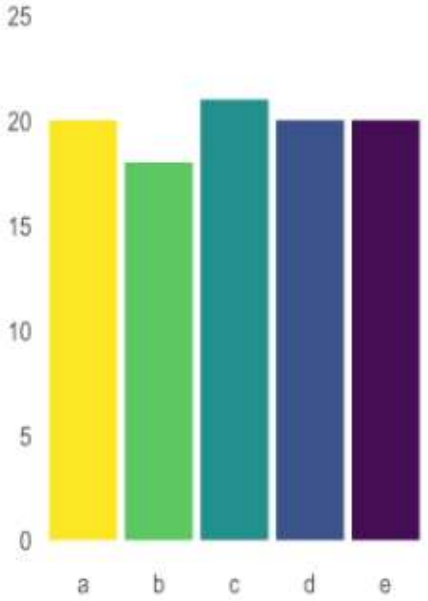


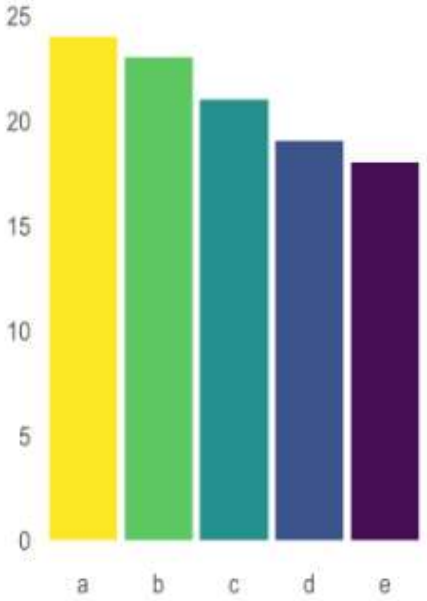


Source: https://www.data-to-viz.com/caveat/pie.html

Example Pitfall Pie Charts







Source: https://www.data-to-viz.com/caveat/pie.html

Example Pitfall Statistics

Small sample size effect

This effect is seen in many fields: cities or regions with small populations tend to show more extreme (very high and very low) numbers. Rare events can swing numbers significantly up or down because of the small population.

Percentages versus percentage points

To avoid any misunderstanding about the size of an effect or of a change in values, make sure to call the result of a simple subtraction of percentages a difference in percentage points.

Ecological fallacy

There is a negative relationship between a state's degree of education and its poverty rate. The ecological fallacy occurred when some people assumed that rising education levels would inevitably lower poverty rates. In truth, the statistics simply revealed that states with greater levels of education had lower poverty rates as a group than states with lower levels of education. This study did not investigate the individual-level association between education and poverty, nor did it evaluate other potential factors that may be contributing to poverty rates.

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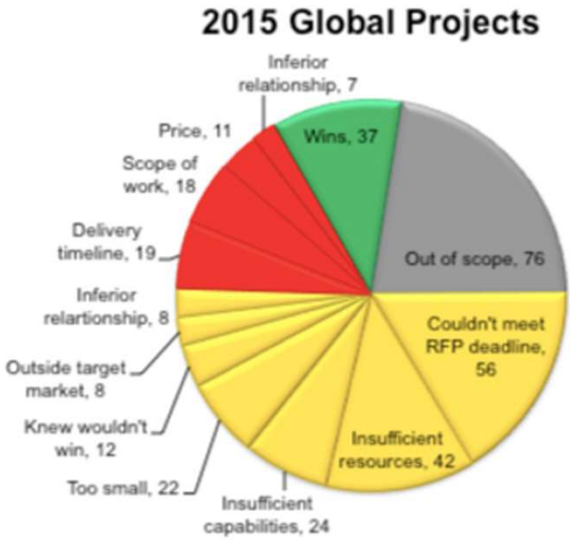
Example Bring it all together

BEFORE: SHOWING DATA

Global Competitive Summary



Global Competitive Summary (1/1/2015-12/31/2015)	
	Global
Total Projects	340
In Scope	264
Proposals	92
Wins	37

Source: https://www.storytellingwithdata.com/

Example Bring it all together

Source: https://www.storytellingwithdata.com/

Resource (Data Viz Tools)

Tableau offers robust tools for data storytellers, and this version is free, just note that everything you create is publicly visible. “Easily create stunning interactive graphs, maps, and live dashboards in minutes on our free platform. No coding required. Connect to data in a variety of formats like Excel, CSV, and Google Sheets.” Explore and share with a global community of creators.
https://public.tableau.com/s/

Visualize Free is a free cloud-hosted, zero-client app for data visualization and analytics. Simply upload your spreadsheet data and drag-and-drop to create visualization dashboards with built-in interactivity.
https://www.visualizefree.com/

Create charts, maps and tables with Datawrapper, no coding required. Datawrapper focuses on mobile-responsiveness and ease of use to get more people visualizing.

https://www.datawrapper.de/

Practical Tips

•Know Your Audience: Tailor visualizations to the preferences and expertise of your audience

•Choose the Right Tool/chart: Select visualization tools based on the complexity of the data and desired outcomes

•Tell a Story: Craft narratives around the data to engage and captivate your audience

•Rip-off and Duplicate, Borrow and Educate, Learn and Create: Continuously refine visualizations based on feedback and evolving data insights

•Embrace Creativity: Experiment with innovative visualization techniques to convey data-driven stories in unique ways

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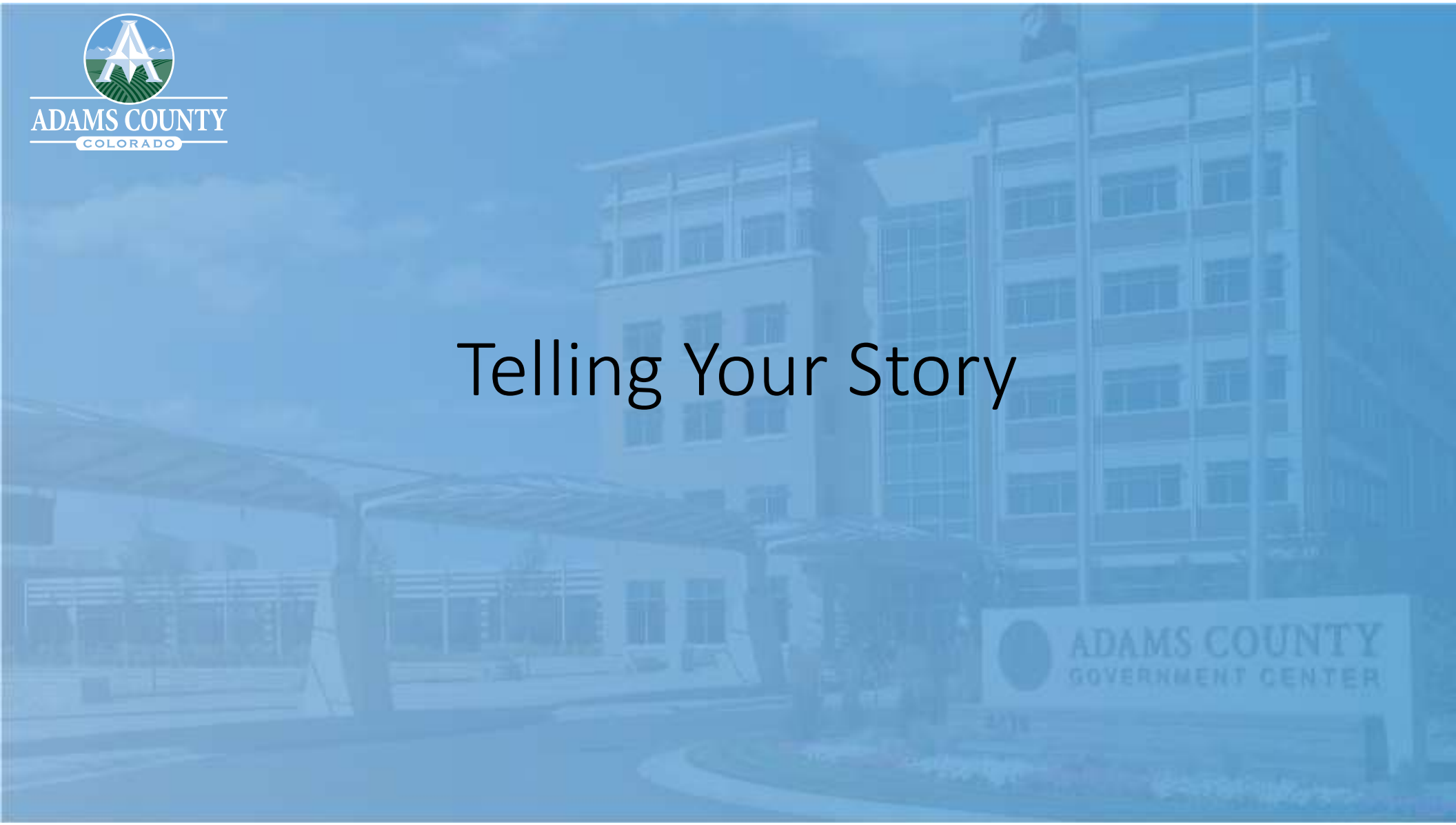

Telling Your Story

Benefits of Telling Your Story

- Report measurable outcomes
- Show return on investment
- Highlight key projects
- Educate your audience on “what is economic development?”
- Build support for future projects and initiatives

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Getting Started

- Who is your audience?
- What information are your trying to convey?
- What do you want to tell them vs. what do they want to hear?
- Format?
- Frequency?

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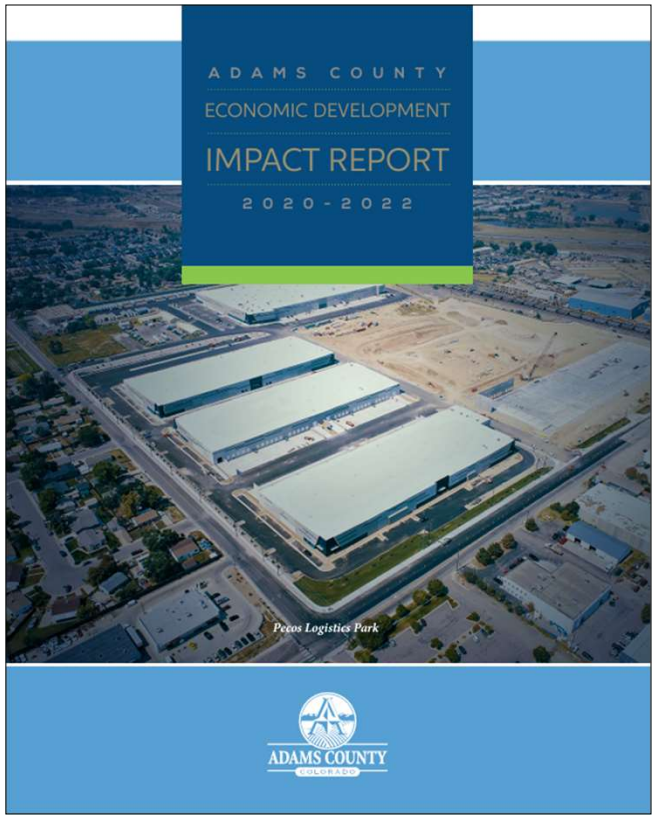
Impact Report Example

Who is your audience?
- Internal audience/stakeholders/commissioners

What information are your trying to convey?
- Projects, impacts, results of last several years

Format?
- Digital pdf and printed booklet

Frequency?
- Annual impact report



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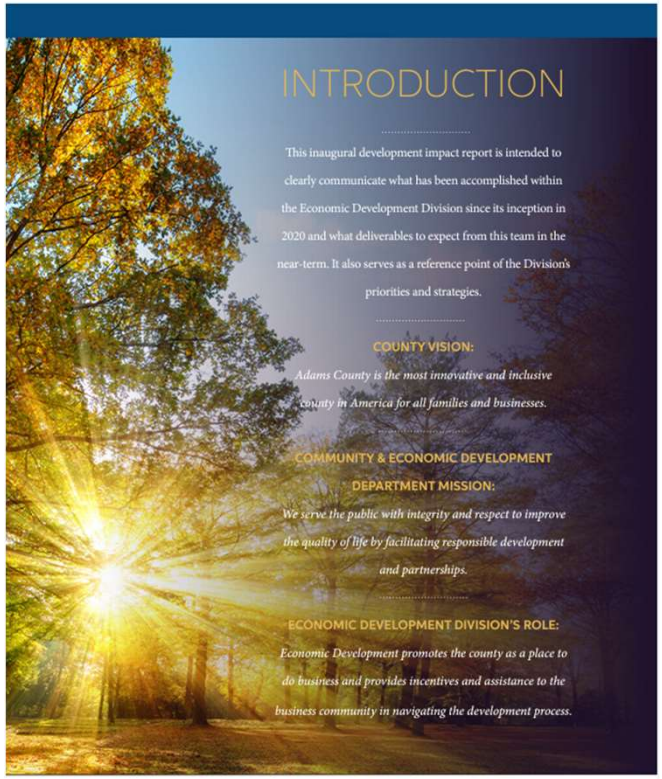
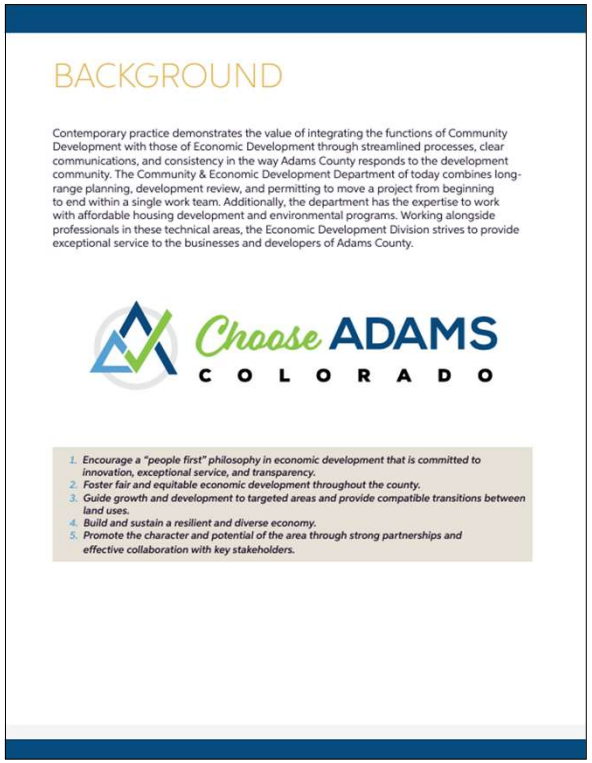
Setting the Tone

- Letter from Director?
- Vision/Mission
- Organizational goals
- Imagery
  - Photos
  - Icons
  - Charts





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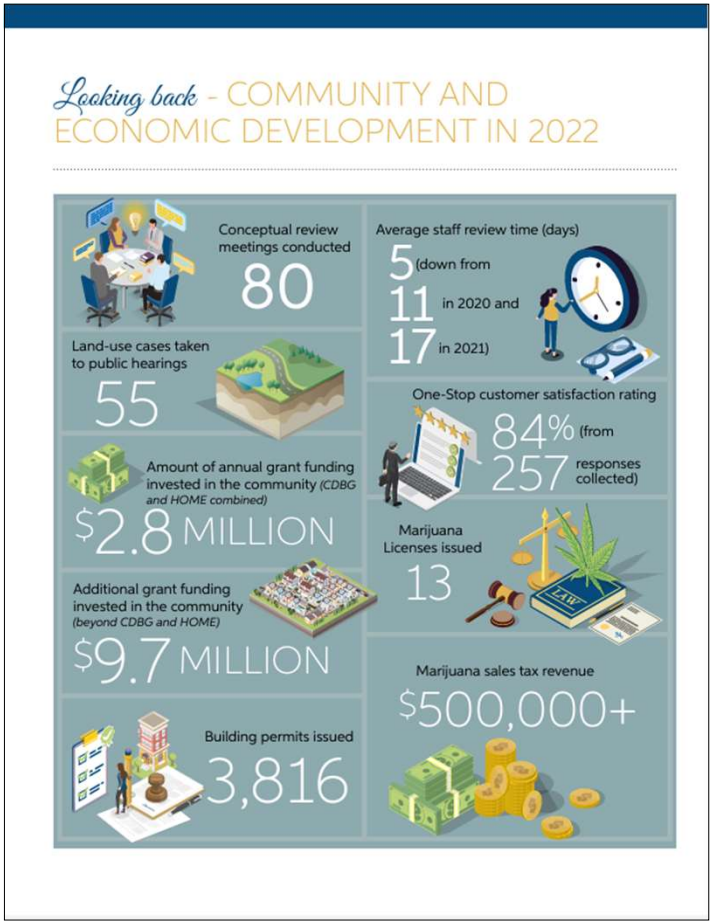
Information to Include

- Major accomplishments
- Incentives executed
- Development projects
- Success stories
- Key data and stats
- What is coming next
- Contact information



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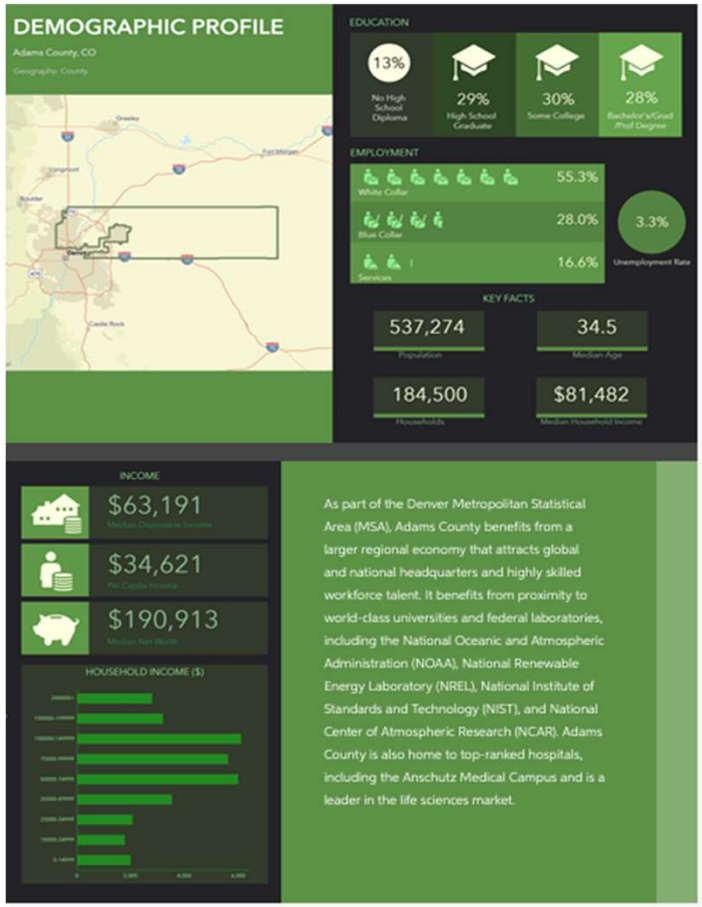
Tips and Tricks

- Get “inspired” by other reports
  - Even if not ED reports
- Use tools that tell the story for you >>
- Collect your information throughout the year
  - Weekly/monthly/quarterly reports
  - Social media
  - Newsletters/media releases
- Stretch the story – Prost example



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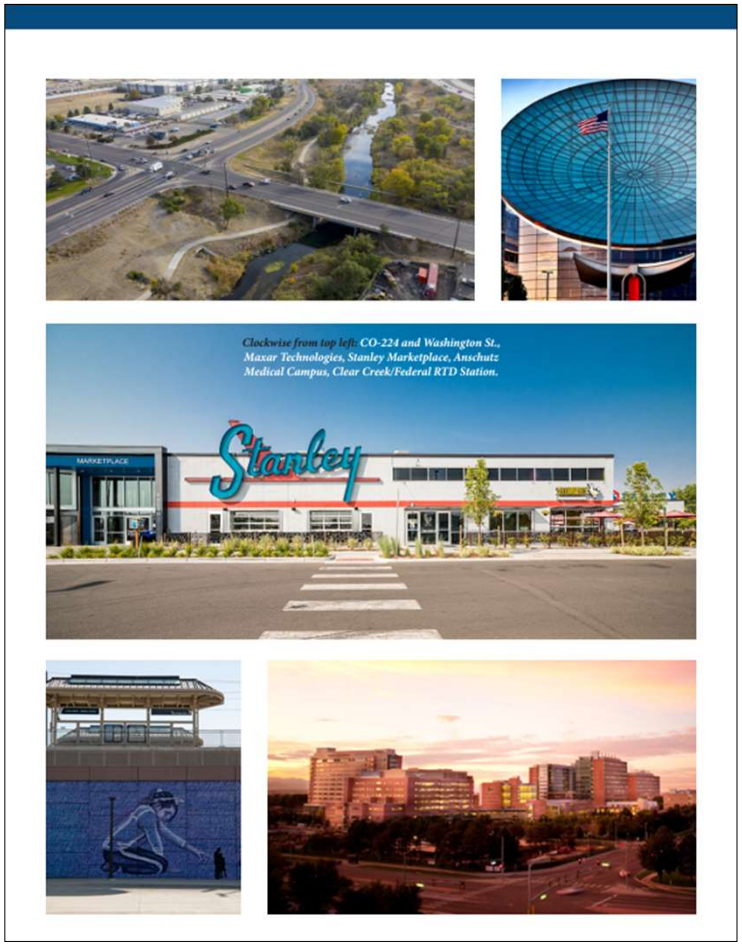
More Tips and Tricks

- Use free platforms to help with design
  - Canva (design)
  - Piktochart (infographics)
  - Blendicons (icons)

- Have your partners/businesses submit photos

- Repurpose your content
  - Social media
  - Speeches
  - Outreach



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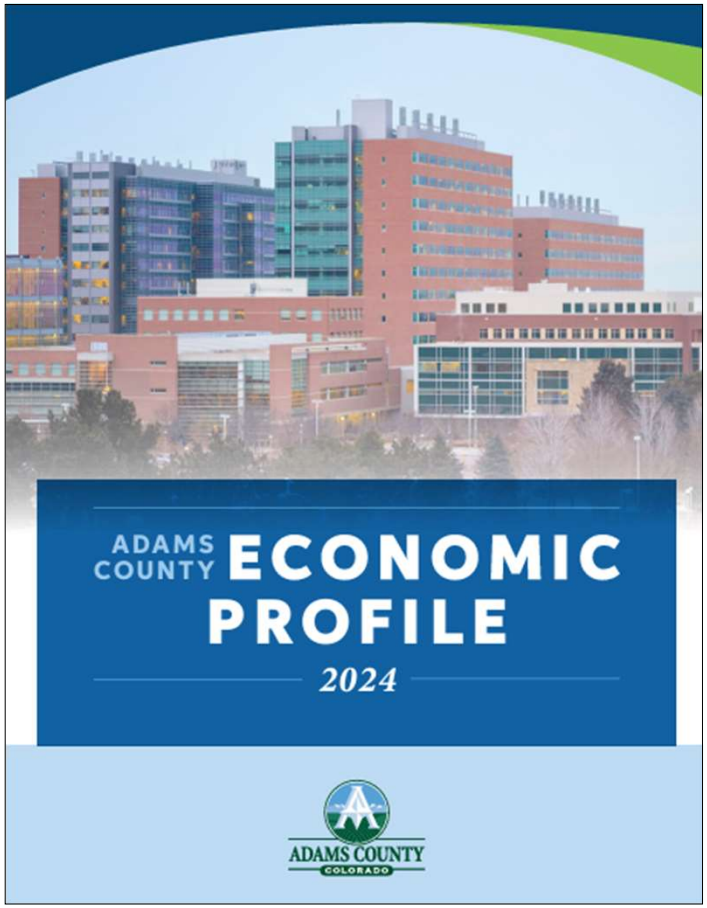
Profile Example

Who is your audience?
- External audience/site selectors

What information are your trying to convey?
- Data, demographics, differentiators

Format?
- Digital pdf and printed booklet

Frequency?
- Annual profile



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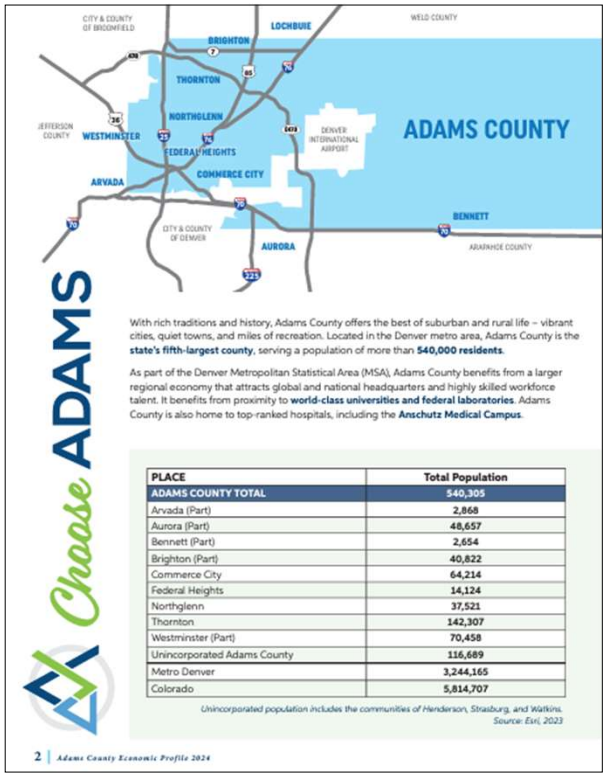
Profile Example

Consider your audience

- External audience/site selectors
- Maps
- Comparative data
- Calling out differentiators



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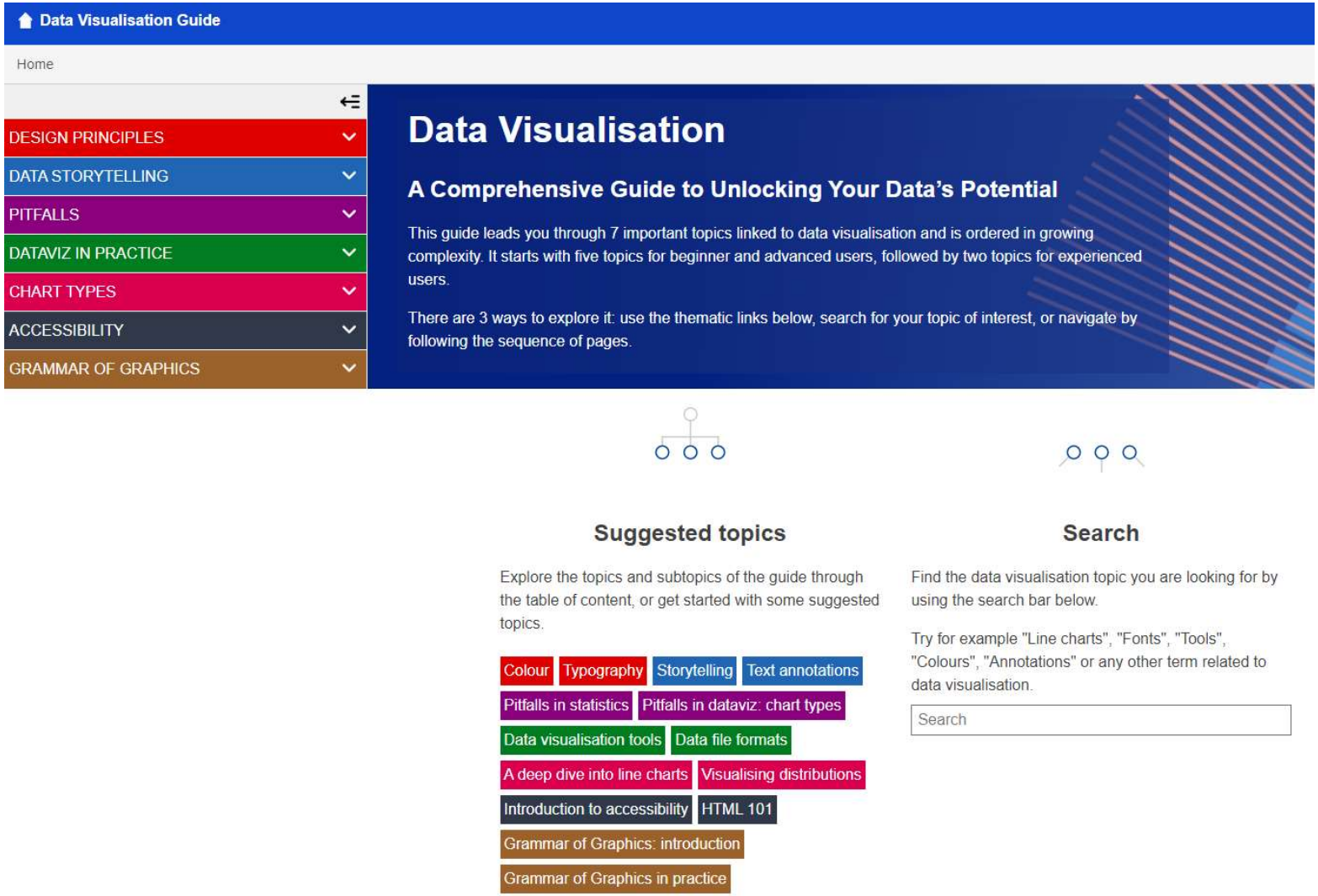
Resources (cont.)



Source: https://data.europa.eu/apps/data-visualisation-guide/

Dashboards

Attribute	Snapshot	Monitoring
Data	Static (point in time such as census count)	Fluctuating (updates intermittently or regularly)
Viewing Frequency	Once	Often
Purpose	Information Explanation Persuasion Analysis	Information Status Performance Progress Analysis
Style	Colors can be used to support branding or storytelling. This type of dashboard can be embedded to add context	A muted color scheme that reserves bold colors for highlighting data of interest or concern on both maps and charts works best

Source: ESRI

Books

Darrell Huff - How to Lie with Statistics

Edward Tufte – The Visual Display of Quantitative Information

Podcast

https://dataviztoday.com/

EDCC Knowledge Vault

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What did we not cover

Maps

Inclusive Design

Accessibility

AI

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