DATA STEWARDSHIP AND GOVERNANCE

PRESENTED BY
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Director of Digital Solutions

Certified GIS professional with over 20 years of experience in the GIS, data, and mobile technology fields. Background in geography and database management, with experience in application development, IT system design and architecture, and mobile device management.

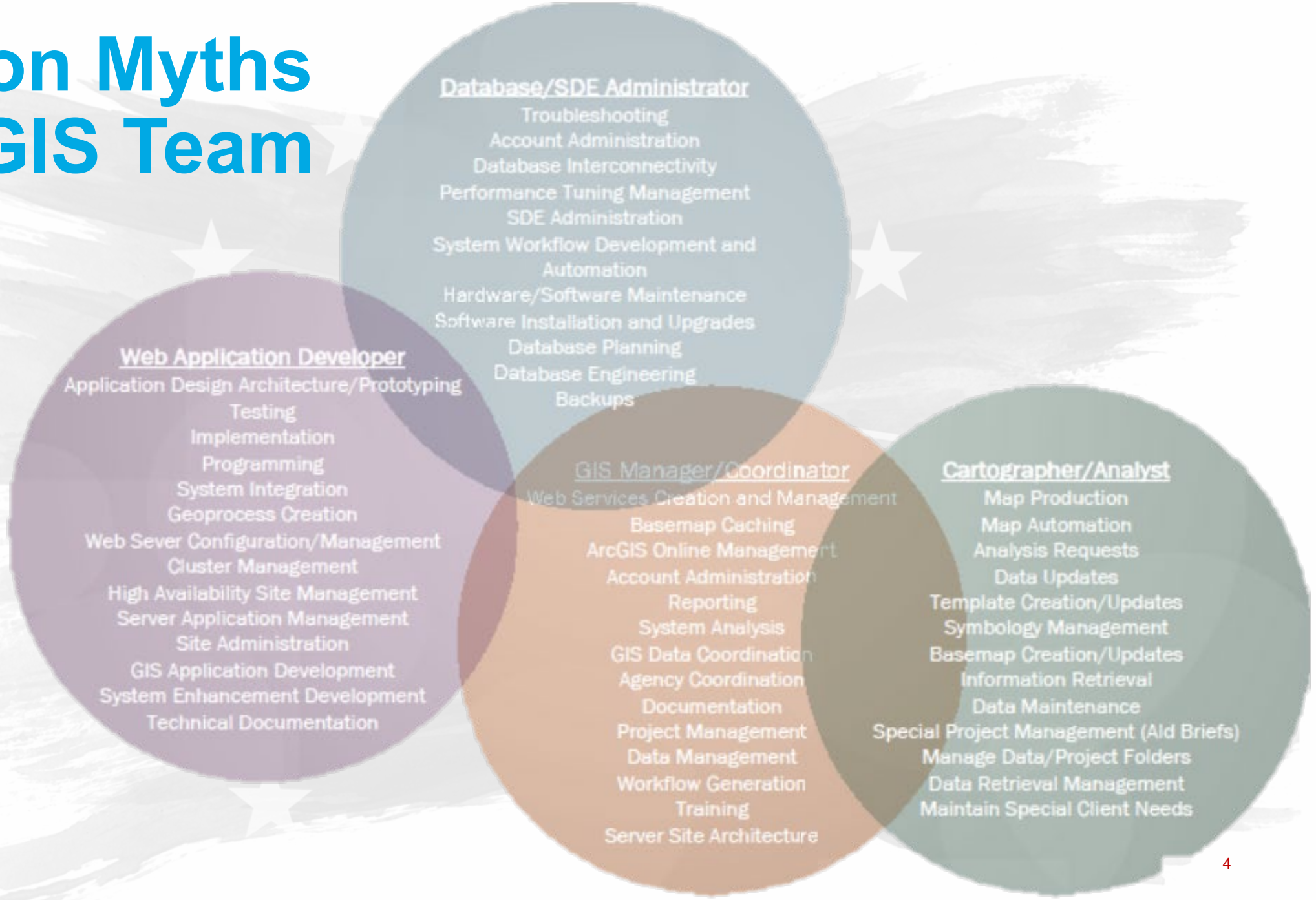
Common Myths of Data

"There were 5 exabytes of information created between the dawn of civilization through 2003, but that much information is now created every two days."
- Eric Schmidt, Former Executive Chairman at Google

"Errors using inadequate data are much less than those using no data at all."
- Charles Babbage, mathematician, inventor, and mechanical engineer

"With data collection, 'the sooner the better' is always the best answer."
- Marissa Mayer, Former Yahoo! President and CEO

Common Myths of the GIS Team



Data Stewardship – What is it?

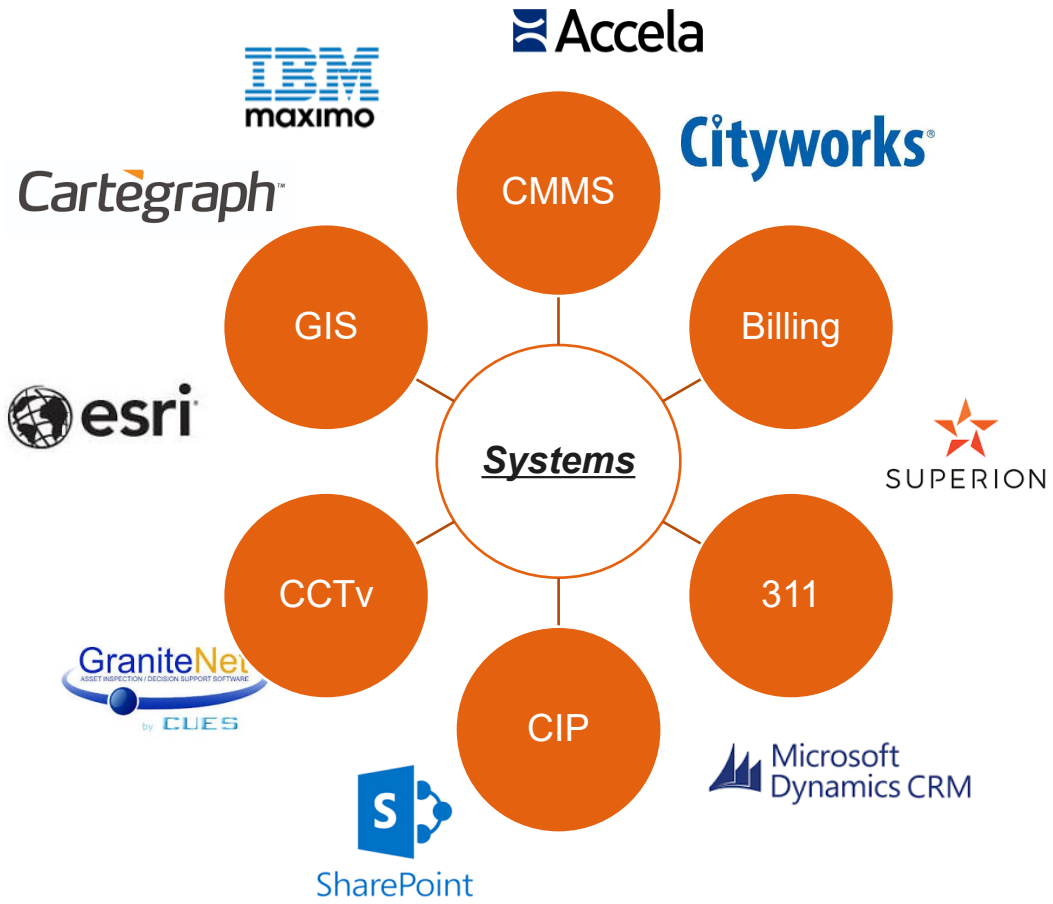
- Knowing what data you have
- Understanding where data resides
- Ensuring that data is accessible
- Safeguarding data accuracy
- Enforcing rules on how data can be used
- Helping to make sure data is utilized
- Driving decision making through data
- Advocating for trusted data

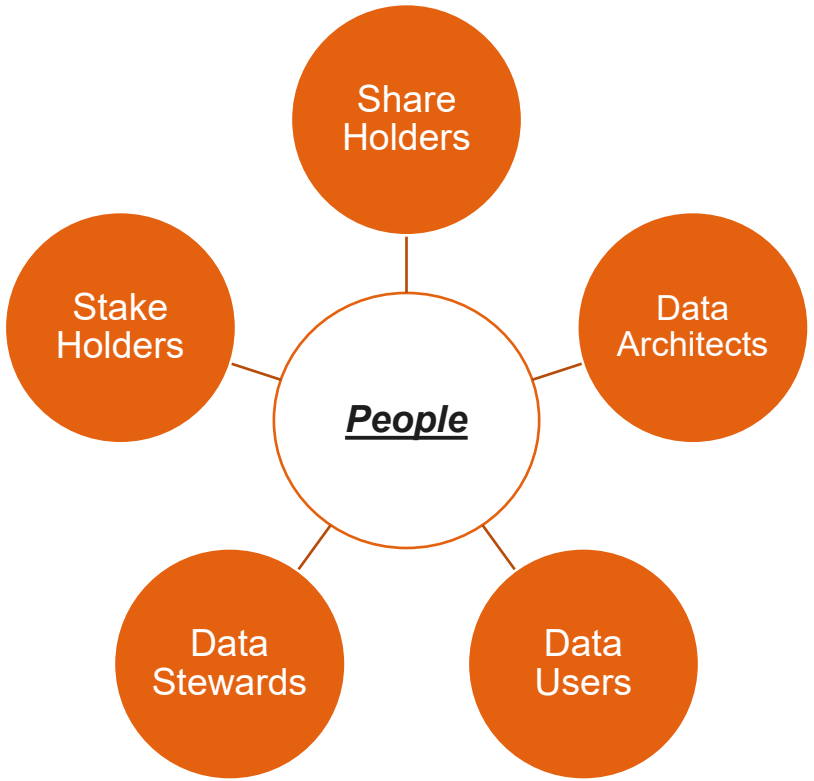
Understanding your assets

Data Stewardship - Responsibilities

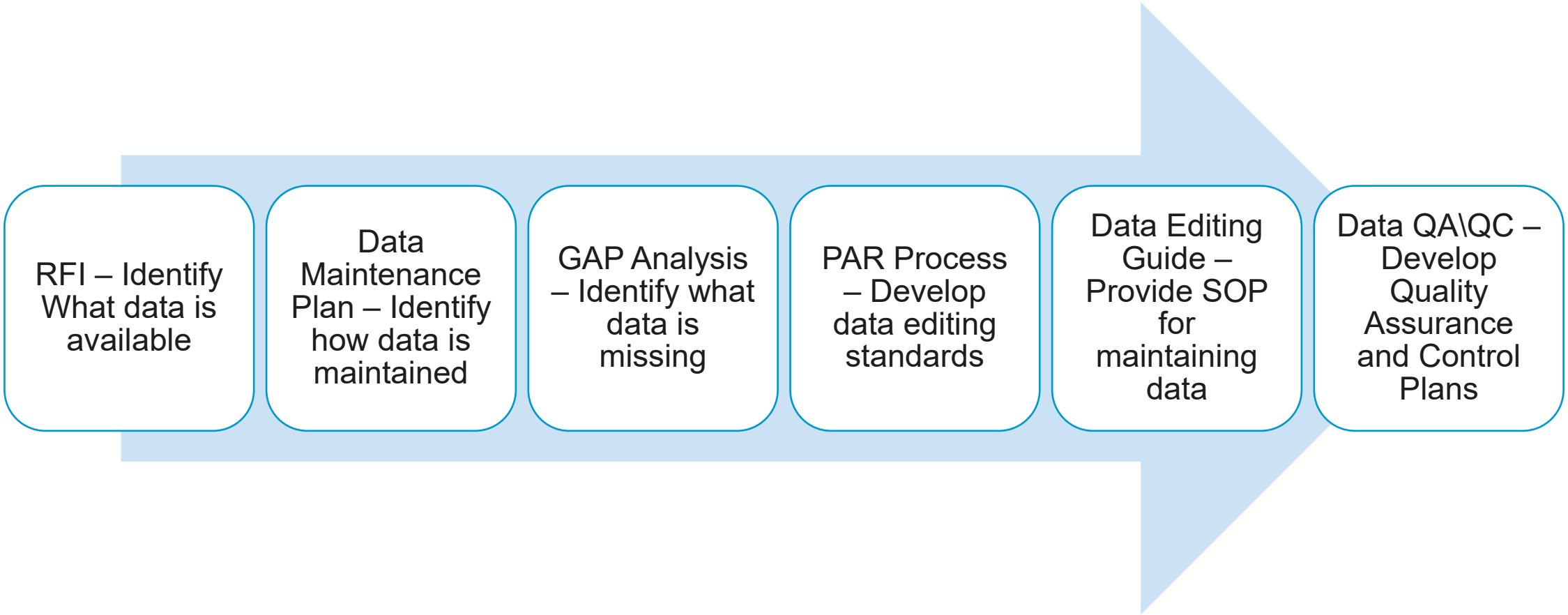
Strategy	Policies and SOPs	Metrics	Technology
• Vision and Mission • Objectives and Goals • Guiding Principles • Alignment with Goals	• Rules • Processes • Standards • Metadata • Controls • Training	• Tracking of Progress • Monitoring of Issues • Continuous Improvement	• System Architecture • Data Architecture • Date Quality Tools • Collaboration Tools

Data Stewardship



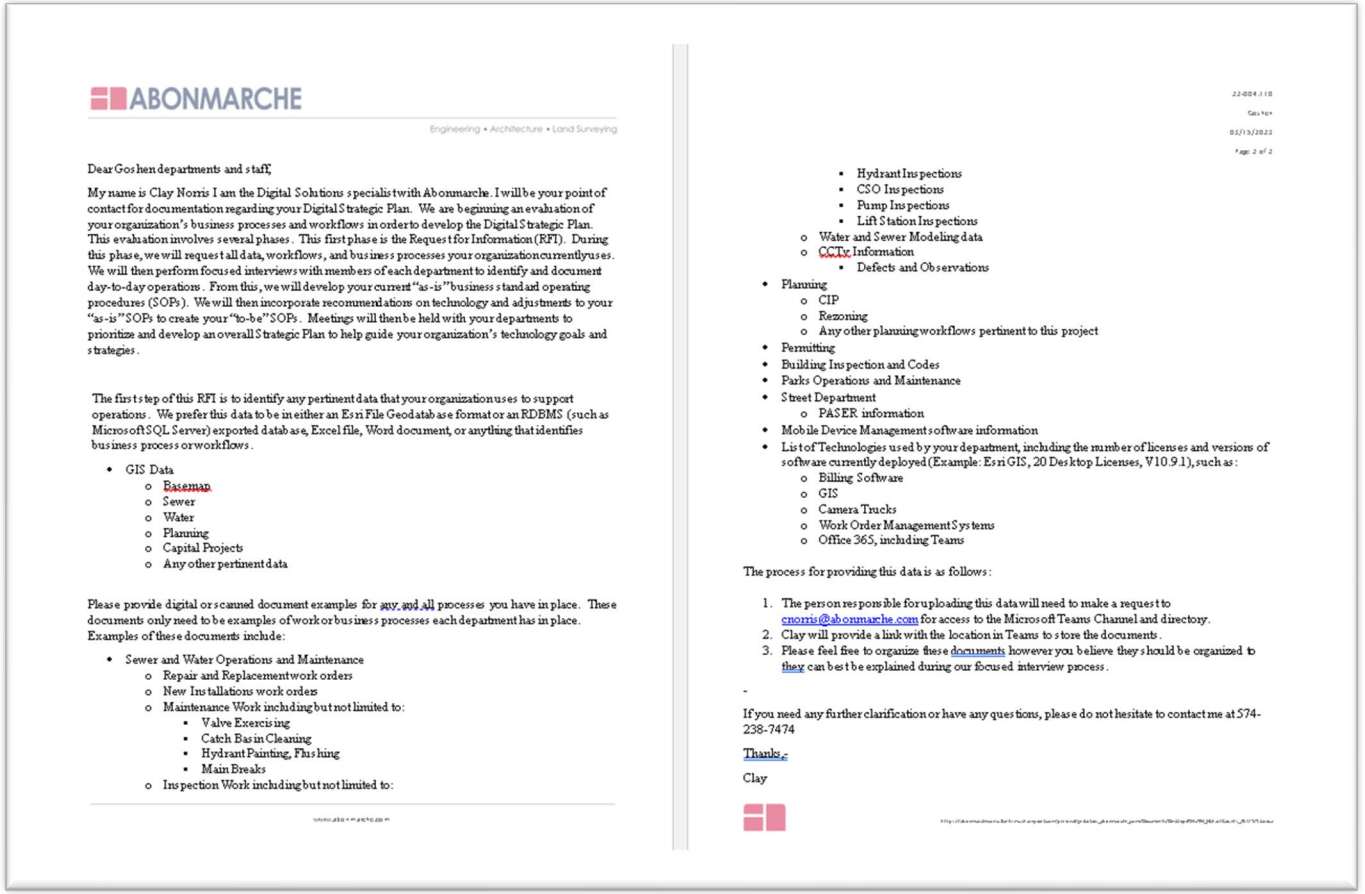


Data Governance



Data Governance – Request for Info

1. RFI – Identify What data is available



ABONMARCHE

Engineering • Architecture • Land Surveying

Dear Goshen departments and staff,

My name is Clay Norris I am the Digital Solutions specialist with Abonmarche. I will be your point of contact for documentation regarding your Digital Strategic Plan. We are beginning an evaluation of your organization's business processes and workflows in order to develop the Digital Strategic Plan. This evaluation involves several phases. This first phase is the Request for Information (RFI). During this phase, we will request all data, workflows, and business processes your organization currently uses. We will then perform focused interviews with members of each department to identify and document day-to-day operations. From this, we will develop your current "as-is" business standard operating procedures (SOPs). We will then incorporate recommendations on technology and adjustments to your "as-is" SOPs to create your "to-be" SOPs. Meetings will then be held with your departments to prioritize and develop an overall Strategic Plan to help guide your organization's technology goals and strategies.

The first step of this RFI is to identify any pertinent data that your organization uses to support operations. We prefer this data to be in either an Esri File Geodatabase format or an RDBMS (such as Microsoft SQL Server) exported database, Excel file, Word document, or anything that identifies business process or workflows.

- GIS Data
  - Basemap
  - Sewer
  - Water
  - Planning
  - Capital Projects
  - Any other pertinent data

Please provide digital or scanned document examples for any and all processes you have in place. These documents only need to be examples of work or business processes each department has in place. Examples of these documents include:

- Sewer and Water Operations and Maintenance
  - Repair and Replacement work orders
  - New Installations work orders
  - Maintenance Work including but not limited to:
    - Valve Exercising
    - Catch Basin Cleaning
    - Hydrant Painting, Flushing
    - Main Breaks
  - Inspection Work including but not limited to:

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    - Hydrant Inspections
    - CSO Inspections
    - Pump Inspections
    - Lift Station Inspections
  - Water and Sewer Modeling data
  - CCTv Information
    - Defects and Observations
- Planning
  - CIP
  - Rezoning
  - Any other planning workflows pertinent to this project
- Permitting
- Building Inspection and Codes
- Parks Operations and Maintenance
- Street Department
  - PASER information
- Mobile Device Management software information
- List of Technologies used by your department, including the number of licenses and versions of software currently deployed (Example: Esri GIS, 20 Desktop Licenses, V10.9.1), such as:
  - Billing Software
  - GIS
  - Camera Trucks
  - Work Order Management Systems
  - Office 365, including Teams

The process for providing this data is as follows:

1. The person responsible for uploading this data will need to make a request to cnorris@abonmarche.com for access to the Microsoft Teams Channel and directory.
2. Clay will provide a link with the location in Teams to store the documents.
3. Please feel free to organize these documents however you believe they should be organized to they can best be explained during our focused interview process.

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If you need any further clarification or have any questions, please do not hesitate to contact me at 574-238-7474

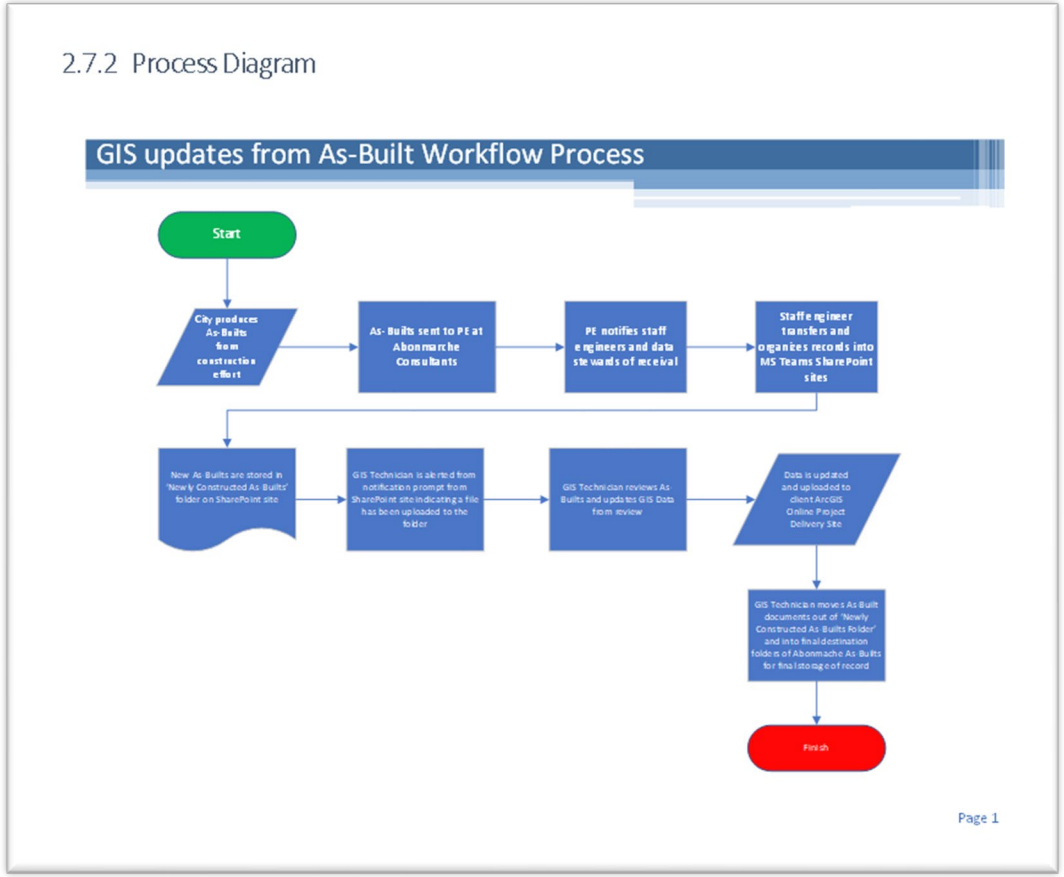
Thanks,

Clay

[New Haven RFI]

Data Governance – Data Maintenance

2. Data Maintenance Plan – Identify how data is maintained



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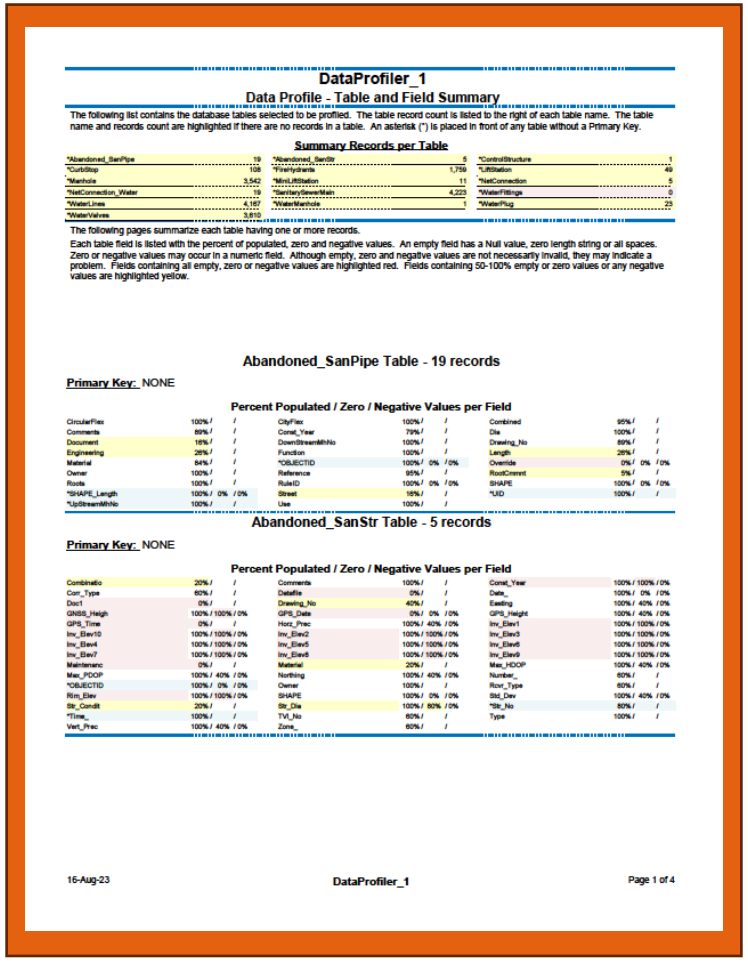
Data Governance – Gap Analysis

3. GAP Analysis – Identify what data is missing



DataProfiler_1

Data Profile - Table and Field Summary

The following list contains the database tables selected to be profiled. The table record count is listed to the right of each table name. The table name and records count are highlighted if there are no records in a table. An asterisk (*) is placed in front of any table without a Primary Key.

Summary Records per Table

*Abandoned_SanPipe	19	*Abandoned_SanStr	5	*ControlStructure	1
*CurbStop	108	*FireHydrants	1,759	*LiftStation	49
*Manhole	3,542	*MiniLiftStation	11	*NetConnection	5
*NetConnection_Water	19	*SanitarySewerMain	4,223	*WaterFittings	0
*WaterLines	4,167	*WaterManhole	1	*WaterPlug	23
*WaterValves	3,810				

The following pages summarize each table having one or more records.

Each table field is listed with the percent of populated, zero and negative values. An empty field has a Null value, zero length string or all spaces. Zero or negative values may occur in a numeric field. Although empty, zero and negative values are not necessarily invalid, they may indicate a problem. Fields containing all empty, zero or negative values are highlighted red. Fields containing 50-100% empty or zero values or any negative values are highlighted yellow.

Abandoned_SanPipe Table - 19 records

Primary Key: NONE

Percent Populated / Zero / Negative Values per Field

CircularFlex	100% / /	CityFlex	100% / /	Combined	95% / /
Comments	89% / /	Const_Year	79% / /	Dia	100% / /
Document	16% / /	DownStreamMhNo	100% / /	Drawing_No	89% / /
Engineering	26% / /	Function	100% / /	Length	26% / /
Material	84% / /	*OBJECTID	100% / 0% / 0%	Override	0% / 0% / 0%
Owner	100% / /	Reference	95% / /	RootCmmnt	5% / /
Roots	100% / /	RuleID	100% / 0% / 0%	SHAPE	100% / 0% / 0%
*SHAPE_Length	100% / 0% / 0%	Street	16% / /	*UID	100% / /
*UpStreamMhNo	100% / /	Use	100% / /		

Abandoned_SanStr Table - 5 records

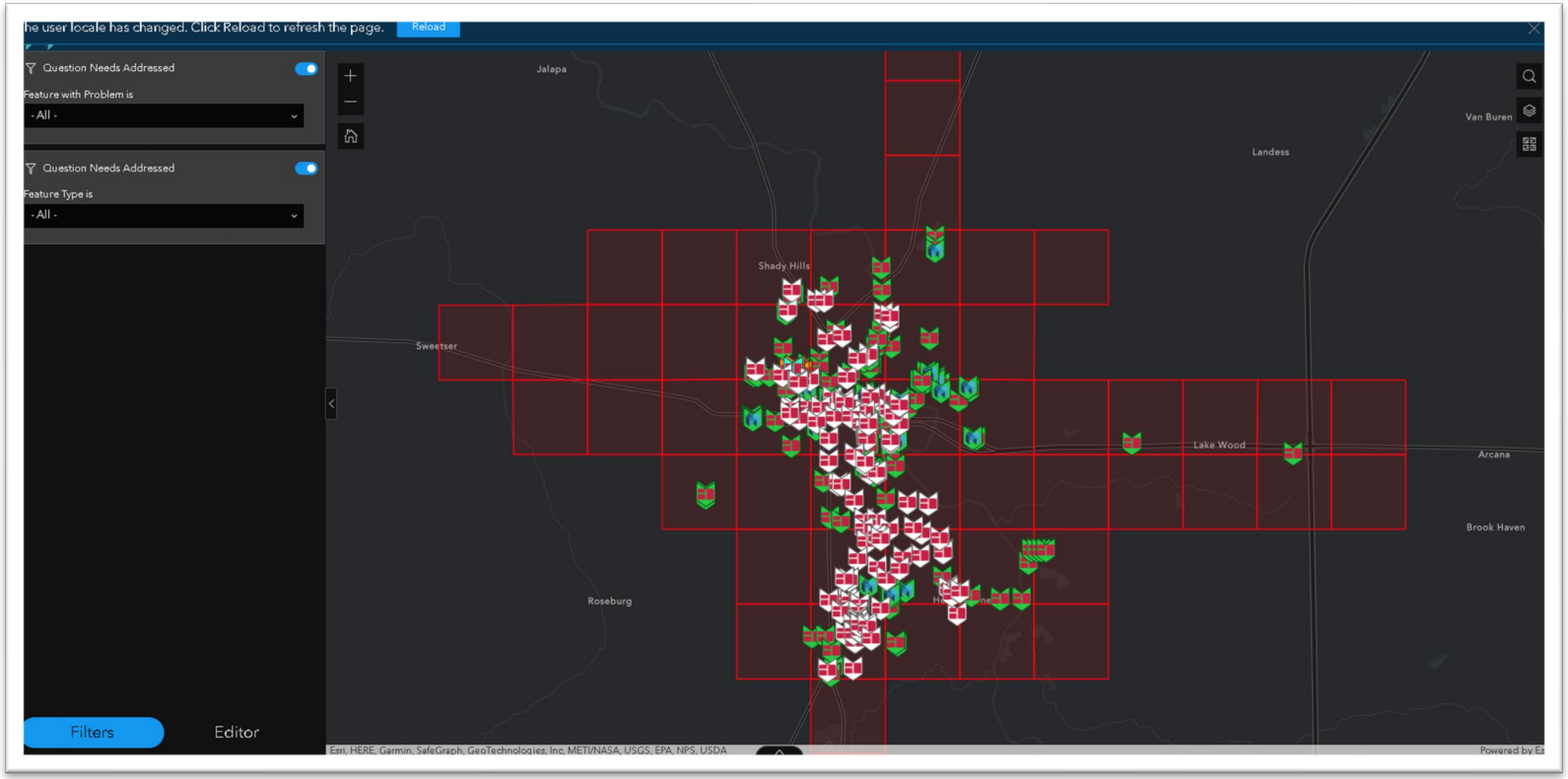
Primary Key: NONE

Percent Populated / Zero / Negative Values per Field

CombineNo	20% / /	Comments	100% / /	Const_Year	100% / 100% / 0%
Corr_Type	60% / /	DateNo	0% / /	Data_	100% / 0% / 0%
Doc1	0% / /	Drawing_No	40% / /	Easting	100% / 40% / 0%
GNSS_Heigh	100% / 100% / 0%	GPS_Date	0% / 0% / 0%	GPS_Height	100% / 40% / 0%
GPS_Time	0% / /	Horz_Prec	100% / 40% / 0%	Inv_Elev1	100% / 100% / 0%
Inv_Elev10	100% / 100% / 0%	Inv_Elev2	100% / 100% / 0%	Inv_Elev3	100% / 100% / 0%
Inv_Elev4	100% / 100% / 0%	Inv_Elev5	100% / 100% / 0%	Inv_Elev6	100% / 100% / 0%
Inv_Elev7	100% / 100% / 0%	Inv_Elev8	100% / 100% / 0%	Inv_Elev9	100% / 100% / 0%
Maintenanc	0% / /	Material	20% / /	Max_HDOP	100% / 40% / 0%
Max_PDOP	100% / 40% / 0%	Northing	100% / 40% / 0%	Number_	60% / /
*OBJECTID	100% / 0% / 0%	Owner	100% / /	Rcvr_Type	60% / /
Rim_Elev	100% / 100% / 0%	SHAPE	100% / 0% / 0%	Std_Dev	100% / 40% / 0%
Str_Condit	20% / /	Str_Dia	100% / 80% / 0%	*Str_No	60% / /
*Time_	100% / /	TVI_No	60% / /	Type	100% / /
Vert_Prec	100% / 40% / 0%	Zone_	60% / /		

Data Governance – PAR Process

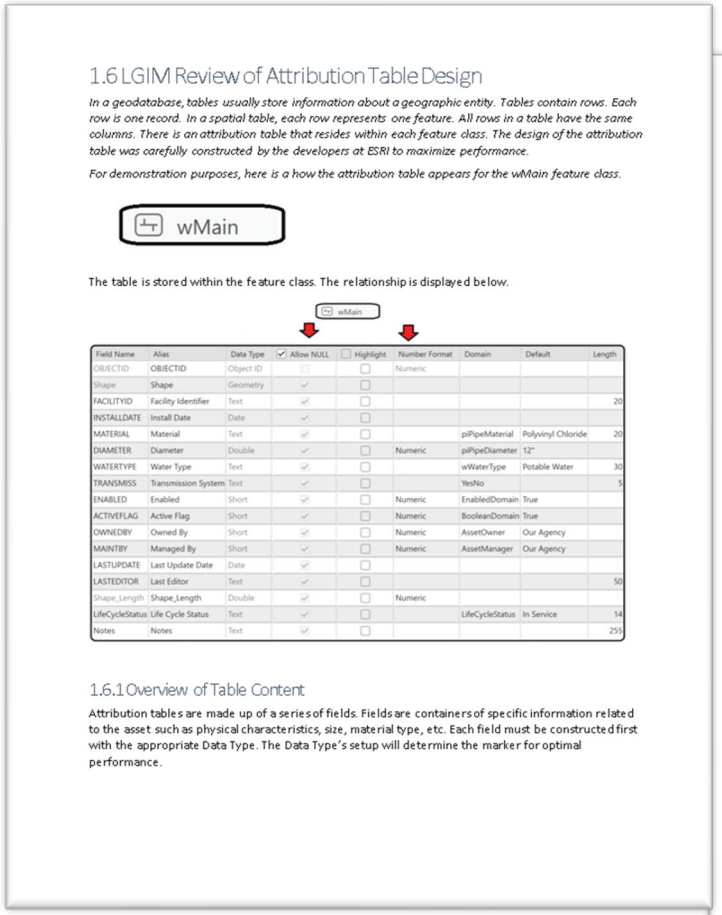
4. PAR Process – Develop data editing standards



Marion PARs

Data Governance – Data Editing

5. Data Editing Guide – Provide SOP for maintaining data



1.6 LGIM Review of Attribution Table Design

In a geodatabase, tables usually store information about a geographic entity. Tables contain rows. Each row is one record. In a spatial table, each row represents one feature. All rows in a table have the same columns. There is an attribution table that resides within each feature class. The design of the attribution table was carefully constructed by the developers at ESRI to maximize performance.

For demonstration purposes, here is a how the attribution table appears for the wMain feature class.

wMain

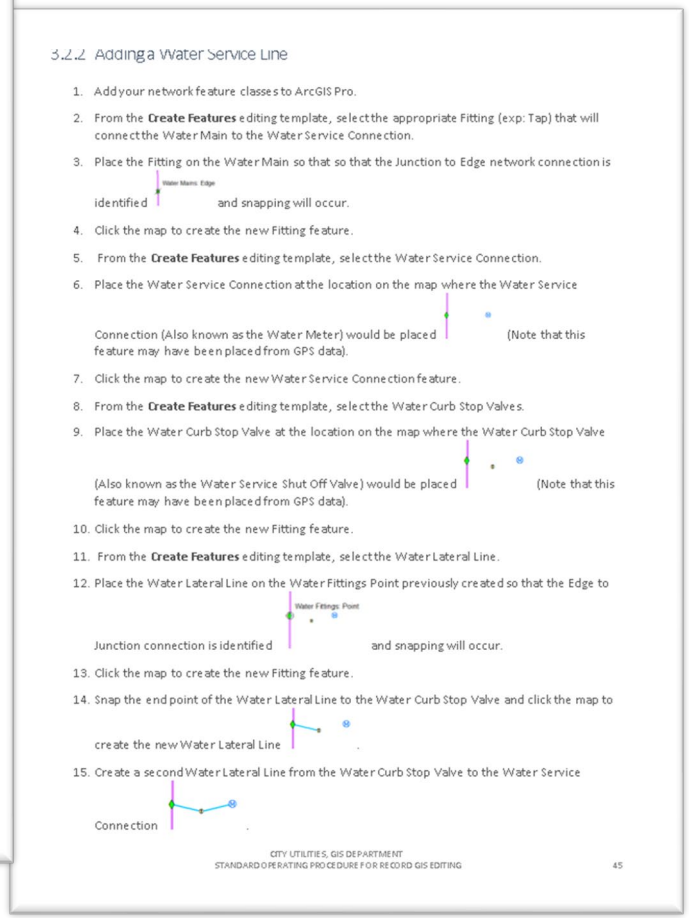
The table is stored within the feature class. The relationship is displayed below.

wMain

Field Name	Alias	Data Type	Allow NULL	Highlight	Number Format	Domain	Default	Length
OBJECTID	OBJECTID	Object ID			Numeric			
Shape	Shape	Geometry	✓					
FACILITYID	Facility Identifier	Text	✓					20
INSTALLDATE	Install Date	Date	✓					
MATERIAL	Material	Text	✓			piPipeMaterial	Polyvinyl Chloride	20
DIAMETER	Diameter	Double	✓		Numeric	piPipeDiameter	12"	
WATERTYPE	Water Type	Text	✓			wWaterType	Potable Water	30
TRANSMISS	Transmission System	Text	✓			YesNo		5
ENABLED	Enabled	Short	✓		Numeric	EnabledDomain	True	
ACTIVEFLAG	Active Flag	Short	✓		Numeric	BooleanDomain	True	
OWNEDBY	Owned By	Short	✓		Numeric	AssetOwner	Our Agency	
MAINTBY	Managed By	Short	✓		Numeric	AssetManager	Our Agency	
LASTUPDATE	Last Update Date	Date	✓					
LASTEDITOR	Last Editor	Text	✓					50
Shape_Length	Shape_Length	Double	✓		Numeric			
LifeCycleStatus	Life Cycle Status	Text	✓			LifeCycleStatus	In Service	14
Notes	Notes	Text	✓					255

1.6.1 Overview of Table Content

Attribution tables are made up of a series of fields. Fields are containers of specific information related to the asset such as physical characteristics, size, material type, etc. Each field must be constructed first with the appropriate Data Type. The Data Type's setup will determine the marker for optimal performance.



3.2.2 Adding a Water Service Line

1. Add your network feature classes to ArcGIS Pro.
2. From the **Create Features** editing template, select the appropriate Fitting (exp: Tap) that will connect the Water Main to the Water Service Connection.
3. Place the Fitting on the Water Main so that so that the Junction to Edge network connection is identified and snapping will occur.
4. Click the map to create the new Fitting feature.
5. From the **Create Features** editing template, select the Water Service Connection.
6. Place the Water Service Connection at the location on the map where the Water Service Connection (Also known as the Water Meter) would be placed (Note that this feature may have been placed from GPS data).
7. Click the map to create the new Water Service Connection feature.
8. From the **Create Features** editing template, select the Water Curb Stop Valves.
9. Place the Water Curb Stop Valve at the location on the map where the Water Curb Stop Valve (Also known as the Water Service Shut Off Valve) would be placed (Note that this feature may have been placed from GPS data).
10. Click the map to create the new Fitting feature.
11. From the **Create Features** editing template, select the Water Lateral Line.
12. Place the Water Lateral Line on the Water Fittings Point previously created so that the Edge to Junction connection is identified and snapping will occur.
13. Click the map to create the new Fitting feature.
14. Snap the end point of the Water Lateral Line to the Water Curb Stop Valve and click the map to create the new Water Lateral Line .
15. Create a second Water Lateral Line from the Water Curb Stop Valve to the Water Service Connection .

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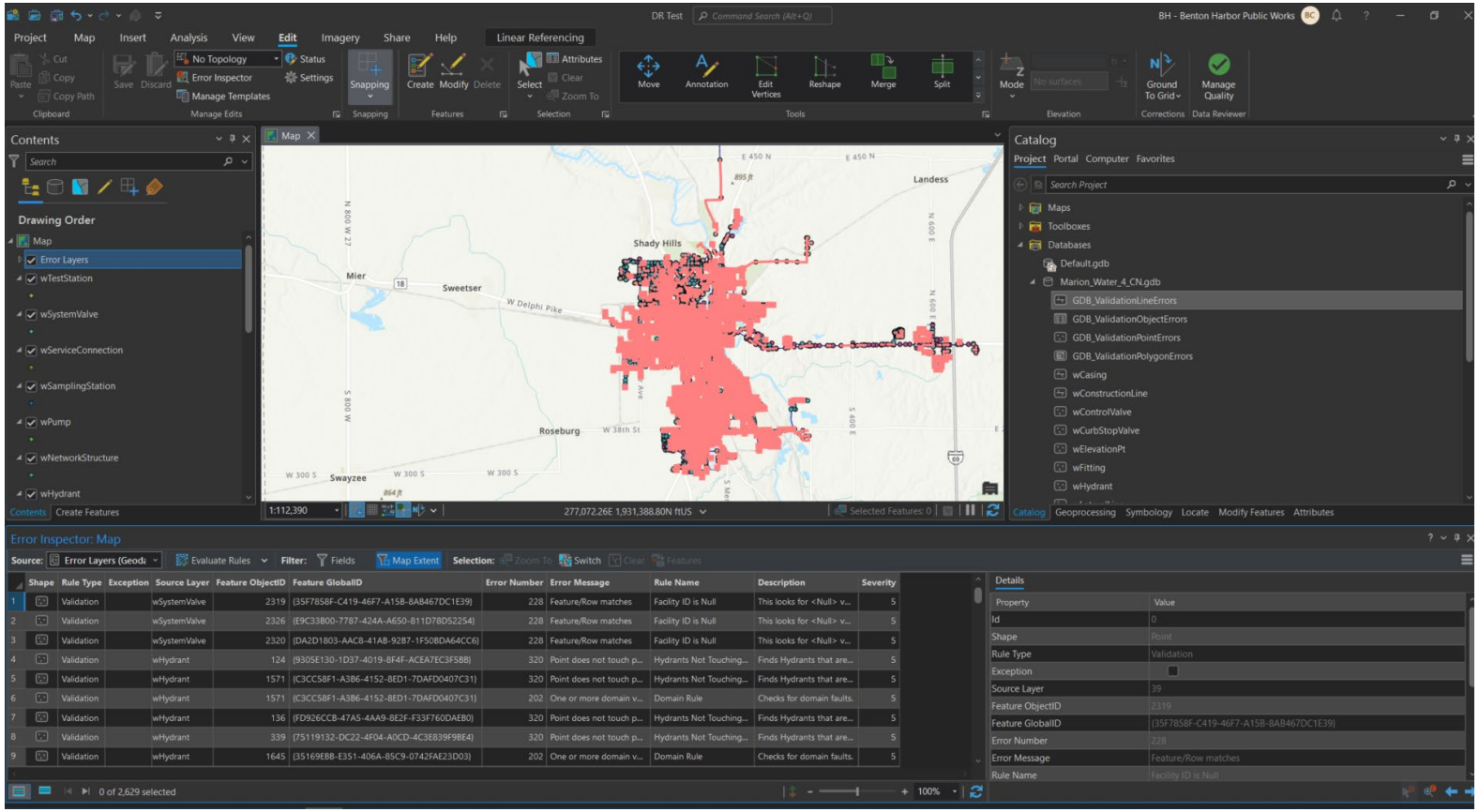
Data Governance – Data QA\QC

6. Data QA\QC – Develop Quality Assurance and Control Plans



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You Need a Team to Manage your Data

- SOPs Need to be Put into Place to Help Not Only with Workflows, but to Provide a Visual Tool to See How Work is Being Performed Within Your Organization.
- Data Accuracy is greatly reduced when data is missing, or changes have not been applied.
- Data Updates don't matter much if the quality of the data is poor at the start.
- Many people are involved in maintaining your data. Bring them together.
- Systems are made to be integrated.
- Understand your data from a high level and force yourself to see opportunities where that data can be utilized and shared.