

# Avoiding Compliance Violations: ArcGIS Online, Python, Collector, and 90 Users

Innovation to Solve Real Utility Problems



SOUTHERN CALIFORNIA  
**EDISON**<sup>®</sup>

Energy for What's Ahead<sup>SM</sup>

7/11/2019

1:00 PM - 2:00 PM

SDCC - Room 26 B

**Gavin Jenkins**

Southern California Edison

**Neil Young**

Jacobs (Las Vegas)

**Michael Brown**

Jacobs (San diego)

**JACOBS**<sup>®</sup>

[www.jacobs.com](http://www.jacobs.com) | worldwide

# Agenda

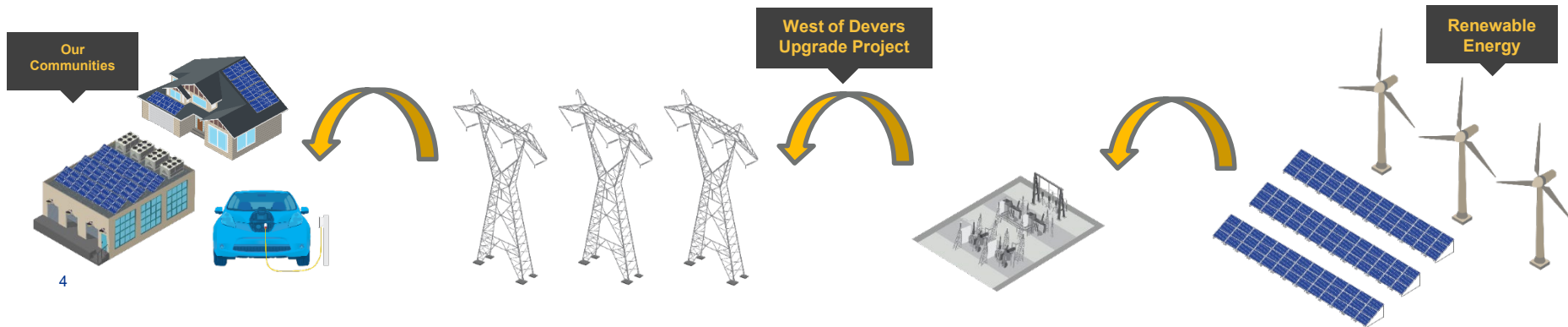
1. Project Overview
2. Challenges
  - Complex Construction project
  - Workforce with diverse roles
  - Regulatory constraints
3. System of Systems Approach
4. Summary

# Project Overview

# BACKGROUND

## Purpose

- The West of Devers Transmission Line Upgrade Project is needed to facilitate the full deliverability of new electric generation resources being developed in eastern Riverside County.
- As renewable energy generating facilities come on-line in eastern Riverside County, the WOD Project will allow the transfer of this electricity into the Los Angeles area. Currently, development of renewable energy generating facilities is limited due to transmission capacity.
- The Project will facilitate progress towards meeting California's Renewable Portfolio Standard goals requiring utilities to produce 33% of their electricity sales from renewable energy sources by 2020.

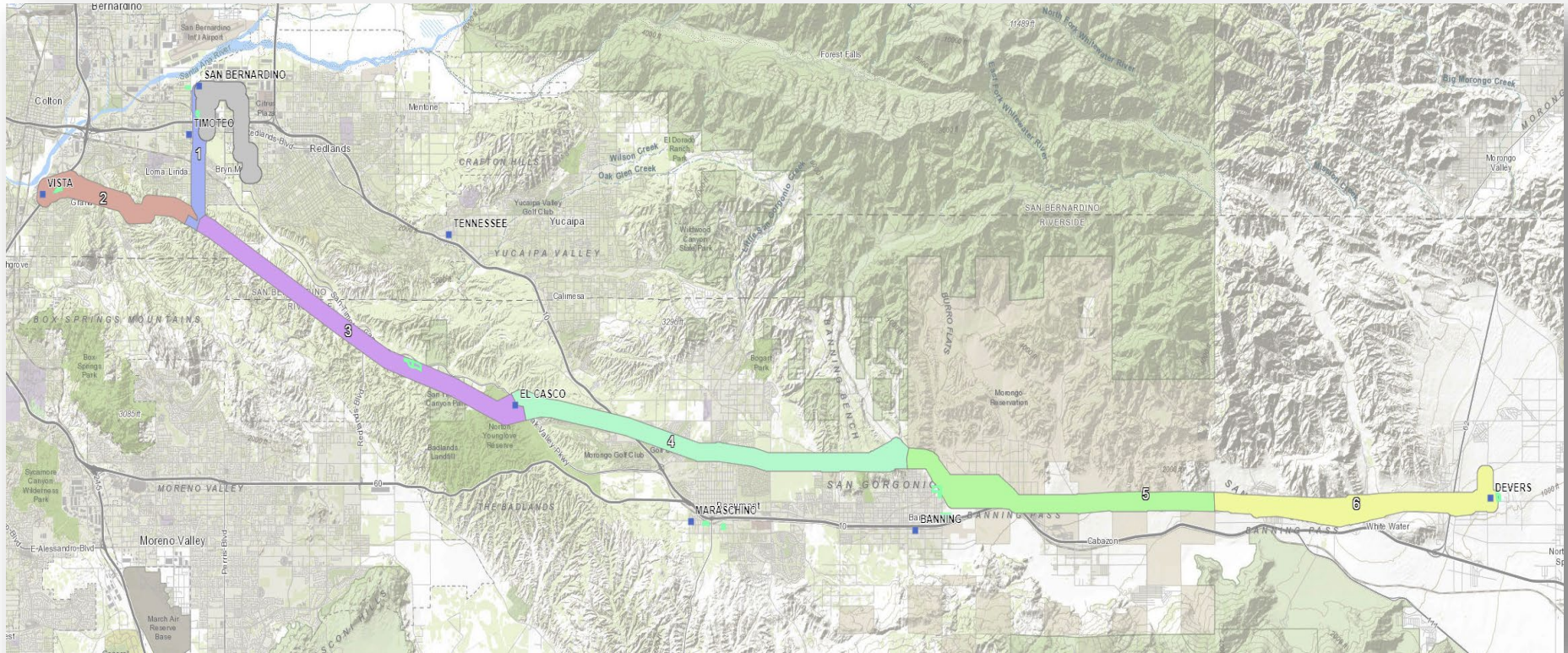


# Background

## Scope

- Tear down and rebuild ~184 circuit miles of existing 220 kV T/L facilities (~ 48 corridor miles)
- Upgrade substation equipment at 5 substations to accommodate increased power transfer on 220 kV lines.
- Removal and relocation of 2 miles of two existing 66 kV subtransmission lines.
- Removal and relocation of 4 miles of existing 12 kV distribution lines.
- Installation of telecommunication lines and equipment for the protection, monitoring, and control of transmission lines and substation equipment.

# Map of Project Area



# Project Overview

## Southern California Edison – West of Devers

- Tracking of nests is maintained in the Environmental Compliance Database
- 90+ active users with varying levels of access
- ArcGIS Online and ArcGIS Server Architecture
  - Collector and Survey123
  - Python & FME
- Real-time data field-to-office data updates
- Integration with project regulatory environmental database

# Challenges



# Challenges

- Many moving parts
  - Over 1000 construction sites
  - Active sites require steady stream of info
  - Construction activities change daily
  - Permit Compliance
- Diverse user base
  - Client
  - Construction Contractor
  - Sub-contractors – Biologists, Botanists, etc.
  - Regulatory Agencies



# Challenges








- Previous workflow required a manual site access determination
  - Extensive email and text message communication
  - Softcopy PDF maps each night, KMZ files emailed, etc.
  - Manual QA of KMZ files
  - Field users would print out updated maps (once available)
  - Many different statuses to track
  - Time consuming and labor intensive - both in the field and the office



# Challenges

- Work Site Status
  - Multiple conditions must be met for entry to be allowed onto site to avoid compliance issues

## Supersite Status

DO NOT ENTER	✓	 Active	Construction may proceed
	✓	 Active -1 Day or Less to Expiry	Construction may proceed – expiry is imminent
		 Not Swept	Supersite will be Active once Clearance Sweep is done
		 Not Swept -1 Day or Less to Expiry	As “Not Swept” but expiry is imminent
		 Awaiting Validation/Activity	Awaiting CPUC field validation
		 Awaiting Validation/Activity -1 Day or Less to Expiry	As above but expiry is imminent
		 Inactive	Site is not active

# System of Systems Approach

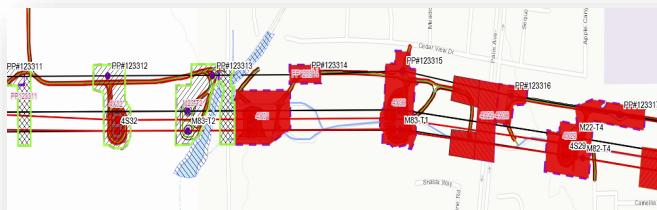
using ArcGIS Online, Python and FME to tie it all together

# Solution Approach

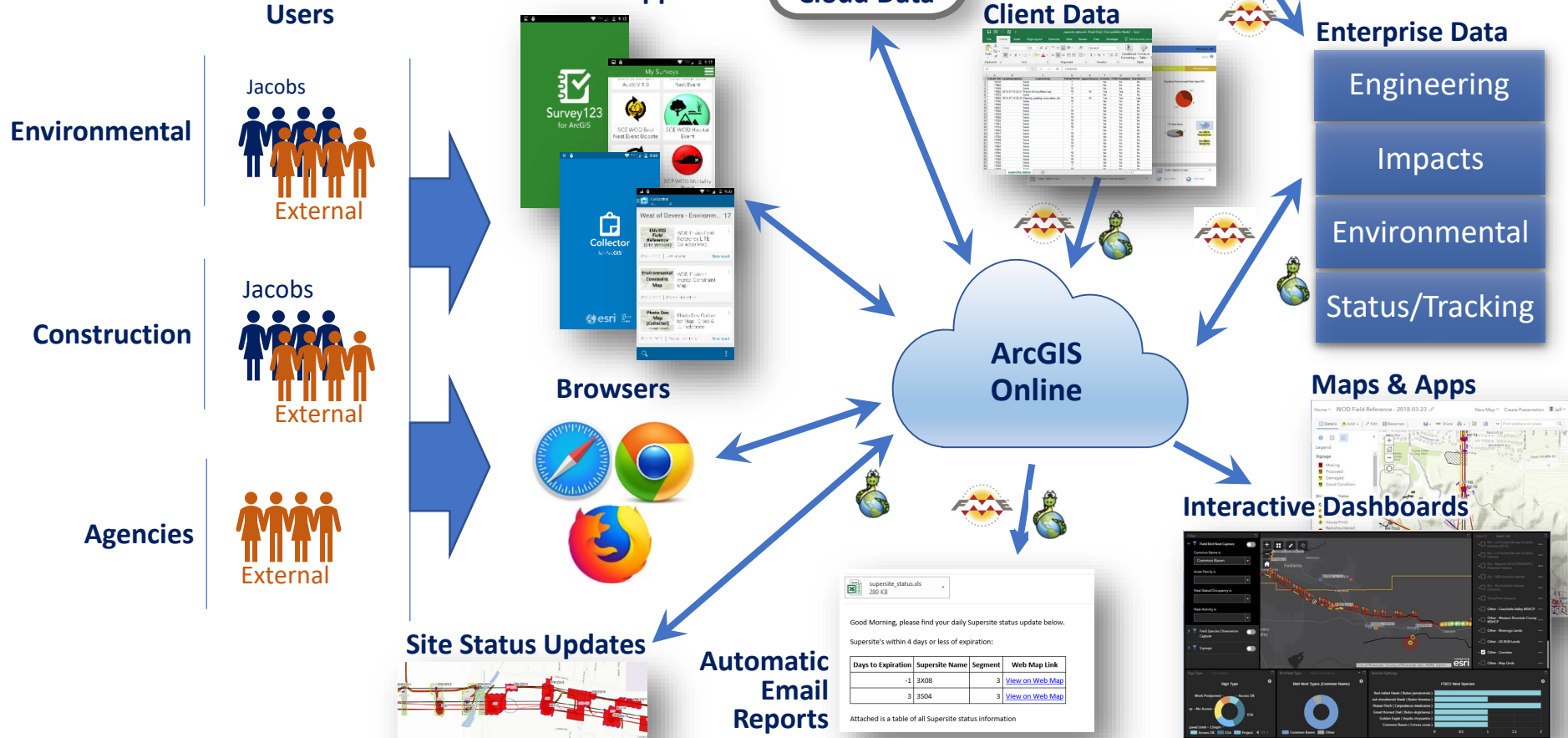
- A geospatial system of systems approach
  - Integrate – Not Assimilate
- Utilize Digital Transformation to streamline workflows
  - Reducing time and effort
  - Increasing quality
- Configure off-the-shelf tools and use customization only when necessary
  - Retains flexibility
  - Allows nimble adjustments to workflows, and rapid prototyping.
- Real-time situational awareness
  - One up to date source of truth means confidence in decision making

# Solution Objectives

- ArcGIS Online based workflow
  - Field updates from Survey123 and Collector
  - Complex logic in python updates the site status from the various field data sources
  - Web based Apps and Operations Dashboard provide instant access to up to date information for entire project team



# Architecture



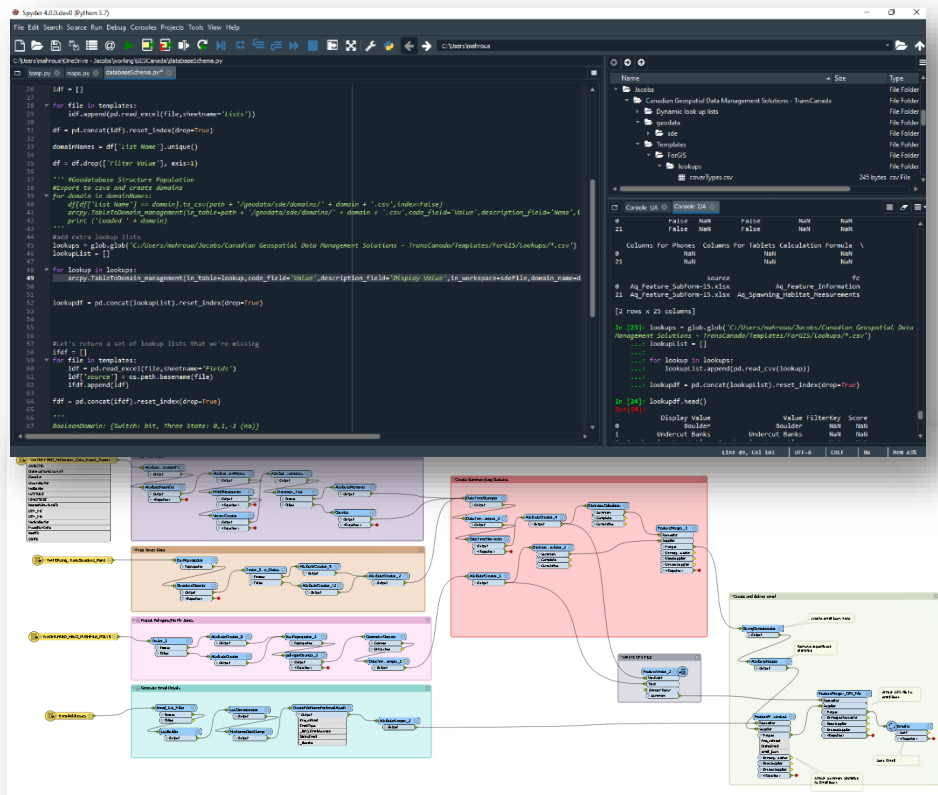
# Enabling Technologies

## Python

- Pull data from 3<sup>rd</sup> party systems
- Automate repetitive tasks
- Replace manual tasks through logic

## FME Server

- Automated Data Processing and Loading across multiple formats
- Nightly Email Alerts of transactions

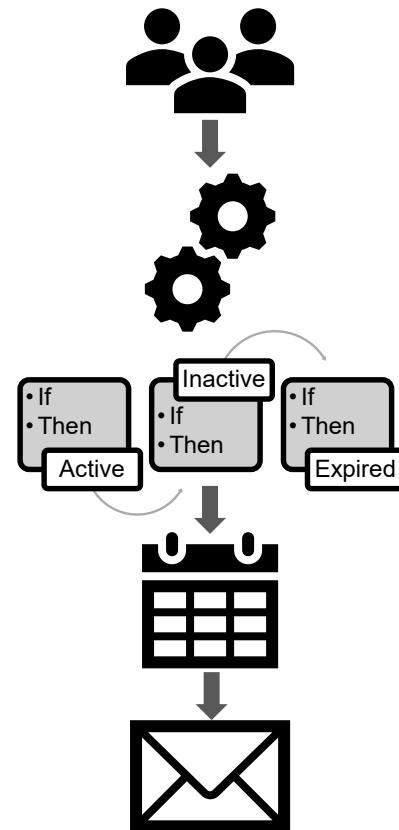




# Construction Site Activity

## Automated site activity tracking

- Field users submitting site activity
- Python applies business logic
  - Based on certain activity, timeframes and status determine status of the Site.
- Site status and expiration updates every 15 minutes.
- Morning emails on soon expiring sites.



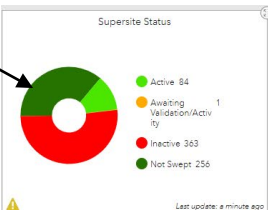
Good Morning, please find your daily Supersite status update below.

Supersite's within 4 days or less of expiration:

Days to Expiration	Supersite Name	Segment	Expiration Date	Web Map Link
3	2N01-W55	1	06/28/2019 02:00 PM	<a href="#">View on Web Map</a>
3	2N02-W55	1	06/28/2019 02:00 PM	<a href="#">View on Web Map</a>
4	STWA-1-RedlandsBlvd-2-TEWS-6	1	06/29/2019 02:00 PM	<a href="#">View on Web Map</a>
2	GS-2N26-2N29	2	06/27/2019 02:00 PM	<a href="#">View on Web Map</a>
3	2N02	2	06/28/2019 02:00 PM	<a href="#">View on Web Map</a>
3	2X06	2	06/28/2019 02:00 PM	<a href="#">View on Web Map</a>

# Site Activity Dashboard

## Site Status



## Sites to Expire in 4 Days

Number of Supersites within 4 Days of Expiration

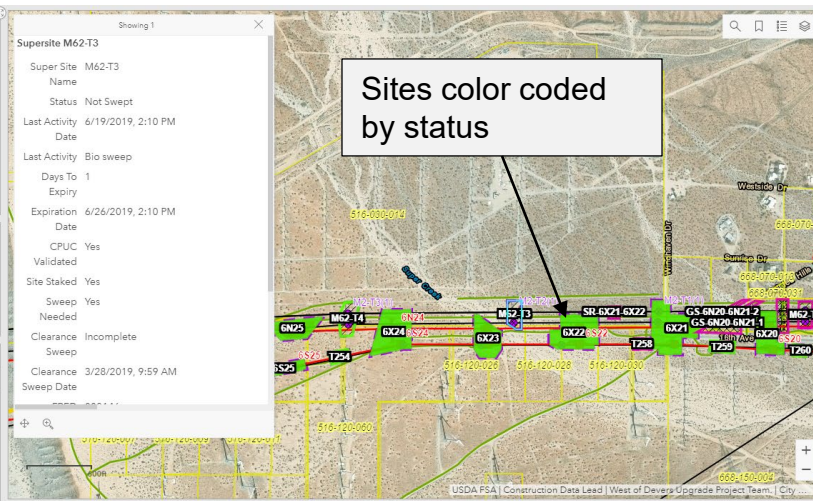
# 95

Last update: a few seconds ago

Supersites Within 4 Days of Expiration

Supersite	Days to Expiration	Expiration Date	Status	Last Activity
M62-T3	1 Days to Expiration	6/26/2019, 2:10 PM	Status: Not Swept	Last Activity: Bio sweep
SR-6X21-6X22	1 Days to Expiration	6/26/2019, 2:10 PM	Status: Not Swept	Last Activity: Bio sweep
T258	1 Days to Expiration	6/26/2019, 2:10 PM	Status: Not Swept	Last Activity: Bio sweep
GS-6N20-6N21-2	1 Days to Expiration	6/26/2019, 2:10 PM	Status: Not Swept	Last Activity: Bio sweep
GS-6N20-6N21-1	1 Days to Expiration	6/26/2019, 2:10 PM	Status: Not Swept	Last Activity: Bio sweep
GS-6N20-E	1 Days to Expiration	6/26/2019, 2:10 PM	Status: Not Swept	Last Activity: Bio sweep

Last update: a few seconds ago



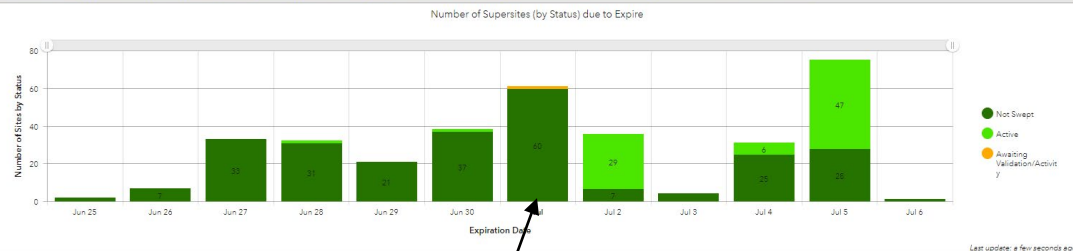
Sites color coded by status

## Recent field activity

Today's Recent Activity

3X65-WSS	6/26/2019, 2:00 PM	Last Activity: Bio sweep	CPUC Validated: Yes	Site Staked: Yes	Sweep Needed: Yes	Clearance Sweep: 4/16/2019, 6:30 AM
6N32	6/25/2019, 5:00 PM	Last Activity: Bio sweep	CPUC Validated: Yes	Site Staked: Yes	Sweep Needed: Yes	Clearance Sweep Date: 5/24/2019, 6:52 AM
M65-T2	Last update: a few seconds ago					
Clearance Sweep Needed/Incomplete						
M6-T2	Bio sweep					
4795755E	Bio sweep					
M6-T3	Bio sweep					
GS-6N20-6N21-2	Bio sweep					
GS-3901-4560-1	Last update: a few seconds ago					

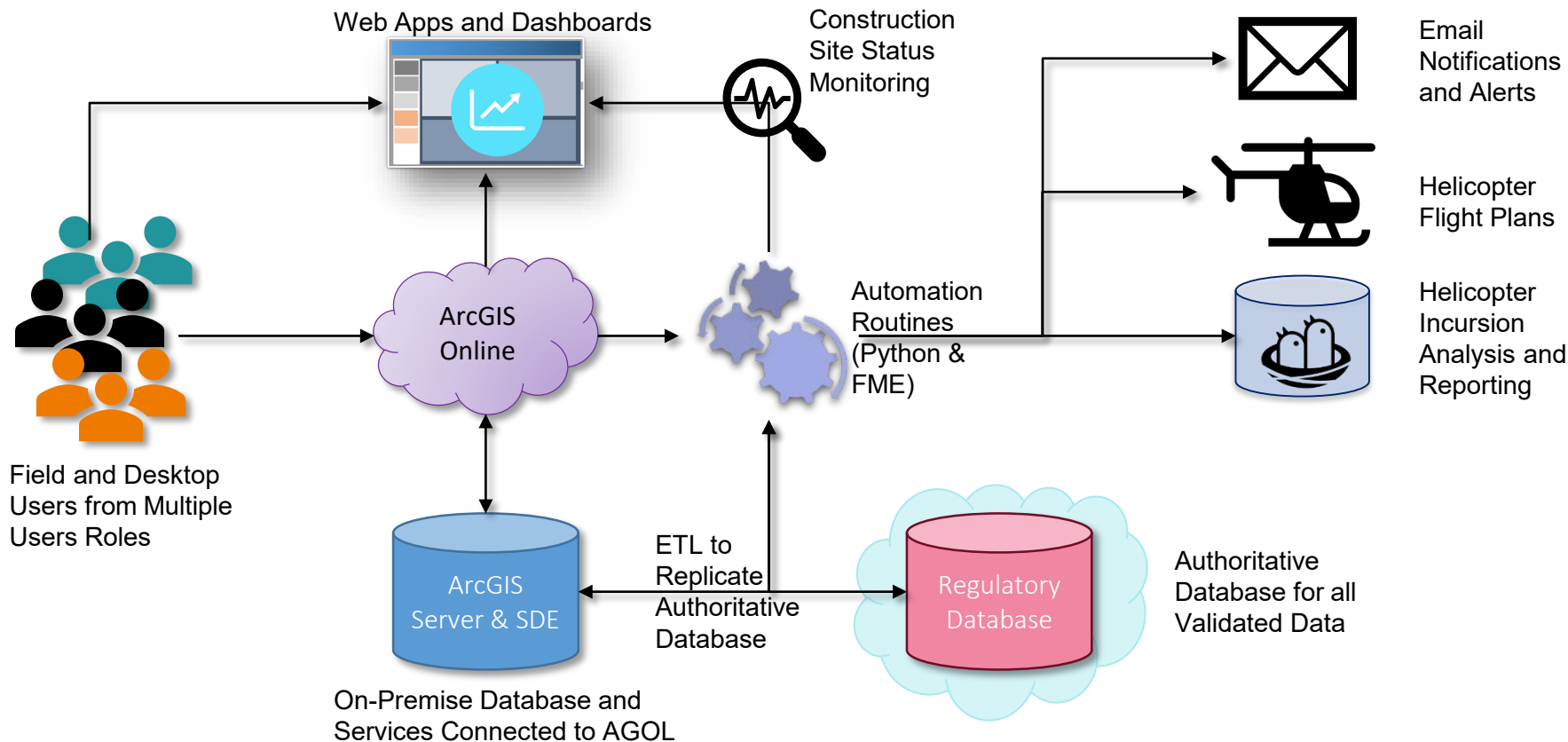
Required activities by Site



Site expiration calendar forecasts when sites are due to expire

# Summary

# Integrated System



# Summary

- 90+ active users daily contributing to avoiding compliance violations
- Esri Mobile Apps have digitally transformed field workflows
- A system of systems approach – integrating where needed extending the ArcGIS Online platform
- Bottom line:

***Costs are down, capabilities, flexibility, responsiveness and value are up.***

# Thank you!

**Gavin Jenkins, SCE**

**[Gavin.1.Jenkins@sce.com](mailto:Gavin.1.Jenkins@sce.com)**

**Michael Brown, Jacobs**

**[Jeff.friesen@Jacobs.com](mailto:Jeff.friesen@Jacobs.com)**

**Neil Young, Jacobs**

**[Jeff.friesen@Jacobs.com](mailto:Jeff.friesen@Jacobs.com)**

© Copyright Jacobs

July 27, 2019



**JACOBS®**

[www.jacobs.com](http://www.jacobs.com) | worldwide

# Disclaimer

## Important

The material in this presentation has been prepared by Jacobs®.

Copyright and other intellectual property rights in this presentation vest exclusively with Jacobs. Apart from any use permitted under applicable copyright legislation, no part of this work may in any form or by any means (electronic, graphic, mechanical, photocopying, recording or otherwise) be reproduced, copied, stored in a retrieval system or transmitted without prior written permission.

Jacobs is a trademark of Jacobs Engineering Group Inc.

© Copyright

July 27, 2019

Jacobs Engineering Group Inc. All rights reserved.