

Overcoming Institutional Inertia Through Automation



**TEXAS GENERAL
LAND OFFICE**

Community Development & Revitalization

Commissioner Dawn Buckingham, M.D.

GLO-CDR: What do we do?

- ❑ Works to rebuild Texas communities by putting Texans back in their homes, restoring critical infrastructure and mitigating future damage through resilient community planning.
- ❑ Long-term Disaster Recovery and Mitigation funded through the U.S. Department of Housing & Urban Development's (HUD) Community Development Block Grant Disaster Recovery and Mitigation (CDBG-DR/MIT) programs.
- ❑ CDR currently manages roughly \$14 billion in CDBG-DR and CDBG-MIT funds covering disasters from 2008 (Hurricanes Dolly & Ike) to the most recent allocation for the 2021 Winter Storms.
- ❑ CDR programs fund the rebuilding or single-family and multifamily housing, buyouts and acquisitions of flood-prone property, economic development, infrastructure, and planning studies.



How does CDR Use Data

- ❑ Determining Applicant/Project Eligibility
 - Low- and Moderate-Income (LMI) Summary Data (HUD – LMISD)
- ❑ Environmental Review
- ❑ Documenting Beneficiaries
 - Census/ACS data
 - Racial and Ethnically Concentrated Areas of Poverty (R/ECAP)
- ❑ Scoring Applications
 - Social Vulnerability Index (SoVI)
 - Composite Disaster Index (CDI)
- ❑ Tracking Progress/Documenting Expenditures/Grant Reporting
 - TIGR & DRGR




Data Issues Start at the Beginning

- ❑ Applicants entering incorrect data
 - Location name, county, Lat/Long
 - Eligibility data – LMI
 - Scoring data – SoVI, CDI, LMI
- ❑ Lack of data validation
- ❑ Missing data
- ❑ Inability to easily rectify data



Start at the beginning: The Application

- Plan for the data lifecycle
 - How your data will be used informs how you collect it
- If data is geographically determined, there is a geographic solution
-  Connect to the RESCUE!



The Application: Survey123 Connect

- ❑ ArcGIS Survey123 is a complete, form-centric solution for creating and sharing surveys, getting answers, and analyzing results, complete with geospatial capabilities.
- ❑ Survey123 Connect provides the survey author with the full XLSForm authoring experience that Survey123 supports.
- ❑ XLSForm is a form standard created to help simplify the authoring of forms in Excel. It is compatible with several different form-based platforms, including ODK Form and Survey123 Connect.
- ❑ Survey123 Connect allows the designer to leverage ArcGIS Online assets and other external data sets to enrich data collection and pre-populate answers.



- Ensure data validation by:
 - Select from pre-existing lists
 - Create dynamic address selection from an existing geocoder
 - Pulldata functions

Jurisdiction Name
Begin typing name and select from choice below

-Please select-

Is the mailing address a Physical Address or P.O. Box?

Physical Address

begin_group	applicantInfo	<p style="color: white; background-color: black; font-weight: bold;text-align: center;">Jurisdiction Inform field-list			
select_one_from_file Location_Names.csv	applicantName	Jurisdiction Name	Begin typing name and select from choice below		autocomplete
text	applicantName2	If Jurisdiction Name is not in list, type here			
select_one mail	applicantMailType	Is the mailing address a Physical Address or P.O. Box?			
text	applicantAddress	Mailing Address	Begin typing address and select from responses below		geocode
text	applicantStAddr	Street Number and Name			hidden pulldata("@json",\${applicantAddress}, "attributes.StAddr")
text	applicantCity	City			hidden pulldata("@json",\${applicantAddress}, "attributes.City")
text	applicantZip	Zip			hidden pulldata("@json",\${applicantAddress}, "attributes.Postal")
text	applicantPO	Enter P.O. Box			
select_one juris_type	applicantType	Jurisdiction Type			



The Application: Survey123 Connect

begin group LMI Score

select_on 20 Points if the project meets the LMI national objective.

decimal

note

decimal

note

note **Number of CDBG-DR Eligible Presidential Declarations from 2008 to 2019 Score**

decimal

note 20 Points Possible (10-12 Disaster Declarations = 20; 7-9 Disaster Declarations = 15; 4-6 Disaster Declarations = 10; 1-3 Disaster Declarations = 5).

select_on

select_on

integer

text

integer

integer

Leverage

integer 5 Points if the project entails non-CDBG Leverage that is at least 10% of the total funds requested.

integer

integer

integer

integer

SoVI Score

integer 15 Possible Points (15 - High; 12 - Medium High; 9 - Medium; 6 - Medium Low; 3 - Low).

integer

integer

integer

integer

integer

text **CDI Score**

text 20 Possible Points (20 - Top 10%; 15 - Top 25%; 10 - Top 75%; 5 - Bottom 25%; 0 - Bottom 10%).

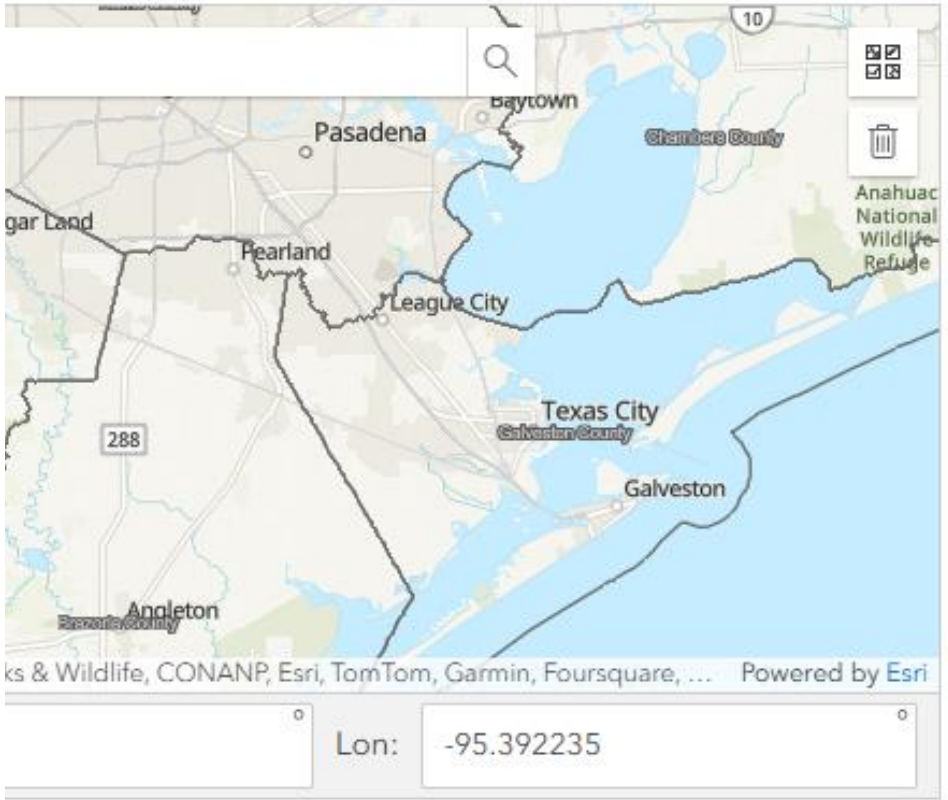
text

integer

integer

integer

integer	pha	Project is from a Public Housing Authority	10 Points if the Project is proposed by a Public Housing Authority.
decimal	povCounty	County Poverty	hidden
decimal	povCity	City Poverty	hidden
decimal	poverty	Poverty Rate	hidden
note	Poverty Rate	In circumstances where applicants have a tie score, Poverty Rate is calculated as: $\text{concat}(\text{round}(\{\text{poverty}\} * 100, 2), \%)$	



Based upon the Service Area Type and the Applicant or Grants for which the applicant is eligible.

```

if(string-length(string(${projectCDBG
th(string(${projectLev})) = 4, concat('
length(string(${projectAmt})) = 4, concat('
rest/services/Texas_Counties_Disaste
+${dr4332}+${dr4377}+${dr4454}+${
DnfApjhE0EY9ik/arcgis/rest/services/
ApjhE0EY9ik/arcgis/rest/services/SoV
medium Low", 6, if(${sovi}="Low", 3, 0
if(${cdi}=5, 20, if(${cdi}=4, 15, if(${cdi}=3, 10, if(${cdi}=2, 5, 0)))
pulldata("@layer", "getValueAt", "attributes.Poverty_Rate", "https://services3.arcgis.com/13DnrfApjhE0EY9ik/arcgis/rest/services/
pulldata("@layer", "getValueAt", "attributes.Poverty_Rate", "https://services3.arcgis.com/13DnrfApjhE0EY9ik/arcgis/rest/services/
if(selected(${applicantServArea}, 'county'), ${povCounty}, if(selected(${applicantServArea}, 'city'), ${povCity}, ""))
concat(round(${poverty}*100, 2), "%")
    
```


The Application: Power Automate



Power Automate

- ArcGIS Connector
- Extract data and reports
- Email results
- Send data to various formats



Where are we now: Monitoring Progress

- ❑ System of Record
 - TIGR – Microsoft CRM
 - Difficult to navigate/not design to track data well
 - Does not dynamically connect with other data systems
- ❑ Teams use their own tracking system – Excel (great at many things but...)
 - Data is not transparent
 - Not easily shared
 - Lack of data validation
 - Labor-intensive to turn into geospatial products



Where are we now: Monitoring Progress

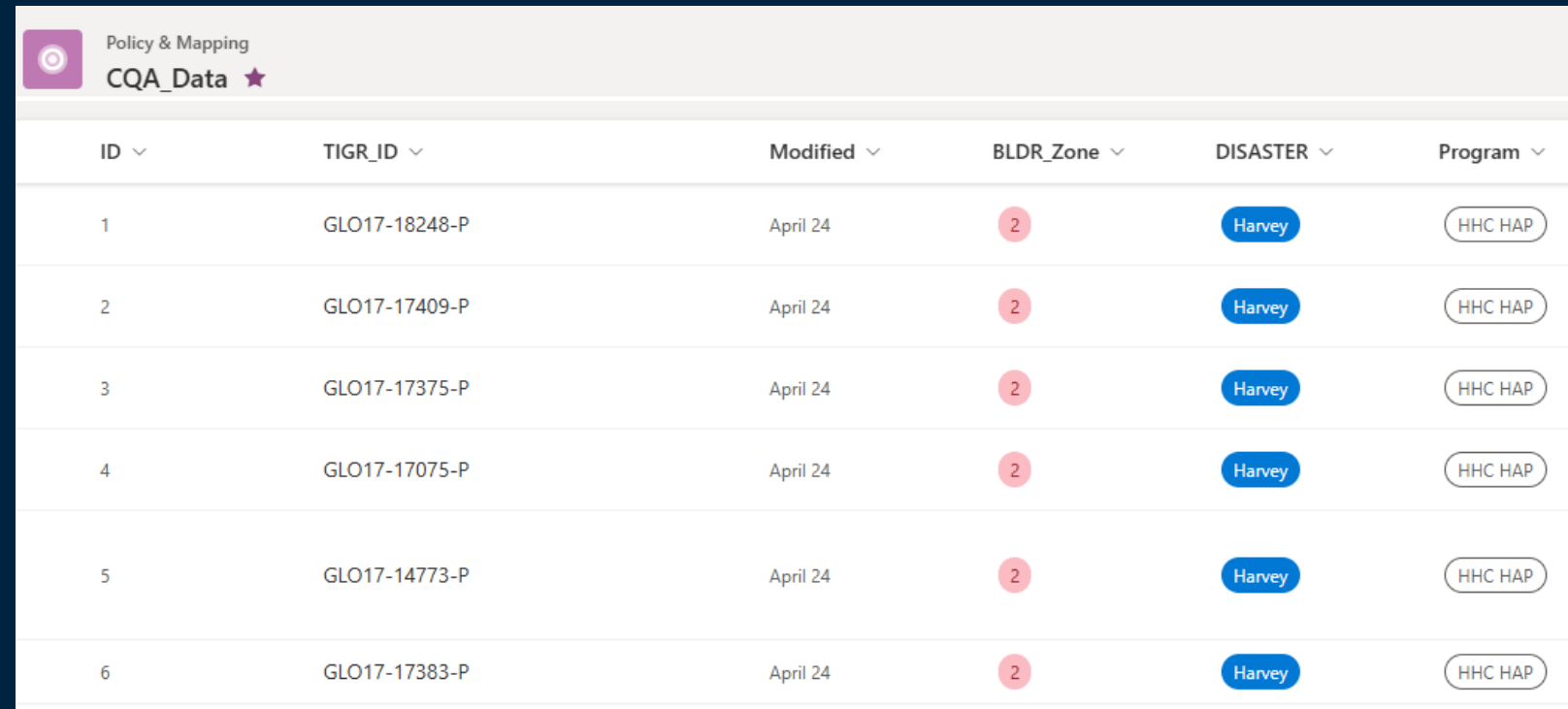
- Utilize the tools at your disposal
 - Microsoft 365 – Microsoft Power Platform
 - SharePoint Lists
 - Power Apps
 - Power Automate
 - Power BI (Now in Microsoft Fabric)
 - Feature Manipulation Engine(FME)/Data Interoperability Tool(FME via ESRI)



Monitoring Progress: SharePoint Lists

SharePoint Lists

- ❑ Supports multiple data types (text, number, choice fields, person fields connected to Microsoft Office Directory)
- ❑ Allow for greater data validation
- ❑ Cloud storage
- ❑ Works across team
- ❑ Control access
- ❑ Allows for simple formulas



ID	TIGR_ID	Modified	BLDR_Zone	DISASTER	Program
1	GLO17-18248-P	April 24	2	Harvey	HHC HAP
2	GLO17-17409-P	April 24	2	Harvey	HHC HAP
3	GLO17-17375-P	April 24	2	Harvey	HHC HAP
4	GLO17-17075-P	April 24	2	Harvey	HHC HAP
5	GLO17-14773-P	April 24	2	Harvey	HHC HAP
6	GLO17-17383-P	April 24	2	Harvey	HHC HAP



Monitoring Progress: Power Apps

TIGR ID	Status	Program	Vendor	Builder	View/Edit
GLO17-18248-P	Complete	HHC HAP	Horne	JW Turner	
GLO17-17409-P	Complete	HHC HAP	Horne	JW Turner	
GLO17-17375-P	Complete	HHC HAP	Horne	JW Turner	
GLO17-17075-P	Complete	HHC HAP	Horne	Ducky Johnson	
GLO17-14773-P	Complete	HHC HAP	Horne	JW Turner	
GLO17-17383-P	Complete	HHC HAP	Horne	Ducky Johnson	
GLO17-18090-P	Complete	HHC HAP	Horne	JW Turner	
GLO17-14823-P	Complete	HHC HAP	Horne	Brizo	

Power Apps

- Power Apps provides a rapid development, low-code environment to build custom apps.
 - Data and Look
- Searchable
- Create.
 - Configure search fields and behavior
 - Galleries
- Control of user experience
 - Forms
 - Embed PowerBI and other apps



Monitoring Progress: Power Apps

Forms

- Customizable
- Data validation
 - Drop downs and lookups
- Make calculations
- Read-only fields
- Variety of ways to enter data

Project Score

100

BQ: # Deficiencies at FINAL INSP

0

BQ: # Deficiencies at TREC INSP

0

Customer Service - Score

34

Override CS Score: No

of Days: NTP to FINAL 100% INSP

42

BQ: # Deficiencies at PROG INSP

0

Building Quality - Score

33

Project Management - Score

33

of Days: NTP to PROGRESS 50% INSP

34



Monitoring Progress: Power Apps



Report Generator

How To (Page 1):

1. Select a Builder from the filter (to select multiple builders hold the 'ctrl' key)
2. Select the time range from the Final Inspection Date filter (to select multiple time periods hold the 'ctrl' key)
3. Export report by hovering over the upper right hand corner of the report, click on the ellipses, select Export data, choose the Data with Current Layout Option

Builder

All

Final Inspection Date

Year, Quarter, Month, Day

2019

2020

2021

2022

2023

2024

Builder	Total Overall Score	Total Projects	Total Average Score
Yates	3,214	53	60.64
Harvey	3,214	53	60.64
TKTMJ	3,271	69	47.41
Harvey	3,271	69	47.41
Thompson	6,219	102	60.97
Harvey	6,219	102	60.97
Tegrity	48,838	537	90.95
Imelda	1,900	19	100.00
Harvey	46,938	518	90.61
Stonewater	71,990	803	89.65
Imelda	1,569	16	98.06
Harvey	66,745	748	89.23
2019-FL	1,678	18	93.22
2018-FL	1,998	21	95.14
SLSCO	35,707	401	89.04
Imelda	1,800	18	100.00
Harvey	33,907	383	88.53
RM Quality	71,037	758	93.72
Imelda	1,629	17	95.82
Harvey	65,454	701	93.37
2019-FL	2,374	24	98.92
2018-FL	1,580	16	98.75
Lemoine	30,554	409	74.70
Imelda	843	12	70.25
Total	695,934	7,734	89.98

Embedded Apps

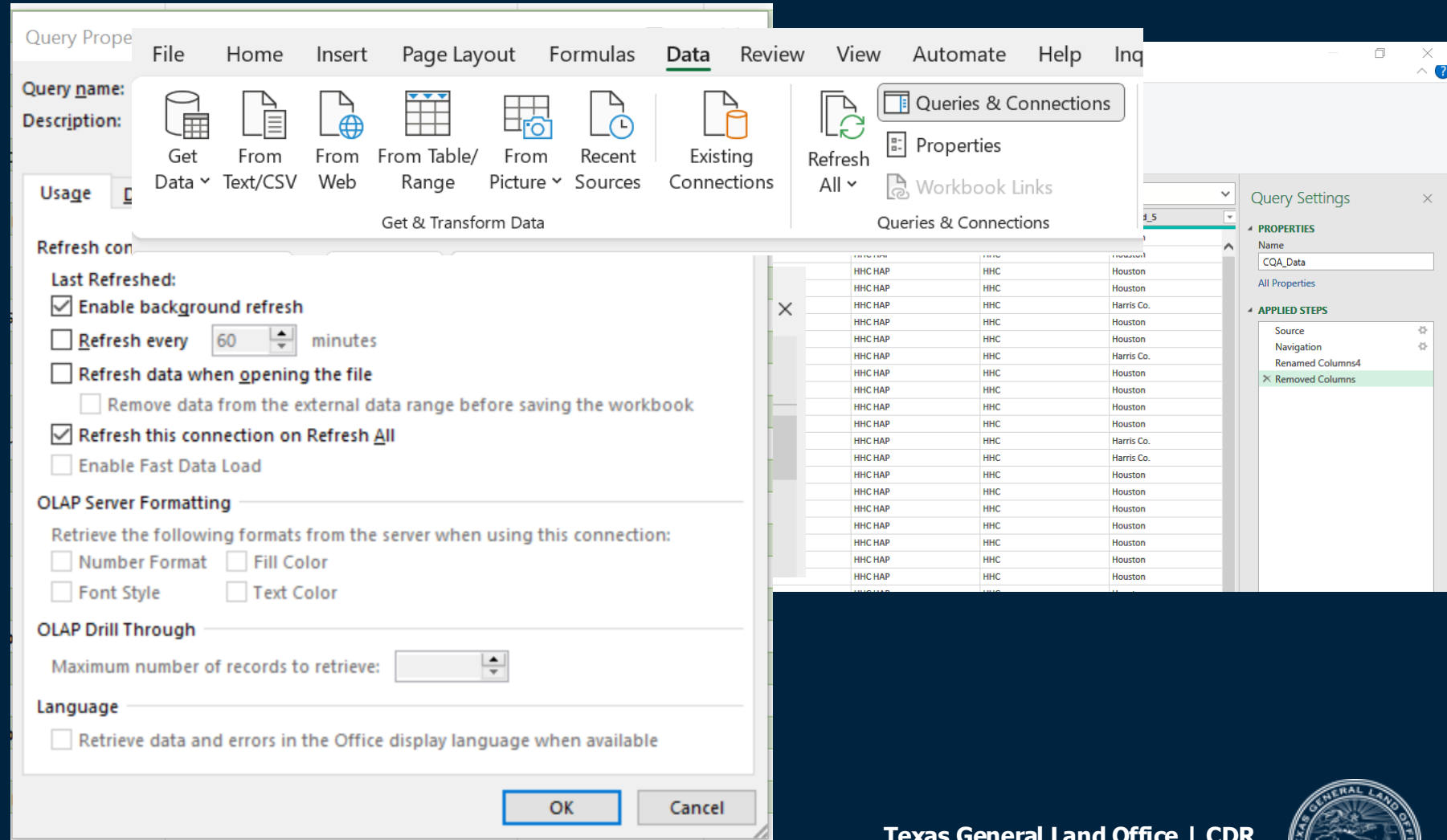
- ❑ Host Power BI Reports
- ❑ Supports multi-page reports
- ❑ Interactive



Monitoring Progress: Power Query

Power Query Editor

- Connect SharePoint Lists to Excel
- Transform & Manipulate Data
- Update Excel upon opening



The screenshot shows the Power Query Editor interface with the 'Query Properties' dialog box open. The dialog box has several sections:

- Usage:** Includes icons for 'Get Data', 'From Text/CSV', 'From Web', 'From Table/Range', 'From Picture', and 'Recent Sources'. The 'Data' tab is active, showing 'Get & Transform Data'.
- Refresh controls:** Includes a 'Refresh All' button and a 'Queries & Connections' task pane.
- Last Refreshed:** Contains checkboxes for 'Enable background refresh', 'Refresh every 60 minutes', 'Refresh data when opening the file', 'Refresh this connection on Refresh All', and 'Enable Fast Data Load'. There is also a checkbox to 'Remove data from the external data range before saving the workbook'.
- OLAP Server Formatting:** Includes checkboxes for 'Number Format', 'Fill Color', 'Font Style', and 'Text Color'.
- OLAP Drill Through:** Includes a dropdown for 'Maximum number of records to retrieve'.
- Language:** Includes a checkbox for 'Retrieve data and errors in the Office display language when available'.

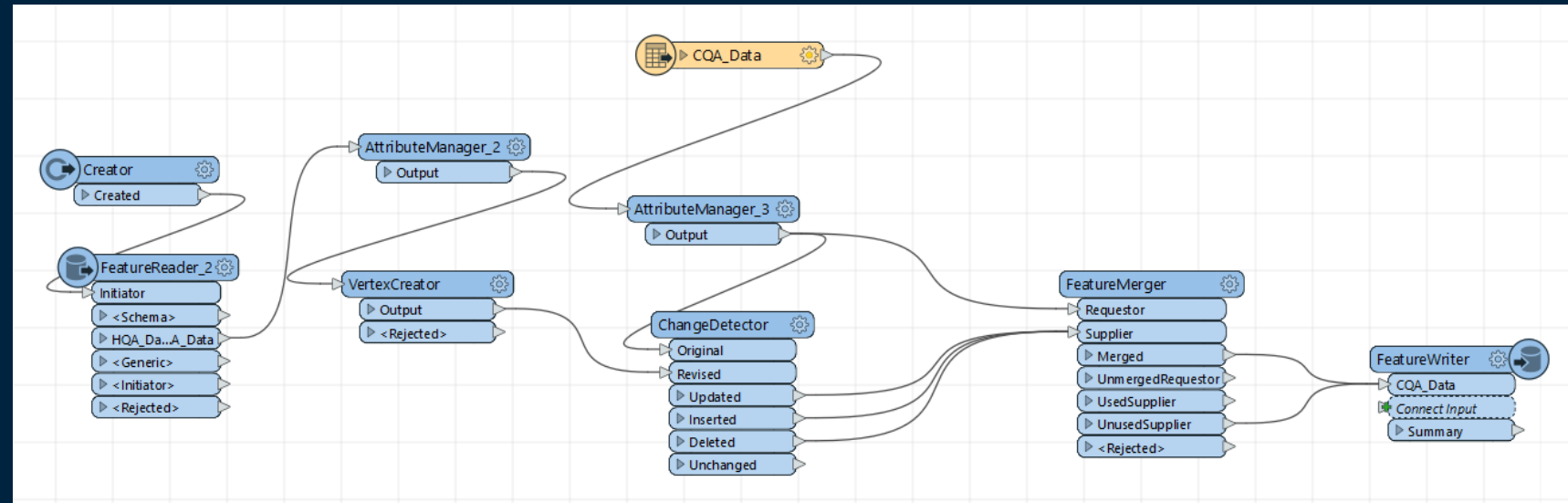
The background shows an Excel spreadsheet with a table of data. The 'Query Settings' pane on the right shows the 'Name' as 'CQA_Data' and 'Applied Steps' including 'Source', 'Navigation', 'Renamed Columns4', and 'Removed Columns'.



Monitoring Progress: FME

Feature Manipulation Engine/Data Interoperability Tool

- ❑ ETL Tool
- ❑ Read in data, transform data, write data to new destination
- ❑ Specialized to work with geospatial data
- ❑ Can test each step of the process
- ❑ FME Flow (formerly Server) allows for scheduling runs

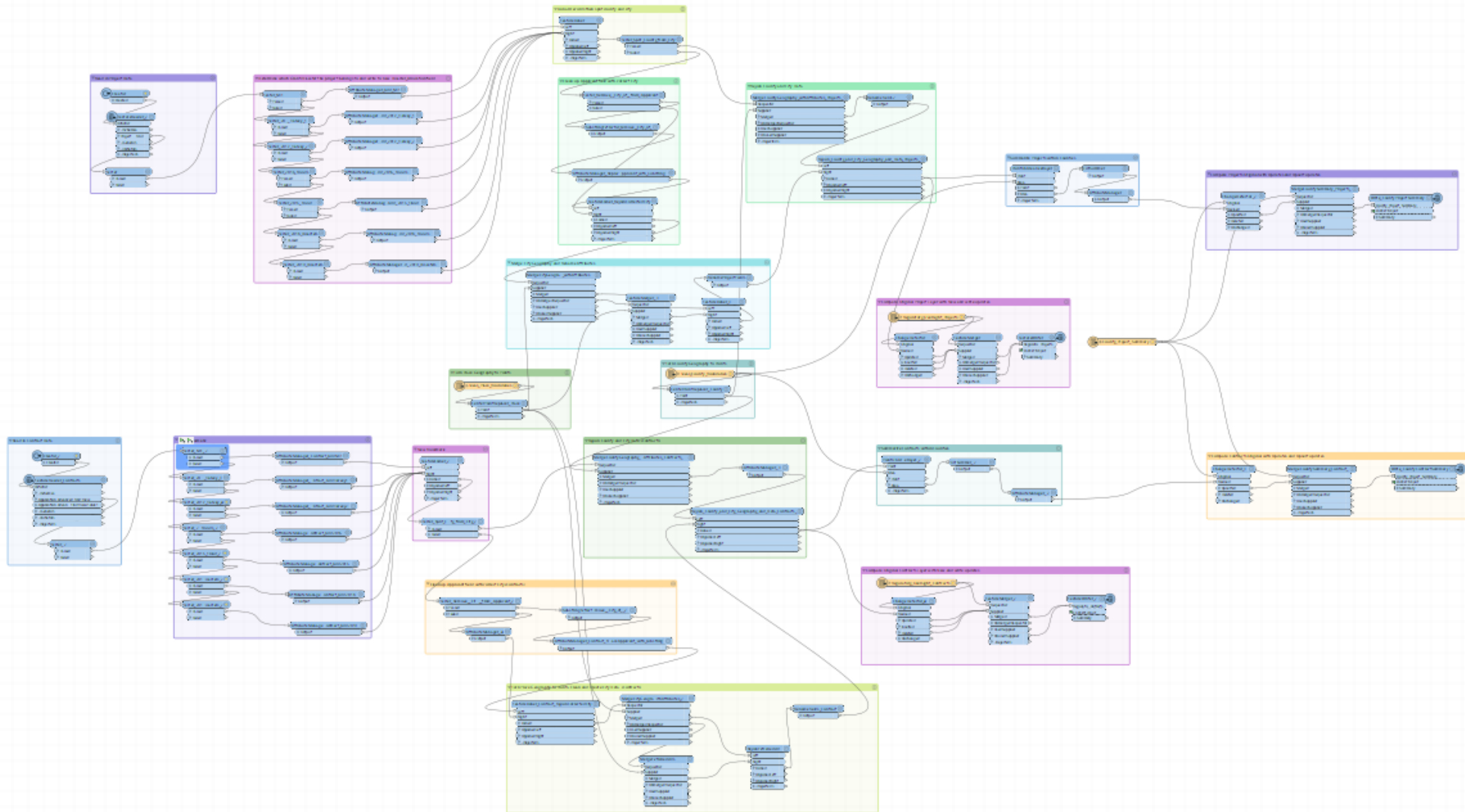


The End: Reporting/Visualizing Data

- ❑ What is the purpose of the data?
- ❑ Who is using the data?
- ❑ How are they using the data?
- ❑ What is the best platform to make it usable?
- ❑ How do you get your data there?



The End: Reporting/Visualizing Data

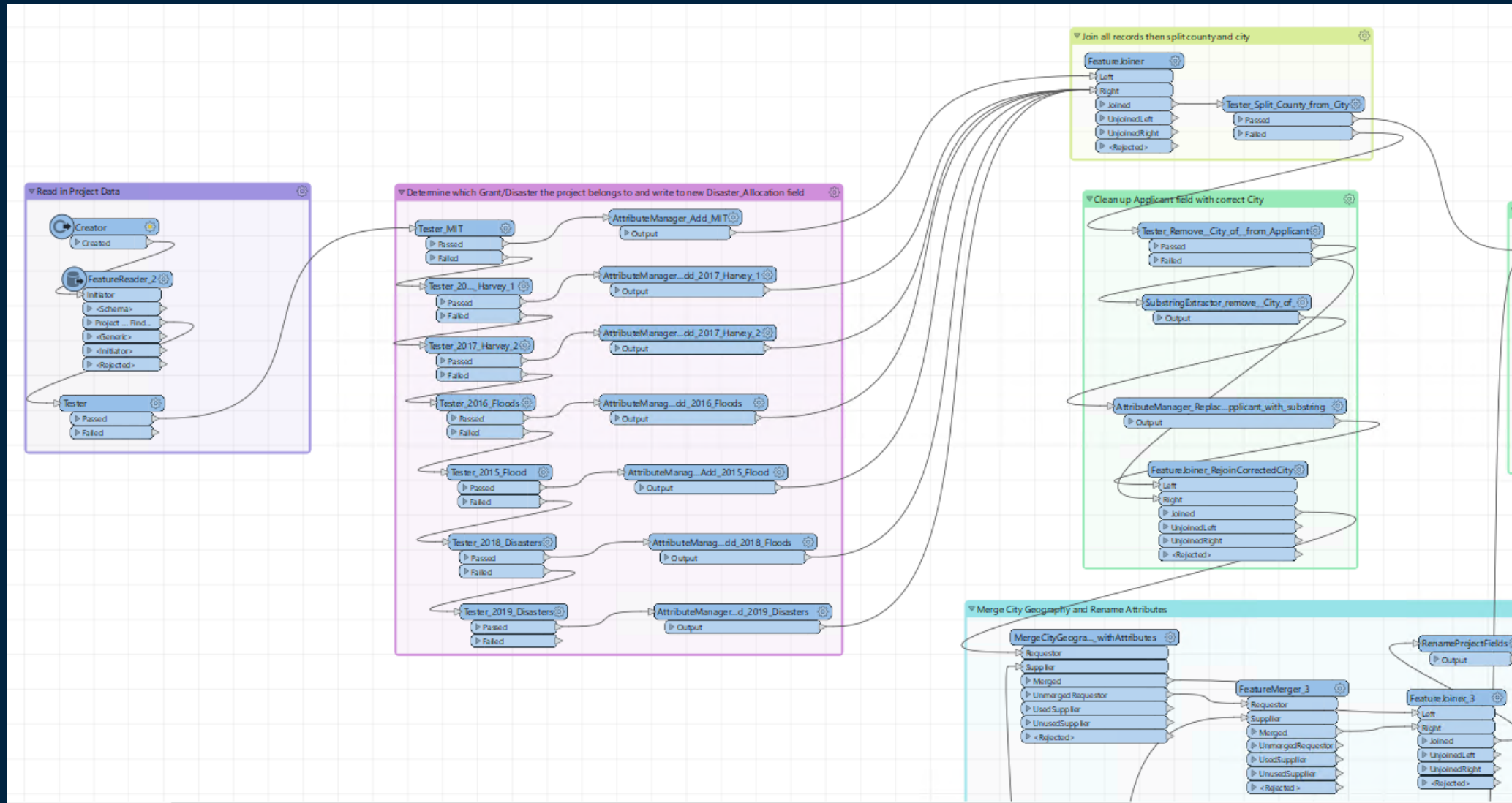


- ❑ Starting with existing data (no control over data structure)
- ❑ Multiple data sources (7 data sources used here)



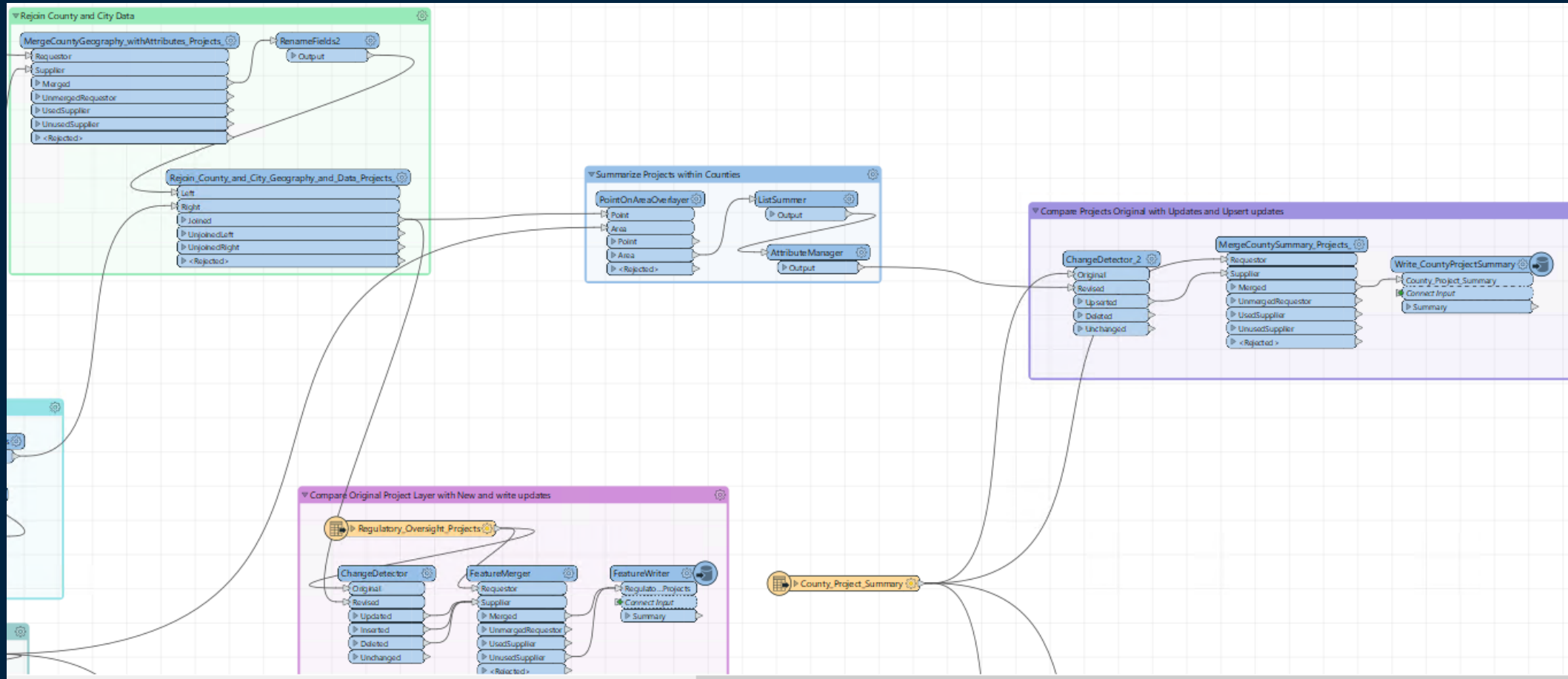
The End: Reporting/Visualizing Data

- ❑ Clean the data
- ❑ Organize the data
- ❑ Enrich the data



The End: Reporting/Visualizing Data

- ❑ Summarize the data
- ❑ Compare to original
- ❑ Write the new data



The End: Reporting/Visualizing Data

Environmental
City of Houston Technical Assistance Geographical Distribution

Filter

Select Contract Number
No category selected

Contract Range Amount
6,378,191.58 - 370,855,752

Contract Status
No category selected

Select Project by Contract Number
No category selected

Project Range Amount
0 - 100,000,000

Project Status
None

Select Disaster Allocation
None

City of Houston
11
Contracts

City of Houston
\$995,333,703
Sum of Contract Budgets

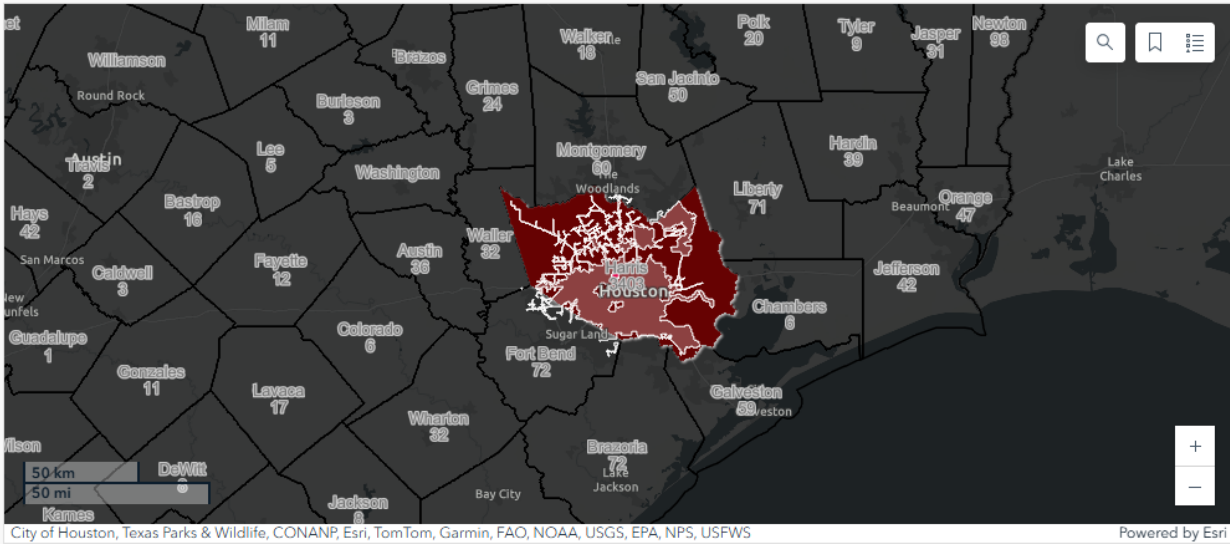
CoH Contracts

Search...

Houston
Hurricane Harvey State Mitigation Competition - HUD MID MIT County | Harris

Application: Houston Fifth Area Flood Mitigation (CDR17-1146-APP)
Contract: N/A
Number of Projects: 1
Total Estimated Funding: \$115,021,697.31
Applicant Contact: Greenfield, Jedediah

Houston
Hurricane Harvey State Mitigation Competition - HUD MID MIT County | Harris



City of Houston
209
Projects

City of Houston
\$848,323,466
Sum of Project Budgets

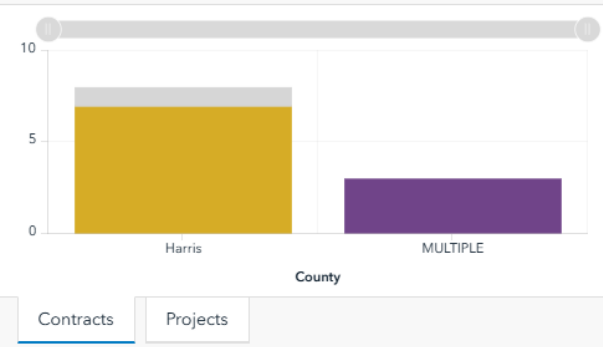
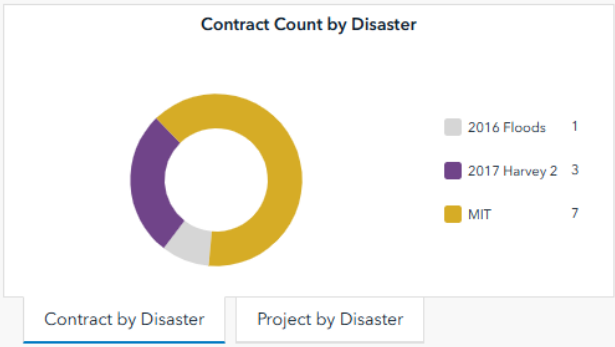
CoH Projects

Search...

Houston
Houston - Small Rental Program (2017 Harvey 2) 2017 Harvey 2 County | Harris

Project: H5B_Fulton and James GLO17-15451-P
Project Status: Application Approved
DRGR
Activity: HouSRP_DA_LMI_21-134-000-C788
Total Estimated/Original Project Budget: \$2,089,954.00
Contract: Houston - SRP (2017 Harvey 2) 21-134-000-C788

Houston
M Harris County Housing (2014





Questions

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