

# Data Dashboards

Concepts to Reality





EMBRACING *Change* AND  
ACHIEVING *Success* FOR ALL



Thank you to the  
Florida Coalition  
for the Homeless



October 9-11, 2019 • Rosen Centre Hotel • Orlando, FL

[www.fchonline.org](http://www.fchonline.org)

# Agenda

A little bit about today's presenter and some info to get us started



## INTRO

Background Information on Gaither and Topics Discussed

## CONCEPTS

Datasets, Visualizations, and Dashboards



Overview of basic data ideas and how they are used to create dashboards

We will go through the steps to build an actual data dashboard!



## REALITY

How to Build a Dashboard in Real-Time



I like to talk and can guarantee we will not run out of things to discuss!

## Q&A

Open Floor for Questions and Discussion



# INTRODUCTION



# Gaither.Stephens

@GulfCoastPartnership.org

@GaitherDyn.com



facebook.com/GaitherStephens



@GaitherStephens



linkedin.com/in/gaitherstephens



231.282.9453



Florida Coalition  
FOR THE HOMELESS  
CELEBRATING **25**  
YEARS

Presented by  
Gaither Stephens



# Fun Facts



**Bob Ross**

*Happy Little Trees*

The Joy of Painting filmed less than a mile from Gaither's childhood home in Muncie, Indiana



**Gaithersburg, MD**

*Dang Autocorrect*

Gaither's family founded Gaithersburg in the 1800's near Washington DC. Autocorrect commonly changes Gaither to Gaithersburg.



**Bill Gaither**

*2<sup>nd</sup> Cousin Once Removed*

Gaither is related to six-time Grammy Award and thirty-four-time GMA Dove Award winner, Bill Gaither. If you don't know this is, chances are one of your older relatives will.



**Family Life**

*Personal Stuff!*

Gaither has a beautiful girlfriend, five kids, three cats, and a really cool drum set. He's lived in or near Marion, IN, Muncie, IN, Fort Wayne, IN, Florence, KY, Cincinnati, OH, Port Charlotte, FL, and Punta Gorda, FL.

# Education



01

Burris Laboratory School  
Collegiate School at Ball State University

02

Purdue University  
Associate of Science in Information  
Systems & Computer Science

03

Indiana Wesleyan University  
Bachelor of Science in Business  
Administration

04

Boston University  
Master of Science in Computer  
Information Systems



# Career



## Radio Manager

1996-2014

Gaither was an operations manager, general manager, and a regional manager for more than six radio stations in Indiana, Ohio, and Kentucky.



## Data Analyst

2015-2016

Gaither was the HMIS data analyst and on-site IT specialist for The Homeless Coalition in Port Charlotte, FL.



## CTO

2016-Current

Responsible for HMIS, IT, local, state, and federal reporting conducting the yearly PIT Count, data analysis and dashboards.



## CEO

2019-Curent

Gaither Dynamic creates data dashboards for communities to publish to their websites for community engagement.





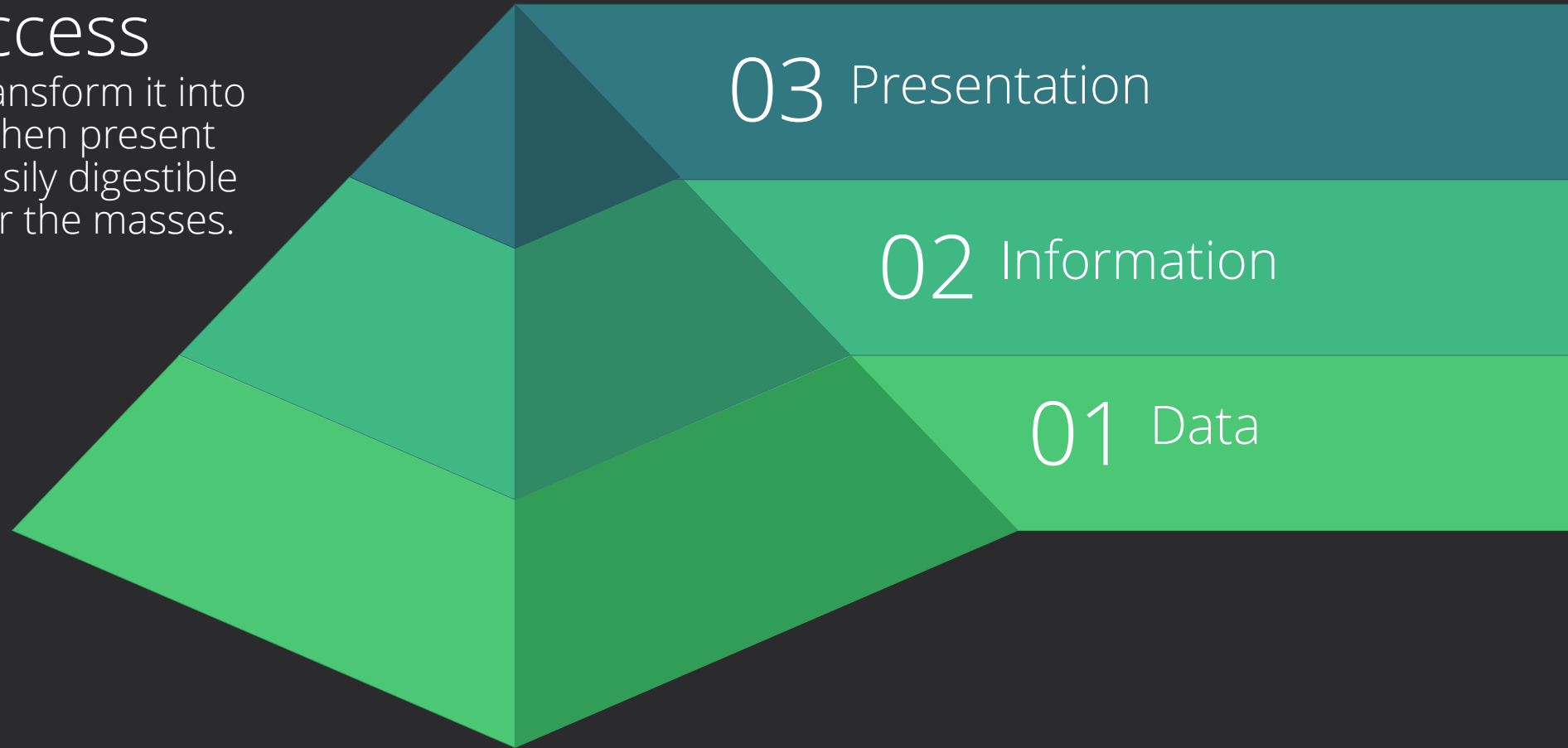
# CONCEPTS

# Data Dashboard Building Blocks

Back to the Basics

## The key to success

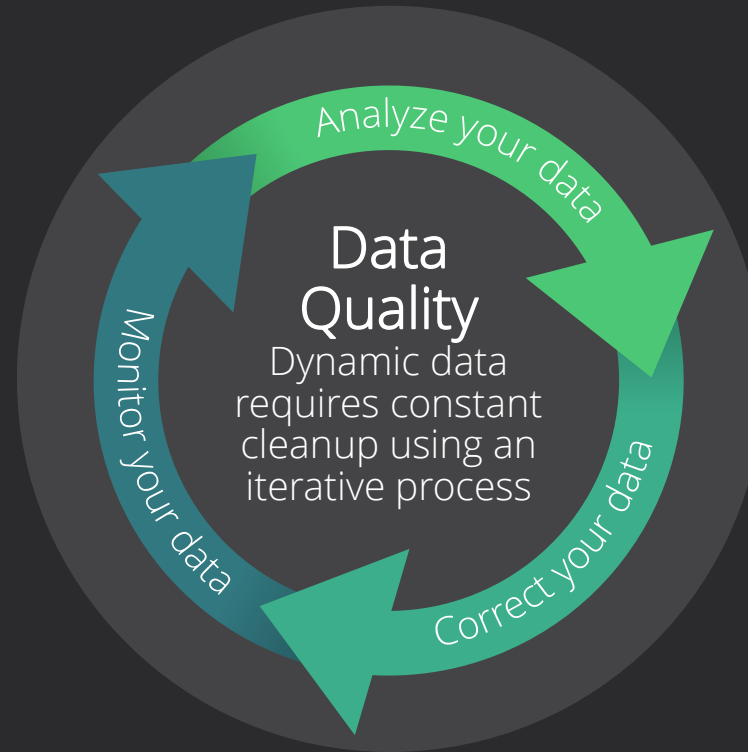
is to take quality data, transform it into useful information, and then present that information in an easily digestible and accessible format for the masses.



# Data

## ETL

For our purpose, we are extracting data from an existing data source (HMIS), transforming it so that it is easier for our visualization software to use, and then loading it into its new home where it can be accessed by our visualization tool to create and power our dashboards.



## Data Quality

Working with quality data is essential to providing accurate information to our dashboard and our community. It is okay to create a dashboard before data quality is perfect because the dashboard itself can be a tool to identify and help improve data quality.

## Analyze

Look for inconsistencies in your data. Compare using multiple reports or data quality reports

## Correct

Look holistically at your data and consider that if data is incorrect in one area it may be incorrect in many

## Monitor

Educate users, create reports to keep an eye on known problem areas, and expect the unexpected



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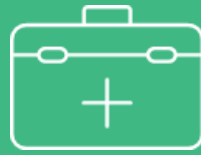
# Information

## Four Stages of Data Analysis



### Describe

Median days for Length of Time (LOT) homeless went up by 5 days for the entire Continuum of Care.



### Diagnose

The Emergency Shelter had a large increase in LOT. This was due to the shelter becoming low-barrier leading to longer lengths of stay.



### Predict

Our median days will increase even more next year because the shelter began prioritizing chronically homeless persons.



### Prescribe

Allocate more funding to Rapid Re-Housing to help house shelter residents more quickly.



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# Presentation

## Advantages of Web Accessible Data Dashboards

01



### Dynamic Content

Ability to keep dashboards up to date and be flexible

02



### Accessibility

Allows anyone to access information easily

03



### Accountability

Creates transparency with community and stakeholders

04



### Economics

Saves in printing and paper costs



# REALITY

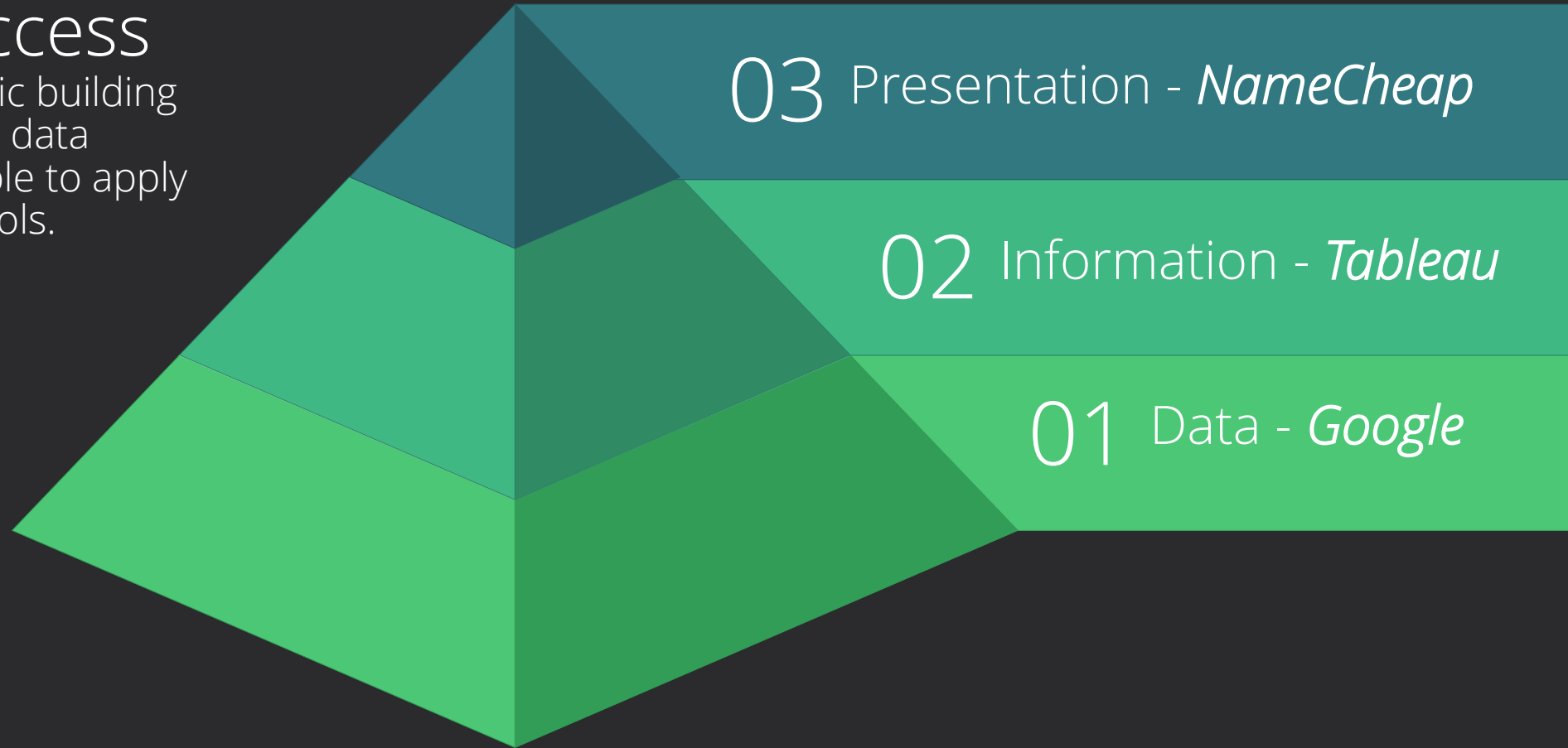


# Practical Tools

Useful real-world tools to build data dashboards

## The key to success

is to understand the basic building blocks used in creating a data dashboard AND to be able to apply them using real world tools.



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# List of Tools

What we will be covering in this presentation



## Google

- Google Drive
- Google Sheets works with Tableau Public for Free
- Google Apps Script
- Free
- Ability to import spreadsheets



## Tableau

- Tableau Desktop used to create dashboards
- Tableau Public will host dashboards for free and updates nightly from Google Sheets
- \$58 on TechSoup for non-profits
- Embed codes and prints to PDF



## NameCheap

- Domain Name
- Web Hosting
- Softaculous
- WordPress
- Plugins
- Embed Tableau Public code into website



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# Steps to Create and Display a Data Dashboard





# DEMONSTRATION



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## ► Reports

New Report

## Tables

 Clients

## Raw Data

Generate data from your system.

This will generally be in non-aggregated form. This means that the data is separated out into individual rows and not aggregated into total amounts.

First, we will work on downloading a table filled with client data.

*\*Examples shown are from WellSky Community Services (formerly ServicePoint)*



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## ☐ Clients

- ☐ [Active](#)
- ☐ [Alias](#)
- ☐ [Anonymous](#)
- ☒ [Client ID](#)
- ☐ [Date Added](#)
- ☐ [Date Updated](#)
- ☐ [First Name](#)
- ☐ [Last Name](#)

- ☐ [Soc Sec No Dashed](#)
- ☐ [Soc Sec No Sorted](#)
- ☐ [Suffix](#)
- ☒ [U.S. Military Veteran?](#)
- ☐ [Unique ID](#)
- ☐ [Unnamed Client](#)
- ☐ [\\* User Creating](#)
- ☐ [\\* User Updating](#)

## Preview

Download Full Report

## Client Data Table

We will be using multiple tables and joining them together.

We do this in order to get the veteran status.

It's possible to join multiple tables together using either a primary key or a composite key.

Client ID is our primary key for this table so we select it and U.S. Military Veteran.



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## ☒ Entry Exits

### ☒ @GCP - HUD CoC & ESG Entry All Other Projects (2017)

#### ☐ **Entry Exits**

- ☐ Active
- ☒ Client ID
- ☐ Date Added
- ☐ Date Updated
- ☐ Destination Other
- ☒ Entry Date
- ☐ Entry Exit ID
- ☐ Entry Subgroup ID

#### ☒ Entry/Exit Destination

#### ☐ Entry/Exit Reason for Leaving

- ☐ Entry/Exit Types
- ☒ Exit Date
- ☐ Exit Subgroup ID
- ☐ Group ID
- ☐ Household ID

#### ☐ **@GCP - HUD CoC & ESG Entry All Other Projects (2017)**

- ☒ Date of Birth
- ☐ Date of Birth Type
- ☐ Did you stay less than 7 nights?
- ☐ Did you stay less than 90 days?
- ☒ Does the client currently have a disabling condition?

#### ☒ Domestic violence victim/survivor

- ☒ Ethnicity
- ☒ Gender
- ☐ Housing Move-in Date
- ☐ If yes for Domestic Violence Victim/Survivor, are you currently fleeing?
- ☐ If yes for Domestic

## EE Data Table

Next, we will get information from a table that has entry/exit information for the client.

We must make sure that we have a way to join our client table to our entry/exit table, so we select Client ID. When a field such as Client ID is a unique ID in a table it is called a Primary Key. When a matching ID is used in another table, but is not necessarily unique, it can be called a foreign key.

The Primary key in the Entry Exits table is the Entry Exit ID field.

Download the report (will have to unzip to get to the csv file).



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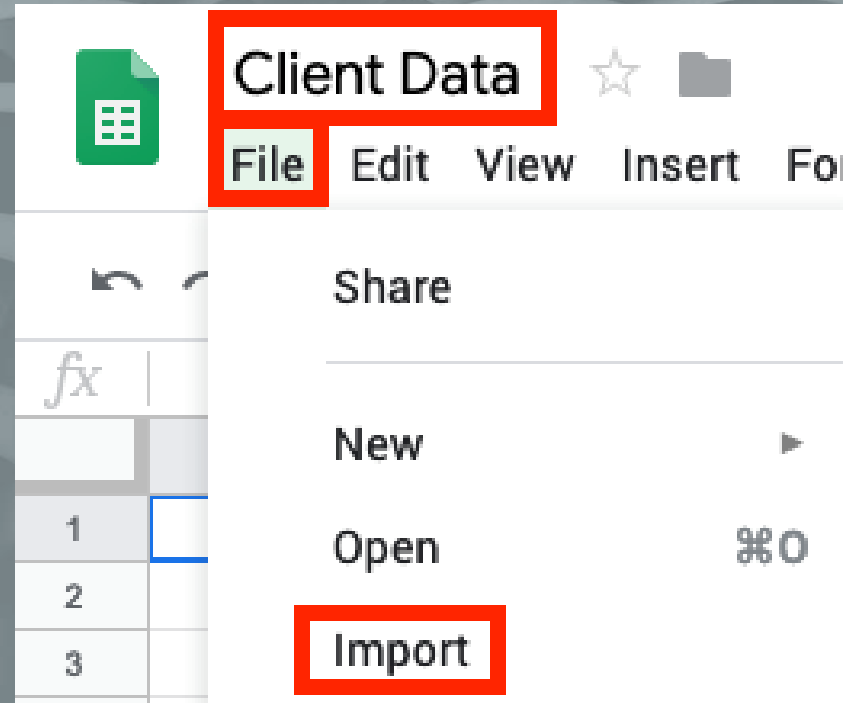
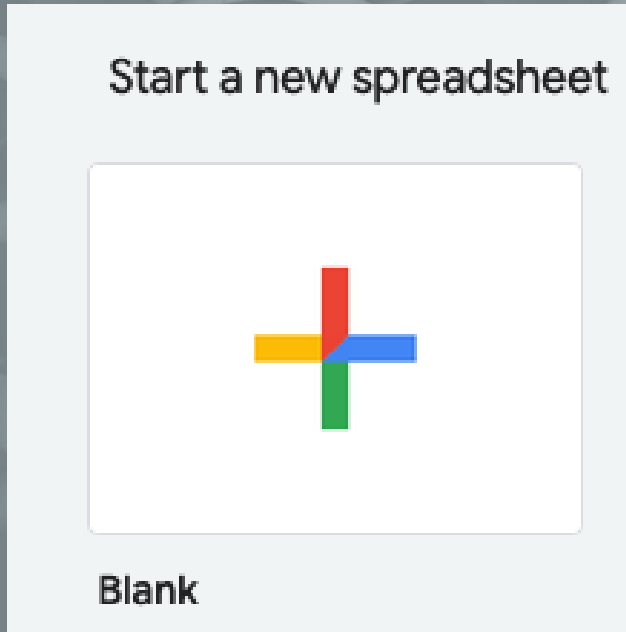




# Google Sheets

Create a new spreadsheet and import your Client data csv.

We use Google Sheets because Tableau Public allows free nightly updates of dashboards that use Google Sheets as their data sources. This allows us to upload new data, walk away, and have our dashboard automatically update itself overnight.



**Upload**

Select a file from your device



Client Data.csv

## Import file



File: @Presentation Client Data.csv

### Import location

- ☒ Create new spreadsheet
- ☐ Insert new sheet(s)
- ☐ Replace spreadsheet
- ☐ Replace current sheet
- ☐ Append to current sheet
- ☐ Replace data at selected cell

### Separator type

- ☒ Detect automatically
- ☐ Tab
- ☐ Comma
- ☐ Custom:

### Convert text to numbers, dates, and formulas

- ☒ Yes
- ☐ No

Import data

Cancel

## Google Sheets

Upload your data as a new Google Sheet and when it is done, click Open now >

You should have a spreadsheet filled with your client data.

You'll notice that we do not have names or social security numbers.

We purposely left this information out when we downloaded our data file.

Go through the same process for your Entry/Exit csv data file.



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# Google Sheets

Allow



Choose an account  
to continue to **Tableau Desktop**



admin@gulfcoastpartnership.org



Gaither Stephens  
gaitherstephens@gmail.com



Gaither Stephens  
gaither.stephens@gulfcoastpartnership.org



Gaither Stephens  
gaither.stephens@hmishelp.com



Gaither Stephens  
gaither@hmishelp.com

Signed out



Admin GCP  
gcpadwords@gmail.com

Signed out



Gaither Stephens  
gaither.stephens@gaitherdyn.com



Use another account

# Tableau Desktop

Connect Tableau Desktop to your Google Sheet data by clicking on the Google Sheets option under the 'To a Server' section on the left-hand side of Tableau Desktop.

Select the account you used to store your data in Google Sheets.

Click the Allow button to give Tableau Desktop access to your data.



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Name	Owned by	Last Opened By Me
Client Data	Gaither Stephens	Sep 30, 2019
Client Data	Gaither Stephens	Sep 30, 2019
@Presentation EE & More Data	Gaither Stephens	Sep 30, 2019
@Presentation Client Data	Gaither Stephens	Sep 30, 2019
EEs	Gaither Stephens	Sep 19, 2019
Clients	Gaither Stephens	Sep 19, 2019
Copy of File Upload Forms	Gaither Stephens	Jul 17, 2019
Copy of File Upload Forms	Gaither Stephens	Jun 14, 2019

#### Client Data

Last Modified On **Sep 30, 2019**

Last Modified By **Gaither Stephens**

[Open in Google Drive](#)

Cancel

Connect

# Tableau Desktop

Select your data source and then click the Connect button.

At this point, Tableau Desktop will read the data from Google Sheets and show you your data with your selected data already in the data pane.

Click on the Add button to repeat the process for additional data.

If your data has corresponding primary and foreign keys that are easily recognizable, Tableau Desktop will join the data for you.



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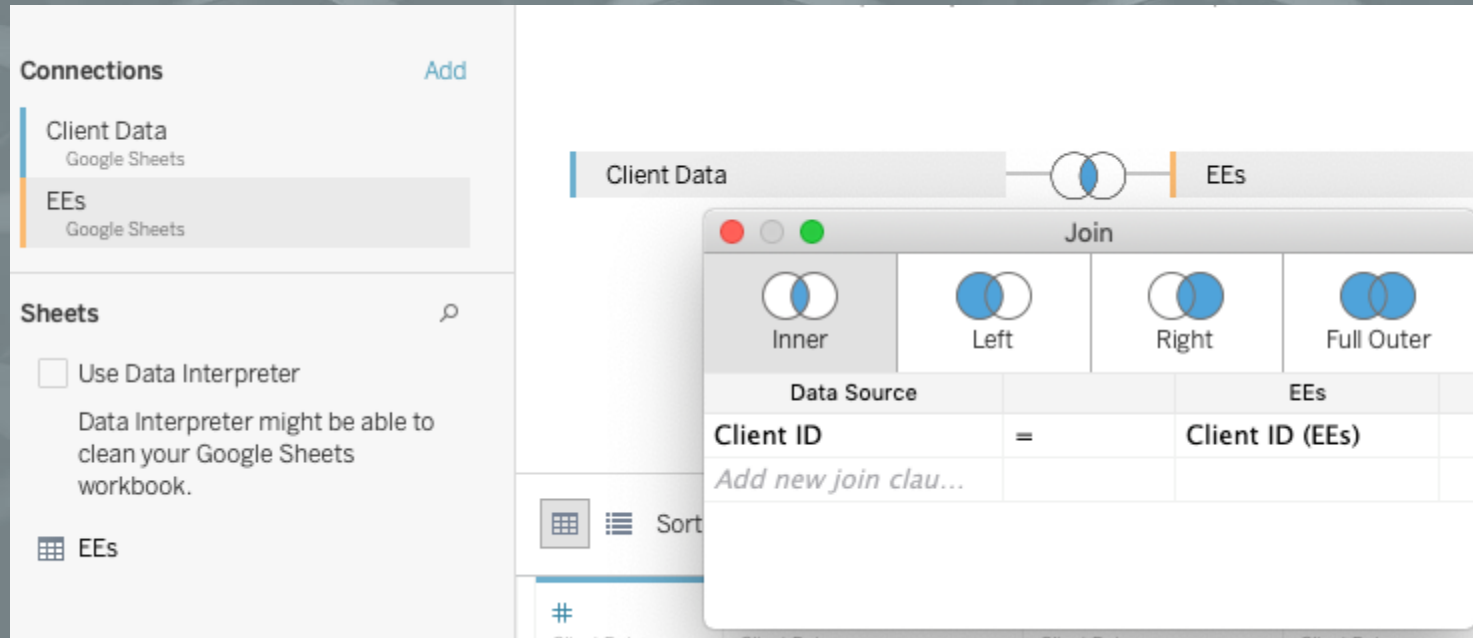


# Tableau Desktop

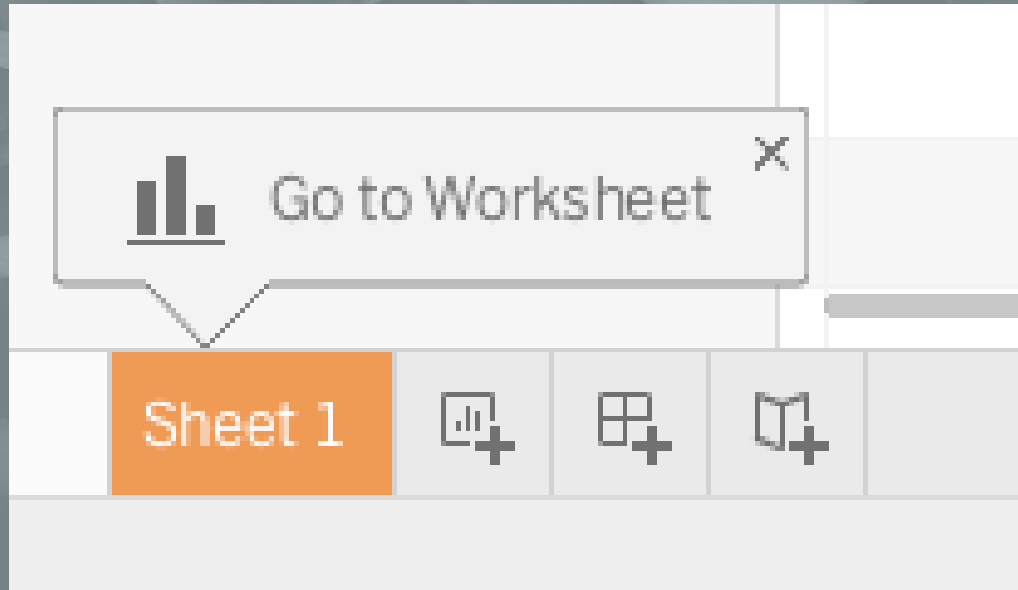
We can see that Client Data and EEs are now available to us under the Connections section.

Tableau has also joined the two tables using the Client ID field. In the Client Data table, Client ID is a primary key. In the EEs table Client ID is a foreign key.

A primary key must be used only once in the table it exists. A foreign key may appear many times in a table.







# Tableau Desktop

We are now ready to create our first Sheet in Tableau.

Tableau is broken down into Sheets, Dashboards, and Stories.

It is customary to have one visualization per sheet.

Sheets can then be used to build a dashboard.

Stories can be used to display multiple dashboards one dashboard at a time in a sequence.



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# Tableau Desktop

Once we have our sheet view available, we have many options to choose from.

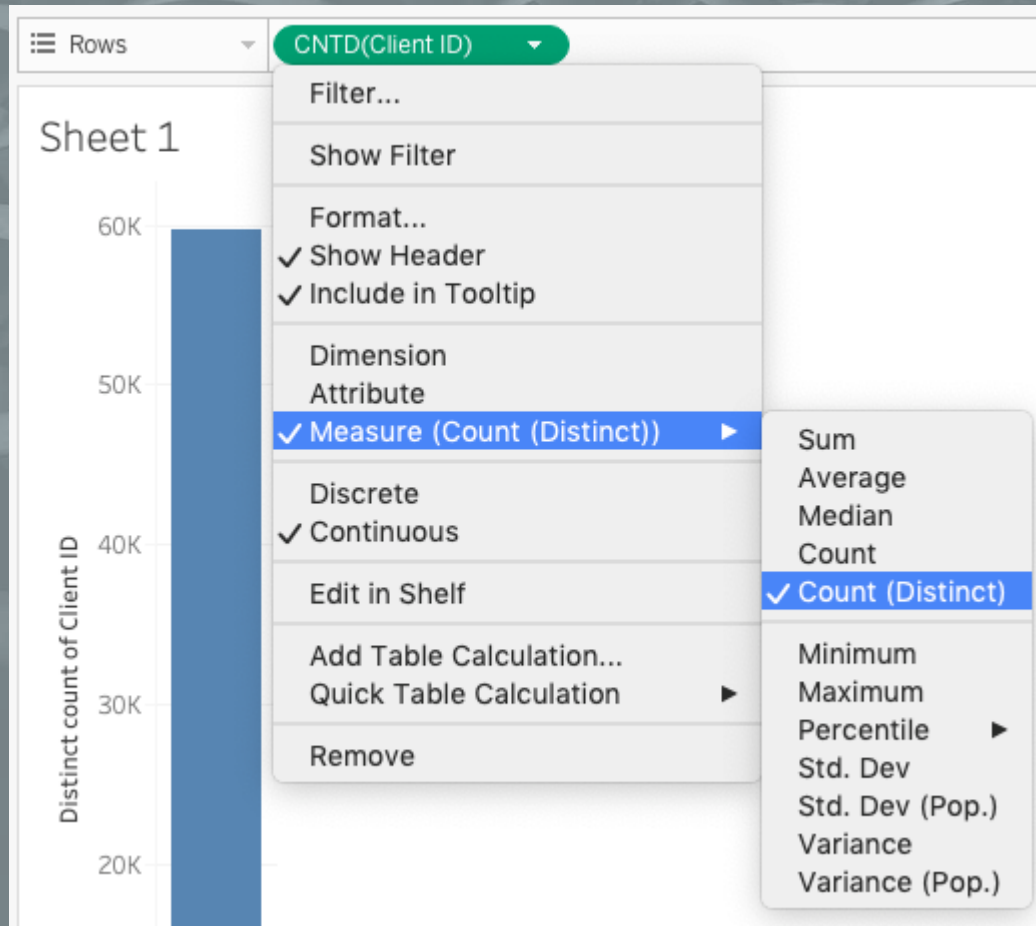
If you double click the Client ID object under Client Data, it will automatically be added to the sheet. You can also drag the Client ID object to the Rows section to perform the same function.

The screenshot shows the Tableau Desktop interface with the 'Client Data' dataset loaded. The 'Columns' shelf is empty, and the 'Rows' shelf contains 'Client ID'. The 'Marks' shelf is set to 'Automatic'. The 'Dimensions' pane on the left shows the following fields:

- Client Data**
  - Client ID
  - Date of Birth
  - Ethnicity
  - Gender
  - Primary Race
  - U.S. Military Veteran?
- EEs**
  - Client ID (EEs)
  - Ethnicity (EEs)
  - Gender (EEs)
  - Primary Race (EEs)
  - Veteran
  - Measure Names

The 'Sheet 1' view displays a table with the following data:

Client ID	
3	Abc
5	Abc
18	Abc
20	Abc
21	Abc
22	Abc
24	Abc
26	Abc
27	Abc
29	Abc
30	Abc
31	Abc
32	Abc
34	Abc
36	Abc



# Tableau Desktop

If you hover over the Client ID 'pill' in the Rows section, it will bring up a menu that you can use to control what is displayed on the sheet.

By selecting Measure > Count (Distinct) we can count how many distinct clients we have in our data.

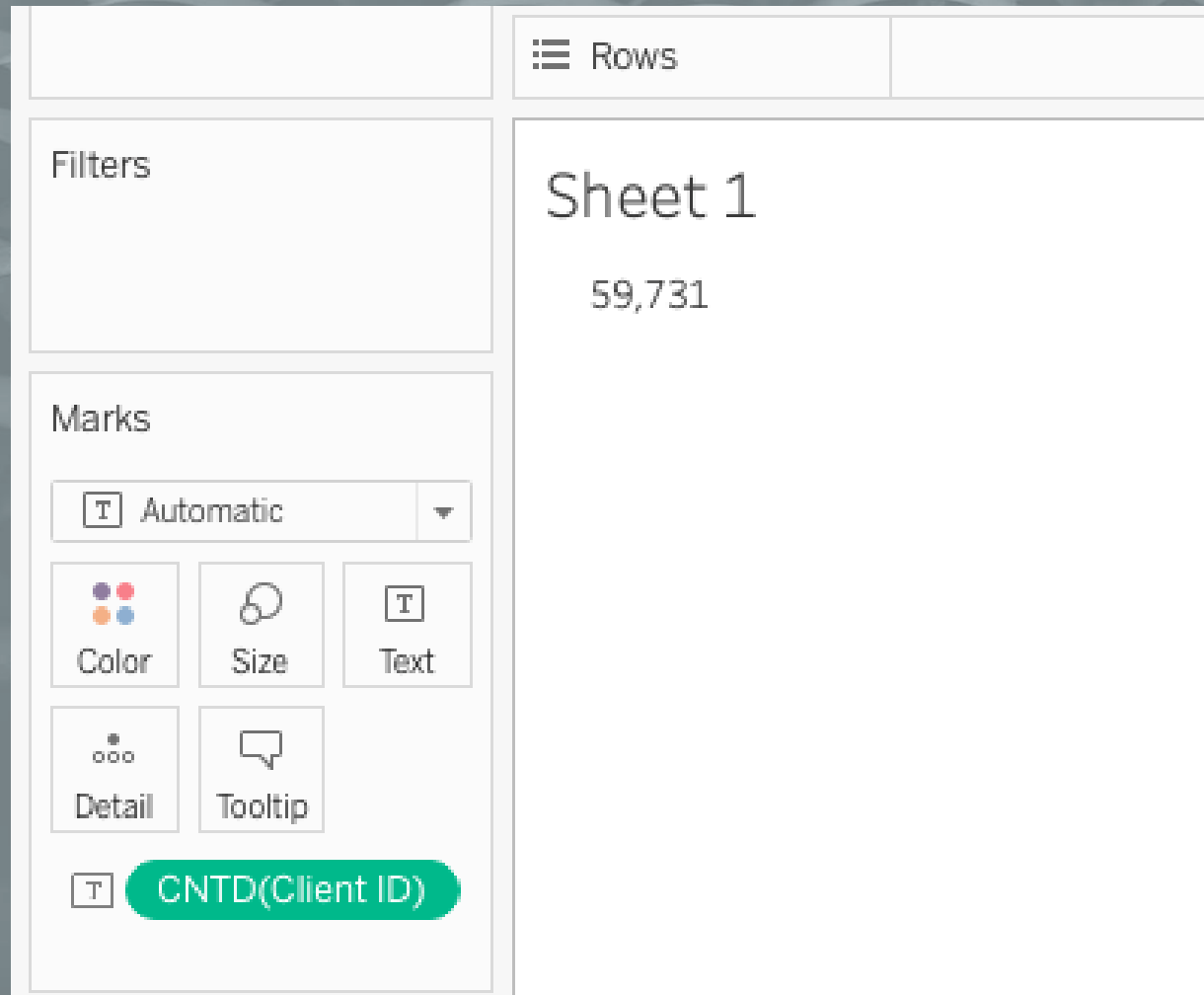
The sheet will automatically turn this into a bar chart.

# Tableau Desktop

On the left side of the sheet screen there is a section called Marks.

This section can be used to alter what is displayed on the sheet such as data color, size of visualizations, and more.

By dragging the Client Data pill onto the Text card in the Marks section, we can now see in an easy to read manner how many distinct clients are in our data.



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Pages

Filters

Marks

Automatic

Color

Size

Text

Detail

Tooltip

CNTD(Client ID)

Columns

Rows

Primary Race (EEs)

Sheet 1

Primary Race (EEs)	
Null	6,679
Alaskan Native (HUD)	1
American Indian (HUD)	54
American Indian or Alaska..	209
American Indian/Alaskan ..	15
American Indian/Alaskan ..	38
Asian (HUD)	207
Asian & White (new HUD 4..	24
Black or African American ..	9,430
Black/African American & ..	194
Client doesn't know (HUD)	891
Client refused (HUD)	98
Cuban	5
Data not collected (HUD)	431
Haitian	10
Jamaican	2
Latino	213
Native Hawaiian (HUD)	3
Native Hawaiian or Other ..	105
Other	548
Other Multi-Racial	110
Pacific Islander (HUD)	24
White (HUD)	40,440

# Tableau Desktop

By dragging and dropping Primary Races (EEs) from the EEs section into the Rows section, we now have a count of races by number of clients.



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Pages

Filters

Marks

Automatic

Color

Size

Text

Detail

Tooltip

CNTD(Client ID)

Columns

Rows

Primary Race (EEs)

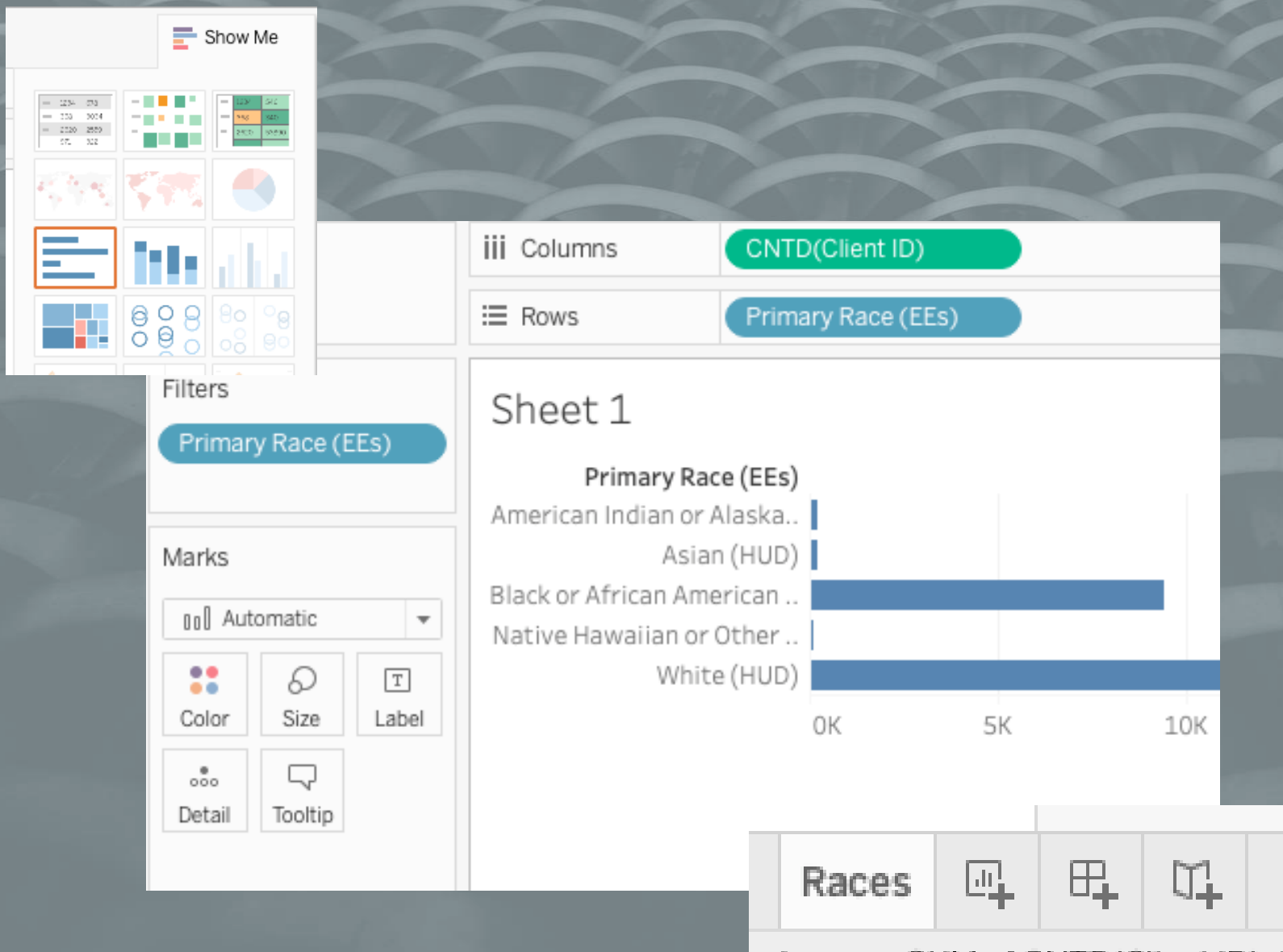
Sheet 1

Primary Race (EEs)	
Null	6,679
Alaskan Native (HUD)	1
American Indian (HUD)	54
American Indian or Alaska..	209
American Indian/Alaskan ..	15
American Indian/Alaskan ..	38
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White (HUD)	40,440

# Tableau Desktop

By dragging and dropping Primary Races (EEs) from the EEs section into the Rows section, we now have a count of races by number of clients.

There may be historical answers that are no longer used in the system. When this happens, you can filter out the options you do not want displayed by dragging the Races (EEs) from the EEs section to the filter section. Select the options you want to keep.

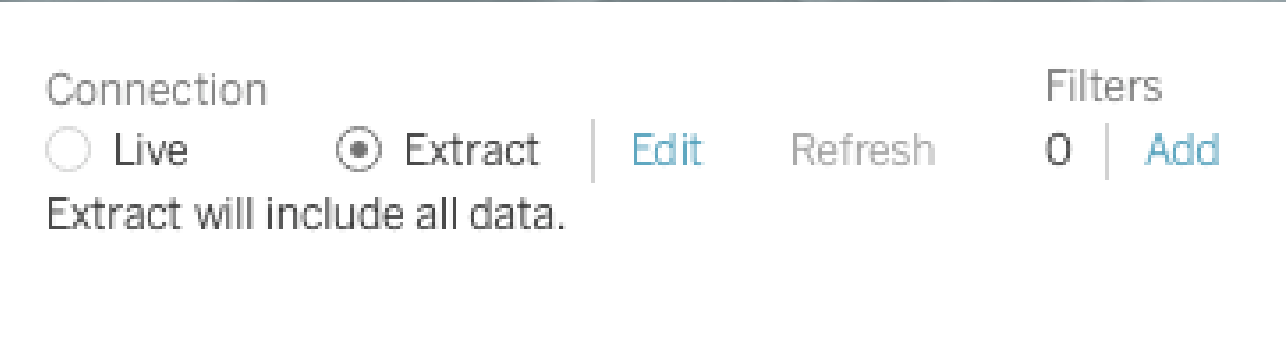
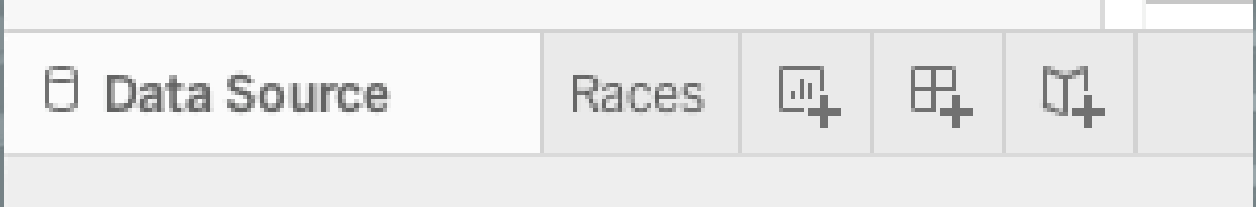


# Tableau Desktop

Use the 'Show Me' button located in the top right of Tableau to view available visualizations for your selected data.

By selecting the bar chart, Tableau will convert our data into a bar chart.

Double click on the Sheet 1 label at the bottom of the sheet view to rename the sheet.



# Tableau Desktop

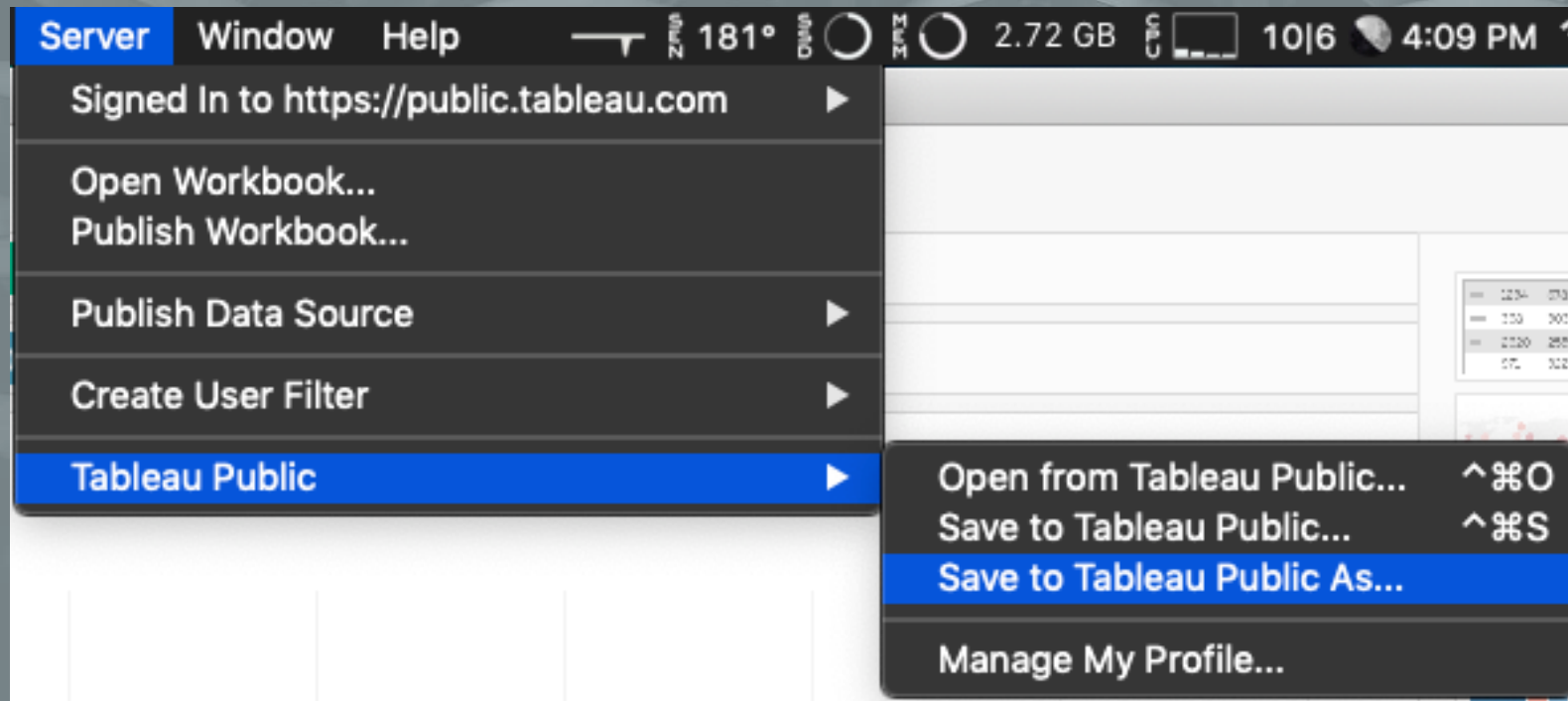
In order to keep our dashboard in sync with our data stored in Google Sheets, we will need to create a data extract.

In the bottom left hand corner of Tableau, click on Data Source.

In the data screen, change the connection type from Live to Extract.

Click on our Races sheet again and you will be prompted to save your data extract.





# Tableau Desktop

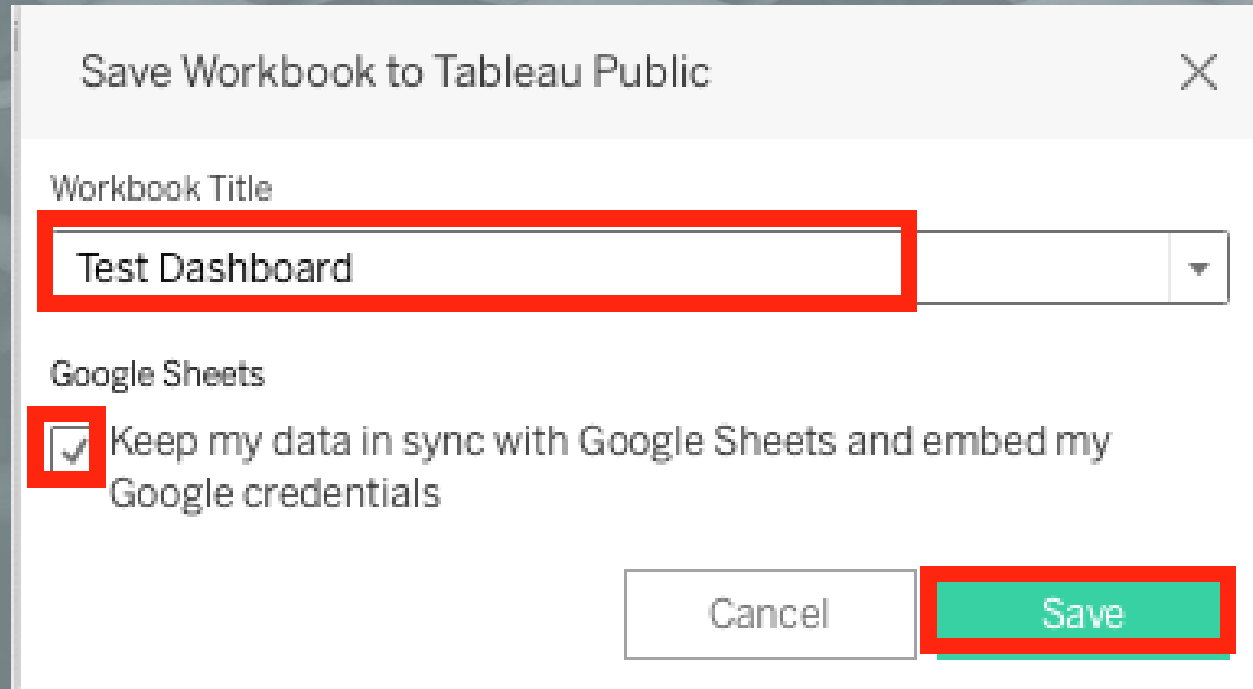
To save our visualization to Tableau Public, we click on Server > Tableau Public > Save to Tableau Public.

Log in to Tableau Public with your free credentials. If you have not signed up for Tableau Public, do so now.



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Save Workbook to Tableau Public

Workbook Title

Test Dashboard

Google Sheets

☒ Keep my data in sync with Google Sheets and embed my Google credentials

Cancel Save

## Tableau Desktop

Once you've logged in to Tableau Public, name your dashboard.

Next, be sure to check the box to keep your data in sync with Google Sheets.

Lastly, click the Save button.

If a pop-up window asks you to log in to your Google Sheets account, select your account and click Allow.





[Edit details](#)

- Toolbar Settings
- ☒ Show view controls *Undo, Redo, Revert*
  - ☒ Show author profile link
  - ☐ Allow workbook and its data to be downloaded by others
- Google Sheets
- ☒ Keep my data updated with Google Sheets every day
- Other Settings
- ☐ Show workbook sheets as tabs

## Tableau Desktop

If all goes well, your dashboard will now be on Tableau Public.

Click Edit details and select the options you want to use.

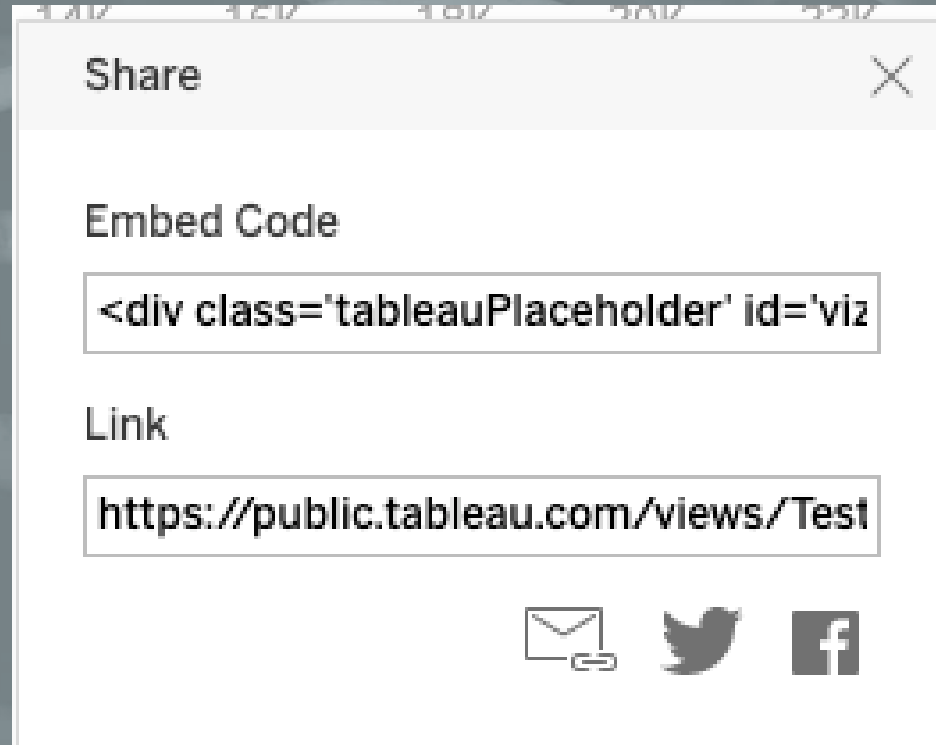
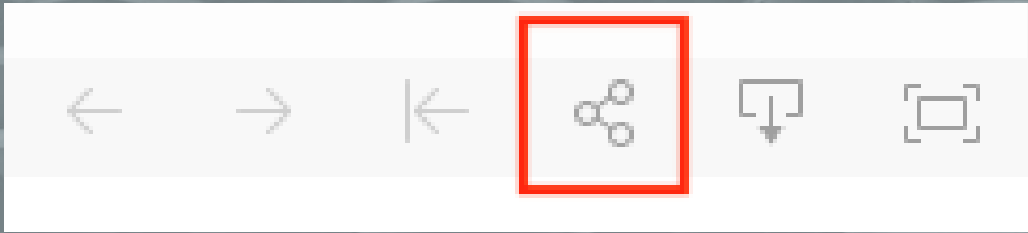
I recommend unchecking the option to allow your workbook and all its data to be downloaded by others.

Also, make sure the box is checked for Google Sheets so that your dashboard will sync each night with your data.



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## Website Embed

By clicking on the 'share' icon you will be presented with two options to embed your dashboard into a web page, an Embed Code and a Link.

For our purposes, we'll copy the Embed Code.

On a side note, the Link generated is good for using an iFrame in your web page.



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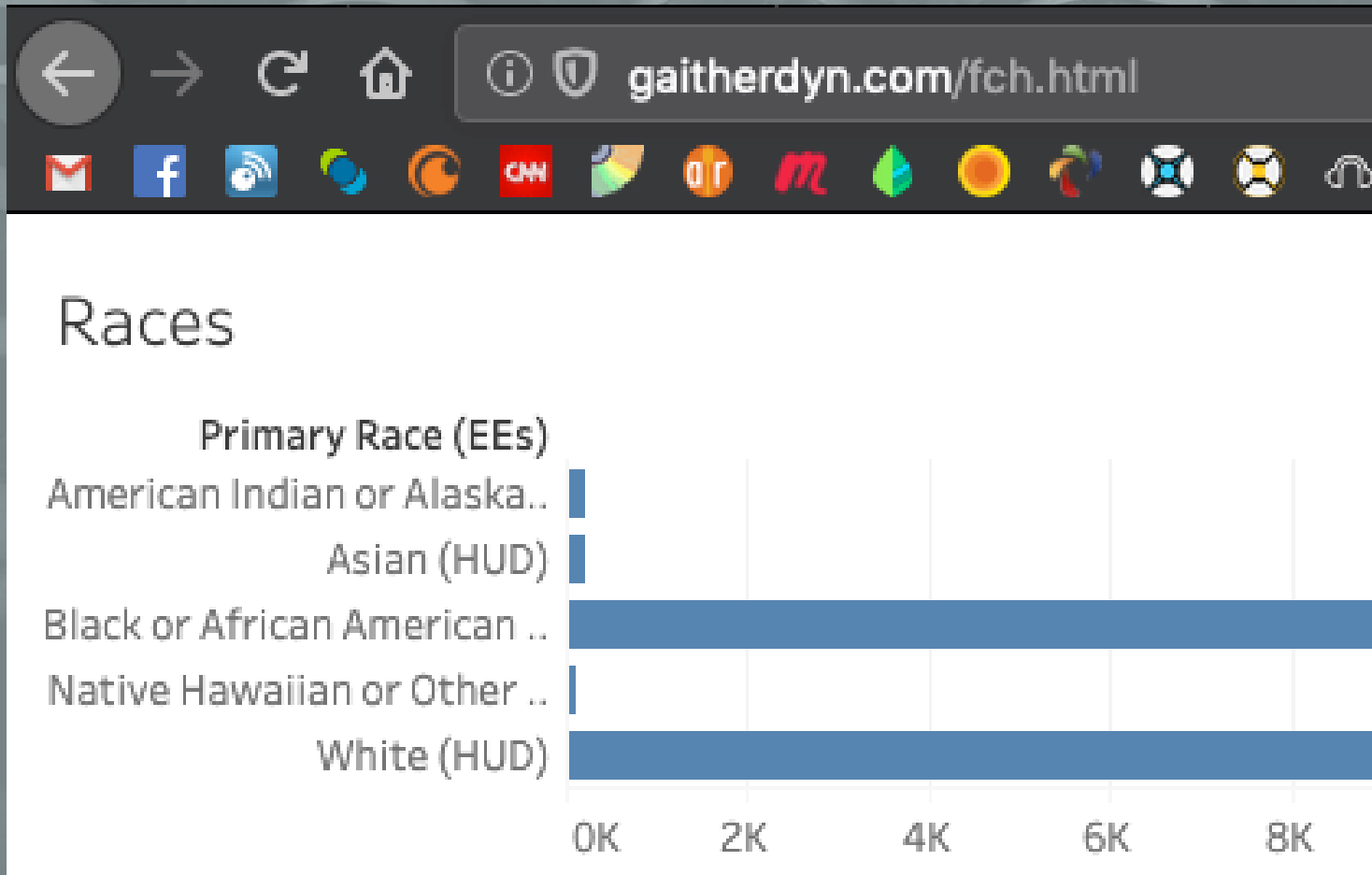


# Website Embed

There are many different ways to embed your dashboard into a website.

The simplest way is to create a new file, add .html as the extension, and then paste your embed code from Tableau Public right into the body of the html file.

```
1 <div class='tableauPlaceholder' id='viz1570393297108' style='position:
relative'><noscript><a href='#'><img alt=' ' src='https://public.tableau.com/static/images/Te/TestDashboard_15703929171210/Races/1_rss.png' style='border: none'
/></a></noscript><object class='tableauViz' style='display:none;'><param
name='host_url' value='https://public.tableau.com/' /> <param
name='embed_code_version' value='3' /> <param name='site_root' value=''
/><param name='name' value='TestDashboard_15703929171210/Races' /><param
name='tabs' value='no' /><param name='toolbar' value='yes' /><param
name='static_image' value='https://public.tableau.com/static/images/Te/TestDashboard_15703929171210/Races/1.png' /> <param name='animate_transition' value='yes' /><param
name='display_static_image' value='yes' /><param name='display_spinner'
value='yes' /><param name='display_overlay' value='yes' /><param
name='display_count' value='yes' /><param name='filter' value='publish=yes'
/></object></div>
<script type='text/javascript'>
var divElement = document.getElementById('viz1570393297108');
var vizElement = divElement.getElementsByTagName('object')[0];
vizElement.style.width='100%';vizElement.style.height=
(divElement.offsetWidth*0.75)+'px';
var scriptElement =
document.createElement('script');
scriptElement.src =
'https://public.tableau.com/javascripts/api/viz_v1.js';
```



## Website Embed

Once the html file is accessible with a web browser, the embed code will allow you to display your dashboard.



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# EXAMPLES

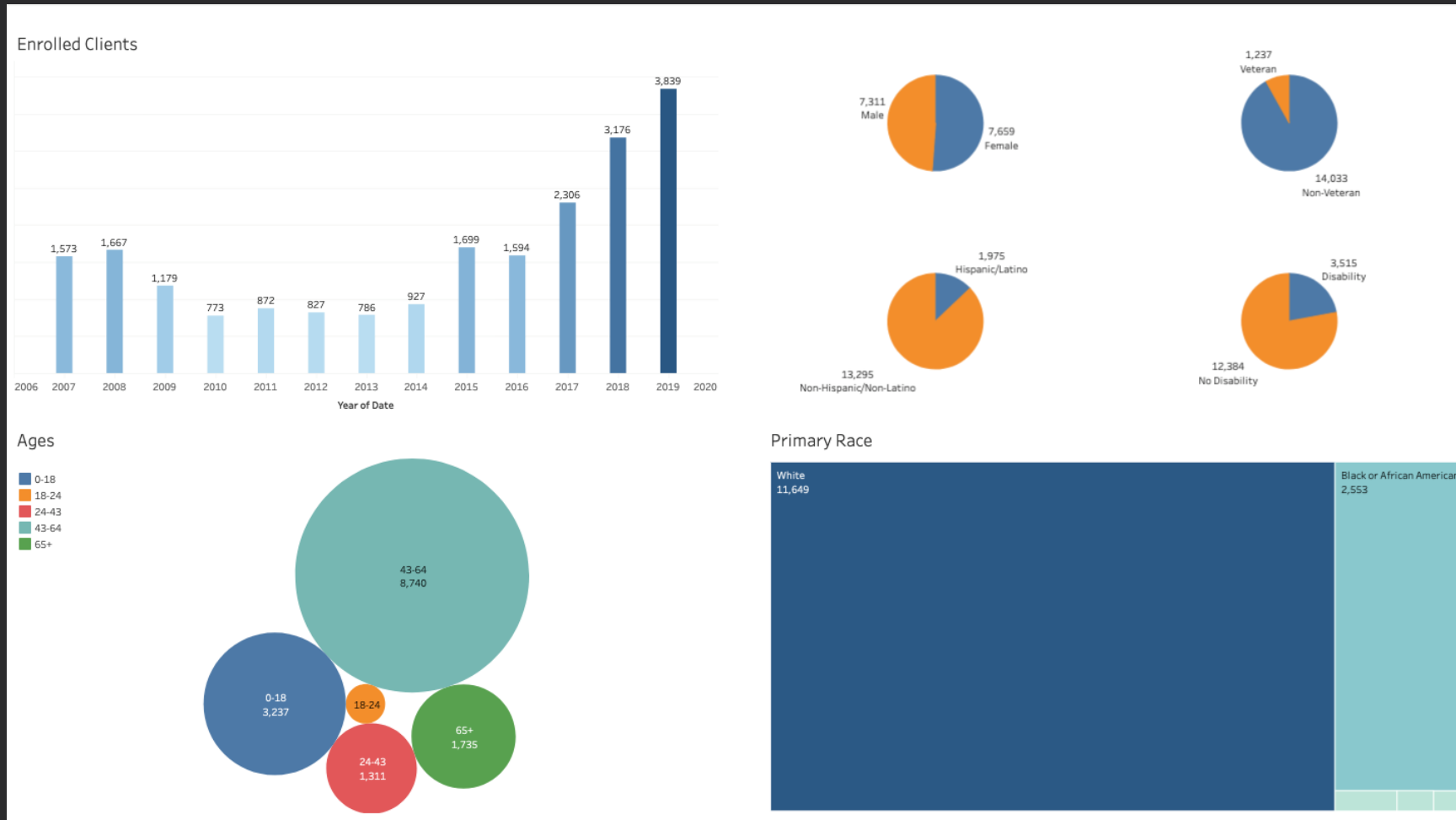


41

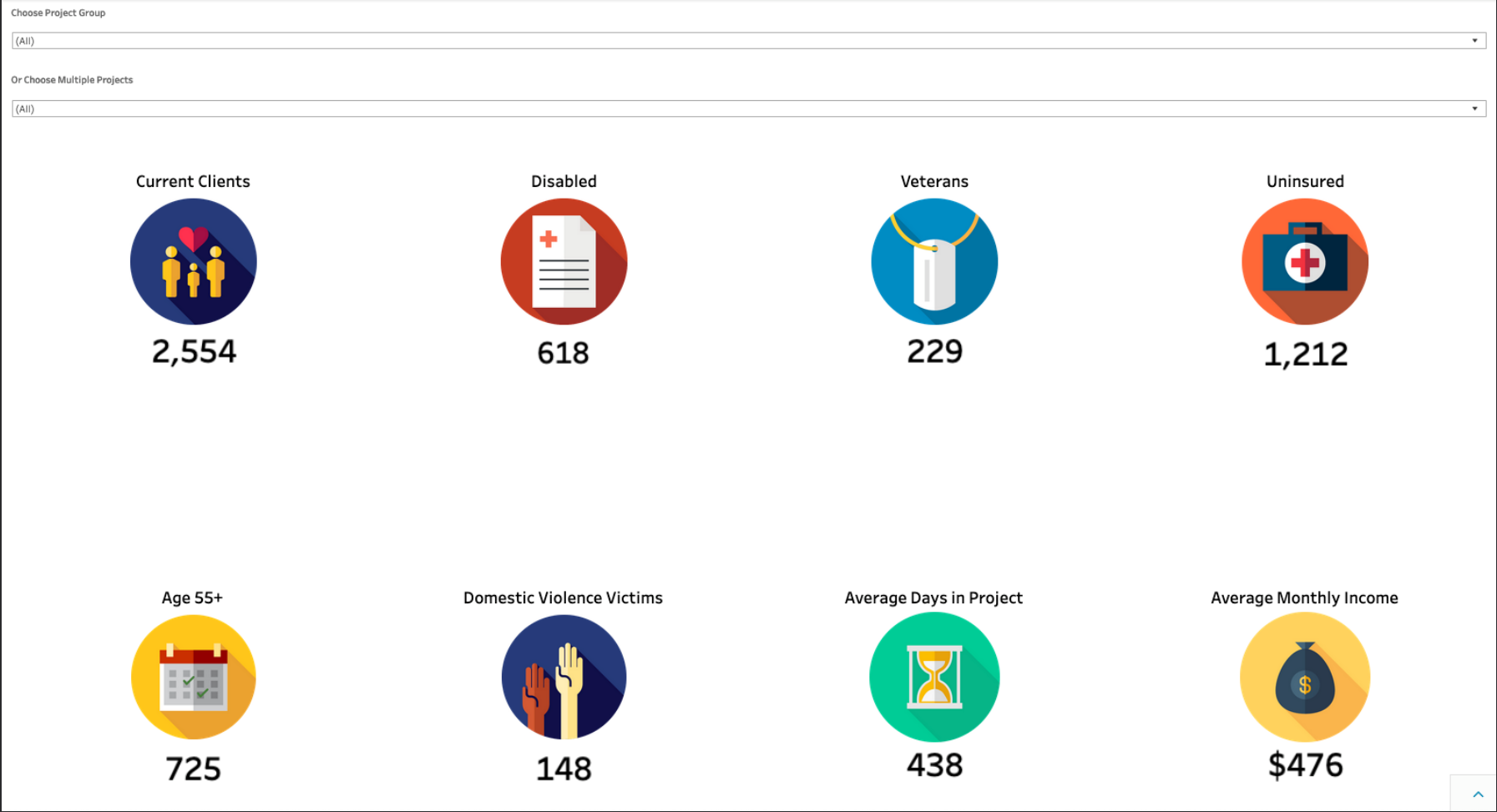




# Project Demographics



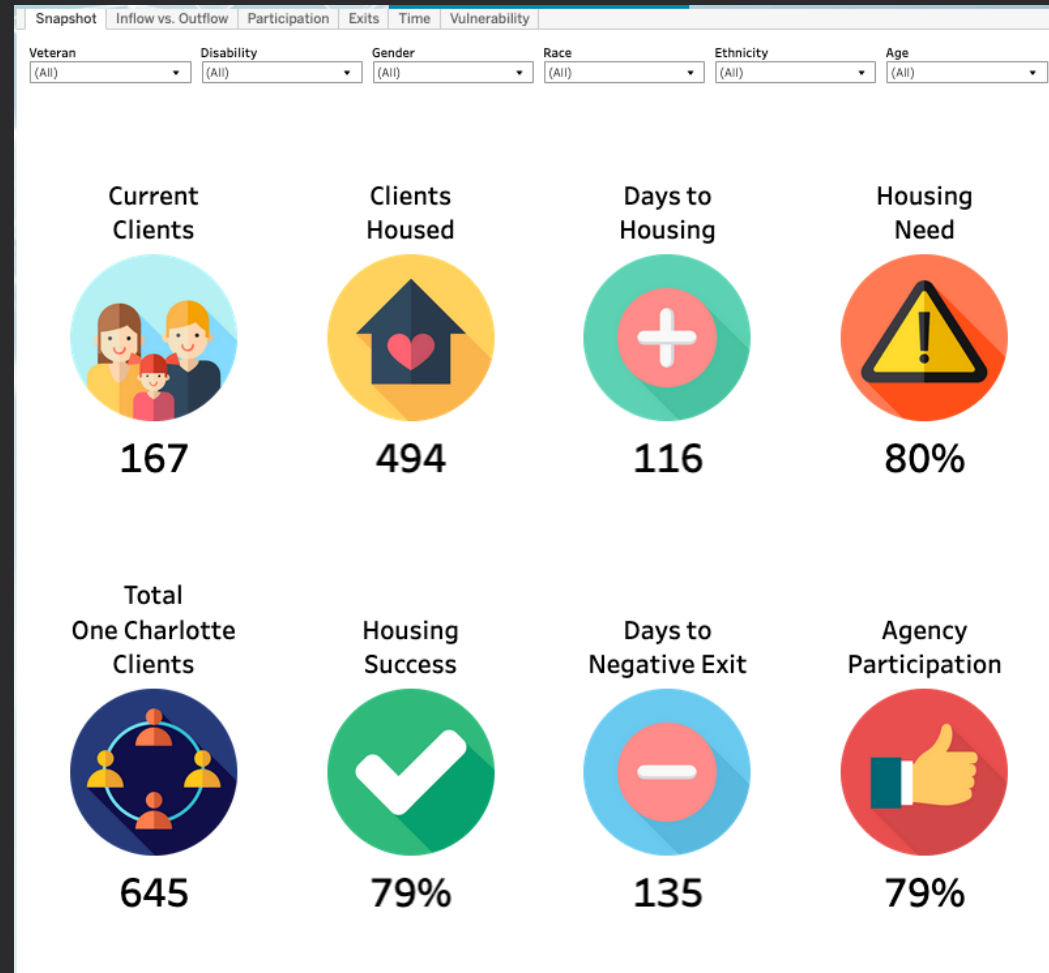
# Project Enrollment



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# One Charlotte Coordinated Entry - Snapshot



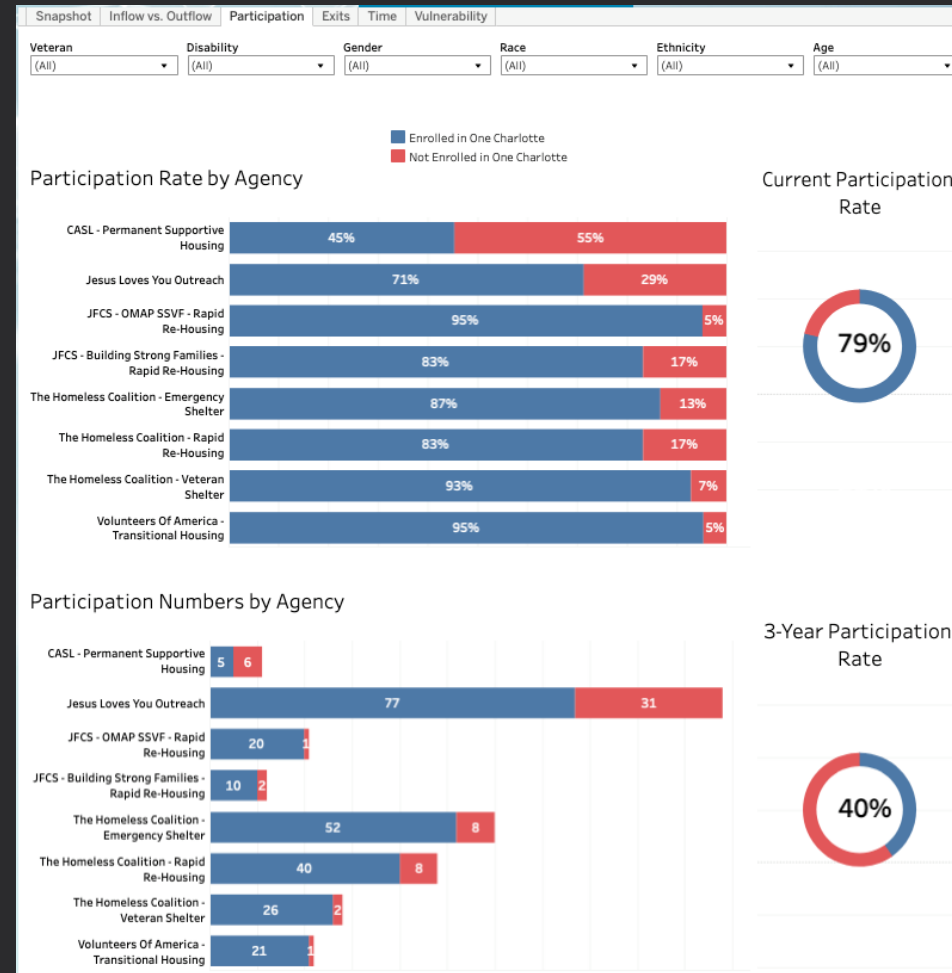
44



# One Charlotte Coordinated Entry – Inflow vs. Outflow



# One Charlotte Coordinated Entry - Participation

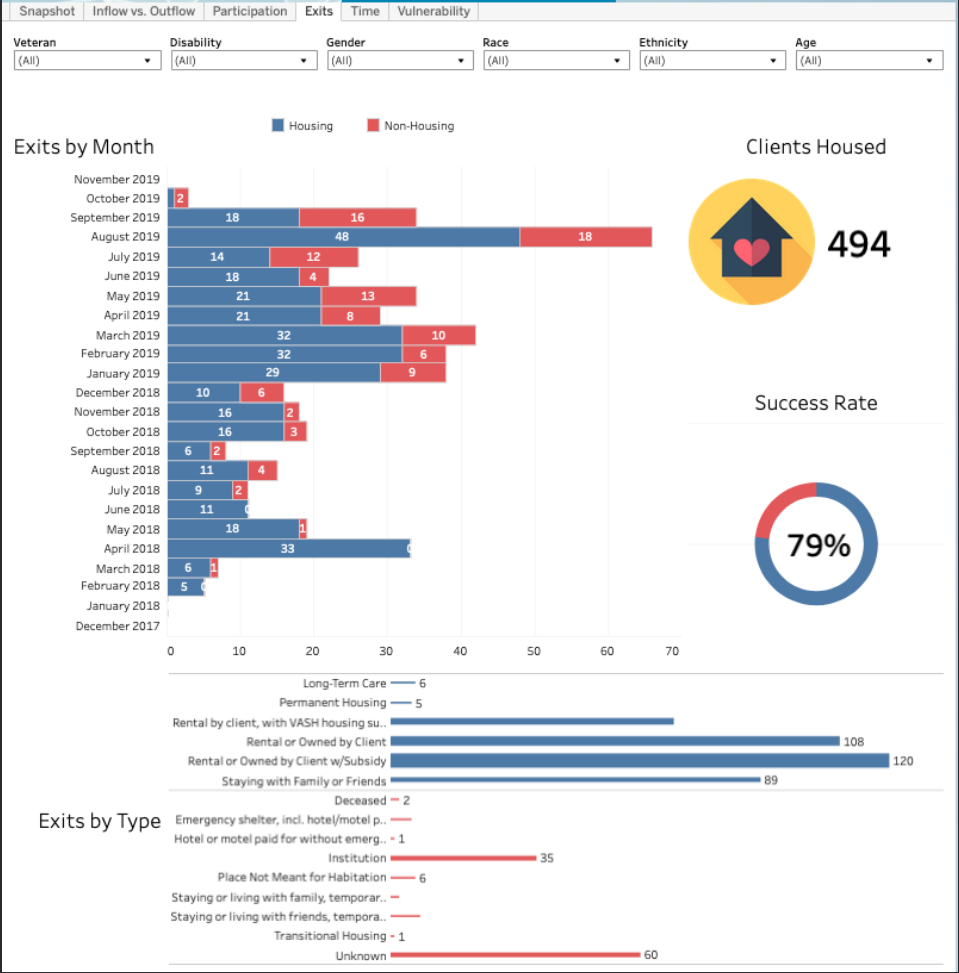


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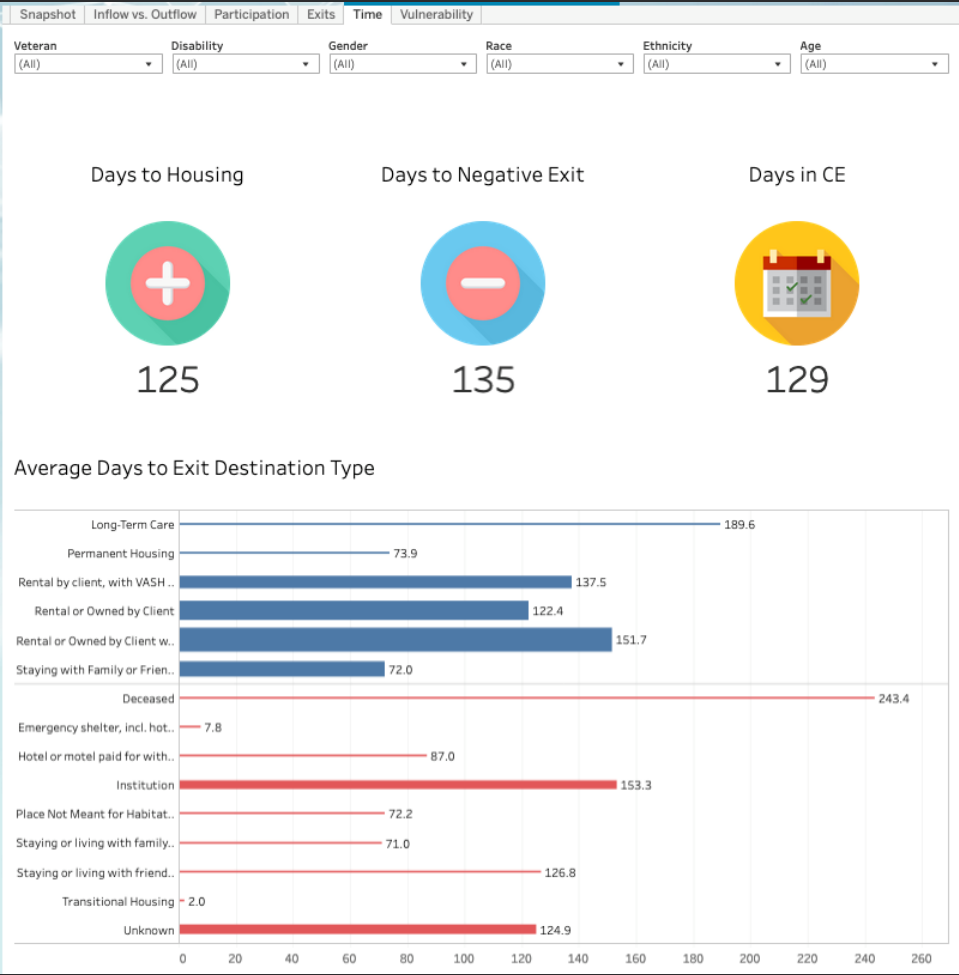




# One Charlotte Coordinated Entry - Exits



# One Charlotte Coordinated Entry - Time



# One Charlotte Coordinated Entry - Vulnerability



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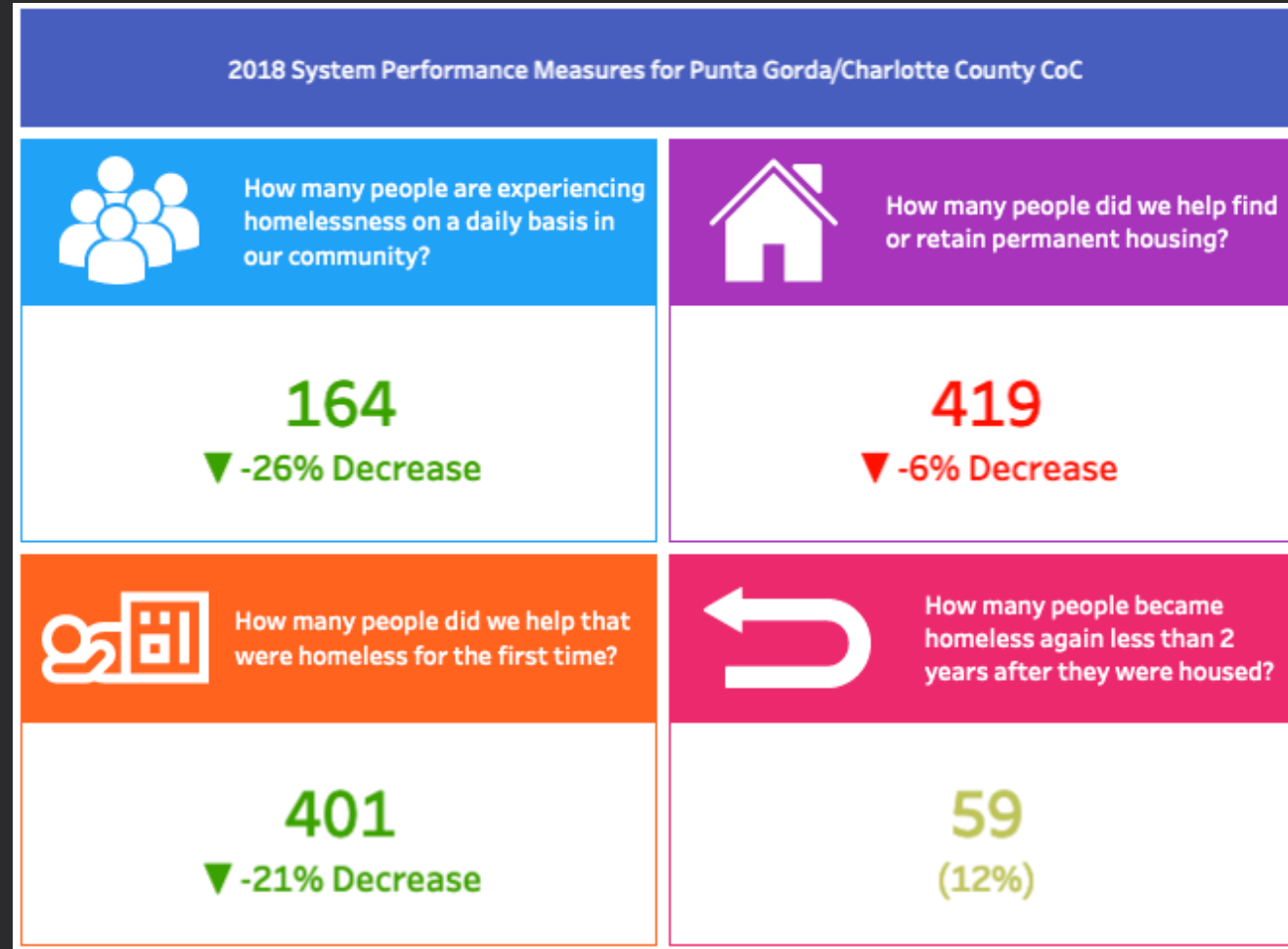
# APR Lite



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# SysPM Lite



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# Q&A



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# Thank You

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@GaitherDyn.com



facebook.com/GaitherStephens



@GaitherStephens



linkedin.com/in/gaitherstephens



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