



# ArcGIS

Geospatial platforms enabling resilient cities with  
GIS, real-time insights and living Digital Twins

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*Business Development Manager – Reality Mapping*

# Why Digital Twins

## Matter for Collaboration...

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- Challenge: Data, People and Systems are disconnected
- Solution: Digital Twins create a Shared, Location-based view that all work from

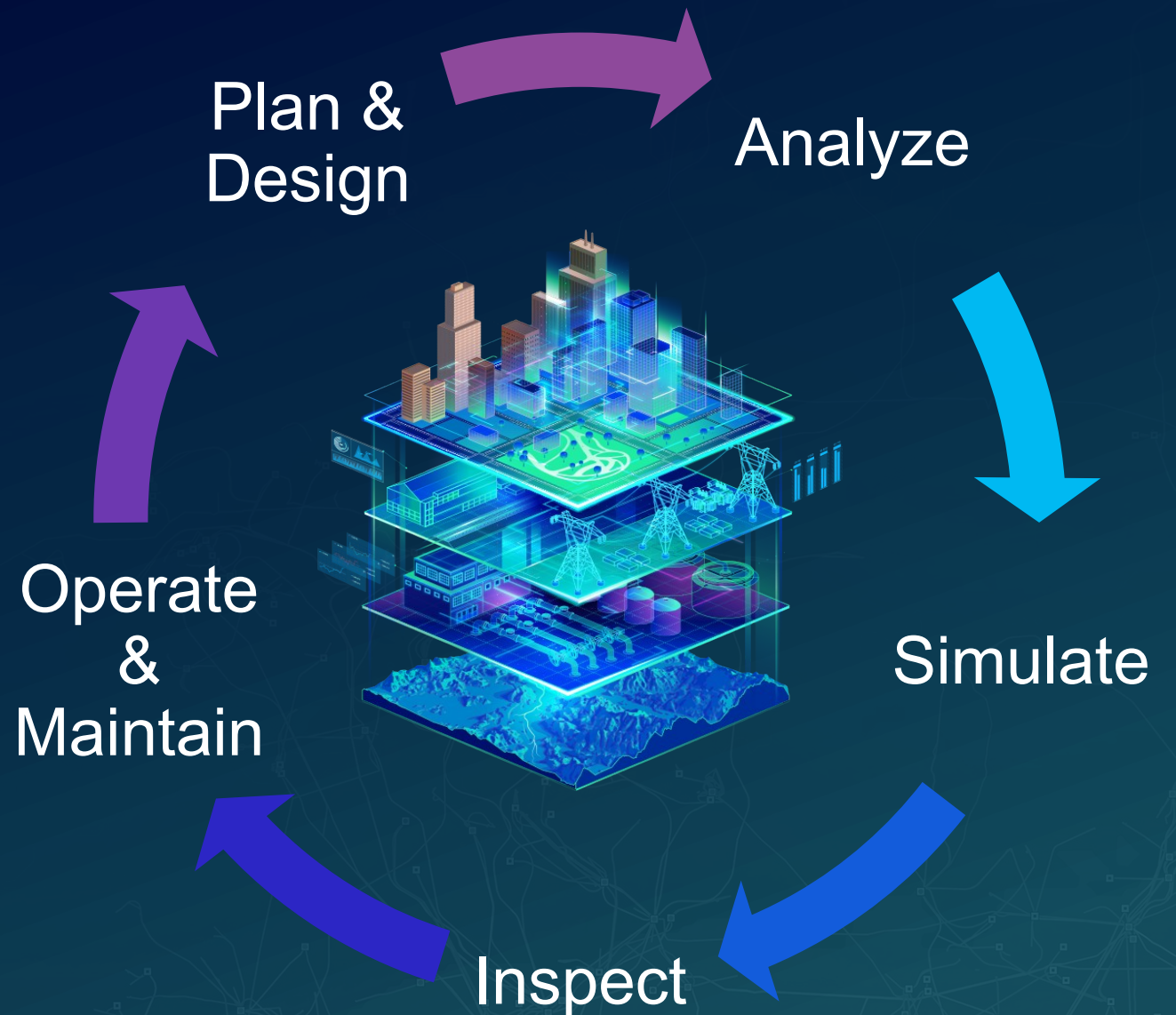
# Location & Spatial **GIS** systems are foundational for **Living Digital Twins**



# Digital Twins

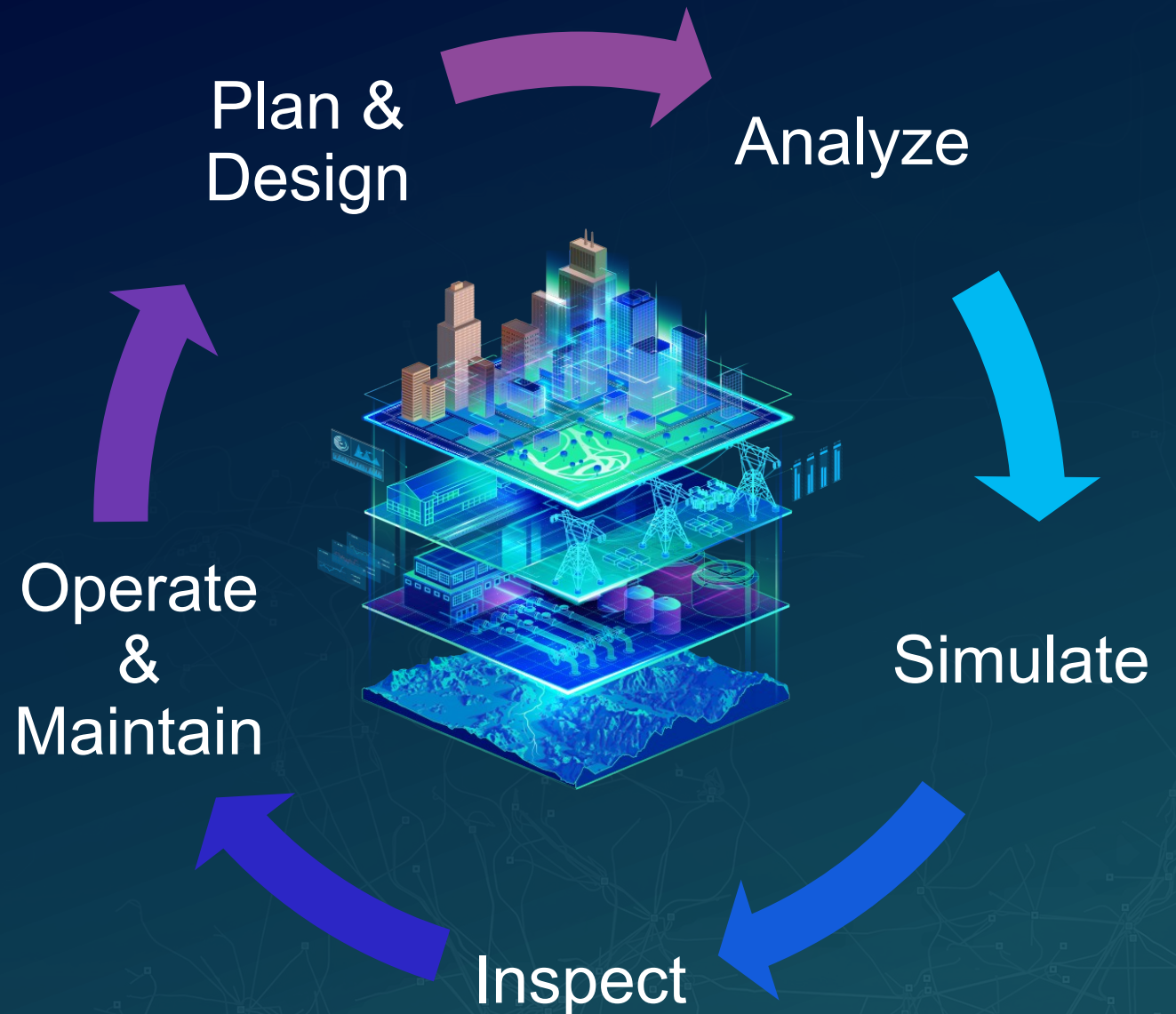
Different twins. One goal...

- Driven by use cases and real needs
- Scales by design
- Support the full lifecycle



# Where does the ROI come from In the Digital Twin lifecycle...

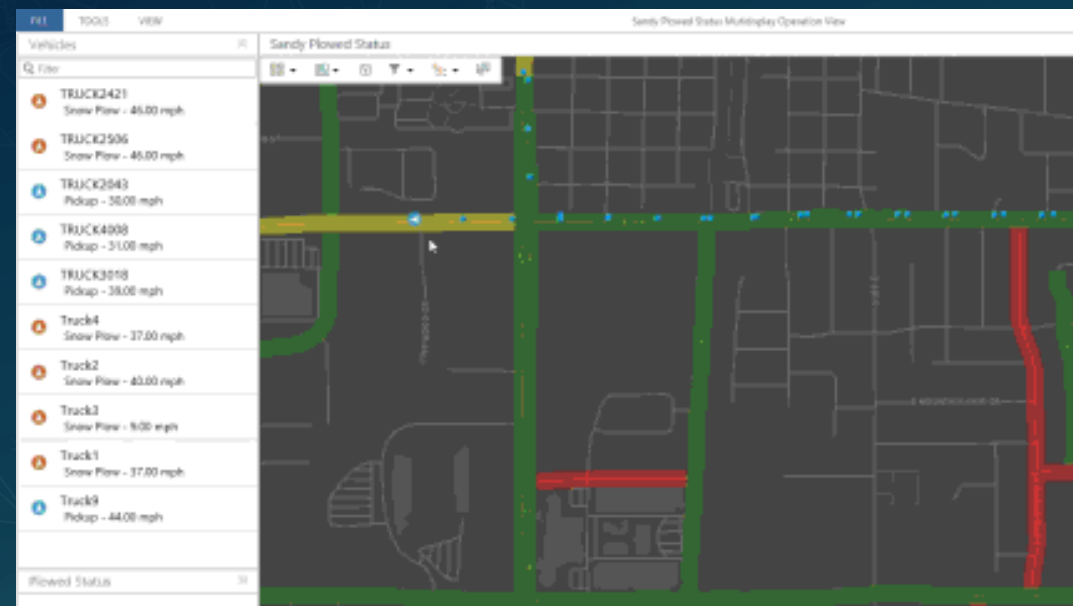
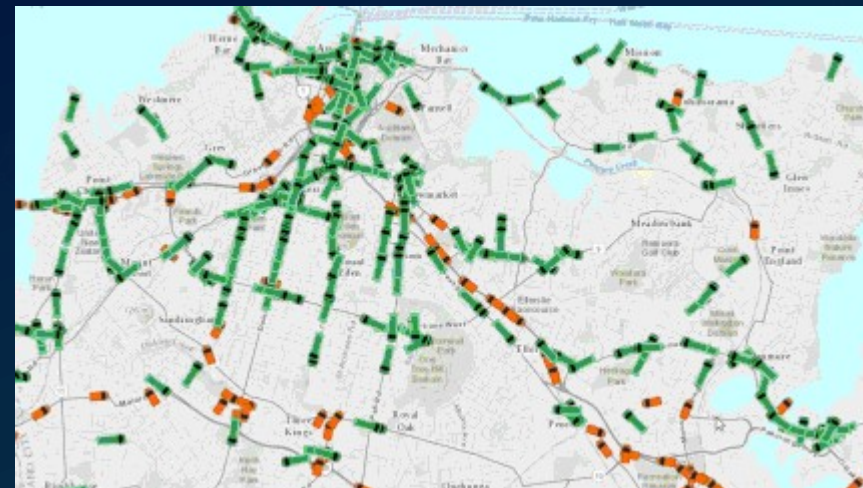
- **Plan & Design:** avoid rework early
- **Analyse:** reduce uncertainty
- **Simulate:** lower risk
- **Inspect:** act sooner
- **Operate & Maintain:** optimize continuously



# Real-time data

Turns a Digital Twin into an operation model

- Earlier warnings
- Better resource allocation
- Reduced emergency response costs
- ...lets check this out in action!





# Raleigh

by the  
Numbers



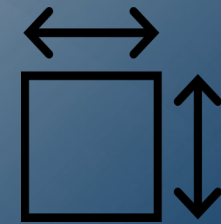
**Population**  
499,825 (est.)



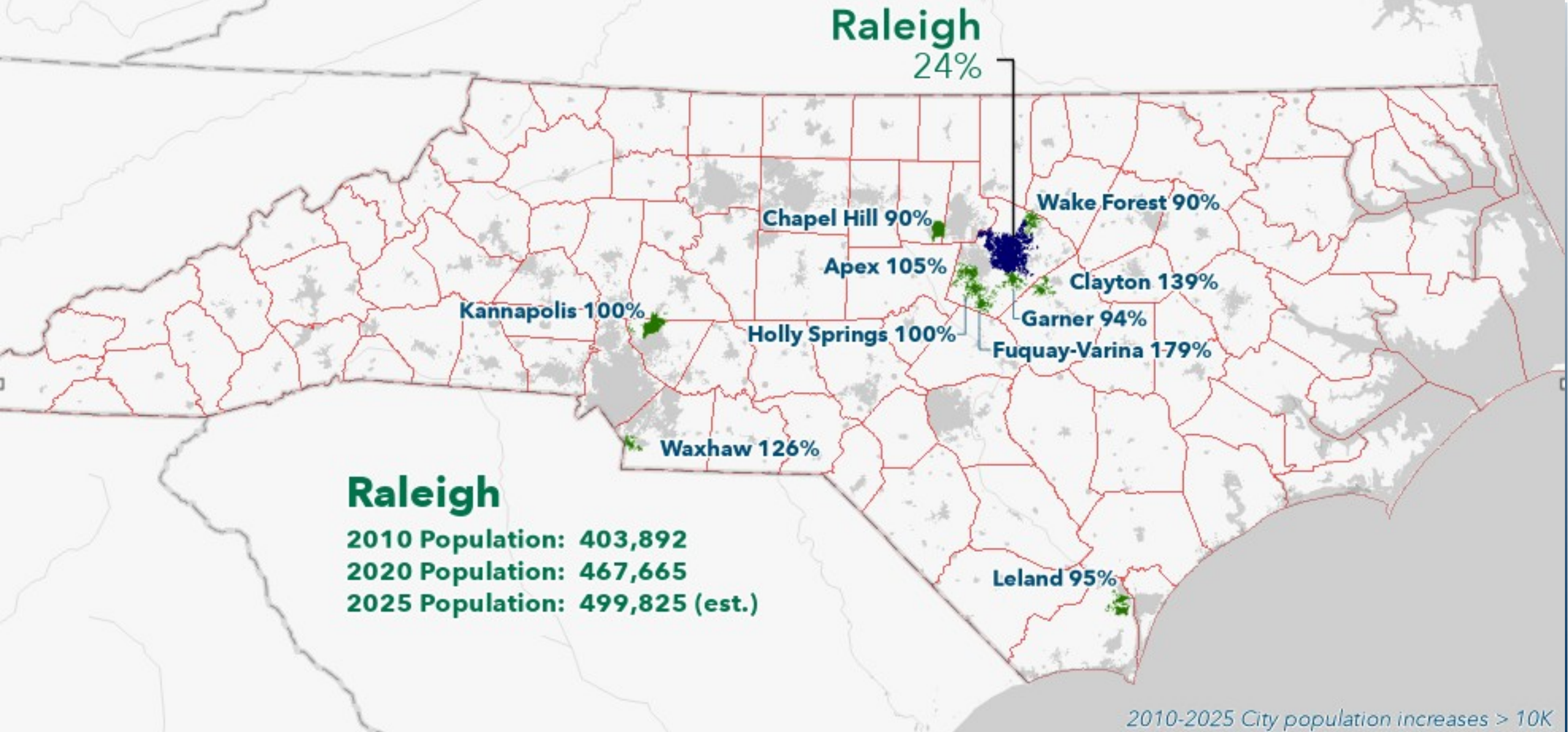
**Employees**  
4,592 (FT)  
3,200 (PT)



**Budget**  
\$494M CapEx  
\$1.1B OpEx



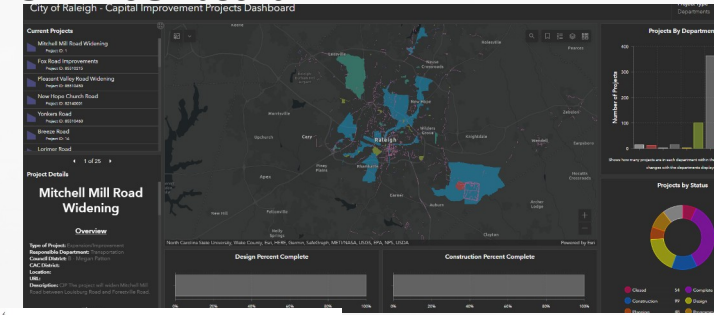
**Land Area**  
146 Sq. Miles



# Managing Growth

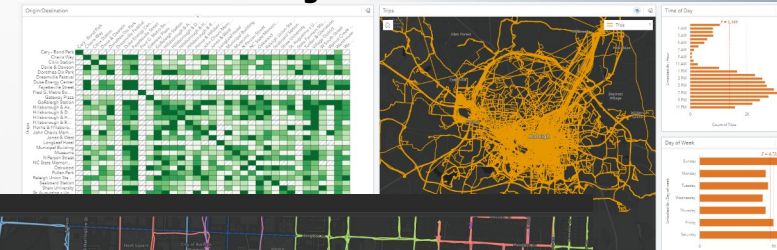
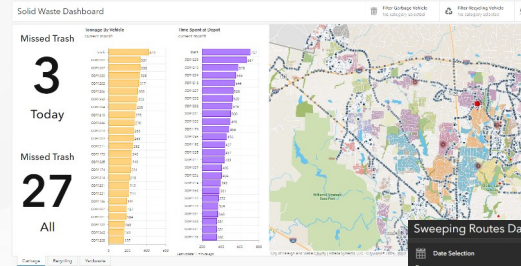


# CIP Dashboard

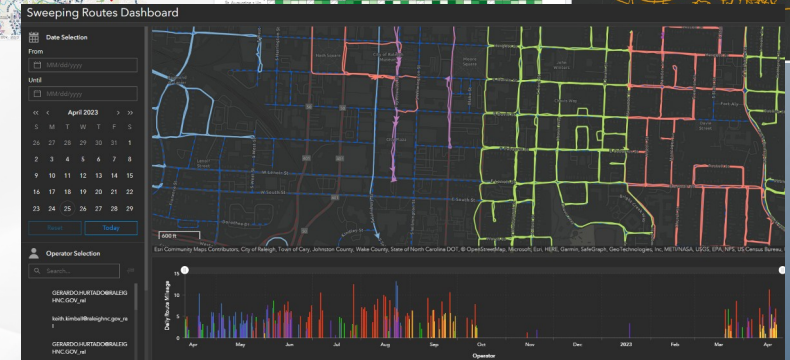


# Real Time Data

## Bike Share Analytics



## Solid Waste Services

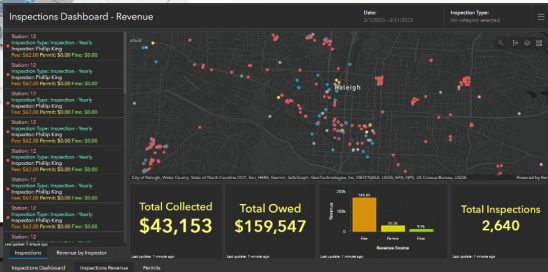
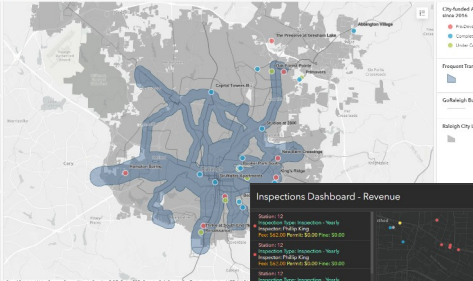


## Street Sweeping Analytics

## Program Tracking

City-funded Affordable Rental Developments Since 2016

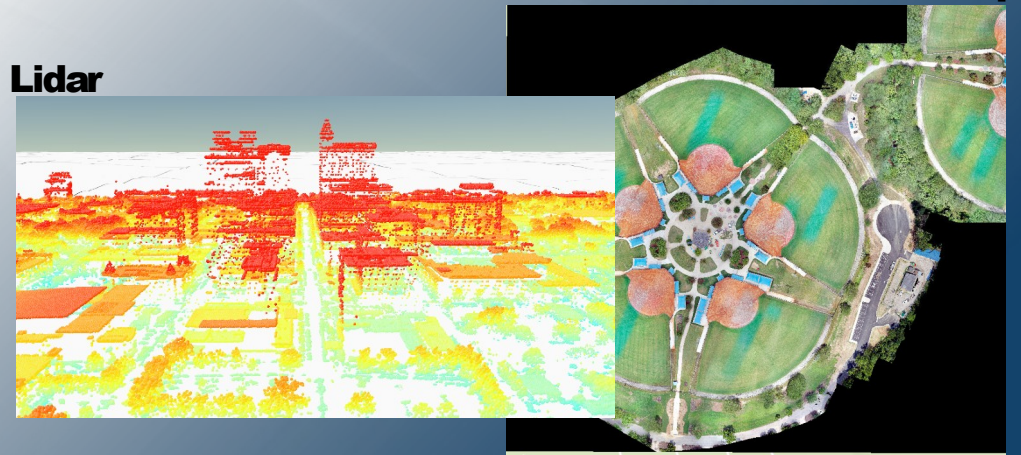
Pre Development  
**1,411**  
Units  
Under Construction  
**836**  
Units  
Completed  
**1,785**  
Units



## Fire Permit Inspections

## Drone2Map

## Lidar



## Image/Data Collection

## Affordable Housing

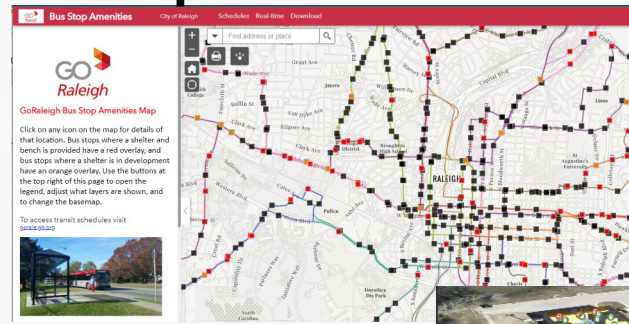


## Stormwater Risk Exposure

# Leveraging Data



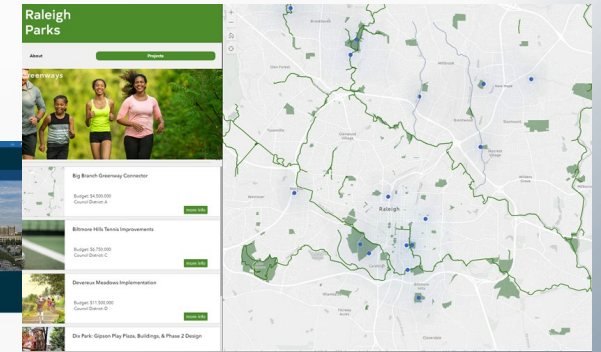
# Transit Operations



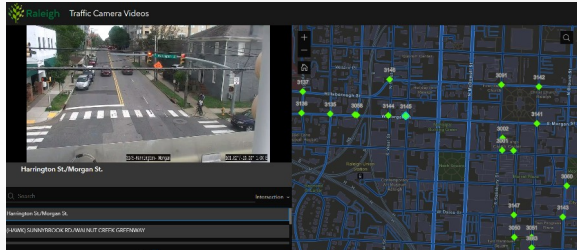
Operation  
Tracking  
and Support

# Public Facing

## Open Data



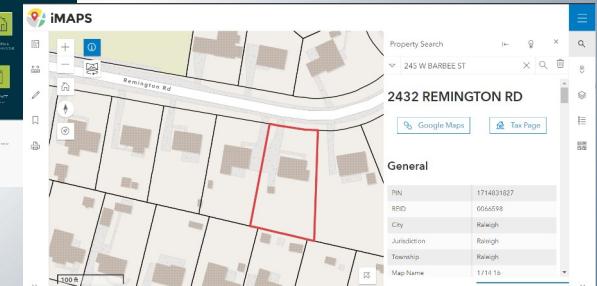
## Park Locator



## Internal Camera Access



## Raleigh Water: Indoors

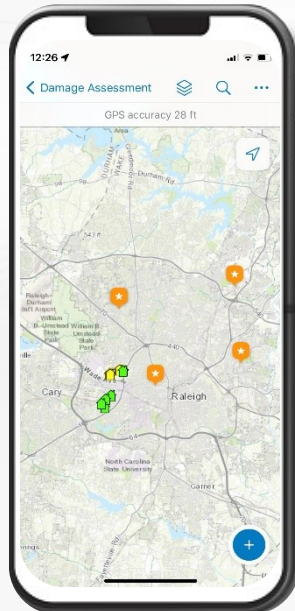


## iMAPS Property Research

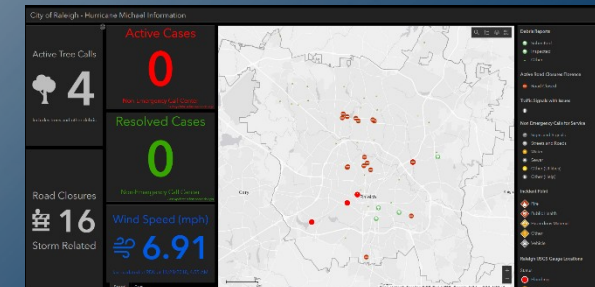
# Damage Assessment

## Emergency Operations Center

## Emergency Operations



## EOC Public Information





# The Instrumentation of the City



# RALEIGH IN MOTION

MON, NOV 10, 2025  
03:48:15 AM LIVE

**Lenoir and Salisbury**  
Stalled vehicle 03:34:00 AM

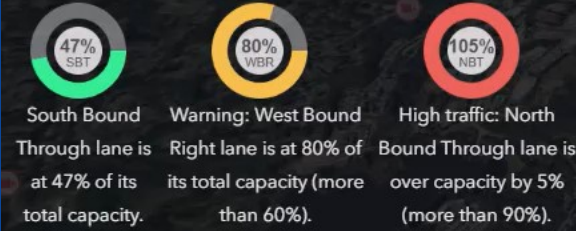


Total counts for the last 5 minutes.  
Last updated: 03:48:15 AM.

MICROMOBILITY

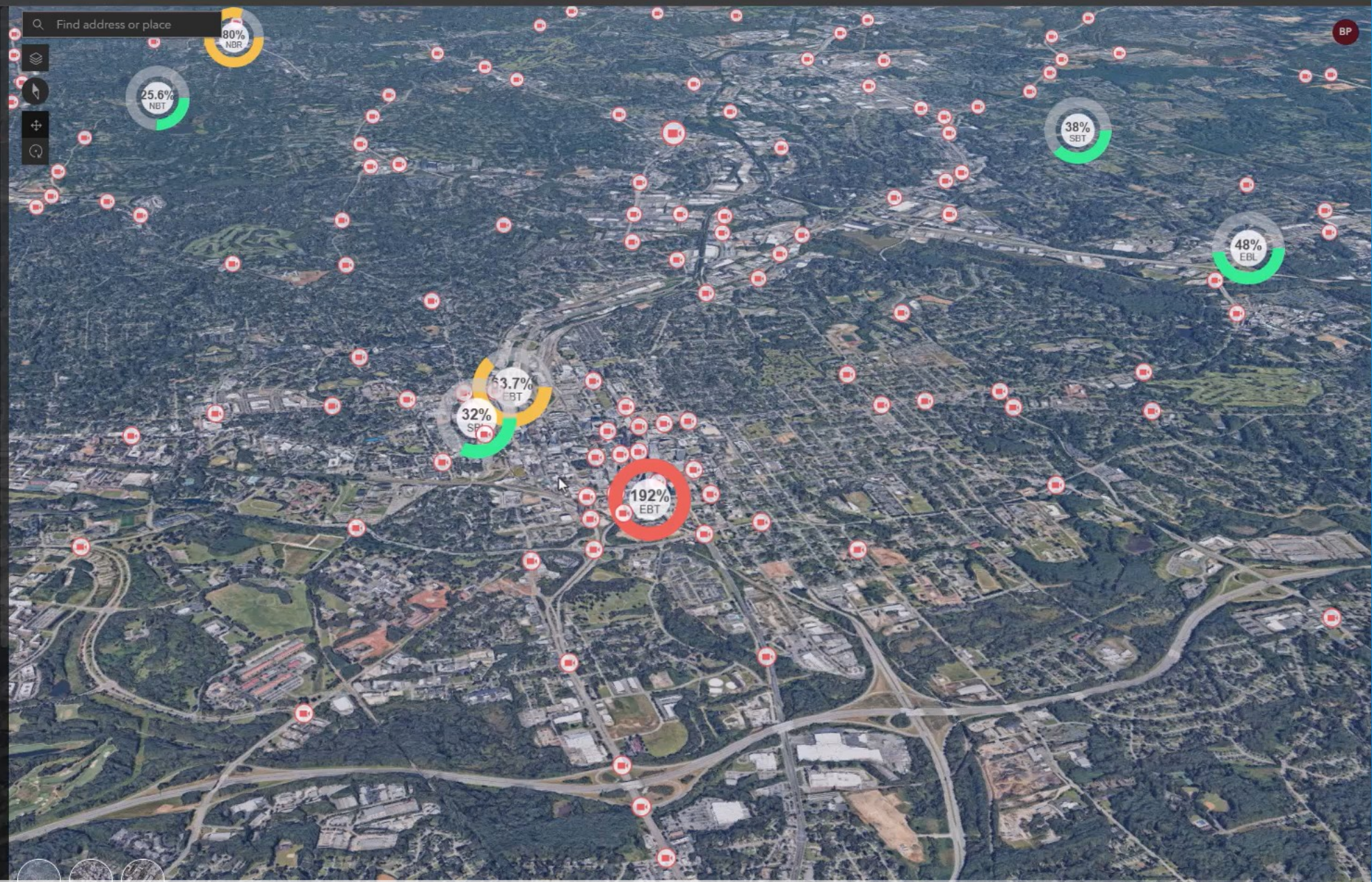
CAMERAS

The camera symbols show the load of the busiest lane in the corresponding intersection. The percentage represents the average number of vehicles detected per hour divided by lane capacity.



Camera with no data.

10 CAMERAS



# Shared Journey

## Defining Digital Twins and Their True Value

### **What is a Digital Twin? Variability of Digital Twins**

Digital twins can vary from simple digital representations to rich 3D models and dynamic, real-time simulations reflecting physical assets.

### **Rethinking Spatial Collaboration Geospatial Integration**

Integrating multiple real-time geospatial data sources enables interactive analysis and actionable insights.

### **Context and Layered Informational Modes**

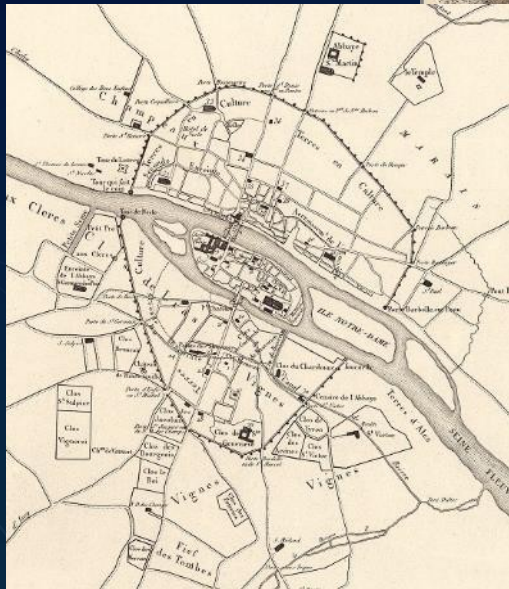
True value of digital twins comes from contextual, integrated and layered data models that can answer complex questions.



# Digital Twin's are The Evolution of Maps

## Maps have always

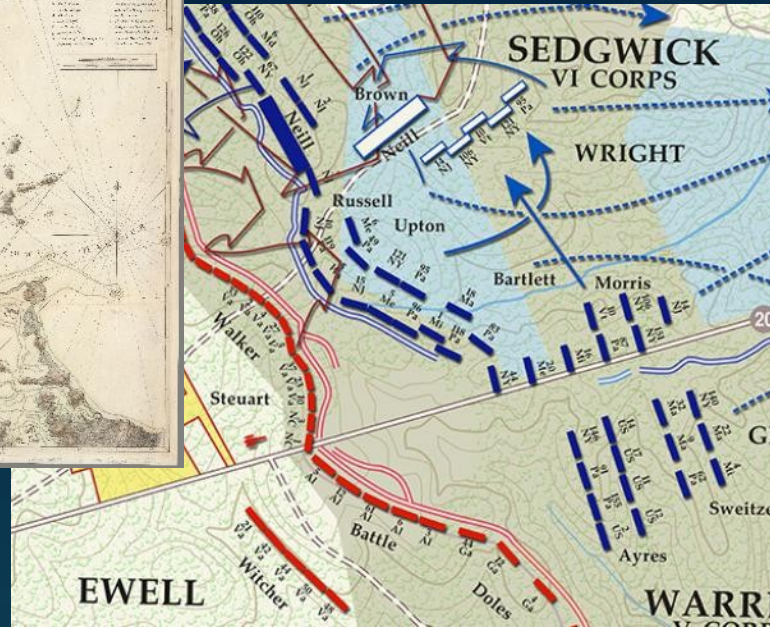
- Abstracted reality to allow for understanding and action
- Been critical for data driven decision making



Paris  
1223



Boston Harbor  
1775

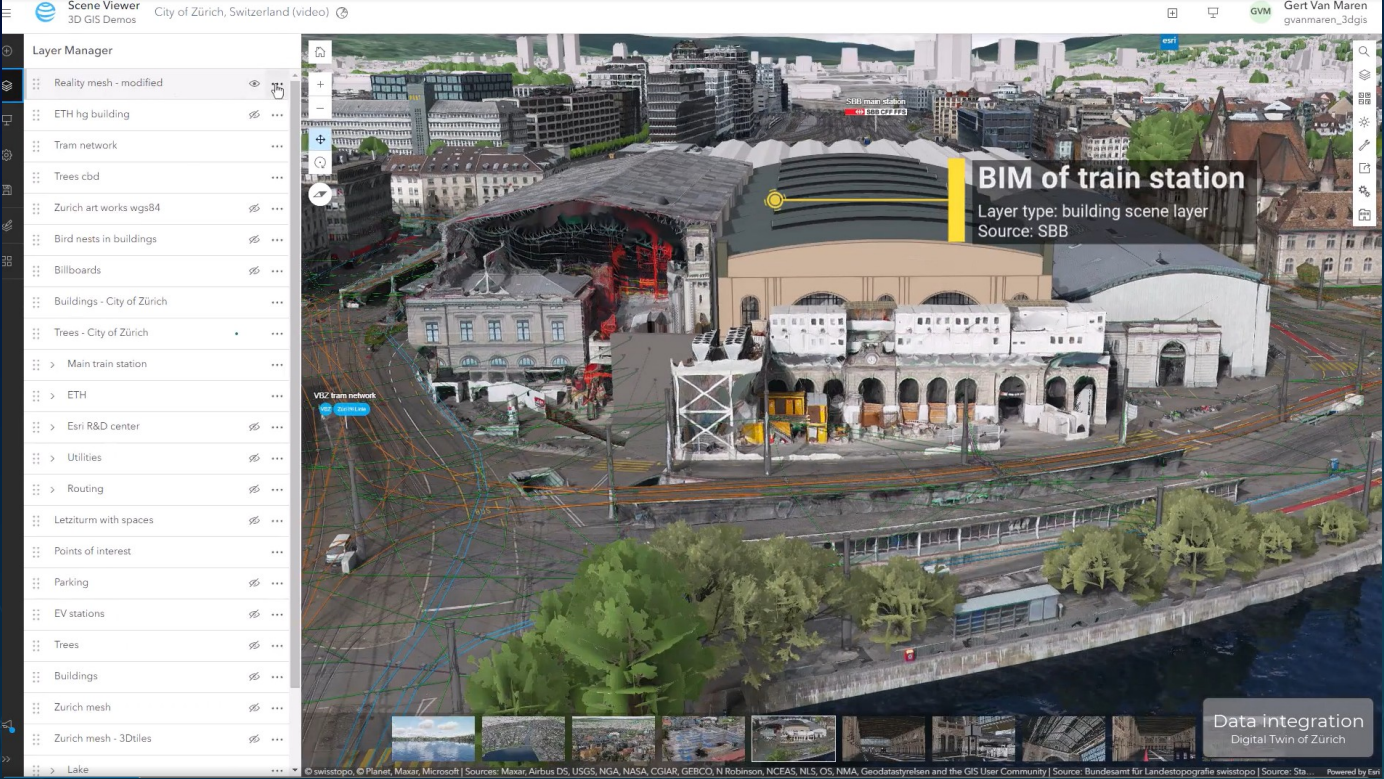


Battle of the Wilderness - Orange Turnpike (US Civil War)  
May 6, 1864



Battle of Britain (WWII)  
Analog Twin of Air Defenses

# Build Your Own Digital Twin In Zurich, Switzerland



# Esri's Legacy

## And Geographic Approach for Digital Twins

### **Legacy of Digital Twins**

Esri has been creating digital twins for over 50 years, showcasing its commitment to innovative geographic solutions.

### **Bridging Physical and Digital Worlds**

Esri's solutions connect physical environments with digital models, empowering smarter decision-making

### **Advances in Data Processing**

Modern digital twins leverage advances in data capture, processing, and visualization for environmental management.



Thank YO

