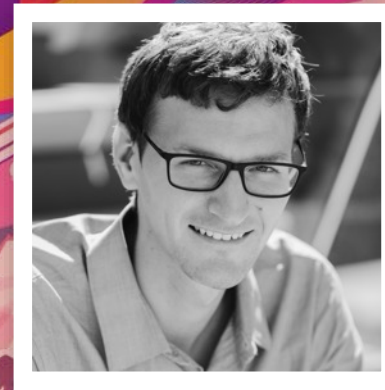


# ArcGIS Dashboards: Designing Effective Dashboards

David Nyenhuis

Soobin Choi



David Nyenhuis



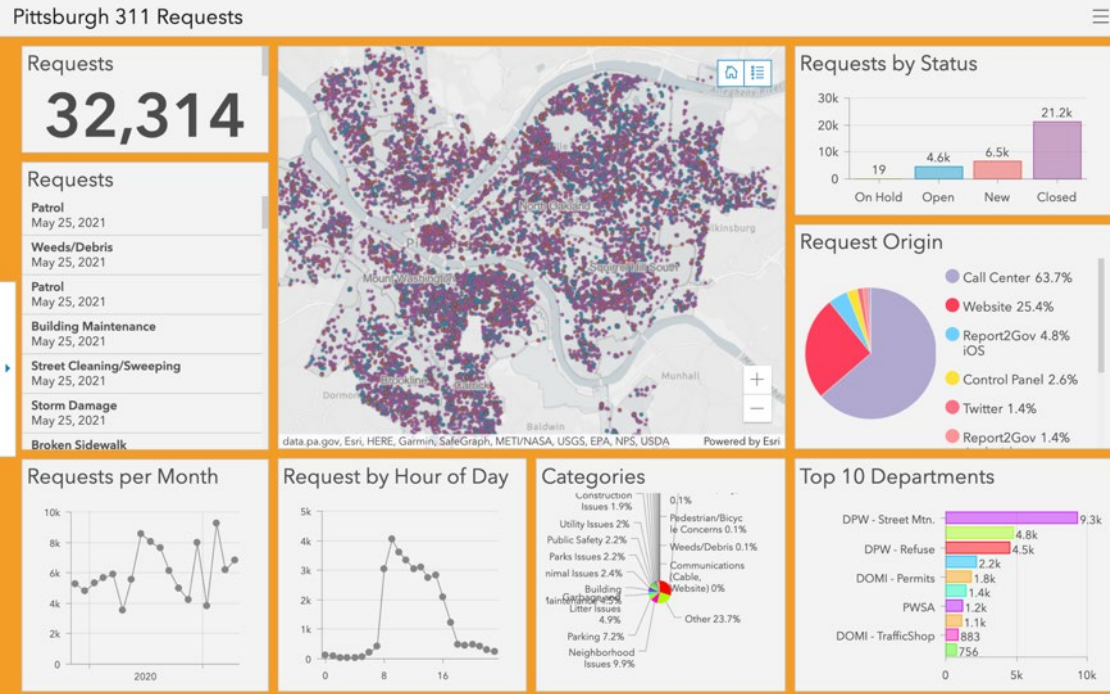
Soobin Choi



# Outline

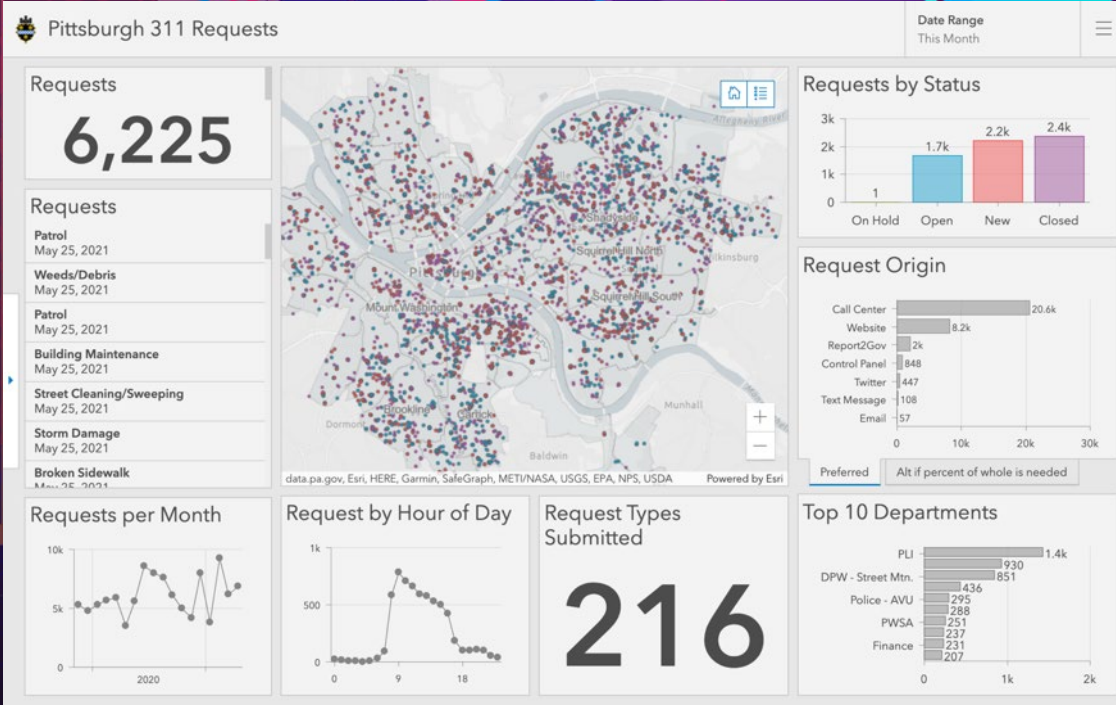
- What Makes a Dashboard Effective
- Types of Dashboards
  - Tips for Advanced Visualizations
- Color
- Mobile Considerations
- Evolving with Time
- Ensuring Dashboards Scale





# Transforming a Dashboard

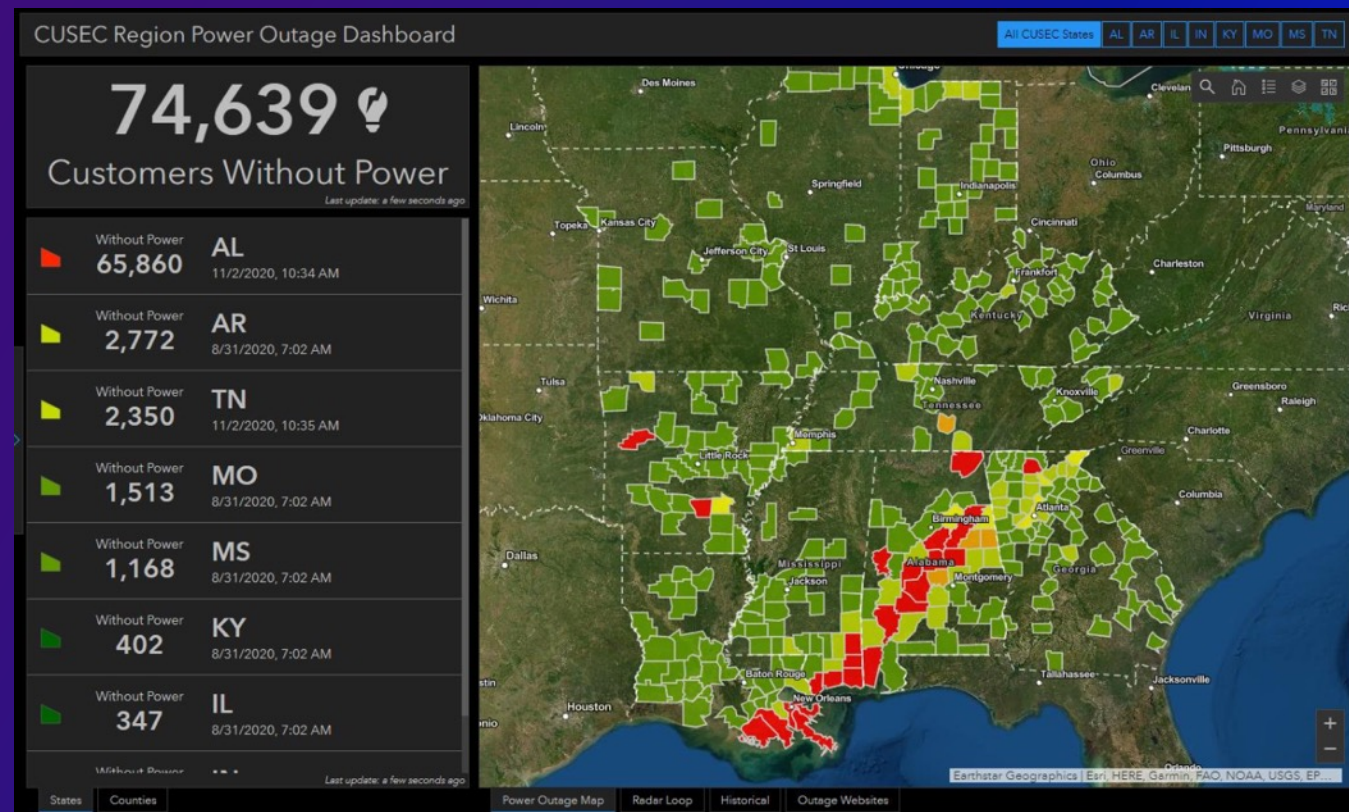
## Demo



# Transforming a Dashboard Demo

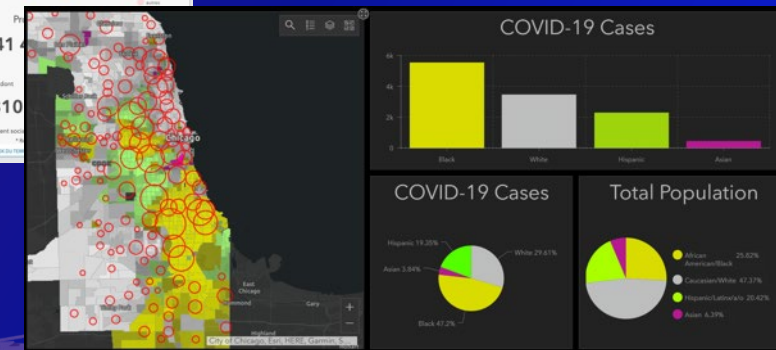
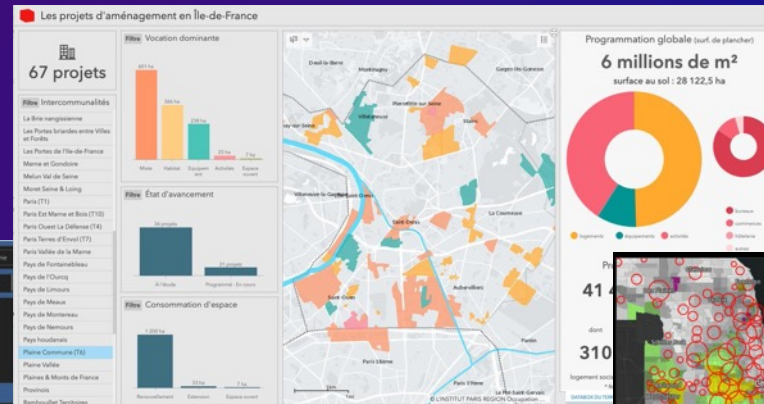
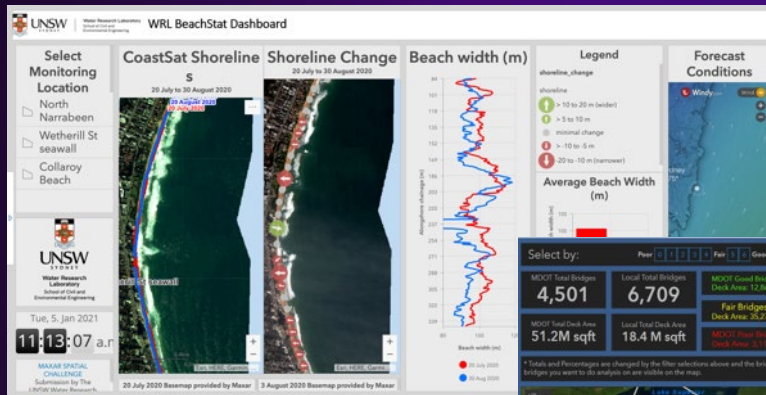
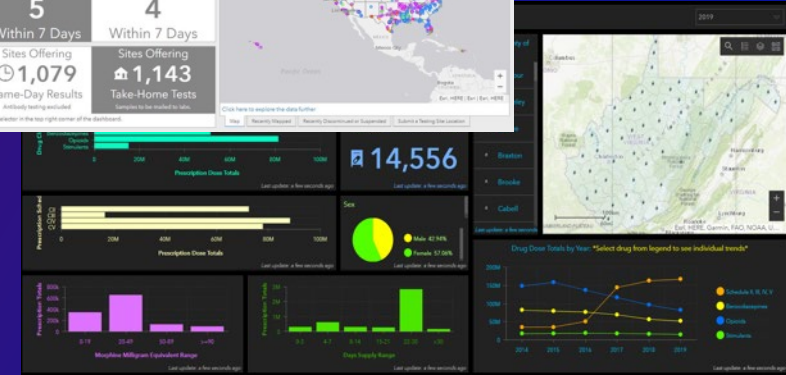
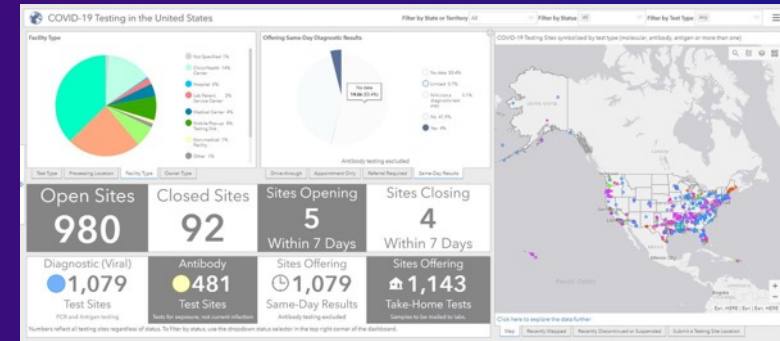
# What Makes a Dashboard Effective?

- A good dashboard...
  - Grabs your attention to where it's needed
  - Communicates information at-a-glance
  - Make it easy to spot what's most important



# But wait, what is a “dashboard”?

- Common understandings
  - “A dashboard is a single screen of information”
  - “A display with charts on it”



# Types of Dashboards

The background features a vibrant, abstract design with a color palette of deep purple, magenta, and bright orange. On the right side, there are large, overlapping, rounded shapes in these colors, along with a thin, curved yellow line. The overall aesthetic is modern and digital.

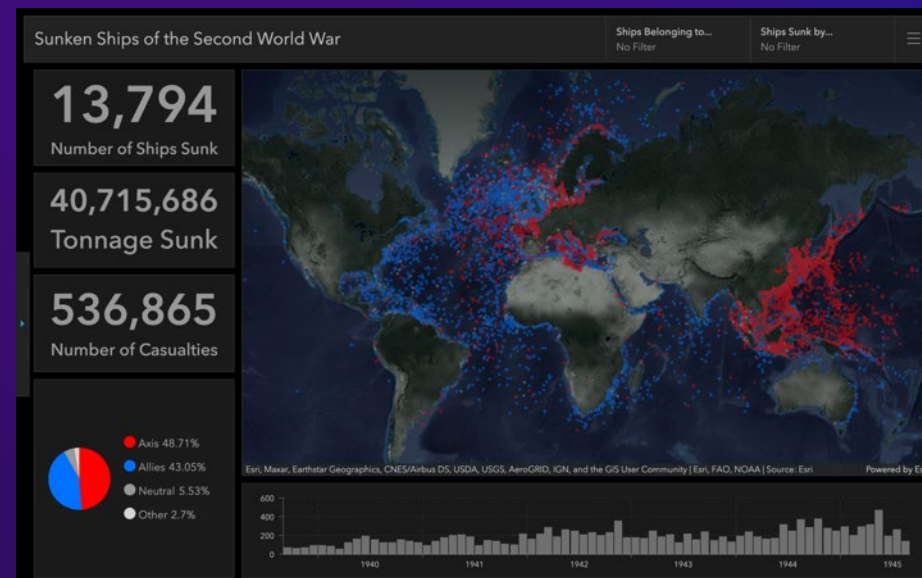


# Groups of Dashboards

	Snapshot Dashboards	Monitoring Dashboards
Data	A snapshot of time. Data behind dashboard doesn't update. (e.g., findings from census 2020)	Updated intermittently or regularly (every second, hour, day, or month). (e.g., field data collection, COVID case counts)
Viewing Frequency	Once	Reoccurring (e.g., always open, daily, monthly)
Purpose	Inform, explain, persuade, analyze. (They can tell a story)	Inform, flag concerns, evaluate performance measures, provide progress update, analyze.
Style	Color can be used for branding and/or to emphasize important dimensions of the data.	Muted colored maps and visualizations with areas of interest or concern highlighted.

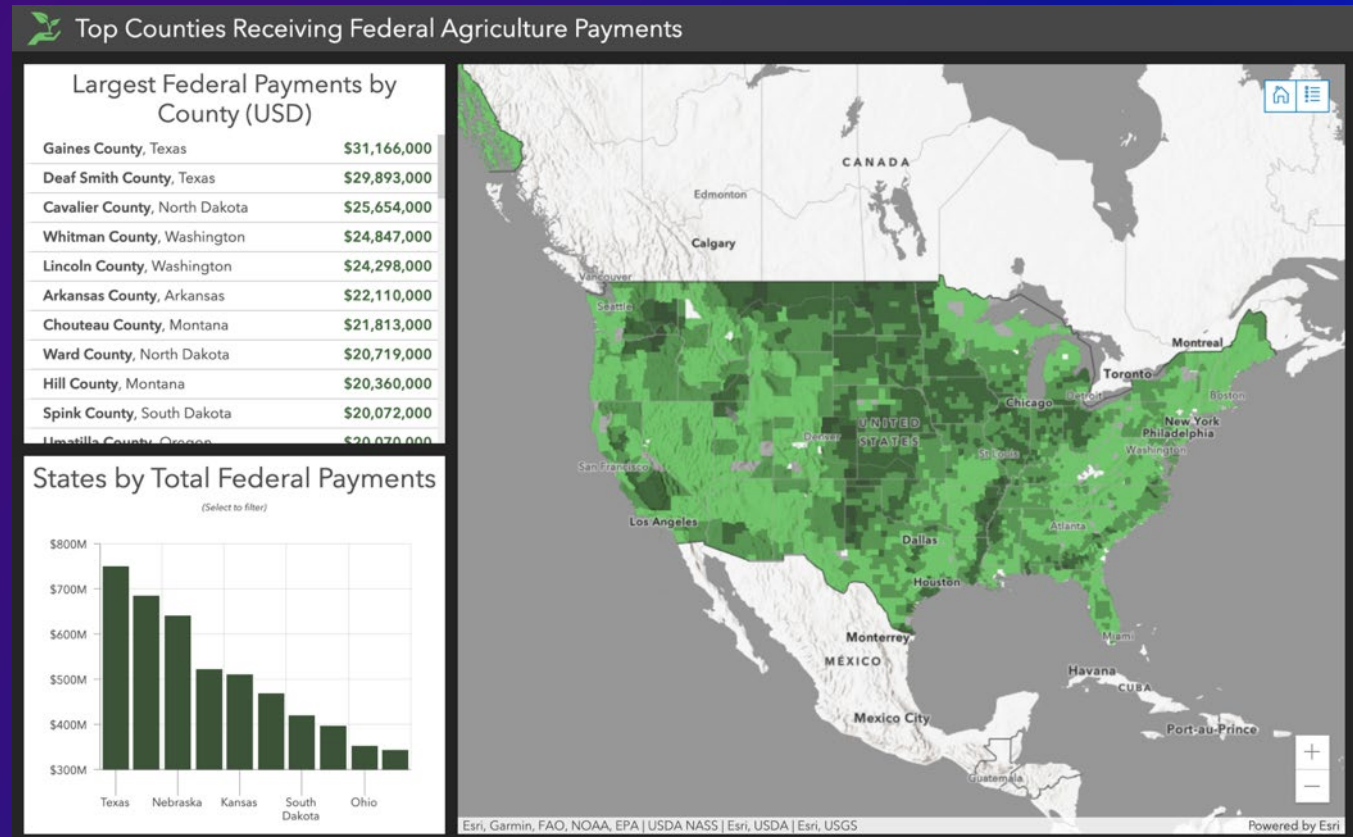
# Snapshot Dashboards

	Information	Explanation	Persuasion	Analysis
Purpose	Inform, educate	Explain something found in the data	Persuade audience to feel a certain way about a topic	Provide interactive filtering to drill into the data



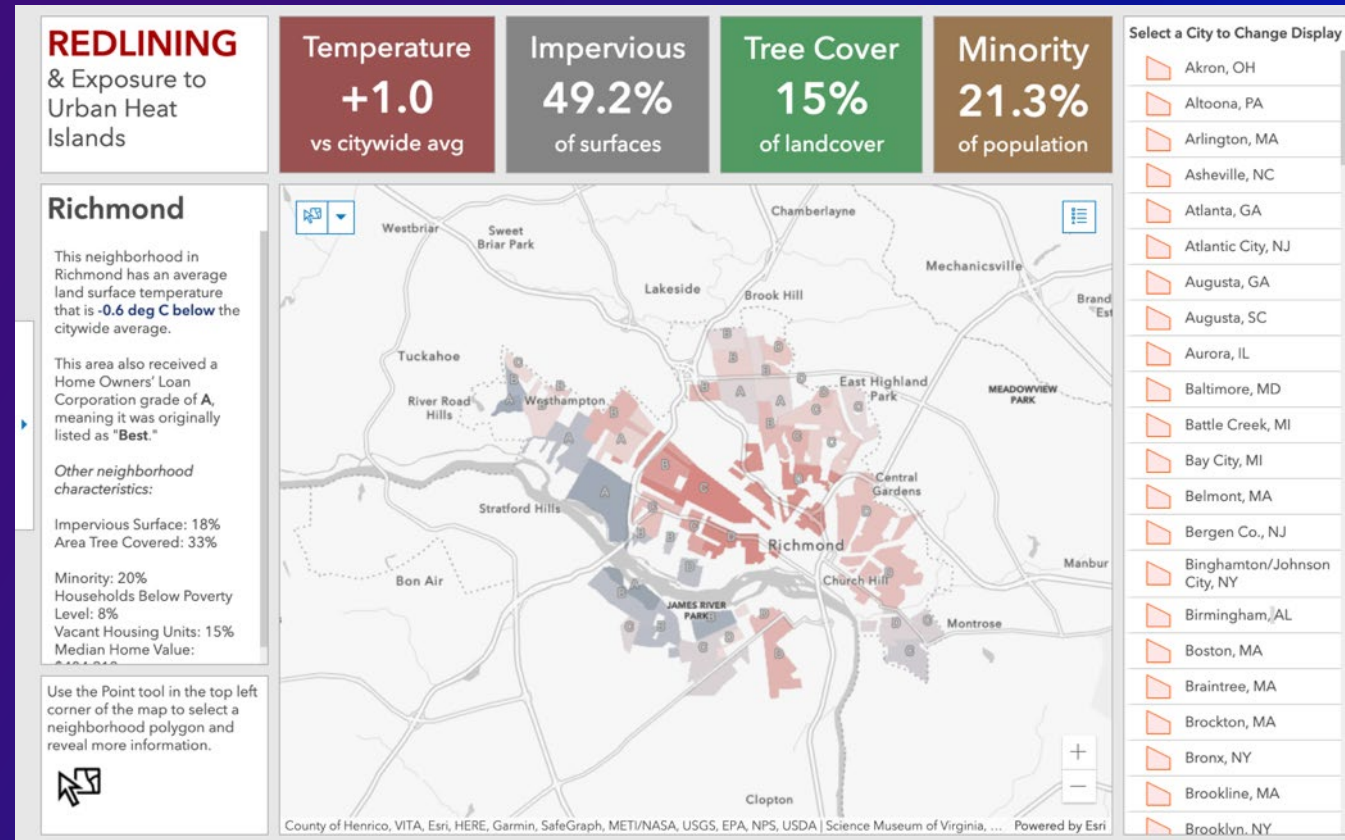
# Snapshot Dashboards: Information

- Inform or educate
- Summarize data
- Unguided (no clear story)



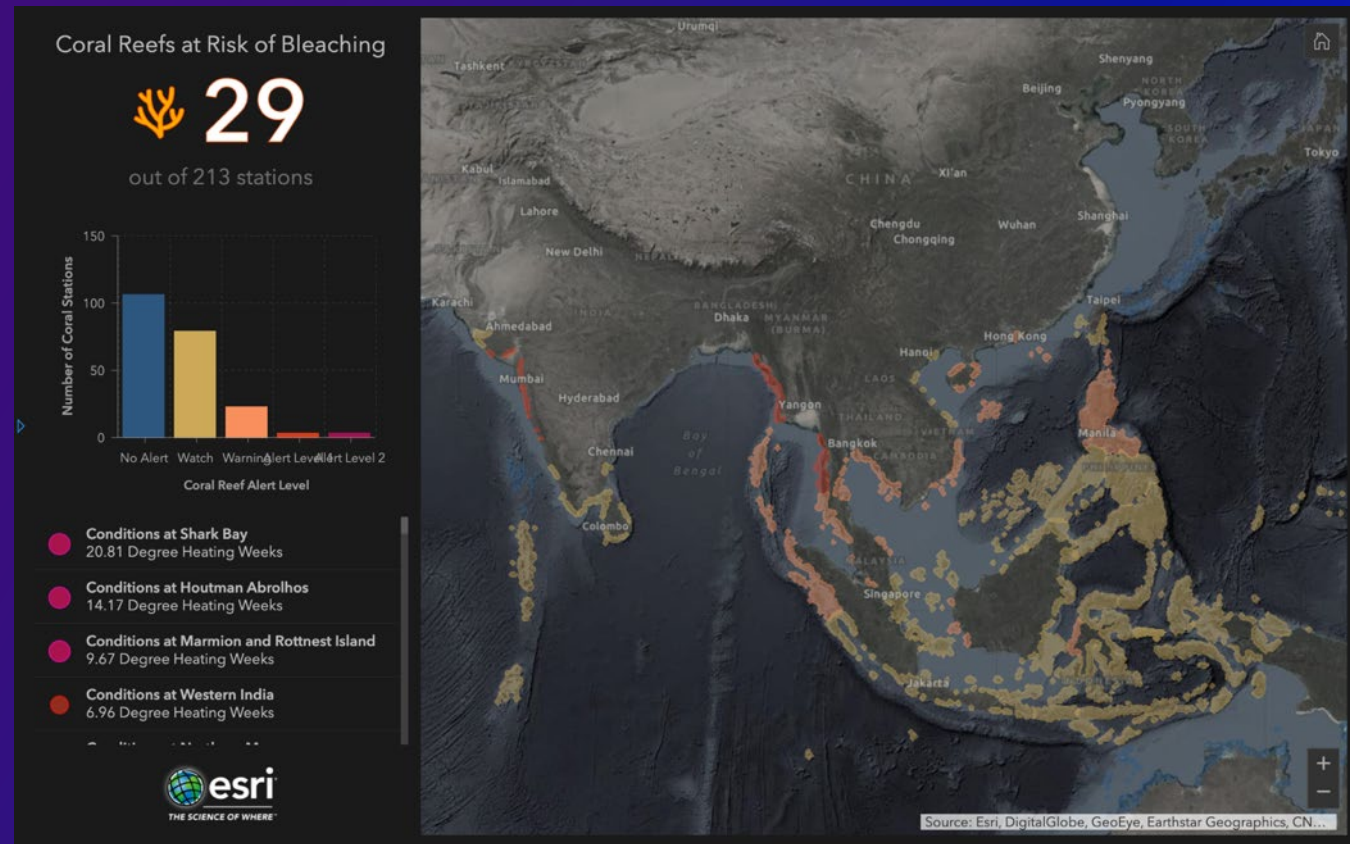
# Snapshot Dashboards: Explanation

- Explain something found in the data
- Uses color highlighting to draw focus and explain story



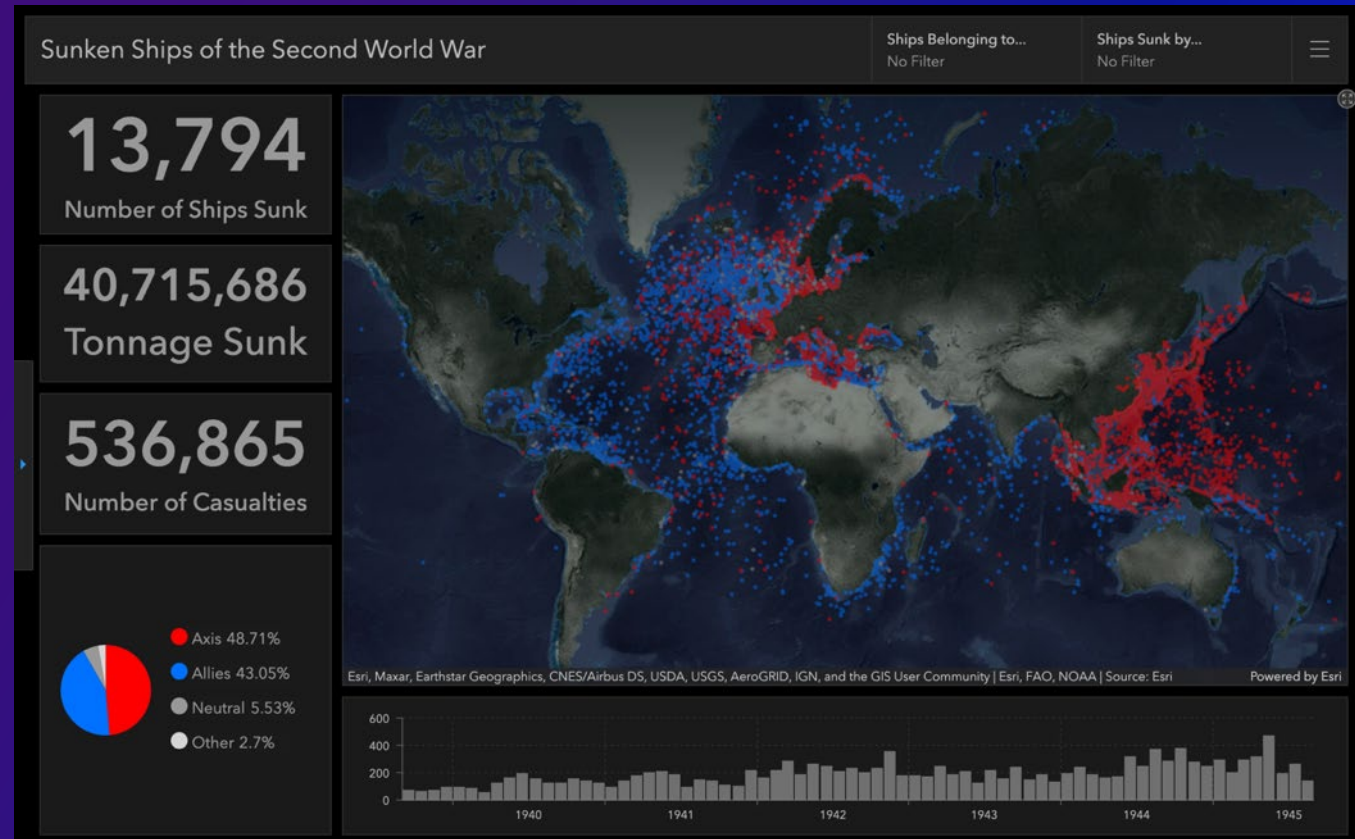
# Snapshot Dashboards: Persuasion

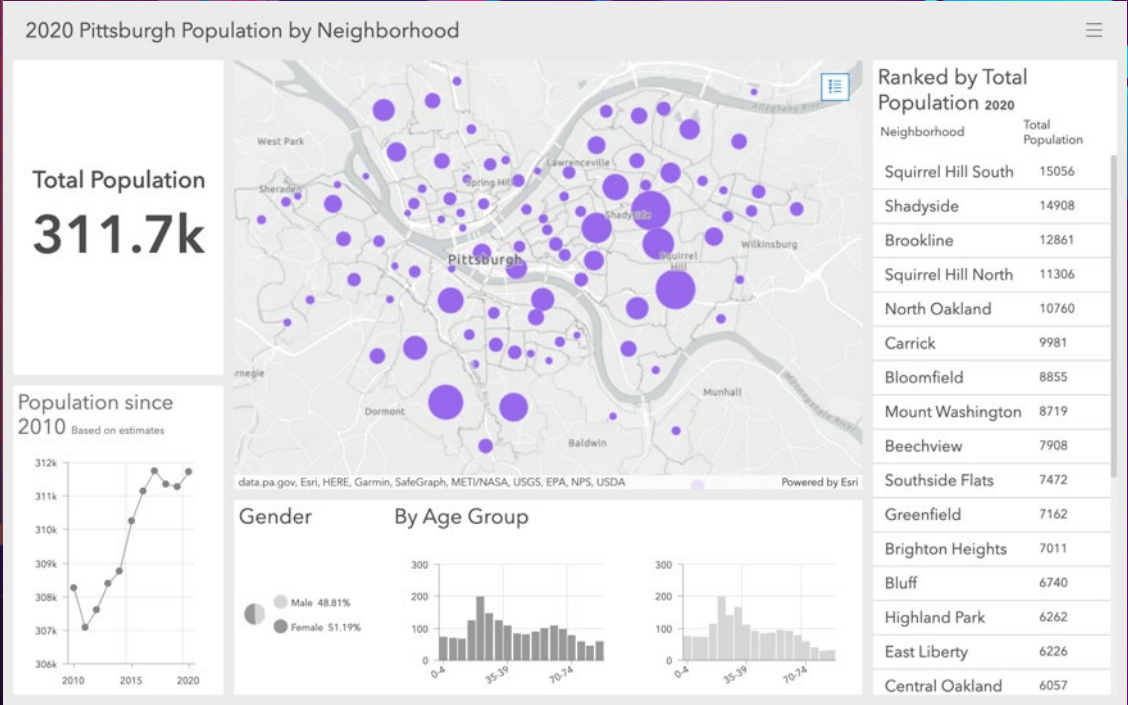
- Persuade audience to feel a certain way about a topic
- Uses colors and visualizations to evoke emotion and elicit a response



# Snapshot Dashboards: Analysis

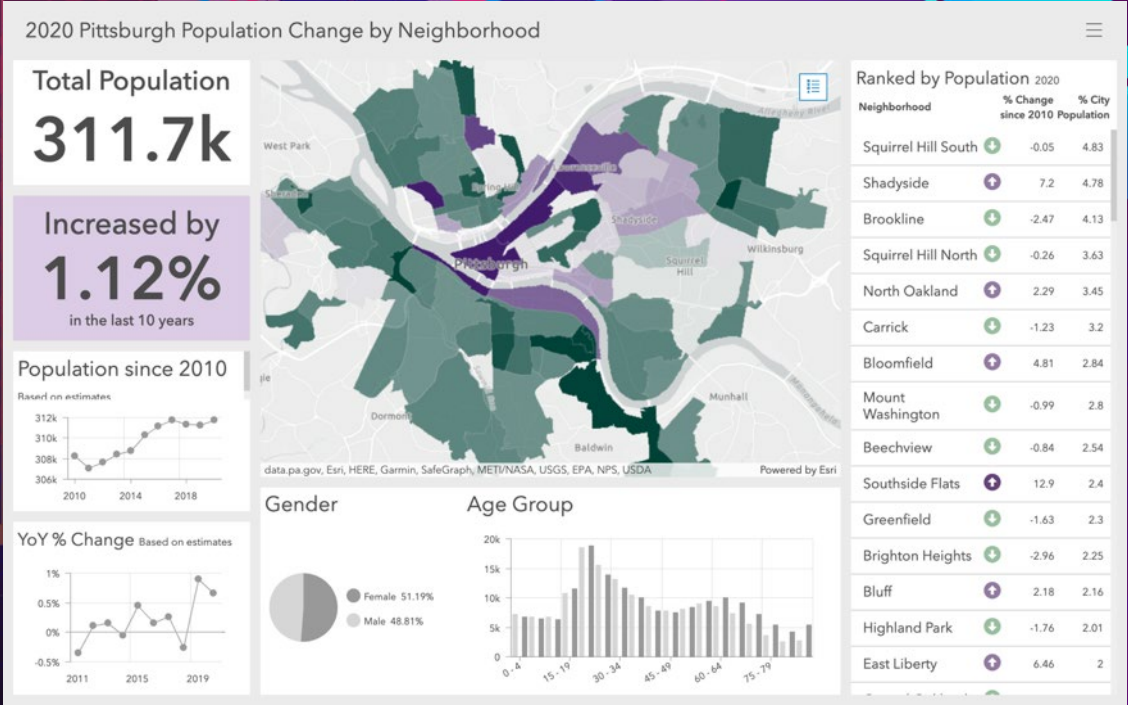
- Provide interactive filtering to drill into the data
- Empowers user to analyze data for patterns and pull out summaries





# Snapshot Dashboards

## Demo



# Snapshot Dashboards

## Demo

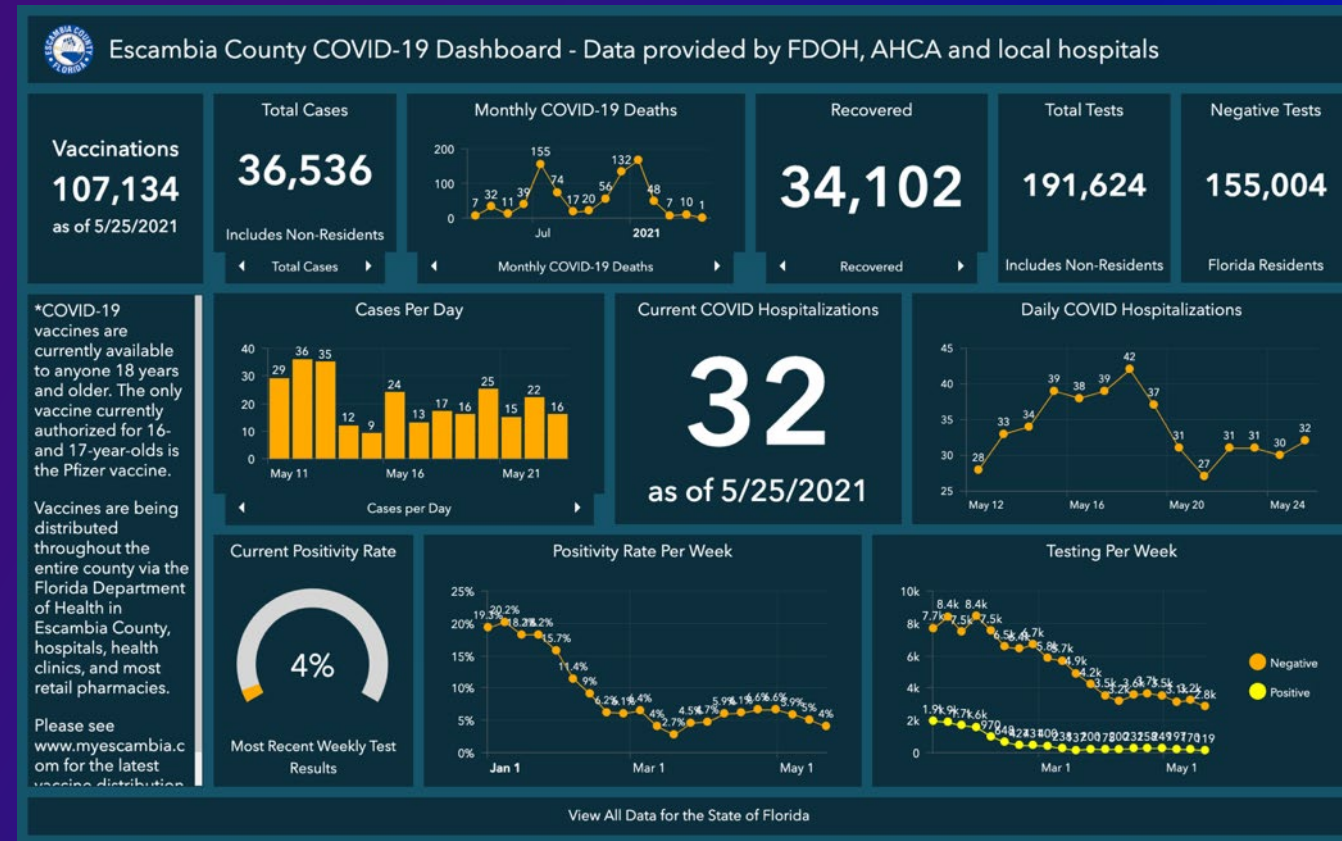


# Monitoring Dashboards

	Information	Status	Performance Evaluation	Progress	Analysis
Purpose	Inform, update	Flag concerning events/data, highlight changes	Evaluate performance measure (KPI)	Provide percent of completion, schedule status	Provide interactive filtering to drill into the data

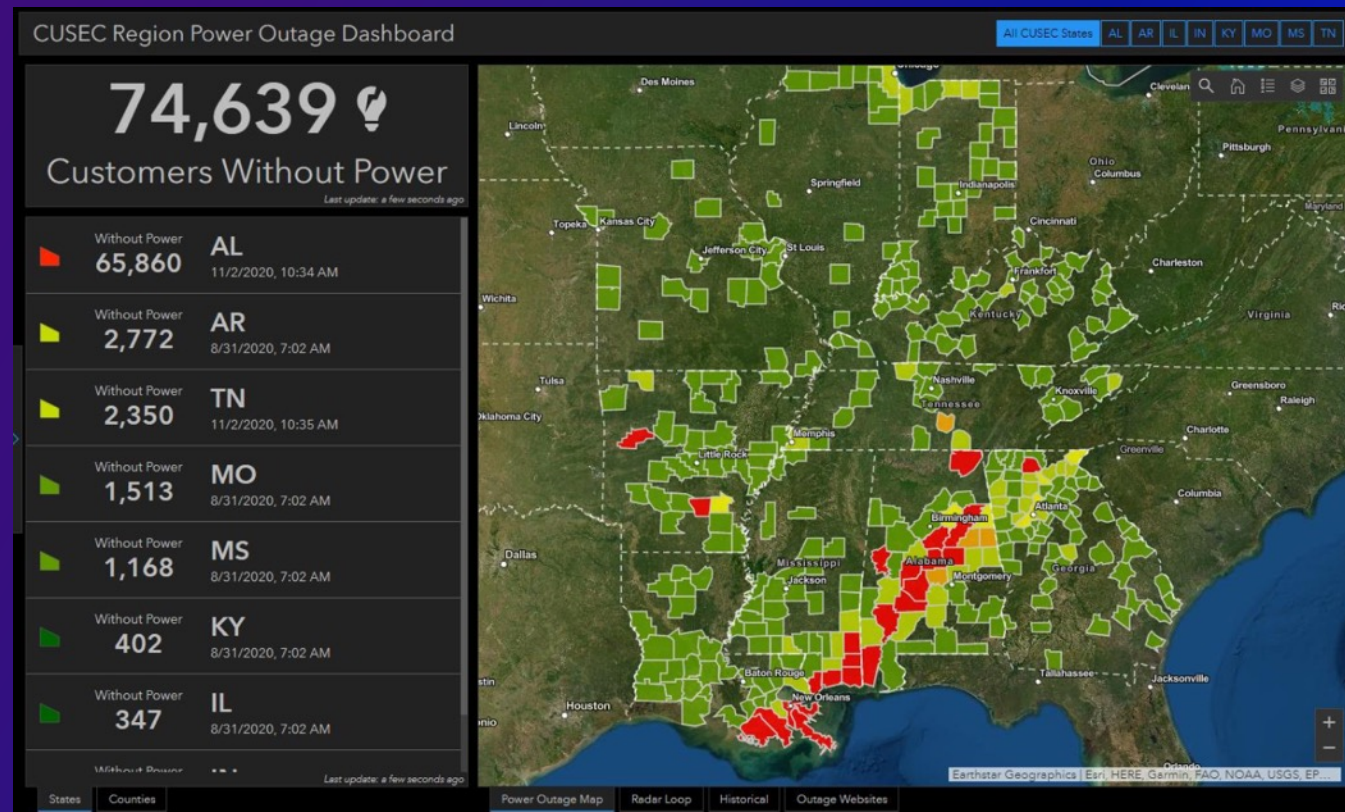
# Monitoring Dashboards: Information

- Inform or update
- Summarize data
- Unguided (doesn't flag concerns or values of interest)



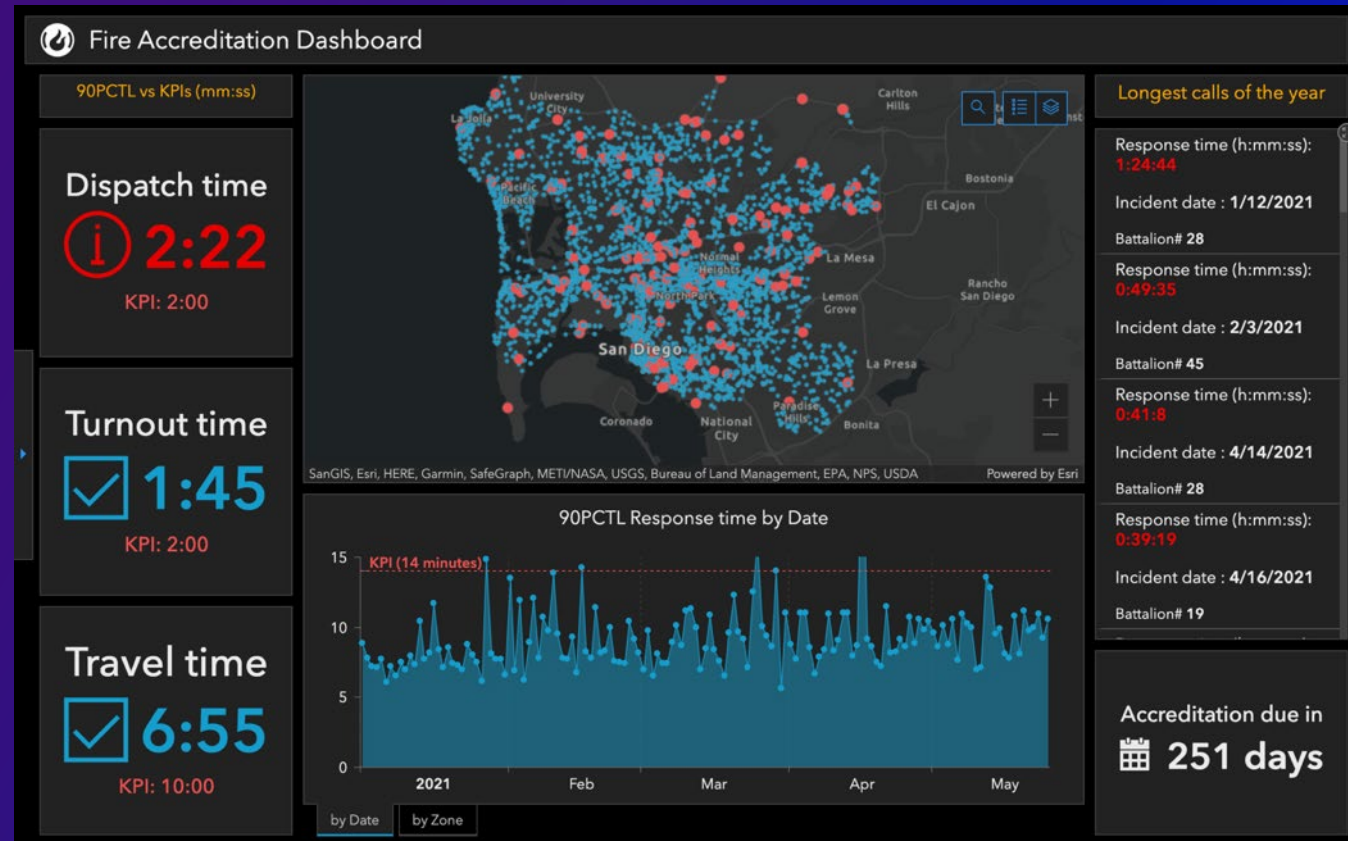
# Monitoring Dashboards: Status

- Flag concerning events/data
- Highlight changes



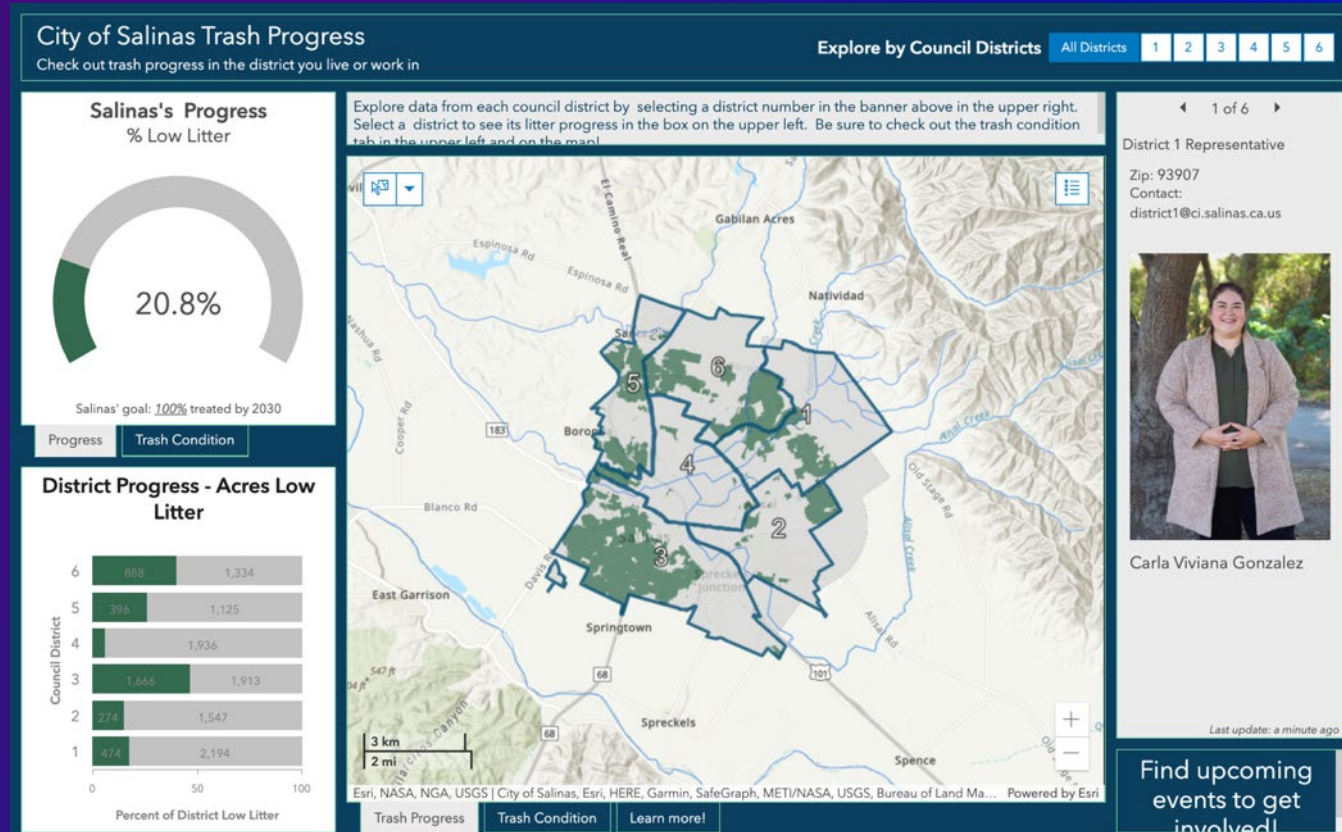
# Monitoring Dashboards: Performance Evaluation

- Evaluate performance measurements (KPI's)
- Like a report card for a strategic initiative
- Flags whether you are meeting a goal



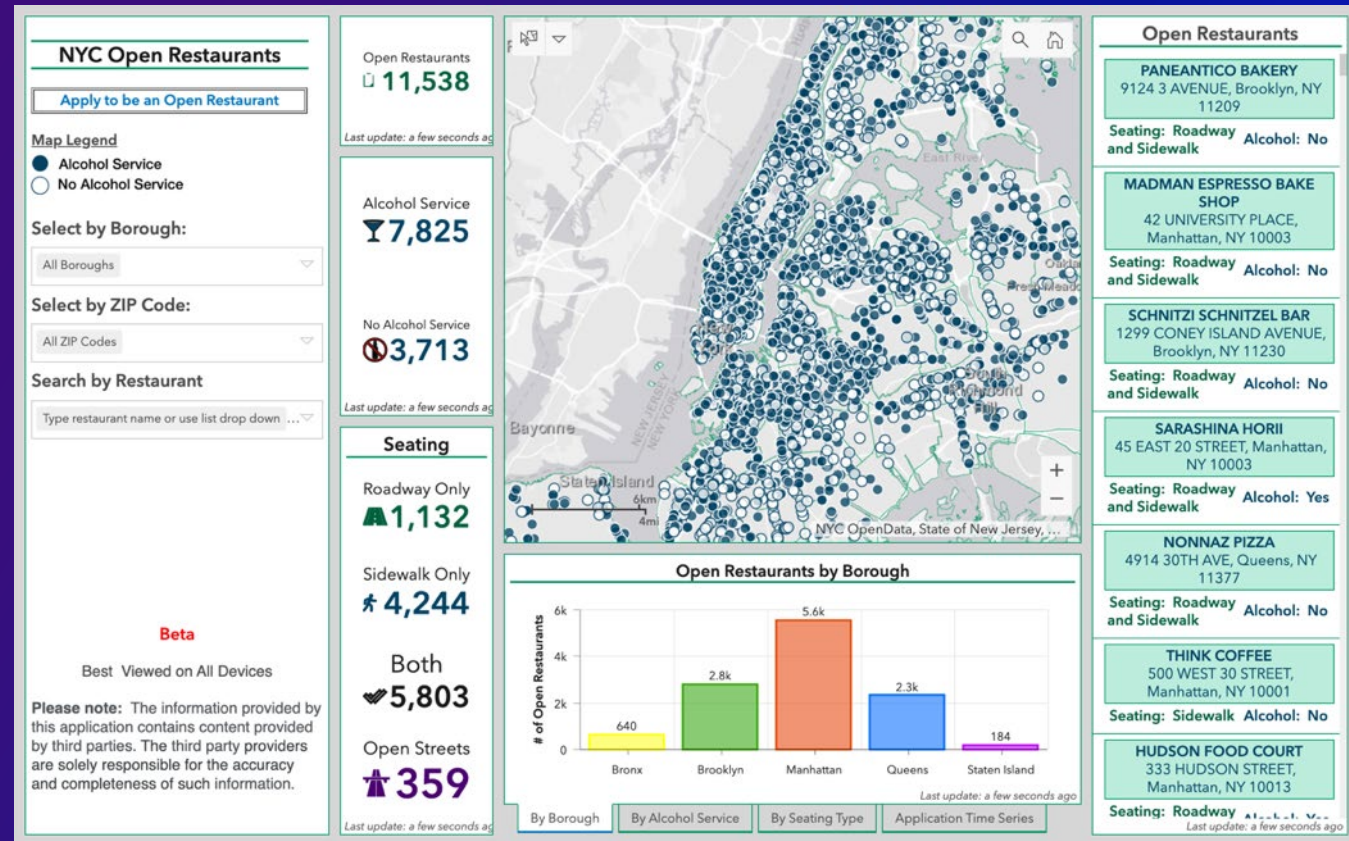
# Monitoring Dashboards: Progress

- Highlights percent of completion
- For a program with a clear start and end



# Monitoring Dashboards: Analysis

- Provide interactive filtering to drill into the data
- Empowers user to analyze data for patterns and pull out summaries



311 Requests - Operations Center

Division 1 2 3 5 6

Date Range Last 24 Hours

24 Hr Request Volume

461



Feed

- 527244 **New**  
City Source (CDBG) - Other  
5/26/2021, 9:36 AM
- 527243 **New**  
Wires - Utility Issues  
5/26/2021, 9:34 AM
- 527242 **New**  
Overgrowth, Parks - Other  
5/26/2021, 9:32 AM
- 527241 **New**  
Weeds/Debris - Neighborhood Issues  
5/26/2021, 9:31 AM
- 527240 **Closed**  
Paving Request - Road/Street Issues  
5/26/2021, 9:28 AM
- 527235 **New**  
Weeds/Debris - Neighborhood Issues  
5/26/2021, 9:27 AM

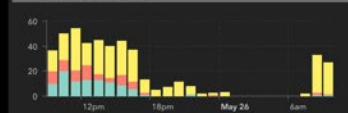
Feed Details for Selected Item



Priority Requests

- Speeding Overbrook
- Patrol East Liberty
- Fire Lane Upper Lawrenceville
- Patrol Squirrel Hill South
- Speeding Brighton Heights
- Patrol Homewood South
- Patrol Manchester
- Homeless Central Business District

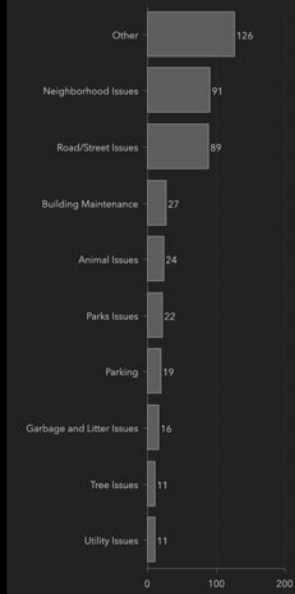
Hourly Requests



Daily Requests Last 14 days



Top 10 Request Categories



# Monitoring Dashboards Demo

311 Requests - Operations Center

Division 1 2 3 5 6

Date Range Last 24 Hours

24 Hr Request Volume

458



Feed

- 527244 City Source (CDBG) Other Larimer Open 3m0s
- 527243 Wires Utility Issues Bloomfield Open 5m0s
- 527242 Overgrowth, Parks Other Perry South Open 7m0s
- 527241



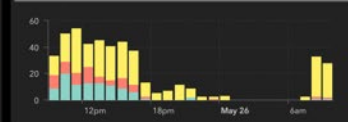
Top 10 Request Categories



Priority Requests

- Speeding Overbrook
- Patrol East Liberty
- Fire Lane Upper Lawrenceville
- Patrol Squirrel Hill South
- Speeding Brighton Heights
- Patrol Homewood South
- Patrol Manchester
- Homeless Central Business District

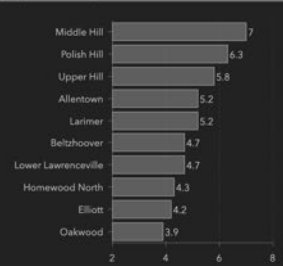
Hourly Requests



Daily Requests Last 14 days



Top 10 Neighborhoods Per 1000 people



# Monitoring Dashboards Demo

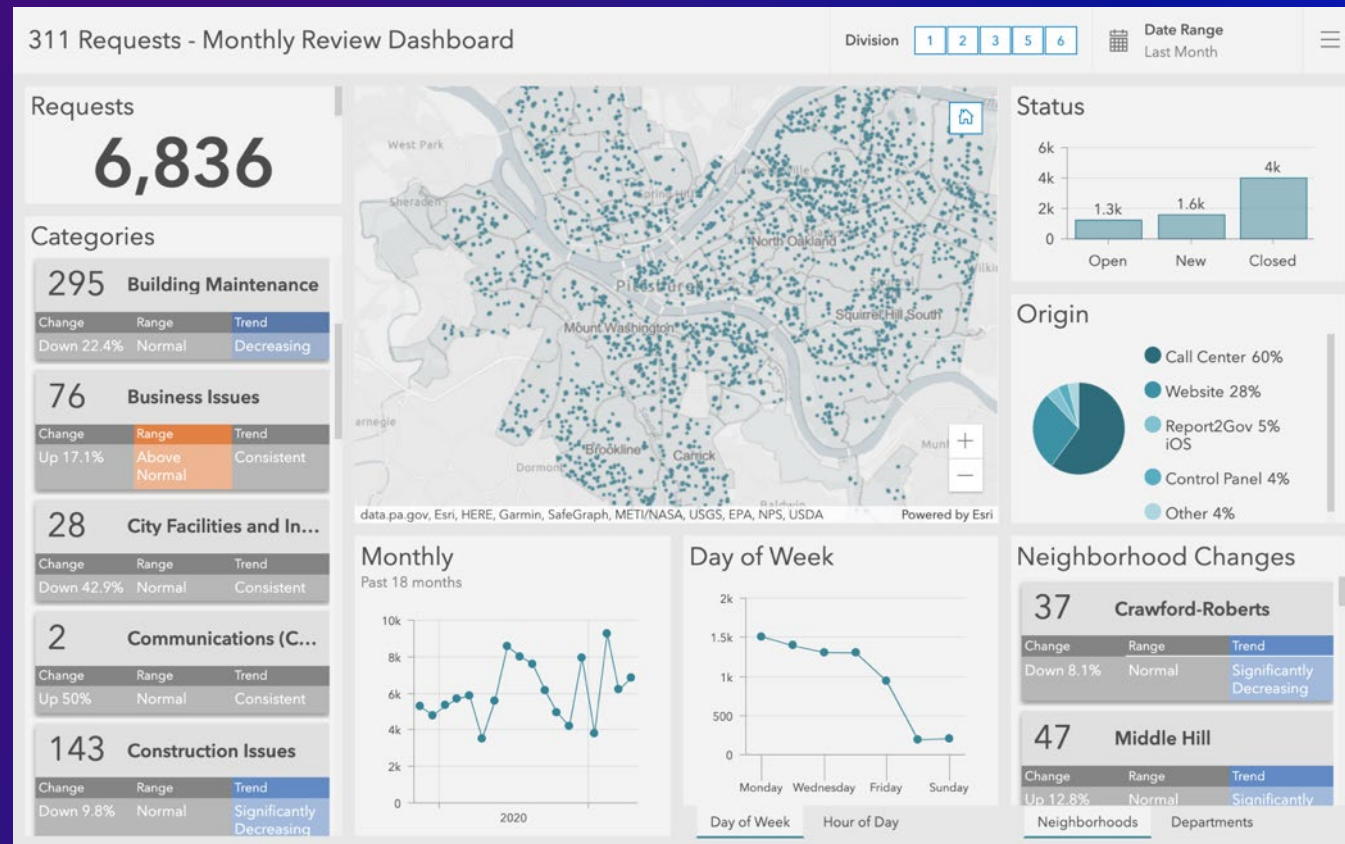


# Additional Topics

The background is a vibrant, abstract composition. It features a gradient of colors from deep purple and blue on the left to bright orange and pink on the right. There are several overlapping, semi-transparent shapes, including a large, curved orange shape on the right side and a smaller, curved pink shape above it. A thin, bright yellow line curves across the middle of the image. In the bottom right corner, there is a stylized, low-poly mountain range in shades of orange and yellow. The overall aesthetic is modern and digital.

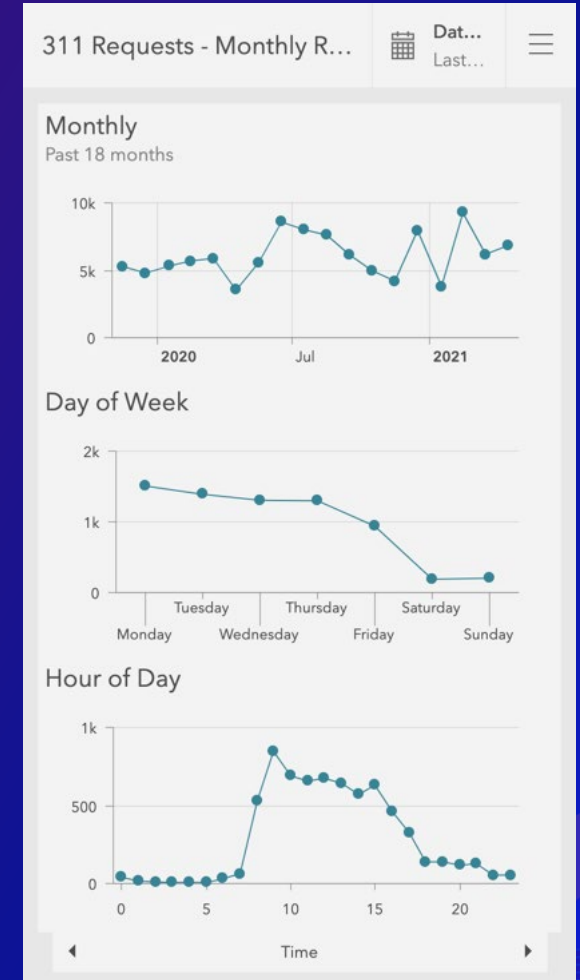
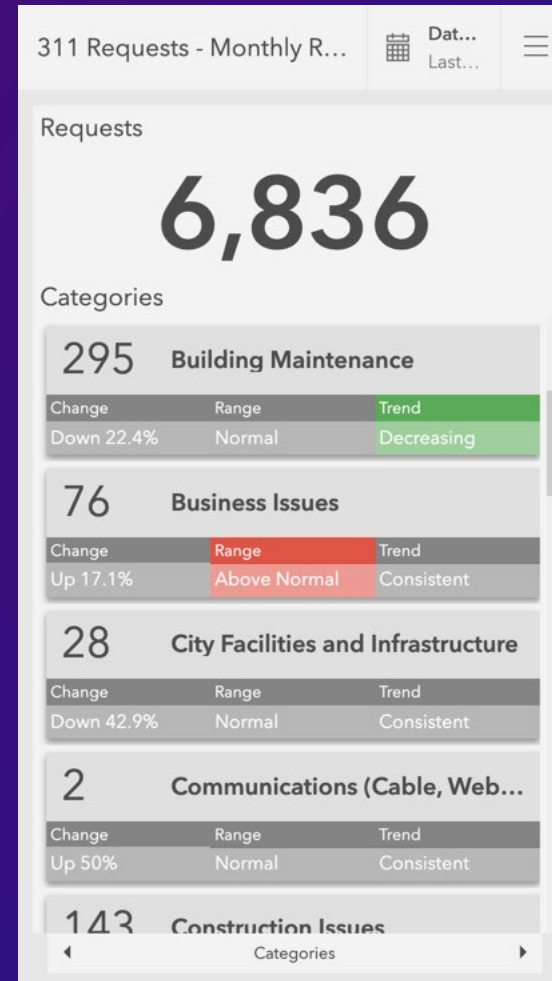
# Color Interpretation and Color Blindness

- Ensure colors are interpreted correctly (good and bad)
- Consider color-blind-friendly colors



# Mobile Considerations

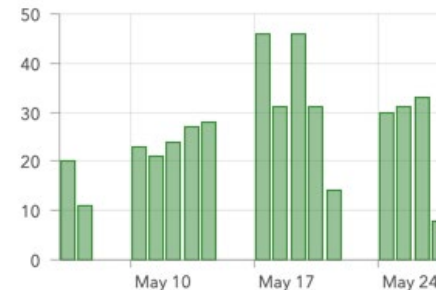
- Have a dashboard with elements positioned and stacked so they work well on mobile devices



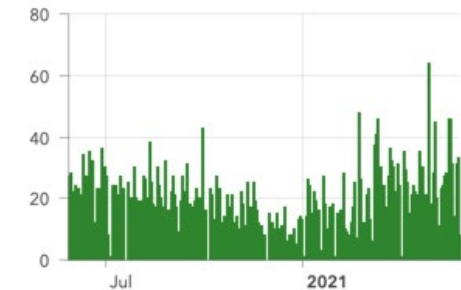
# Evolving with Time

- Charts may need to change as data accumulates
- Priorities change
- New questions need answering

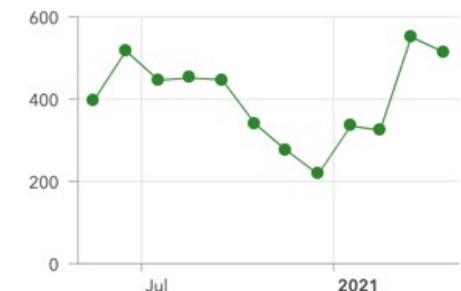
Completed per Day



Completed per Day

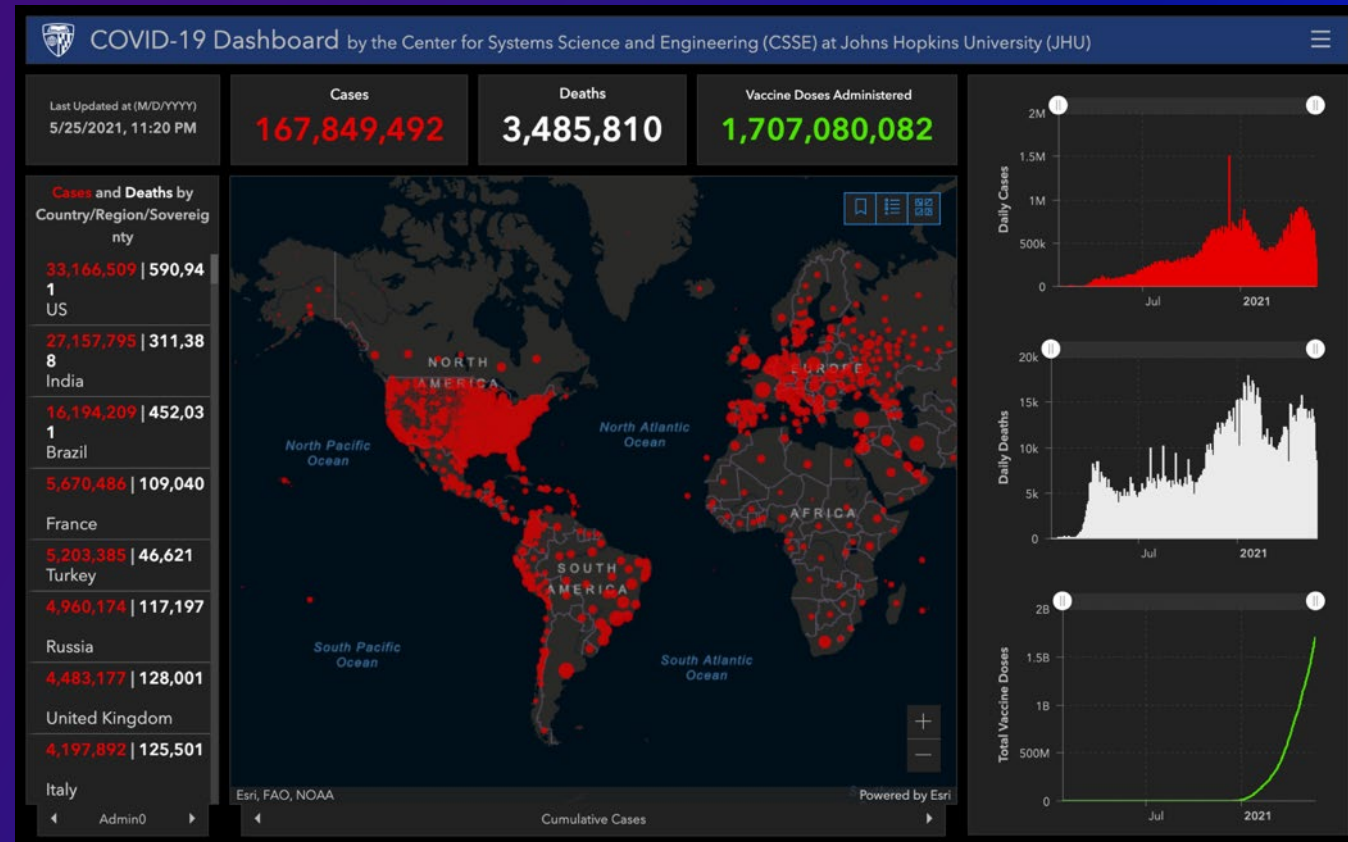


Completed per Month



# Ensuring Dashboards Scale

- For high traffic dashboards, follow best practices to ensure it leverages ArcGIS Online's scalable architecture
- See ArcGIS Dashboards doc page on [Build highly scalable dashboards](#)



# Summary

- **A good dashboard...**
  - **Grabs your attention to where it's needed**
  - **Communicates information at-a-glance**
  - **Make it easy to spot what's most important**



# Resources

- Arcade Language Documentation  
<https://developers.arcgis.com/arcade/>
- Documentation
  - Advanced formatting expressions  
<https://esriurl.com/DashboardDoc3>
  - Data expressions  
<https://esriurl.com/DashboardDoc2>
  - Highly scalable dashboards  
<https://esriurl.com/DashboardDoc1>
- Blog Articles
  - Getting started with Arcade in the ArcGIS Dashboards  
<http://esriurl.com/DashboardArcadeBlog1>
  - Introducing Data Expressions in ArcGIS Dashboards  
<https://esriurl.com/DashboardArcadeBlog6>
- Blog Articles Cont.
  - Communicating status with icons in the ArcGIS Dashboards Beta  
<http://esriurl.com/DashboardArcadeBlog2>
  - Conditional formatting in dashboard indicators with Arcade  
<http://esriurl.com/DashboardArcadeBlog3>
  - Displaying time spans with Arcade in dashboards  
<http://esriurl.com/DashboardArcadeBlog4>
  - Pushing the limits of Arcade in dashboards  
<https://esriurl.com/DashboardArcadeBlog5>
  - Add Context to your Dashboards using Data Expressions + Living Atlas  
<https://esriurl.com/DashboardArcadeBlog7>
  - Mobile Dashboard Tips  
<https://esriurl.com/DashboardMobileBlog1>

The background features a vibrant, abstract design. On the left, there are layered, wavy shapes in shades of blue, purple, and pink. On the right, a stylized mountain range is depicted in warm tones of orange, red, and yellow, with a thin yellow arc curving over it. The overall color palette is rich and modern.

# We want your feedback

Click on the [Session Survey link](#)  
below this video window



# Questions & Answers

The background is a vibrant, abstract composition. It features a gradient of colors from deep purple and blue on the left to bright pink and orange on the right. There are several overlapping, semi-transparent shapes, including a large, curved yellow shape on the right side. The overall aesthetic is modern and dynamic, with a focus on bold colors and geometric forms.



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