

# A Guide to Incorporating Reader-Friendly Visual Elements in

**Reporting** *Supplement to “Using Visual Elements in Reports” presented on 3-15-17 by Rebecca Brinkley, Oregon Secretary of State, Audits Division*

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## About this guide

This guide was created by staff at the Oregon Audits Division as a tool to help auditors include visual elements in the reporting writing process. As such, much of it reflects that perspective and includes examples from published audits.

## Why is including visuals important to my audit report?

At the Oregon Audits Division, we have three primary audiences: the agency under audit, the legislature, and the public. We have an obligation to communicate our findings to our audience in ways they can understand. Effective data presentation can play a strong role in audit reports. By presenting data visually in more user-friendly ways, we can reach lawmakers and the public in a timely manner to inform decisions and ensure audit topics are of importance. In doing so, we can further the impact of our findings. How you present information can impact interpretation, or misinterpretation.

**Visuals help readers understand the information** you are presenting to them.

- Most people are visual thinkers, with 30% strongly thinking in pictures and 45% using both pictures and words in their thinking. Only 25% think exclusively in words. ([Linda Kreger Silverman, 2005](#))
- Visuals can help engage your reader, and help them to connect with your material. Visuals enhance retrieval and increase retention by increasing the likelihood the information associated with the image(s) will be remembered ([Kouyoumdjian, 2012](#)).
- Visuals can enhance your readers' ability to remember the material, and decrease the time it takes your readers to learn or comprehend the material ([Kouyoumdjian, 2012](#)).
- Repetition of some graphic elements adds unity to the piece, **makes work more memorable** ([Evergreen, 2013](#)).
- "Multimode learning increases chance at storage of info in long-term memory because it eases cognitive load of body text. Choose pictures or graphics related to your topic. Graphics include, but shouldn't be limited to, tables and charts" ([Evergreen, 2013](#)).



*"... by retrieving a visual cue presented on the pages of a book or on the slides of a lecture presentation, a learner is able to accurately retrieve the content associated with the visual"*  
([Kouyoumdjian, 2012](#)).

**Effective visuals are extremely powerful when used correctly to communicate an appropriate message**

- Our brains process visual information [60,000 times faster than text](#)
- 90% of the information transmitted to the brain is visual

- 70% of your sensory receptors are in your eyes
- 50% of your brain is active in visual processing
- [A 1995 GAO report](#) found costly federal program evaluations were not circulated or used, despite the high profile of the agencies being evaluated. The evaluations, GAO concluded, were not organized and communicated effectively, nor did they reach the right people in an easily-digestible form.



## Visuals should....

- Engage the reader
- Help tell the story
- Convey meaning
- Reinforce and/ clarify ideas

*If they don't do one of the above, you may want to reconsider their use in your report.*

## Words of Caution

- How you present information can impact interpretation, or misinterpretation.
- Give [proper credit](#) for photos and images you use
- From [Stephanie Evergreen's Report Evaluation Checklist, 2013](#):
  - Be careful not to overdo it – too many elements can add clutter or complication
  - Color looks different on a computer screen than on paper. Print on a black-and-white printer and then make a copy of that printout to check legibility.
  - People with colorblindness have difficulty with red-green and yellow-blue combinations



## Photos

Photos are a great way to incorporate visuals into your report. These can be used in sidebars, or within the body of your report to emphasize a point or idea. Make sure to attribute the photos or images, if needed.

### Take photos during Scoping and Fieldwork

When you're out in the field, take your smartphone or digital camera along and snap photos that could be of use in the report. Email the photos to yourself shortly afterward and save them on the H drive for later use. For example, the Forestry team took this photo during the course of the audit:



*Remote-detection camera monitors*

### Obtain photos from the agency

As you enter the reporting phase, get in touch with agency contacts who may have access to photos your team may want to use in the report. Obtain permission to use the photos in the report, especially if the photos include people. For example, in the Oregon State Hospital audit, the team was not able to contact or interview patients due to HIPPA regulations. To obtain photos, the team got in touch with contacts at the agency and explained they'd like to have photos of patients in the audit report. The agency, with permission of the patients photographed, provided photos the team could use, including these two:



*Hospital staff meet with a Bridges patient to discuss benefits*



*Patients pose for a photo outside of the Empowerment Center*

**For all photos or images, you need to make sure you are giving appropriate credit when necessary.** This may vary by website and whom you obtain photos from.

### [Understanding types of usage rights](#)

- Free to use or share: Allows you to copy or redistribute its content if the content remains unchanged.
- Free to use, share, or modify: Allows you to copy, modify, or redistribute in ways specified in the license.

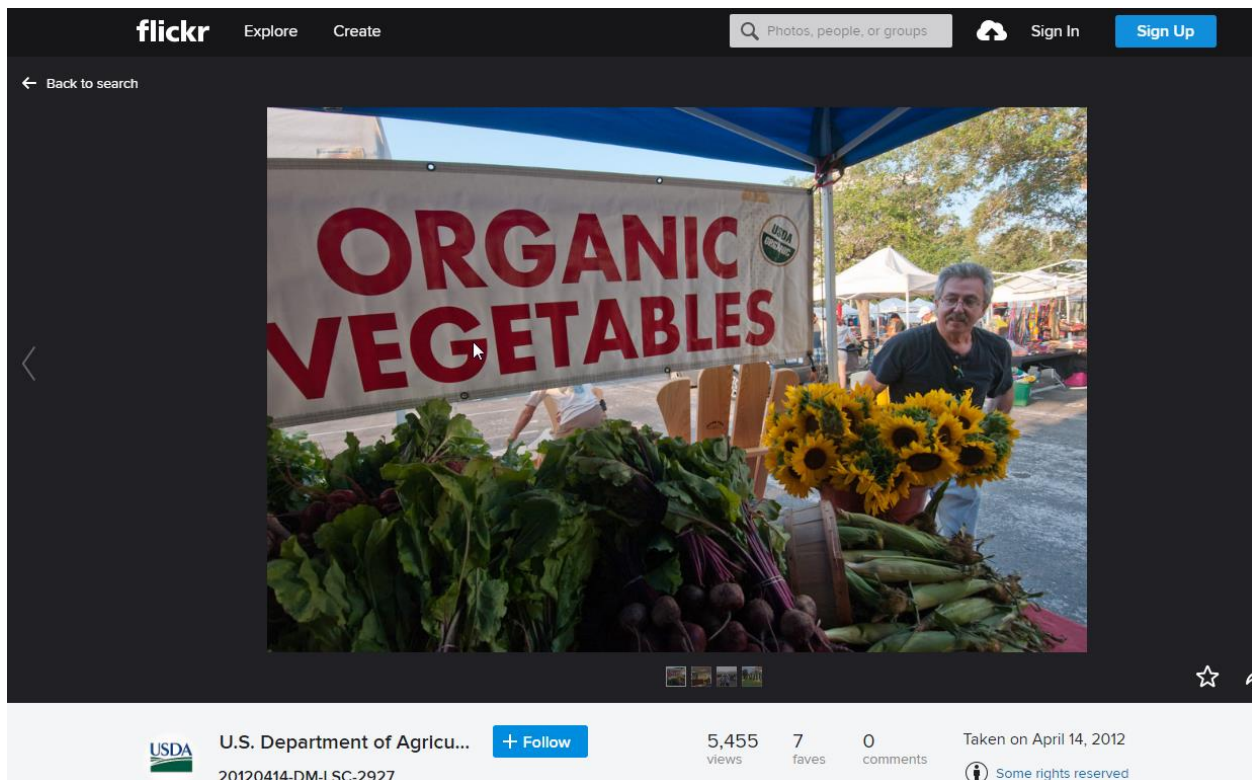
- **Commercially:** If you want content for commercial use, be sure to select an option that includes the word "commercially," (you would not need to do this for an audit report).

## Free stock photos

Stock photos are a great resource to add photos to your report.

**Pexels:** All photos on this site are licensed under Creative Commons Zero (CC0) license, which means the pictures are free to use for any legal purpose. In addition, **no attribution is required.**

**Flickr Creative Commons:** Some federal agencies have Flickr streams, which may be useful for your audit. From the Department of Agriculture's Flickr stream:



Many Flickr users have chosen to offer their work under a [Creative Commons license](#), but you need to **make sure you are using content under the correct type of license for usage:**

- **Attribution license:** Okay to use, but you must give credit.
- **Noncommercial license:** Okay to use.
- **No derivative works:** Okay to use, but you cannot alter the work.
- **Share alike:** Okay to use. Similar to "no derivative works."
- **Public Domain Dedication:** Okay to use.
- **Public Domain Work:** Okay to use.

## Google images

### Searching

Go to [Advanced Image Search](#). Turn on SafeSearch and filter by license type.

The screenshot shows the Google Advanced Image Search interface. At the top, the Google logo is on the left and "Advanced Image Search" is on the right. Below this, there are two columns of search criteria. The left column is titled "Find images with..." and includes four input fields: "all these words:", "this exact word or phrase:", "any of these words:", and "none of these words:". The right column is titled "To do this in the search box" and provides instructions for each field: "Type the important words: winter hoarfrost", "Put exact words in quotes: 'frost flower'", "Type OR between all the words you want: trees OR weeds OR grasses", and "Put a minus sign just before words you don't want: -windows".

Below these fields is a section titled "Then narrow your results by...". It includes several filters: "image size:" (dropdown: any size), "aspect ratio:" (dropdown: any aspect ratio), "colors in image:" (radio buttons: any color, full color, black & white, transparent, this color: with a red color picker), "type of image:" (dropdown: any type), "region:" (dropdown: any region), "site or domain:" (dropdown: not filtered by license, free to use or share, free to use or share, even commercially, free to use share or modify, free to use, share or modify, even commercially, not filtered by license), and "file type:" (dropdown: not filtered by license). Each filter has a corresponding instruction on the right. The "SafeSearch:" and "usage rights:" options in the "site or domain:" dropdown are circled in orange.

At the bottom right of the form is a blue button labeled "Advanced Search".

## Paid stock images

There are many to choose from! Paid sites can have higher quality images and more variety than free sites. Depending on your need, you may find some sites more useful than others—buying in bulk versus buying one or two photos for example. Here are some examples of potentially useful sites:

Dreamstime <https://www.dreamstime.com/>

Photodune <https://photodune.net/>

500 Pixels <https://500px.com/home>

Snapwire <https://www.snapwi.re/invest>

## Maps

- Grab the readers' attention
- Highlight important geographical differences
- Add context

Maps can be a powerful tool in a report- it is much easier and more effective to show someone where something is happening than to tell them.

- Examples from OAD reports include maps using GIS, Google Maps, and images obtained from the agency.

Figure 1: Unemployment Rate by County, 2007-2009

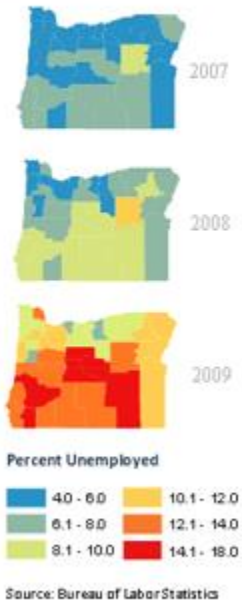


Figure 3: WRD Water Management Regions and Districts, 2015



Most of Oregon's 66 standard enterprise zones are in rural areas, (marked in blue above), but zones in Washington and Multnomah counties accounted for much of the new jobs reported for the program.

## Shade Boxes

- Differentiate a large amount of text
- Signal a change in style and tone
- Set off facts or info that may not follow report flow

In the simplest form, it is an example that is visually different than the rest of the report. It was first used in a report to highlight the profile of a staff person who worked at the agency under audit. Here, the team used it to highlight water rights.

**Profile of a Water Right: Fehrenbacher Reservoir 2**



*Fehrenbacher Reservoir 2, February 1988. Last documented presence of water in reservoir.*

The Fehrenbacher Reservoir 2 was established in 1959 with the initial purpose of storing water for irrigating crops. In the following decades, spring runoff and water levels in the reservoir declined so rapidly the owner opted to use the remaining water for cattle instead.

Water supply in the area has continued to decline. Water has not been documented at this location by WRD since 1988. However, the landowner has chosen to retain the storage water right to the reservoir, which requires inspections every four years. Even where water sources have gone dry, WRD field staff must still perform regulatory duties on existing rights.



*Fehrenbacher Reservoir 2, August 2016*



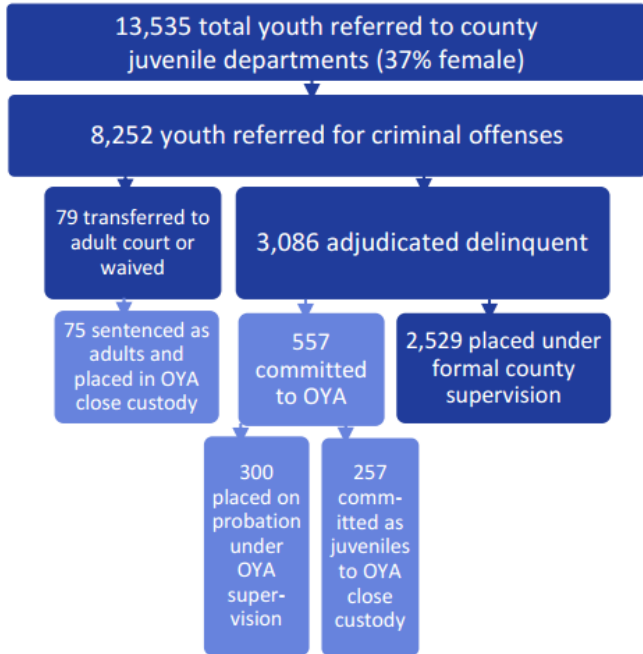
*Watermaster inspects the Fehrenbacher Reservoir 2, August 2016*



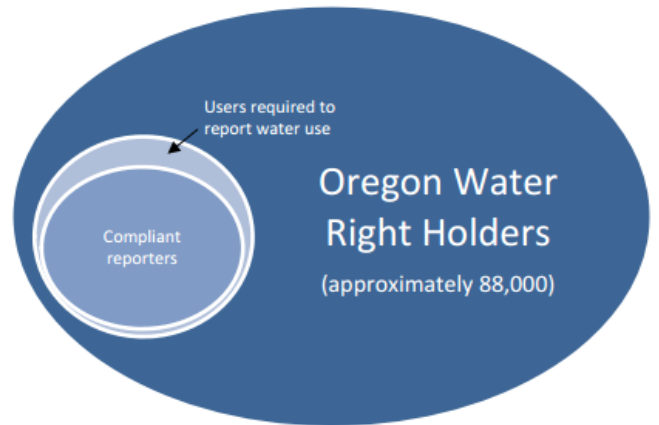
## SmartArt

SmartArt is a tool in Office products that can be helpful for showing processes or relationships, such as organizational charts.

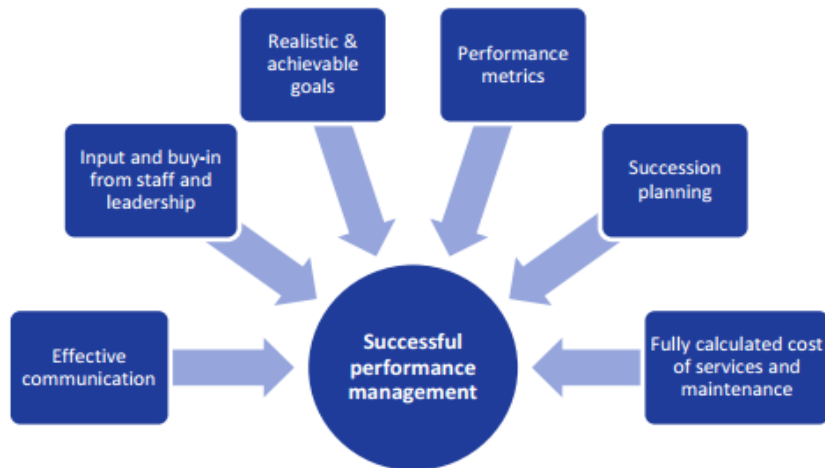
**Figure 2: Number of youth that moved through the juvenile justice system, 2014**



**Figure 7: Extent Water Right Holders Report Their Water Use**



**Figure 17: Successful Performance Management Practices**



# Timelines

Timelines can be simplistic, or detailed with as much or as little information as you want.

**Data Center Security Warnings Issued:**

- [2006 Public Audit](#)
- [2008 Public Audit](#)
- 2008 Confidential Audit
- 2008 Consultant Report
- [2009 Public Audit](#)
- 2009 Confidential Audit
- [2010 Public Audit](#)
- [2010 Public Security Audit](#)
- 2010 Confidential Audit
- [2012 Public Audit](#)
- 2012 Confidential Audit

**2011**

- October
  - New Director
- November
  - Portland Office Closes

**2012**

- January
  - 1<sup>st</sup> Restructuring
- April
  - New Executive Team

**2013**

- February
  - Transition Planning Begins

**2014**

- February
  - Transition Plan to Legislature
- March
  - Strategic Planning Begins
- July
  - 2<sup>nd</sup> Restructuring
- September
  - Strategic Operations Plan
- November
  - 3<sup>rd</sup> Restructuring

**2016**

- January
  - HB2442, strengthening Housing Stability Council
- May
  - Director Resigned
- November
  - New Director


**1999**

OYA provides a transition program for 25 young women at Corvallis House



**2009**

OYA closes Corvallis House and moves transition program into Oak Creek YCF serving an average of 9-12 young women.




## Callouts or Sidebars

- Highlight important facts or data that may be buried in the text or add new information
- Draws your attention to something you want to emphasize.
- May or may not be information in the body of the report
- Can be helpful to list information that you want to convey, but don't want to take up space in the body.

### Figure 4: JOBS Services Cut in 2011

#### Currently Available

Job Search  
Work Experience  
Subsidized Employment (limited)  
High School Diploma or GED (limited)

#### No Longer Available

Adult Basic Education  
English as a Second Language  
Life Skills  
JOBS Skills Training  
Community Services Program  
Vocational Training  
On the Job Training  
Employment Retention  
Parents as Scholars  
Program Entry/ Holistic Orientation  
Child Related Activities  
Domestic Violence  
Drugs and Alcohol  
Mental Health  
Learning Disability Assessment  
Short-Term Medical Issues  
Rehabilitative Services

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### Security Functions Reviewed

Security Planning and Staffing

Vulnerability Management

Network Security

User Account Management

Security Patching and Anti-virus

Replacing Outdated Operating  
Systems

Security Awareness Training

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*"We used the data to try and determine the areas of strength and weaknesses in our curriculum and make adjustments accordingly."*

*-Principal Survey Respondent*

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*Highways lost over 400  
employees to retirement from  
2008-2013*

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## Icons

- Visually communicate an idea
- Organizes information for the reader throughout the report
- Can be used in graphs, SmartArt
- Visual cues to guide the reader

### ***Several barriers to county program tracking still need to be addressed***

Counties identified several barriers to recording program information.

#### *Too few county staff*



Following years of budget cuts in several county departments, county probation officers may have anywhere from 5 to 60 juveniles on their caseload in a given month. According to county probation officers we spoke with, the demands of the job mean an ideal caseload number is about 15 cases at a time.

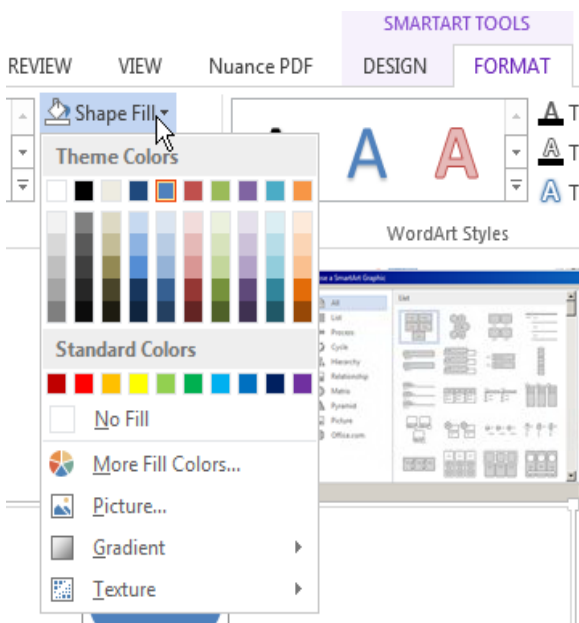
#### *Time-consuming data entry requirements*



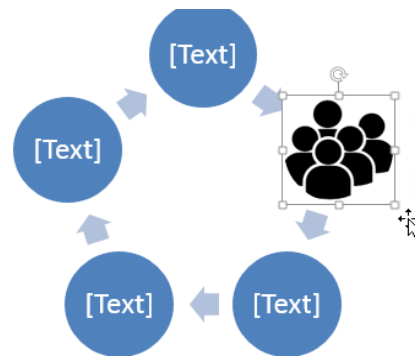
The increasing amount of paperwork and documentation that is required of probation officers and service providers cuts into the amount of time that they have to spend working directly with youth. Adding more detailed program information into JJIS may further increase the administrative burden on both parties.

## Inserting an icon or photo into SmartArt

- Choose a SmartArt graphic from the 'Insert' tab
- Click on one of the shapes within the graphic, then click on the "Format" tab on the ribbon when it appears.
- Choose "Shape Fill," then "Picture"



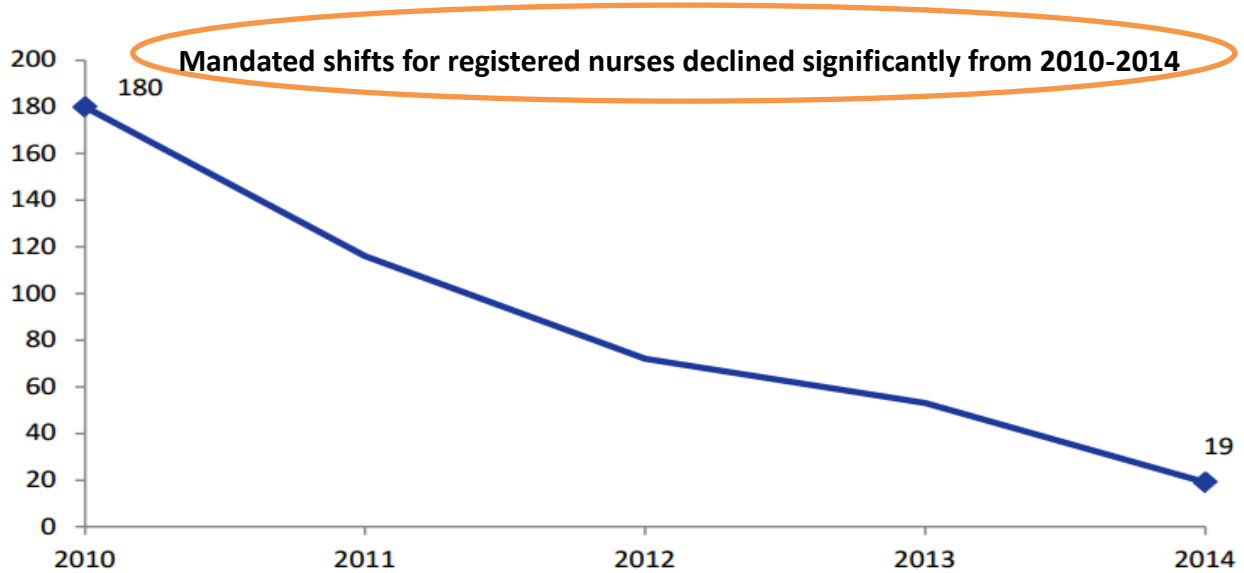
- Choose your saved icon from the list of available options



*\*It is important to always check the licensing information to see how the creator needs to be credited.*

## Making Graphs More Reader-Friendly

Use active language in the title to tell the reader what is going on. Don't make them guess. Instead of a descriptive title, try a declarative sentence.



Directly label your data points and delete the legend when possible.

- R click on last data point, choose 'Add data label'
- R click on data label, choose 'Format data label'
- Unclick 'Value' and choose 'Series Name'
- Select the label and drag it to where you'd like it to be

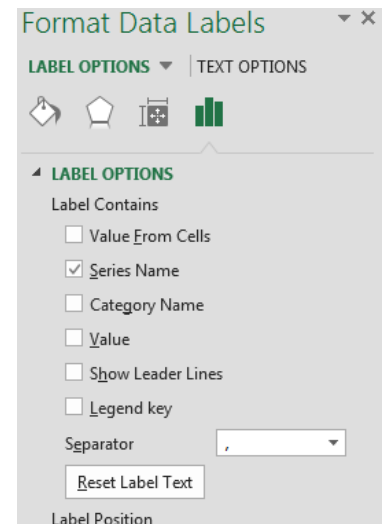
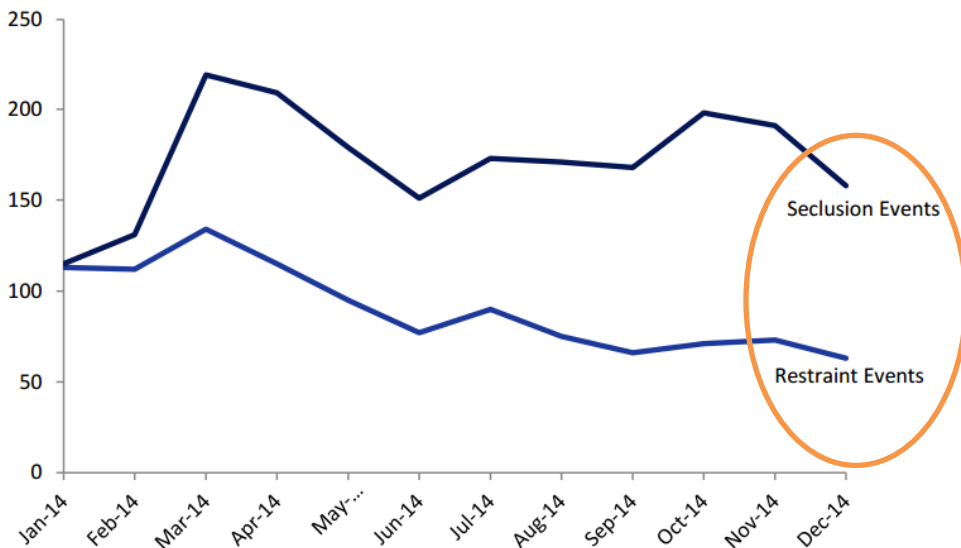
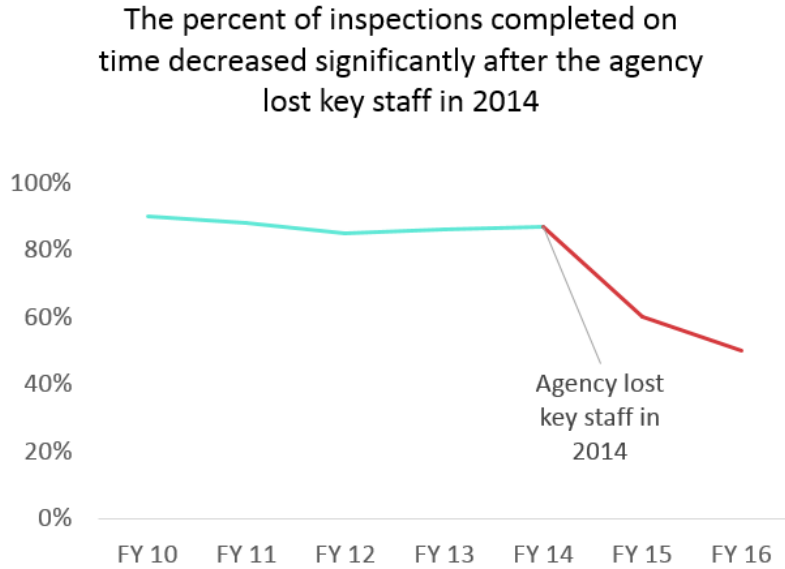


Figure 5: Seclusion and restraint trends suggest progress in 2014



Use color and shading to guide the readers' eye to what's important.

Format lines by right-clicking on each data point after the point in time of change to format the line.



Format Data Series

SERIES OPTIONS

LINE MARKER

LINE

- No line
- Solid line
- Gradient line
- Automatic

Color

Transparency

Width

Compound type

Dash type

Cap type

Join type

Begin Arrow type

Begin Arrow size

End Arrow type

End Arrow size

Smoothed line

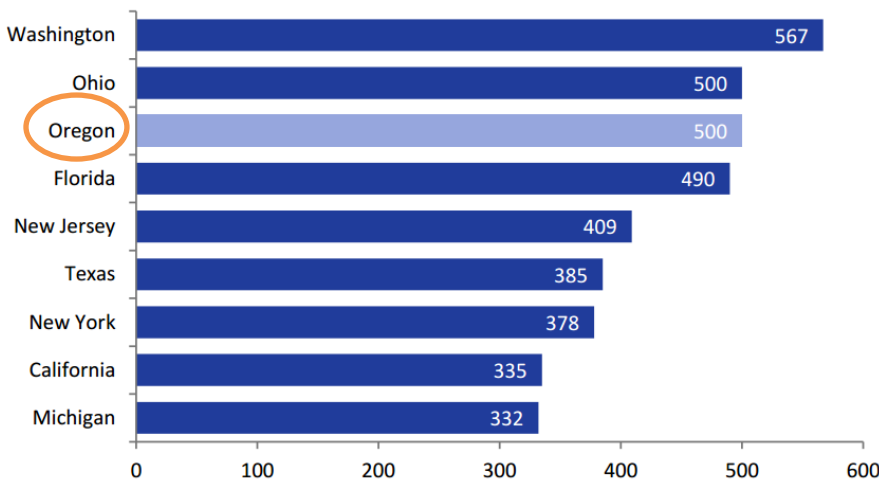
Theme Colors

Standard Colors

More Colors...

In this example, the auditors used a lighter shade of blue to draw the readers' attention to where Oregon ranked.

Figure 3: Oregon is tied for the 2nd highest number of FDA contract inspections



## Resources and Design Inspiration

### Photos

- [Giving credit for photos you use](#)
- [Flickr Creative Commons](#)
- [Google Images](#)
- [Dreamstime](#)
- [Pexels](#)

### Icons

- [Use and Abuse of Icons in the Modern Age](#)
- [Creating icons with Adobe Illustrator](#)
- [FLATICON \(used in the design page example\)](#)
- [Vector Portal](#)
- [Freepik](#)

### Data Visualization and Visual Reporting

- [Data Visualization Approaches for Program Evaluation \(and Beyond\)](#)
- [Stephanie Evergreen](#)
- [The art of visual design](#)
- [Ann K. Emery](#)
- [Edward Tufte](#)
- [Stephen Few](#)
- [Nate Silver example](#) (FiveThirtyEight is a good resource for data viz in general)

### Data Visualization Tools

- Stephanie Evergreen and Ann Emery's [Data Visualization Checklist](#)
- Stephanie Evergreen's [Evaluation Report Layout Checklist](#)
- [22 Free Tools for Data Visualization and Analysis](#)
- [The 36 Best Tools for Data Visualization](#)

### Graphs

- [How to create a chart in Excel](#)
- [Beginner and Intermediate Tips for Excel Charts](#)
- [Microsoft's eight best tutorials on Excel charts](#)
- [Creating a timeline in Excel](#)
- [Secondary Axes in Charts](#)
- [Dual-Scaled Axes in Graphs Are They Ever the Best Solution? \*Stephen Few\*](#)
- Stephanie Evergreen
  - How to [Add a Benchmark Line to a Graph](#)
  - How to create [Lollipop Graphs](#)
  - How to create [Dumbbell Dot Plots](#)
  - How to create [Slopegraphs](#)
  - How to create [Overlapping Bar Graphs](#)
  - How to create [Back-to-Back Graphs](#)

### Books

- Stephanie D.H. Evergreen, *Presenting Data Effectively* (2014)
- [Edward Tufte](#) *Visual Display of Quantitative Information* (2001), *Envisioning Information* (1990), *Visual Explanations* (1997), *Beautiful Evidence* (2006)

### Interactive or Visual Reports

- [Institute for Health Metrics and Evaluation: Data Visualizations](#)
- [Interactive web version](#) of WA JLARC report: Medicaid Fraud False Claims Act Sunset Review
- [Multnomah County Tax Equity Interactive Map](#)
- The City of Scottsdale- 2016 [Report to Citizens](#)

## OAD Audits Referenced in Guide

- TANF: High Expectations, Stronger Partnerships, and Better Data Could Help More Parents Find Work (2014) <http://sos.oregon.gov/audits/Documents/2014-08A.pdf>
- ODOT: Better Workforce Planning Needed to Maintain Staff Expertise for Quality Construction (2014) <http://sos.oregon.gov/audits/Documents/2014-12.pdf>
- Oregon State Hospital: Significant Actions Taken to Improve Safety and Promote Patient Recovery, but Further Improvements are Possible (2015) <http://sos.oregon.gov/audits/Documents/2015-23.pdf>
- State Data Center: First steps to address longstanding security risks, much more to do (2015) <http://sos.oregon.gov/audits/Documents/2015-20.pdf>
- Improving State Computer System Security will take Time, Resources, and Cooperation (2016) <http://sos.oregon.gov/audits/Documents/2016-30.pdf>
- Oregon's Department of Fish and Wildlife Needs a Comprehensive Management Strategy to Prioritize Workload and Plan for the Future (2016) <http://sos.oregon.gov/audits/Documents/2016-01.pdf>
- Teacher Standards and Practices Commission: Better Oversight and a More Productive Work Environment Could Improve Service to Educators (2016) <http://sos.oregon.gov/audits/Documents/2016-04.pdf>
- OYA: Female Youth Offenders Need More Transition Options (2016) <http://sos.oregon.gov/audits/Documents/2016-07.pdf>
- ODF: Actions Needed to Address Strain on Workforce and Programs from Wildfires (2016) <http://sos.oregon.gov/audits/Documents/2016-18.pdf>
- ODE: Clearer Communication, Consistent Use of Results and an Ongoing Commitment to Improvement Could Help Address Testing Concerns (2016) <http://sos.oregon.gov/audits/Documents/2016-21.pdf>
- DHS: To Better Achieve its Mission, Vision, and Goals, DHS Must Increase Efforts to Address Employees' Concerns (2016) <http://sos.oregon.gov/audits/Documents/2016-24.pdf>
- ODA: Improved Management Practices, Use of Resources Could Help Food Safety Program Achieve its Mission (2016) <http://sos.oregon.gov/audits/Documents/2016-27.pdf>
- OHCS: Critical Improvements Needed to Help Ensure Preservation of Affordable Housing for Low-Income Oregonians (2016) <http://sos.oregon.gov/audits/Documents/2016-31.pdf>



- Oregon Water Resources Department: Enhancing Sustainability Efforts and Agency Planning Needed to Better Address Oregon's Water Supply Needs (2016) <http://sos.oregon.gov/audits/Documents/2016-33.pdf>
- Business Oregon Can Improve the Evaluation and Transparency of Economic Development Incentives and Loan Programs (2016) <http://sos.oregon.gov/audits/Documents/2016-34.pdf>

## Examples of Other Audit Reports Using Good Visual Design

California State Audits: Department of Public Health audit	
<a href="http://www.auditor.ca.gov/pdfs/reports/2014-111.pdf">http://www.auditor.ca.gov/pdfs/reports/2014-111.pdf</a>	
Visual Elements and PDF Pages	
Element	PDF Page
Use of white space throughout	varies
Highlighting key audit findings in summary ( <i>sidebar</i> )	pgs. 7, 30
Use of <i>tables</i>	pgs. 16, 19, 20, 21, 26, 33
Use of <i>map</i>	p. 17
<i>Descriptive graphic</i>	p. 59

Idaho Office of Performance Evaluations Visual Reports	
Rakesh Mohan Idaho Director of the Office of Performance Evaluations- blog post on <a href="#">Embracing Data Visualization in Evaluation: A Management Perspective</a>	
<i>Idaho <a href="#">Before</a> using data visualization</i>	
<i>Idaho <b>After</b> incorporating data visualization elements into audit reports</i> <i><a href="#">"Challenges and Approaches to Meeting Water Quality Standards"</a></i>	
Element	PDF Page
• See use of <i>photos</i> throughout the document	<i>various</i>
Use of <i>icons</i> in table of contents	p. 7
<i>Acronyms</i> in side bar	p. 9
Embedded <i>links</i>	p.12
Use of <i>tables for comparison</i>	p. 16
Use of <i>headings</i> - descriptive, larger, and red	p.19
Highlighting <i>key facts</i>	p. 20
Additional example of key facts size and color	p. 22
<i>Line graph</i>	p. 23
Introduction to a <i>new section</i>	p. 25 and 35
<i>Table Examples</i>	pgs. 26,-27, 29; detailed table p. 51
<i>Combining different visual elements</i>	P 40-41
Maps	p. 46