GIS SYSTEM MAINTENANCE PLAN
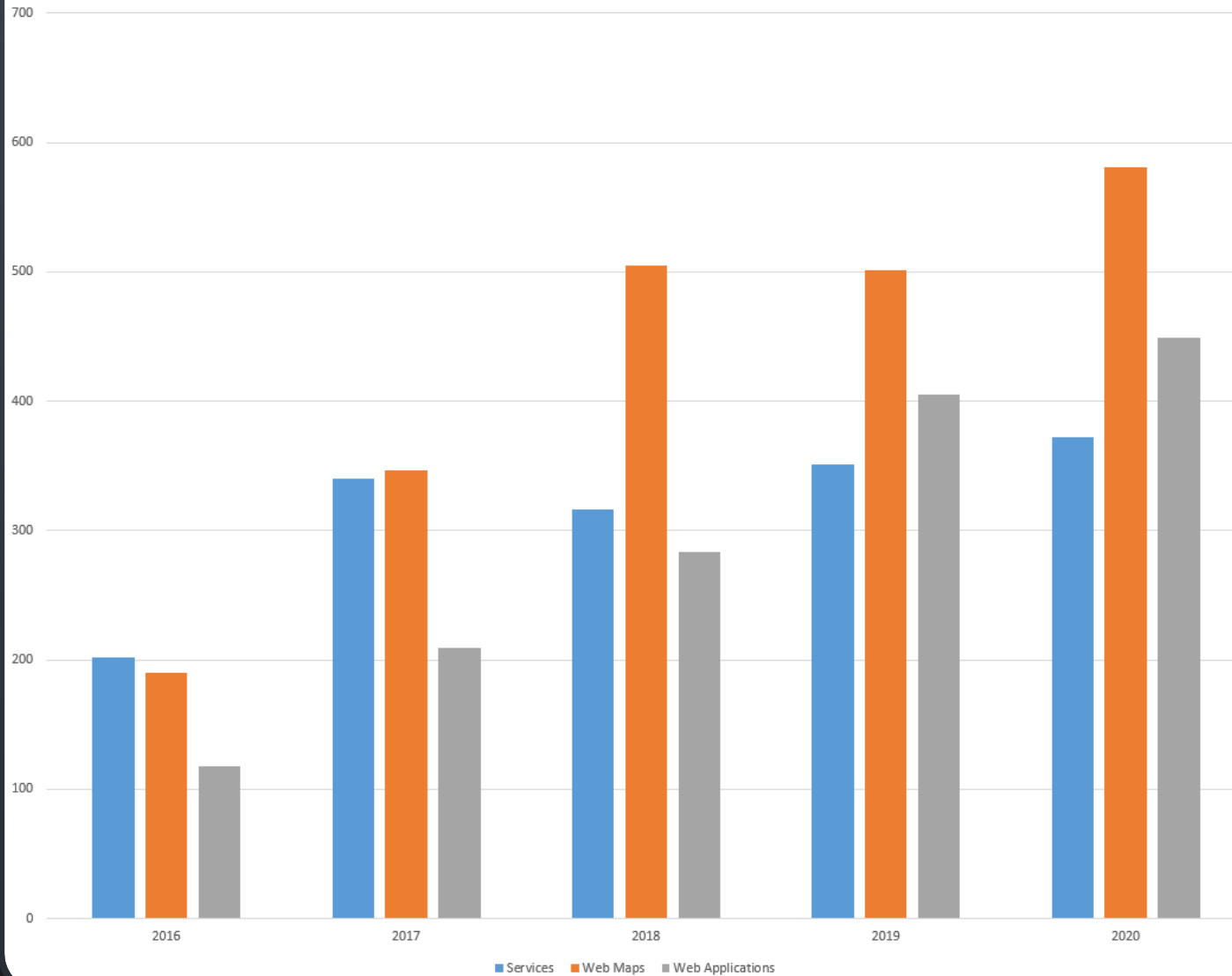
Joe Guzi

GROWTH OF GIS SYSTEM

WE HAD BEEN DOING AUDITS AND MAINTENANCE FOR SOME TIME, BUT WE REALIZED….

I have *part* of a plan!

SO WE DID A LITTLE SOUL SEARCHING AND REALIZED...

12% OF A PLAN

KIRKS

- THE 12% OF THE PLAN WAS A START
  - IT BEGAN VERY ORGANICALLY
- SOME OF THE AUDITS HAVE BEEN WORKING SUCCESSFULLY FOR 2 OR 3 ITERATIONS
- IT HAD SOME GOOD IDEAS ABOUT WAYS TO ORGANIZE OUR SYSTEM
- WE HAD SOME PROCEDURES

KAHNS

- WE WERE MISSING SYSTEM COMPONENTS
- WE HAD NO PLAN FOR UPGRADES
- IT WASN'T REALLY A PLAN IT WAS MORE OF A COLLECTION OF THINGS WE WOULD LIKE TO DO.
- IT WAS VERY UNORGANIZED

QUESTIONS WE WANTED ANSWERED
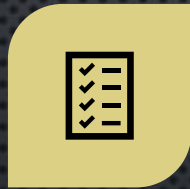

Everything's shiny, Cap'n. Not to fret.

- WHY?
  - WHAT'S THE PURPOSE OF THIS PLAN?
- WHAT WILL WE DO?
- WHAT WILL WE USE TO MAINTAIN OUR GIS SYSTEM?
- HOW WE WILL MAINTAIN OUR GIS SYSTEM?

SO WE BEGAN BRAINSTORMING DIFFERENT COMPONENTS OF WHAT BECAME OUR SYSTEM MAINTENANCE PLAN

OVERVIEW OF OUR GIS SYSTEM

AUDITS

MONTHLY HIGH-LEVEL SYSTEM CHECK

UPGRADES

TOOLS

PROCEDURES

THE OVERVIEW OF THE GIS SYSTEM OUTLINES ALL OF THE COMPONENTS THAT MAKE UP THE GIS SYSTEM.

GIS databases	ArcGIS Servers	ArcGIS Enterprise	GeoEvent Server	supplemental servers
ArcGIS Desktop	Python scripts	ArcGIS Online	Third Party Integrations	

Websde

Tyler IASWorld
CAMA

SCGIS Parcel Views

County Tyler CAD System
New World Computer Aided Dispatch

Stark County GIS

Sheriff Sales
Sheriff

GIS CAMA

Sanitary Engineer

Sanitary Engineer UMBS Billing
Utility Management Billing System

Canton Township

City of Canton

Board of Elections
Elections Results

Canton Tyler Billing
Utility Billing

Canton Township Cartegraph
Cartegraph

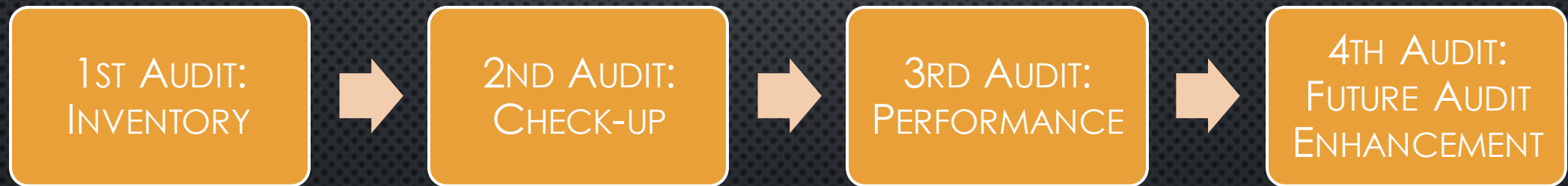## City of Canton Cartegraph
Cartegraph

AUDITS

- ArcGIS Enterprise Lineage Audit
- ArcGIS Online Audit & ArcGIS Enterprise Audit
- ArcGIS Server Audit
- Automated SQL Server Component Audit
- GeoEvent Audit
- GP Tools and GP Services Audit
- Python Script Audit
- User Audit

AUDIT IMPLEMENTATION WORKFLOW

1ST AUDIT: INVENTORY → 2ND AUDIT: CHECK-UP → 3RD AUDIT: PERFORMANCE → 4TH AUDIT: FUTURE AUDIT ENHANCEMENT

FUTURE AUDIT ENHANCEMENT WORKFLOW

BRAINSTORM   EXECUTE   IMPLEMENT

WRITE PROCEDURES   REFINE

EXAMPLE – PYTHON AUDIT

- Check log files to make sure scripts are running properly and are running during the appropriate time

- Some scripts reference timestamps in text files for querying
  - Make sure the timestamps are being updated

- Perform any additional modifications to scripts as needed

- Upgrade ArcGIS Pro on server that runs scripts

Audits	1st Half 2017	2nd Half 2017	1st Half 2018	2nd Half 2018	1st Half 2019	2nd Half 2019	1st Half 2020	2nd Half 2020	1st Half 2021	2nd Half 2021
Python Script Audit										
ArcGISServer/Enterprise Audit										
GeoEvent Audit										
ArcGIS Online Audit										
GP Tools and GP Services Audit										
Automated SQL Server Component Audit										
User Audit										
ArcGIS Enterprise Lineage Audit										

SCGIS AUDIT IMPLEMENTATION

MONTHLY HIGH LEVEL SYSTEM CHECK

- Check server logs on ArcGIS Server and GeoEvent Server
- Review the number of maximum and minimum instance on ArcGIS Servers
- Review a Python Script Audit that summarizes the last time each script ran
- Check alerts on ArcGIS Monitor
- Check available memory, available disk space and processor time of server using ArcGIS Monitor
- Review desktop license usage using ArcGIS Monitor
- Evaluate additional features of ArcGIS Monitor, to be added for future monthly system checks

UPGRADE SCHEDULE CONSIDERATIONS

Esri's current release schedule occurs during the months of March and July

The July x.x.1 release typically has a longer support cycle

Occurrence of patch releases to fix bugs

Scheduling with the Stark County IT Team

Scheduling during a time of low utilization; possibly in December when staff takes vacation for the holidays

Avoidance of major events that rely heavily on the GIS system
- Reappraisal
- Elections

Weighing the business needs of Stark County

Weighing the risk of upgrading

The necessity to properly vet new functionality due to the limited documentation regarding the new functionality of new releases

Attempting to stay no more than four releases behind.

UPGRADE SCHEDULE

- **Biannual Development Server Upgrade Schedule**
  - Meet the second Tuesday in April to review the new release and schedule the upgrade of the development servers
  - Meet the second Tuesday in August to review the new release and schedule the upgrade of the development servers
  - If the testing and evaluation of the new release proves to be immediately beneficial to the business needs of Stark County, and there is minimal risk, the system maintenance team may recommend upgrading the staging and production servers sooner that what is outlined below

- **Annual Staging and Production Server Upgrade Schedule**
  - Meet during the ArcGIS Server Audit in November to evaluate the options to upgrade
  - If the decisions is made to proceed with the upgrade, it will be scheduled for December

$ Evaluate the benefits of new features, and effort/risk of upgrading

✕ The preference is to be no more than 4 releases behind

↻ Due to the longer support cycle for the X.X.1 releases, these releases will be favored

✓ Consider upgrading development servers at every release to look closer at the release
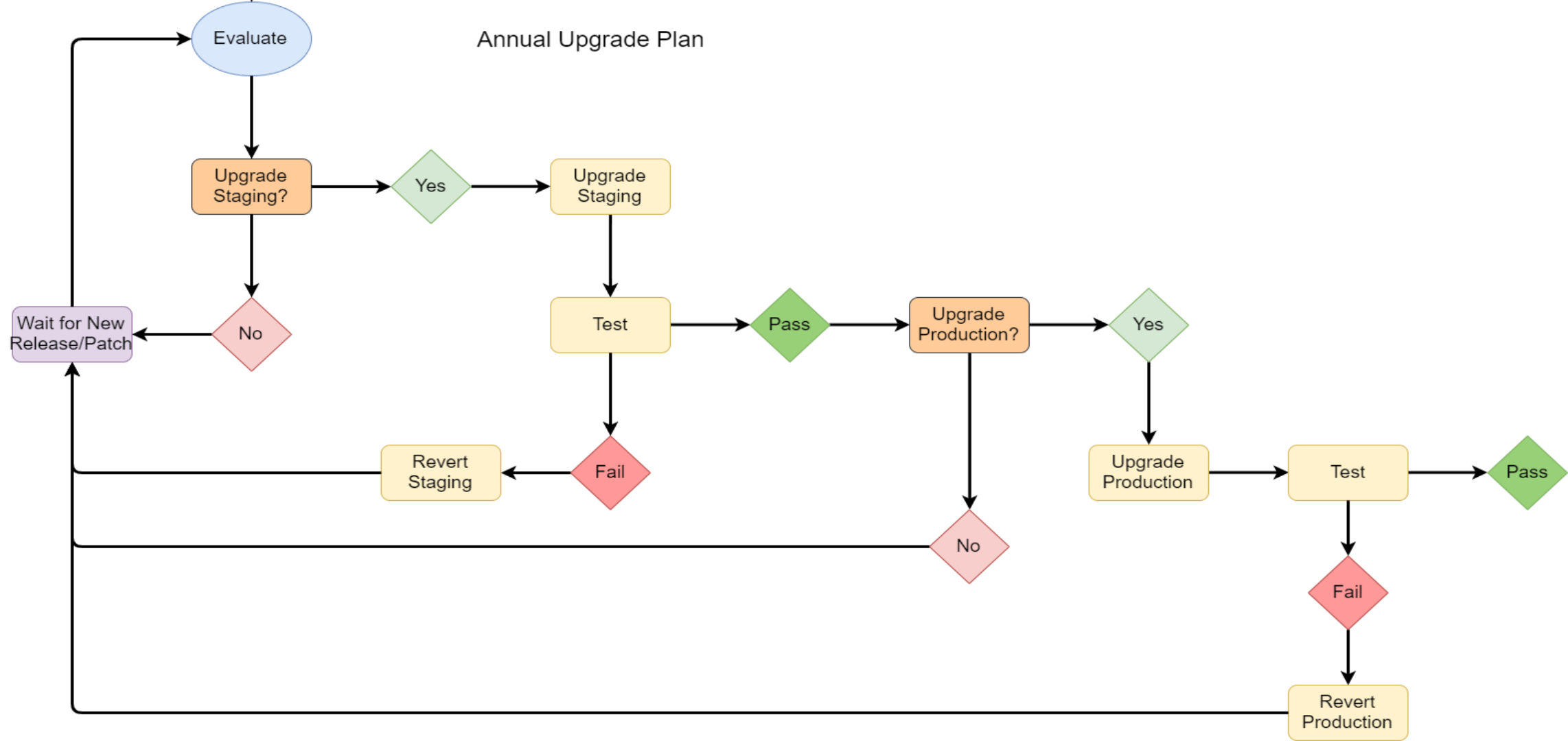
UPGRADE PLAN

Upgrade Plan

Bi-Annual Upgrade Plan

Upgrade Dev → Test → Document Test Results

Annual Upgrade Plan

MISSION CRITICAL TEST LIST

ArcGIS ONline/Enterprise

Data Store Item/ Bulk Publishing
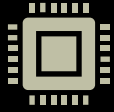Publishing Services
Export Data from Open Data

ArcGIS Server

Testing print services
Address Locators
Publishing Services

Arcmap

Versioning Test

Review the Technology - Understand what the technology is best used for and what existing technology it would replace. R&D the New Technology

Procurement - The system maintenance team will propose the final procurement plan in October for evaluation.

Implementing - The system maintenance team will use the scope outlined before to implement the new technology, and document its usage.

Audit - After the new technology is implemented, the system maintenance team will schedule an audit during the next audit cycle. At that time, the system maintenance team will follow the audit implementation workflow outlined above.

PROCESS FOR EVALUATING NEW TECHNOLOGY

TOOLS

TOOLS – PYTHON SCRIPTS/SSRS REPORTS

- [FEATURE CLASSES BEING REPLICATED](#)

- [GEODATABASE COMPONENTS](#)

- [DATA SOURCE OF LAYERS IN SERVICES PUBLISHED TO ARCGIS SERVER](#)

- [SERVICES ON ARCGIS SERVER](#)

- [ITEMS ON ARCGIS ONLINE AND ARCGIS PORTAL](#)

- [LAYERS IN WEB MAPS ON ARCGIS ONLINE](#)

- [ERRORS WITH LAYERS IN WEB MAPS](#)

- [GROUPS ON ARCGIS ONLINE AND ENTERPRISE](#)

- [USERS ON ARCGIS ONLINE AND ENTERPRISE](#)

- [WEB APPLICATIONS ON ARCGIS ONLINE AND ENTERPRISE](#)

- WIDGETS IN WEB APPLICATIONS

- DATA SOURCE OF FEATURE CLASSES AND TABLES USED IN PYTHON SCRIPTS
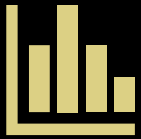
TOOLS – ARCGIS ENTERPRISE LINEAGE

- Shows the relationships of components in the GIS system
  - Database
  - ArcGIS Server
  - Web Maps and Apps
  - Widgets
- Consists of a SQL view and an SSRS report for viewing the data
- The SQL view combines the audit tables generated by the python scripts

REASONS TO HAVE A SYSTEM MAINTENANCE PLAN

Whether you have a ...
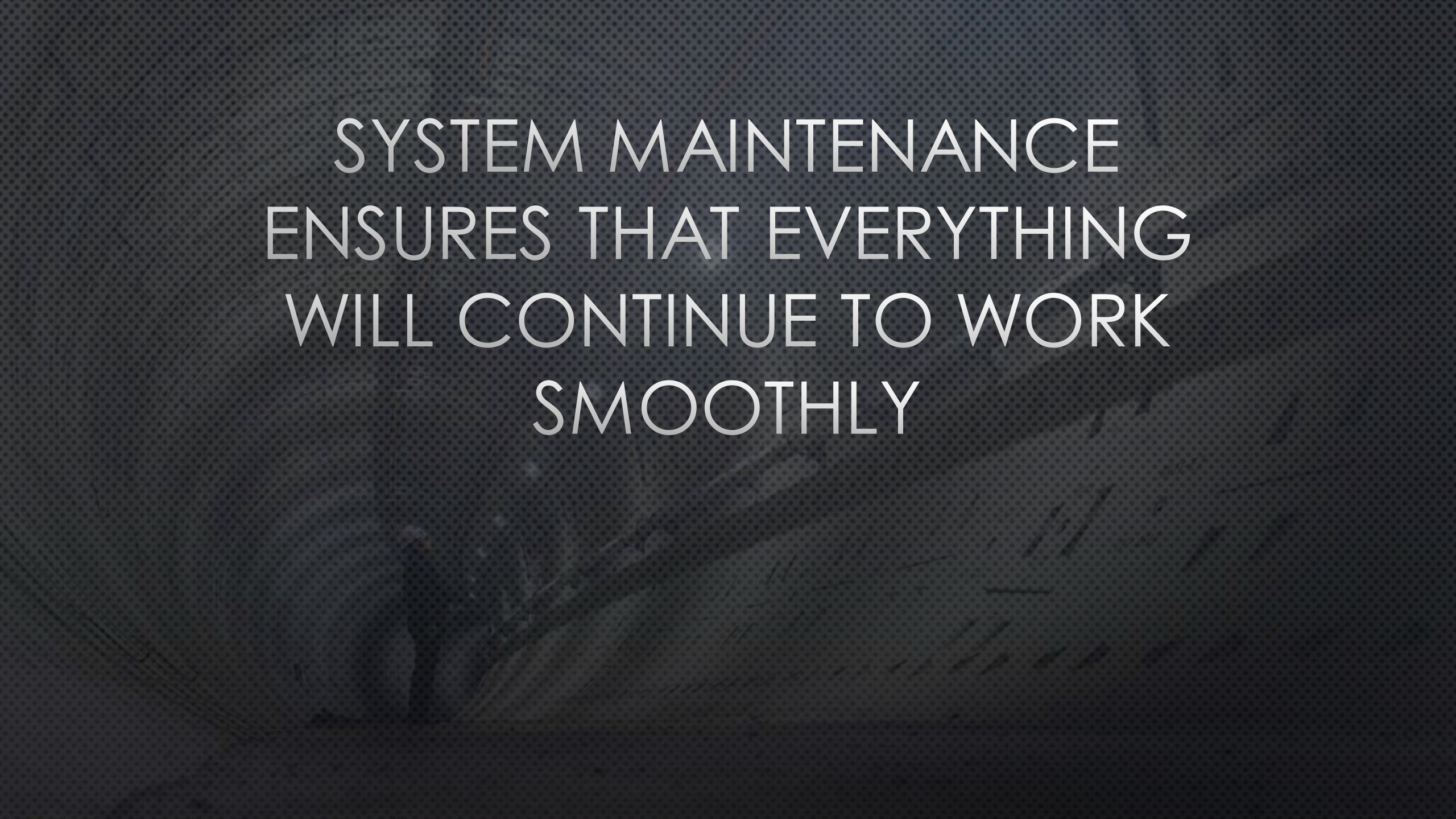
Small GIS System

Large GIS System

GIS SYSTEM IS SIMILAR TO
A LIVING THING

SYSTEM MAINTENANCE ENSURES THAT EVERYTHING WILL CONTINUE TO WORK SMOOTHLY

SYSTEM MAINTENANCE PLAN PROVIDES

Inventory of all System Components

Periodic check of all system components

More informed decision making

Procedures upgrade system components

Increased "Bus Factor"

THINGS TO CONSIDER WHEN DRAFTING A SYSTEM MAINTENANCE PLAN

By failing to prepare, you are preparing to fail.

(Benjamin Franklin)

Audits	1st Half 2017	2nd Half 2017	1st Half 2018	2nd Half 2018	1st Half 2019	2nd Half 2019	1st Half 2020	2nd Half 2020	1st Half 2021	2nd Half 2021
Python Script Audit		■	■	■	■	■	■	■	■	■
ArcGISServer/Enterprise Audit				■	■	■	■	■	■	■
GeoEvent Audit					■		■		■	
ArcGIS Online Audit					■	■	■	■	■	■
GP Tools and GP Services Audit						■				■
Automated SQL Server Component Audit								■		■
User Audit									■	
ArcGIS Enterprise Lineage Audit										■

START SMALL

START AUDITING ORGANICALLY

AUTOMATE AUDITS WHEN ABLE

FIND A SCHEDULE THAT WORKS FOR YOU

Month	Server Planning	Application/Web Map Usage	ASSCA	GP tools	GP Services	ArcGIS Lineage Audit	Python Scripts	GeoEvent	System Upgrades	GIS User Audit	Esri Releases*
January								X			
February							X				
March				X	X	X					Desktop/ Enterprise
April			X								
May	X	X									
June										X	
July											Desktop/ Enterprise
August							X				
September											
October			X								
November	X	X									
December									X		

THE MISSION CRITICAL TEST LIST SHOULD BE UNIQUE TO YOUR ORGANIZATION

DOCUMENT, DOCUMENT, DOCUMENT

1 Document the system

2 Document procedures

3 Document audit results

Questions?

Stark County GIS System Maintenance Plan

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