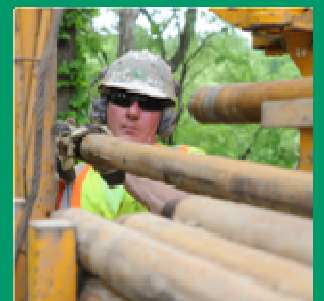
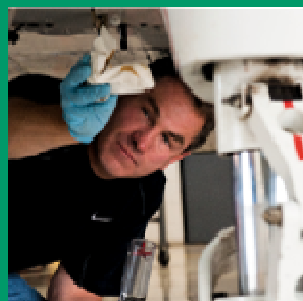
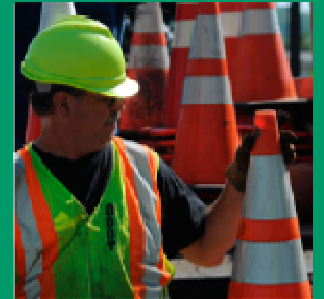
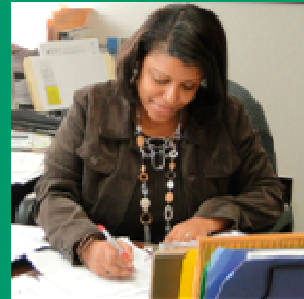


ESRI COLLECTOR DATA LOSS

8/23/18



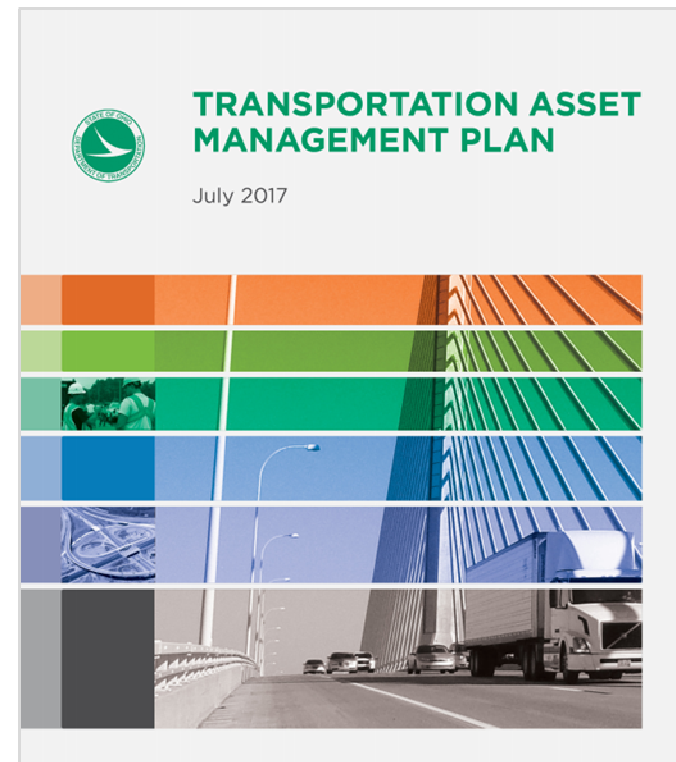
OHIO DEPARTMENT OF
TRANSPORTATION

ESRI COLLECTOR DATA LOSS

Business Objectives

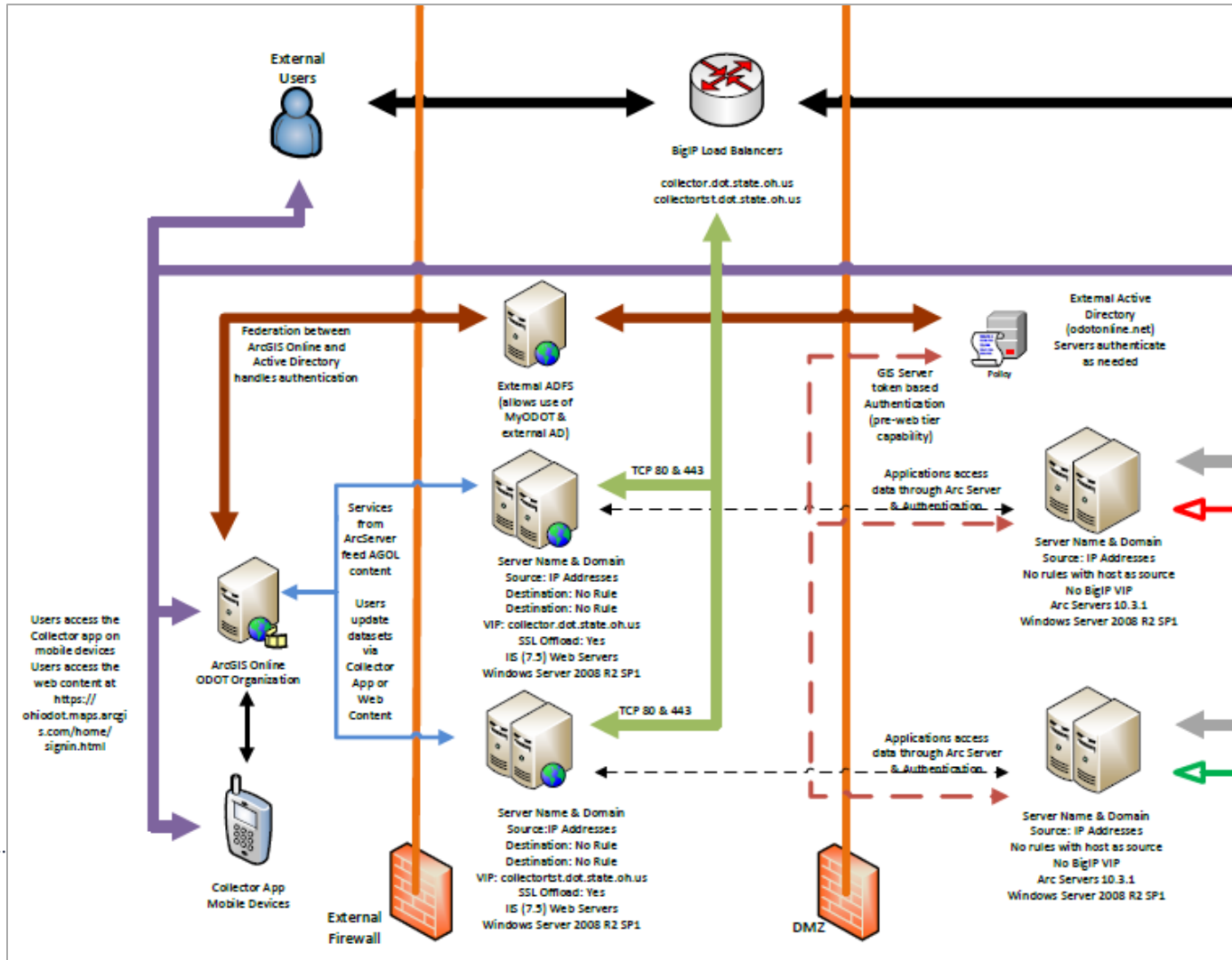
Transportation Asset Management

- Title 23 USC 119(e)(1)
- MAP-21 § 1103
- MAP-21 § 1106



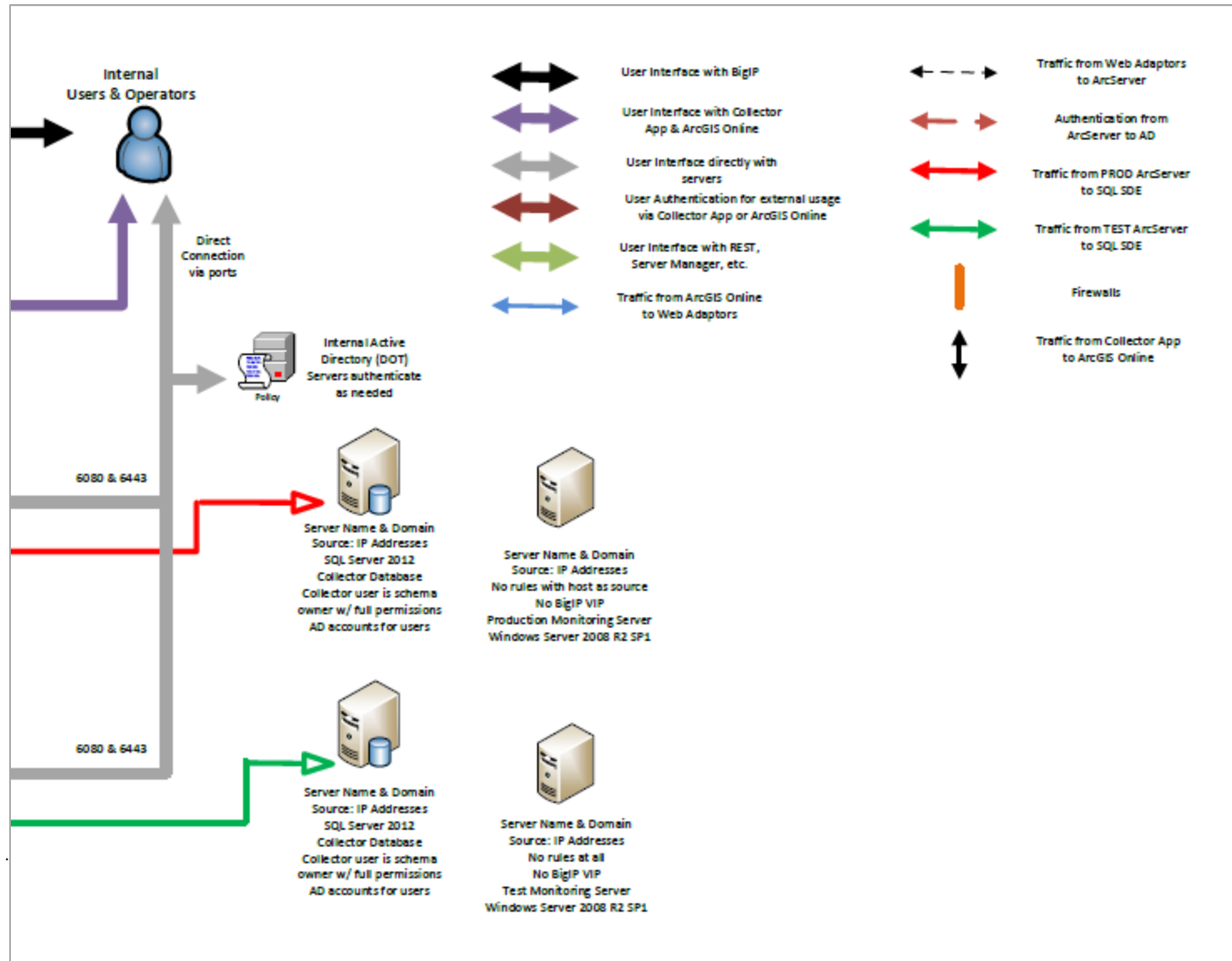
ESRI COLLECTOR DATA LOSS

System Overview - Architecture



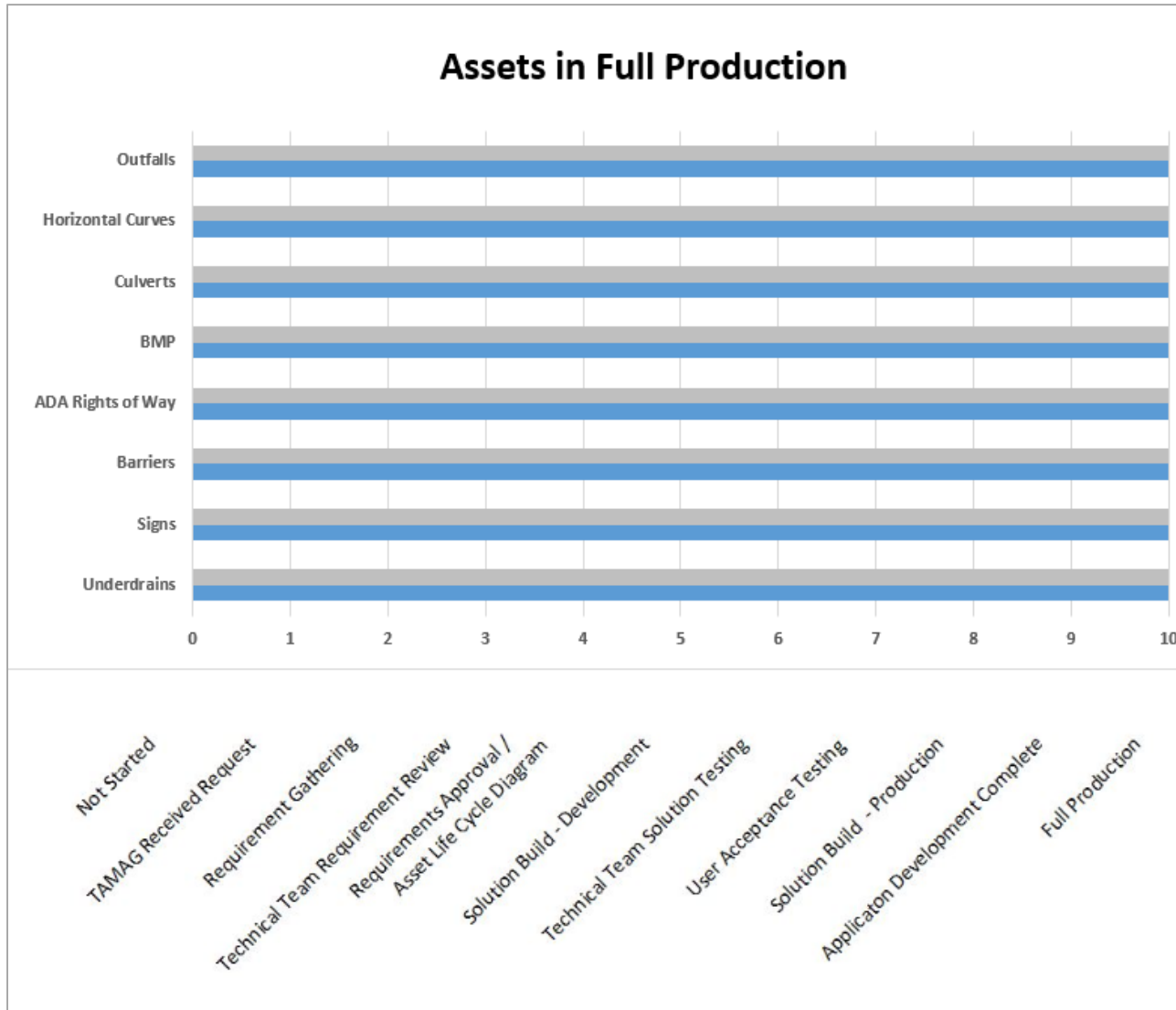
ESRI COLLECTOR DATA LOSS

System Overview - Architecture



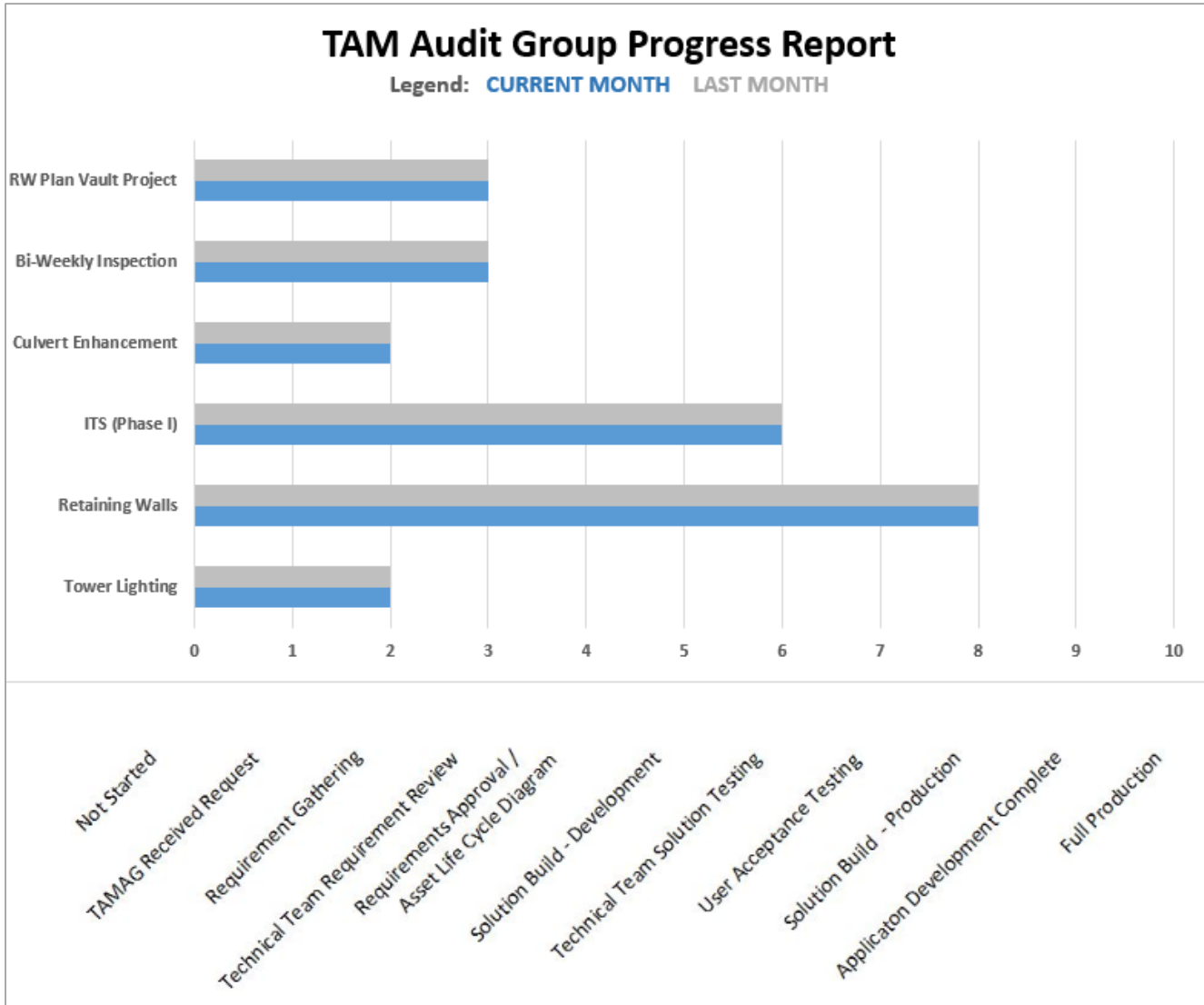
ESRI COLLECTOR DATA LOSS

System Overview – Solutions



ESRI COLLECTOR DATA LOSS

System Overview – Solutions



ESRI COLLECTOR DATA LOSS

System Overview – Solution Summary

- In Production = 8
- In Development = 5
- ArcGIS Online Named Users = 750
- Devices (iPad Mini, iPhones) = 400+
- Geographic Districts = 12
- County garages = 88

ESRI COLLECTOR DATA LOSS

System Overview – Investment (estimate)

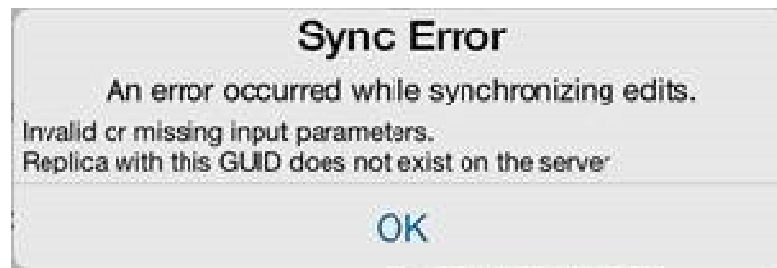
Infrastructure	One Time	Annual
Servers / DBs		\$121,752
ESRI Licensing*		\$15,000
AGO Named Users*		\$73,500
Field Equipment	\$236,000	
Docking Stations	\$50,000	
Data Plans		\$180,000
Sub-Total	\$286,000	\$390,252
<i>Years In Production</i>		2
Sub-Total	\$286,000	\$780,504
Grand Total	\$1,066,504	
*Estimate based on ESRI maintenance costs		

Core Project Team	
Role	Collector FTE
DBA	0.5
GIS Server Admin	0.8
Tester/QA	0.7
BA	0.8
PM	0.5
Tech Lead	0.8
GIS Analyst	0.8
GIS Analyst	0.8
Team Lead	0.2
Sponsor 1	0.3
Sponsor 2	0.1
Total	6.3

\$1M+

ESRI COLLECTOR DATA LOSS

The Problem

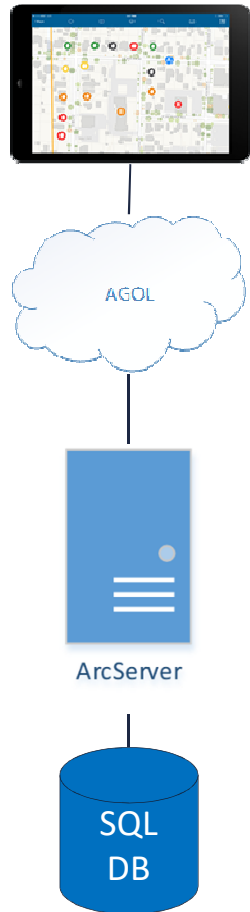


The iPad error coincides with an ArcServer error message that reads:

Replica with GUID ({D5D7AAEC-3923-4DB0-AB56-293F305FB0FB}) does not exists on the server

ESRI COLLECTOR DATA LOSS

What We Think Is Happening



1. User runs successful sync process to send daily edits to enterprise
2. User removes Offline Map
 1. Message sent to **ArcServer** to remove replica ID
 2. Replica ID is unregistered successfully on the **ArcServer**
3. User downloads new Offline Map for new day of work
 1. **Somehow – previous SQLite DB (ipad) with previous GUID is used for Offline collection**
4. Goes to field, collects data not knowing this has occurred
5. End of day, User runs sync process to send daily edits to enterprise
6. **Sync Error (replica with this GUID does not exist on server)**



6. User clicks "OK" on Sync Error message
7. User can attempt sync again; if fails again:
 - Sign Out, Restart iPad or force close app
 - Work around fails unknown to user
8. SQLite DB on iPad is lost by app = **entire day of work lost**

Previous successful workaround

ESRI COLLECTOR DATA LOSS

ODOT Troubleshooting / ESRI Support

Date	Activity	App	Data Loss	Comment
3/13/2018	Potential Issue Noticed	Culverts		possible first incident with Replica with GUID error, looking back at emails
5/8/2018	Data Loss Incident	Culverts	Lost 1 day of work	Mentioned that this has happened 3-5 since March
5/23/2018	Data Loss Incident	Culverts	Lost 1 day of work	
5/25/2018	ODOT Troubleshooting			we first suspected this new Issue causing data loss.
6/1/2018	Data Loss Incident	Sign and Support	Lost 1 day of work	
6/7/2018	Data Loss Incident	Culverts	Lost 1 day of work	
6/8/2018	ODOT Troubleshooting			We were able to replicate the issue internally (on CollectorTst). Step provided.
6/11/2018	ODOT Troubleshooting			Emergency Meeting with TAM Coordinators to gather communicate known issue and gather feedback/incidents.
6/11/2018	ODOT Troubleshooting			Emailed ECT to install iTunes on a couple computers in hope we could retrieve data if issue occurred again.
6/14/2018	ODOT Troubleshooting			Emailed TAM Coordinators instructions for users to relay Offline Maps if issue occurs again
6/15/2018	Communication with ESRI			ESRI Ticket Opened
6/20/2018	Data Loss Incident	Culverts	Lost 1 day of work	
6/21/2018	Communication with ESRI			ESRI Ticket Escalated - requested Incident logs from Fiddler or ArcGIS Server (recommended Fiddler)
7/10/2018	Data Loss Incident	Sign and Support	Lost 1 day of work	
7/12/2018	Communication with ESRI			Info for troubleshooting passed along at ESRI UC.
7/13/2018	ODOT Troubleshooting			Detailed new work around to try to 'catch' this issue before heading out to the field
7/24/2018	Data Loss Incident	Culverts	Lost 1 day of work	
7/24/2018	Data Loss Incident	Culverts	Lost 1/2 day of work	

Data Loss Incident
ODOT Troubleshooting
Communication with ESRI

ESRI COLLECTOR DATA LOSS

ODOT Troubleshooting / ESRI Support

Date	Activity	App	Data Loss	Comment
7/26/2018	Communication with ESRI			Passed Along Issue info, Workaround, AGS log files, Ticket # to Brenneman and Shaner at ESRI
7/31/2018	Communication with ESRI			Communicated issue with Rodenberg (email from Michael)
7/31/2018	ODOT Troubleshooting			Scheduled ArcGIS Server Event Monitor tool. Emails if new error occurs.
7/31/2018	ODOT Troubleshooting			Fiddler installed on CollectorTstNew confirmed
8/1/2018	ODOT Troubleshooting			Submitted ticket to get fiddler services added as exception to ODOT-Mobile firewall
8/1/2018	ODOT Troubleshooting			Submitted ticket to install fiddler certs on devices
8/2/2018	ODOT Troubleshooting			Passed along debug logs from AGS to Simon (ODOT network team)
8/7/2018	Communication with ESRI			Passed AGS Logs to Ticket owner
8/7/2018	Communication with ESRI			Passed along issue info to ESRI Feature Service Team
8/8/2018	Data Loss Incident	Culverts	Lost 12 records	
8/8/2018	Data Loss Incident	Culverts	None	Made a fake point while trying to troubleshoot
8/10/2018	Communication with ESRI			Passed along issue info to ESRI Feature Service Team
8/13/2018	Communication with ESRI			follow-up with more info passed along to ESRI Feature Service Team
8/14/2018	Data Loss Incident	Culverts	None	First sync of the day with no data.
8/22/2018	ODOT Troubleshooting			Fiddler Certs Installed and WIFI rule enabled
8/22/2018	ODOT Troubleshooting			Testing began and ended in 1 hour (with Fiddler running)
8/22/2018	Data Loss Incident	Culverts (dev)	None	5 iterations to replicate issue (Fiddler Logs captured)
8/22/2018	ODOT Troubleshooting			Fiddler Package currently being sent to ESRI

Data Loss Incident
ODOT Troubleshooting
Communication with ESRI

ESRI COLLECTOR DATA LOSS

ODOT Troubleshooting / ESRI Support

Status Summary

- ODOT monitoring issue via Event Monitor
- ODOT promote workaround internally
- ODOT preparing Fiddler logs to send to ESRI
- ESRI response on Fiddler logs once received
- ESRI response to already sent AGS logs

ESRI COLLECTOR DATA LOSS

Data Loss Impact Summary

Total Number of Known Incidents X shift hours X duplication of effort*	192
ODOT Troubleshooting Hours	
QA Tester(s)	32
Collector Dev Lead	24
Collector Team Member	32
ArcServer Admin	16
TAM Coordinators	20
PM / Supervisors	16
<i>Sub-Total</i>	<i>140</i>
Total Hours of ODOT Productivity Loss	332

*12 x 8 x 2

ODOT Field Crews are beginning to lose confidence in the ESRI Collector application, reverting to paper forms

**Annual Solution
Operational Cost
\$2M**

ESRI COLLECTOR DATA LOSS

Current Work Around

Identify Whether existing SQLite DB exists on iPad

Start of Day

1. Remove Offline Map
2. Download New Offline Map
3. Verify a successful sync before collecting new data in field
 - a. If Sync fails, force close app & try again
 - b. If Sync still fails, go repeat Step 1

Hopefully, this ensures matching SQLiteDB between iPad & ArcServer / SQL DB

ESRI COLLECTOR DATA LOSS

Current Strategy

Identify ArcServer replica DB & iPad SQLite DB are in sync

➔ Catch the issue before it happens!

Immediately after new map(s) downloaded (before leaving office)

1. Double-Tap the home button and swipe the app closed.
2. SYNC your map (even though you have 0 edits).
 - If the sync is successful -> proceed to the field!
 - Verifies that the offline map on the iPad matches the offline map on the server.
3. If the sync is unsuccessful with the 'Replica with GUID' error:
 - A. Remove your offline map.
 - B. Download the offline map.
 - C. Go back to step 1.

ESRI COLLECTOR DATA LOSS

Conclusion

- 1 user reported using workaround, and still losing data (have not verified)
 - **Work around is not acceptable for a production enterprise solution**
- Highlights need for ODOT Collector team to establish more formal incident / problem management process to effectively escalate issues
- Hoping ESRI can provide assistance with log data provided
- Community feedback – anyone have suggestions?

ESRI COLLECTOR DATA LOSS

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