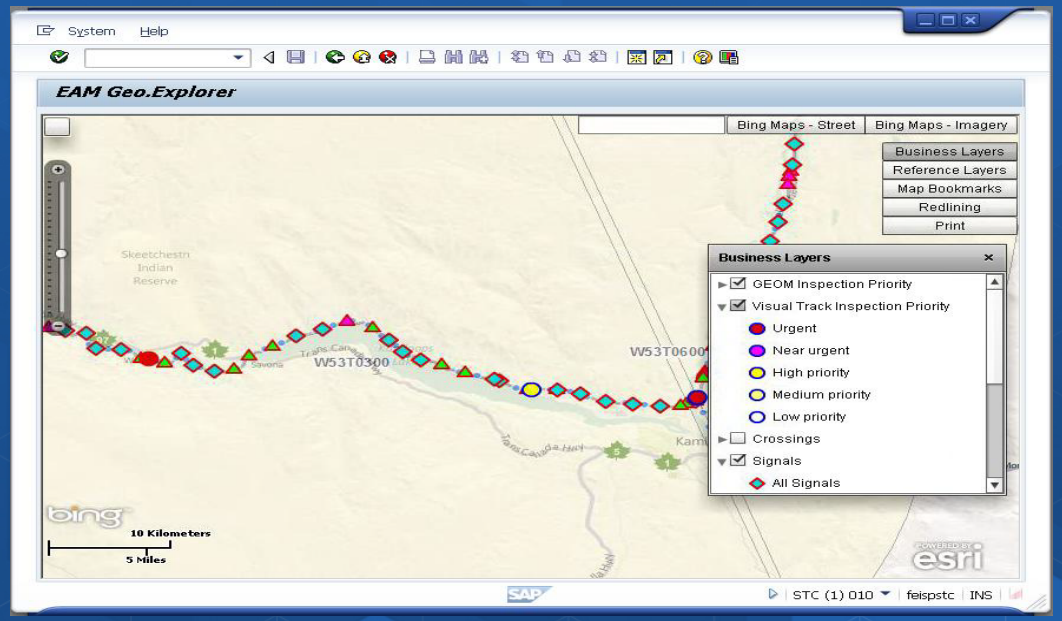
Esri Departments of Transportation Webinar Series

GIS and Transit State of Good Repair

GIS and Transit State of Good Repair



Terry Bills, Esri

Allen Ibaugh, Doug Lynch, Patrick Meenan, DTS

Asset Management in Public Transit

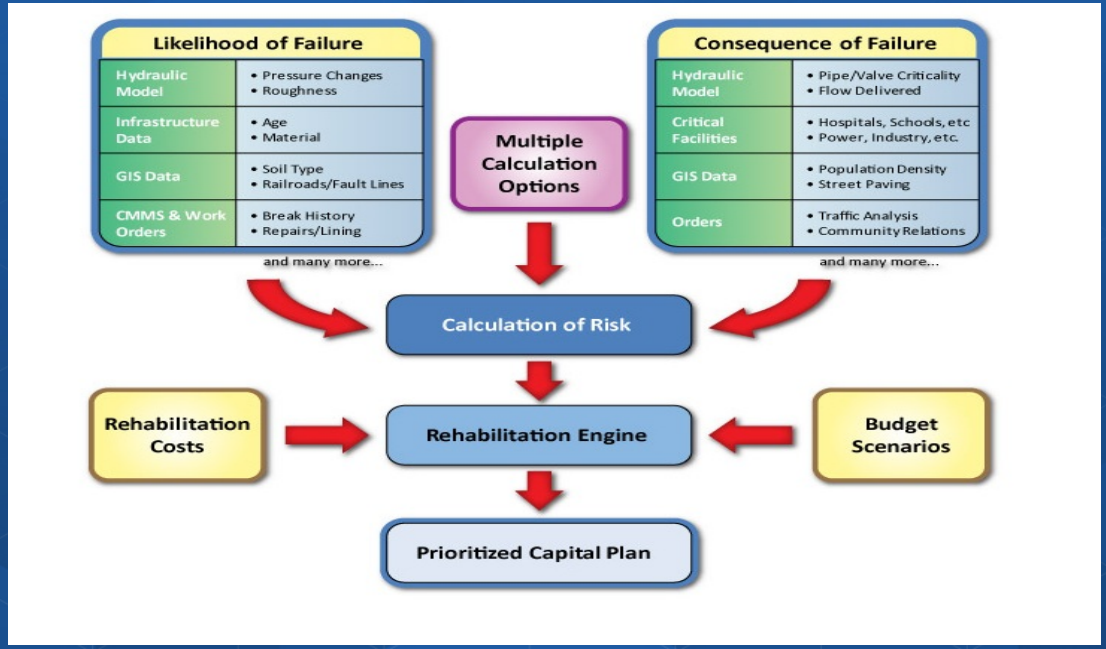
- MAP-21: Mandates an Asset Management Plan which contains at minimum: inventory, condition assessment, and investment prioritization.
- A recognition that deferred maintenance has caused significant damage to our public transit infrastructure: New York, Washington DOT, San Francisco Bay Area as key examples.
- Public Transit agencies are often “late-comers” to Asset Management; it represents a change in culture, and in processes to be effective.
- Good Asset Management practice is designed to prolong the lifecycle of your assets, and to be significantly more cost effective over the life of the asset

Best Practice in Asset Management

- A TAMP is designed to help agencies make the most strategic investments, “the right work, at the right time, to achieve the right level of service for the right cost.”
- The Goal is Moving From Reactive to Proactive, and Ultimately to Predictive Asset Management
- Part of the TAMP should include Life Cycle Costing and a Risk Management Analysis

Calculation of Risk in Asset Management

- Good Asset Management Considers Risk in Asset Management Plans
- Risk is a function of Probability of Failure * Impact of Failure
- Impact of Failure Depends on the Criticality of the Asset, Which is a Function of Location (GIS)



Additional Resources

Guidance for Developing a Transit Asset Management Plan

TRANSIT COOPERATIVE RESEARCH PROGRAM

TCRP REPORT 172

Guidance for Developing a Transit Asset Management Plan

William Robert
Virginia Reeder
Katherine Lawrence
Spy Pond Partners, LLC
Arlington, MA

Harry Cohen
Ellicott City, MD

Katherine O'Neil
KKD & Associates, LLC
Andover, MA

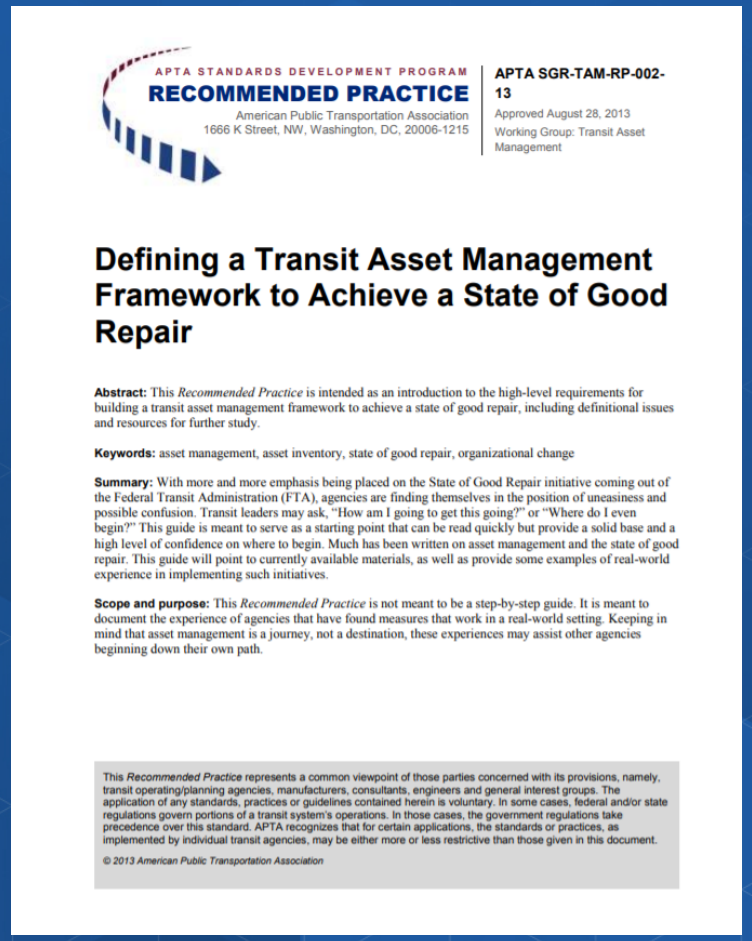
Subject Areas
Public Transportation

Research sponsored by the Federal Transit Administration in cooperation with the Transit Development Corporation

TRANSPORTATION RESEARCH BOARD

WASHINGTON, D.C.
2014
www.TRB.org

Copyright National Academy of Sciences. All rights reserved.



APTA STANDARDS DEVELOPMENT PROGRAM

RECOMMENDED PRACTICE

American Public Transportation Association
1666 K Street, NW, Washington, DC, 20006-1215

APTA SGR-TAM-RP-002-13

Approved August 28, 2013

Working Group: Transit Asset Management

Defining a Transit Asset Management Framework to Achieve a State of Good Repair

Abstract: This *Recommended Practice* is intended as an introduction to the high-level requirements for building a transit asset management framework to achieve a state of good repair, including definitional issues and resources for further study.

Keywords: asset management, asset inventory, state of good repair, organizational change

Summary: With more and more emphasis being placed on the State of Good Repair initiative coming out of the Federal Transit Administration (FTA), agencies are finding themselves in the position of uneasiness and possible confusion. Transit leaders may ask, "How am I going to get this going?" or "Where do I even begin?" This guide is meant to serve as a starting point that can be read quickly but provide a solid base and a high level of confidence on where to begin. Much has been written on asset management and the state of good repair. This guide will point to currently available materials, as well as provide some examples of real-world experience in implementing such initiatives.

Scope and purpose: This *Recommended Practice* is not meant to be a step-by-step guide. It is meant to document the experience of agencies that have found measures that work in a real-world setting. Keeping in mind that asset management is a journey, not a destination, these experiences may assist other agencies beginning down their own path.

This *Recommended Practice* represents a common viewpoint of those parties concerned with its provisions, namely, transit operating/planning agencies, manufacturers, consultants, engineers and general interest groups. The application of any standards, practices or guidelines contained herein is voluntary. In some cases, federal and/or state regulations govern portions of a transit system's operations. In those cases, the government regulations take precedence over this standard. APTA recognizes that for certain applications, the standards or practices, as implemented by individual transit agencies, may be either more or less restrictive than those given in this document.

© 2013 American Public Transportation Association

dts
MAKERS OF VUEWorks®

LYNX®

Transit Asset Management and the State of Good Repair: A LYNX Case Study

Allen Ibaugh, AICP, GISP

–

CEO

Doug Lynch, GISP

–

Sr. Project Manager

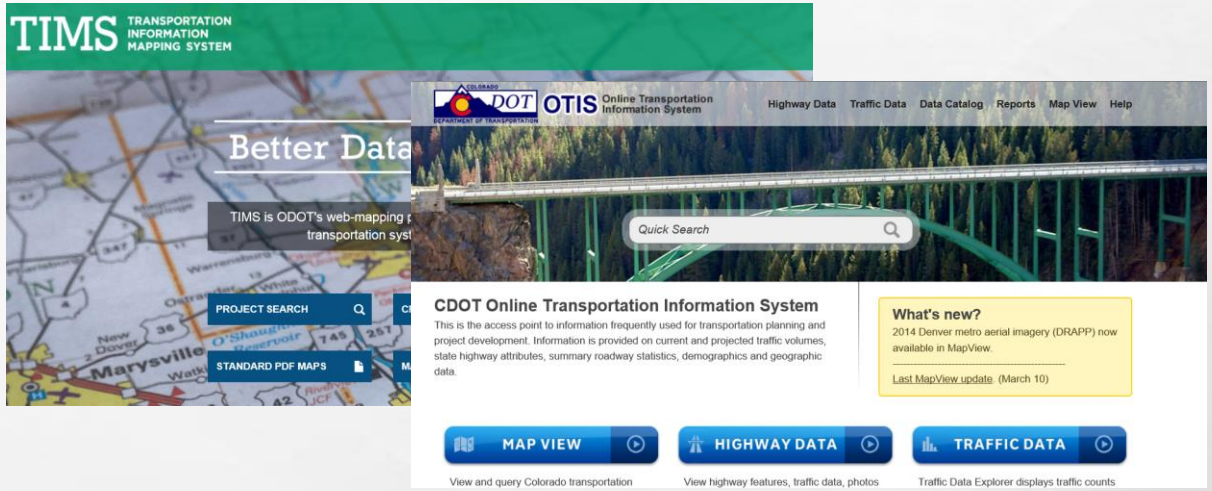
Patrick Meenan

–

Western Regional Manager

Asset Management Data Collection

Enterprise Geospatial Portals



Performance-Based Enterprise Asset Management Systems

Institute of Asset Management
IAM
CORPORATE MEMBER

vueworks.

What does DTS do?

Sample Clients

The Moving Ahead for Progress in the 21st Century Act (MAP-21) required the Secretary to develop rules to establish a system to monitor and manage public transportation assets to improve safety and increase reliability and performance, and to establish performance measures, and the Fixing America's Surface Transportation (FAST) Act reaffirmed this requirement. On July 26, 2016, FTA published the Transit Asset Management (TAM) Final Rule.

Transit Asset Management

The purpose of the Final Rule is to help achieve and maintain a state of good repair (SGR) for the nation's public transportation assets. Transit asset management is a business model that uses transit asset condition to guide the optimal prioritization of funding. Currently, there is an estimated $85.9 billion transit SGR backlog.

The regulations apply to all Transit Providers that are recipients or sub recipients of Federal financial assistance under 49 U.S.C. Chapter 53 and own, operate, or manage transit capital assets used in the provision of public transportation.

State of Good Repair

The condition in which a capital asset is able to operate at a full level of performance. A capital asset is in a state of good repair when that asset:

1. Is able to perform its designed function,
2. Does not pose a known unacceptable safety risk, and
3. Its lifecycle investments must have been met or recovered.

vueworks.

State of Good Repair

Tier I	Tier II
Operates rail **OR** ≥ 101 vehicles across all fixed route modes **OR** ≥ 100 vehicles in one non-fixed route mode	Subrecipient of 5311 funds **OR** American Indian Tribe **OR** ≤ 100 vehicles across all fixed route modes **OR** ≤ 100 vehicles in one non-fixed route mode

Subpart C—Transit Asset Management Plans TAM Plans - Tier I vs. Tier II Applicability

It is expected that all assets used in the provision of public transit will be included in the TAM Plan asset inventory. This includes (with the exception of equipment) assets that are owned by a third party or shared resources. The inventory must include all service vehicles, and any other owned equipment assets over $50,000 in acquisition value. Agencies only need to include condition assessment for assets for which they have direct capital responsibility.

1. Inventory of Capital Assets 2. Condition Assessment 3. Decision Support Tools 4. Investment Prioritization	Tier I & II
5. TAM and SGR Policy 6. Implementation Strategy 7. List of Key Annual Activities 8. Identification of Resources 9. Evaluation Plan	Tier I Only

Subpart C—Transit Asset Management Plans TAM Plan Elements

Asset performance is measured by asset class, which means a subgroup of capital assets within an asset category. The following table shows the distinction between what assets must be included in asset inventories and the assets for which transit providers must measure performance.

Assets: *Only those for which agency has direct capital responsibility*	**Performance Measure**
Equipment Non-revenue support-service and maintenance vehicles	Percentage of vehicles met or exceeded Useful Life Benchmark
Rolling Stock Revenue vehicles by mode	Percentage of vehicles met or exceeded Useful Life Benchmark
Infrastructure Only rail fixed-guideway, track, signals and systems	Percentage of assets in a State of Good Repair
Facilities Maintenance and administrative facilities; and passenger stations (buildings) and parking facilities	Percentage of assets with condition rating below 3.0 on FTA TERM Scale

Useful Life Benchmark

The expected lifecycle of a capital asset for a particular Transit Provider's operating environment, or the acceptable period of use in service for a particular Transit Provider's operating environment

vueworks.

Subpart D—Performance Management

Assets	TAM Plan Inventory	TAM Plan Condition Assessment	NTD Inventory & Condition Submittal	SGR Targets
Revenue Vehicles				
Owned	yes	yes	yes	yes
Direct Capital Responsibility	yes	yes	yes	yes
3rd Party Owned (Direct Capital Responsibility)	yes	yes	yes	yes
3rd Party Owned (NO Direct Capital Responsibility)	yes	no	yes*	no
Equipment: Non-revenue Vehicles (regardless of cost)				
Owned	yes	yes	yes	yes
Direct Capital Responsibility	yes	yes	yes	yes
3rd Party Owned	no	no	no	no
Equipment: Over $50,000 in Acquisition Value				
Owned	yes	yes	no	no
Direct Capital Responsibility	yes	yes	no	no
3rd Party Owned	no	no	no	no
Equipment				
Under $50,000 in Acquisition Value	no	no	no	no
Facilities:				
Owned	yes	yes	yes	yes
Direct Capital Responsibility	yes	yes	yes	yes
3rd Party Owned (Direct Capital Responsibility)	yes	yes	yes	yes
3rd Party Owned (NO Direct Capital Responsibility)	yes	no	yes**	no
Infrastructure: Non Rail Fixed Guideway				
Owned	yes	yes	no	no
Direct Capital Responsibility	yes	yes	no	no
3rd Party Owned (Direct Capital Responsibility)	yes	yes	no	no
3rd Party Owned (NO Direct Capital Responsibility)	yes	no	no	no
Infrastructure: Rail Fixed Guideway				
Owned	yes	yes	yes	yes
Direct Capital Responsibility	yes	yes	yes	yes
3rd Party Owned (Direct Capital Responsibility)	yes	yes	yes	yes
3rd Party Owned (NO Direct Capital Responsibility)	yes	no	yes	no

Included in TAM Plan

Reported to NTD

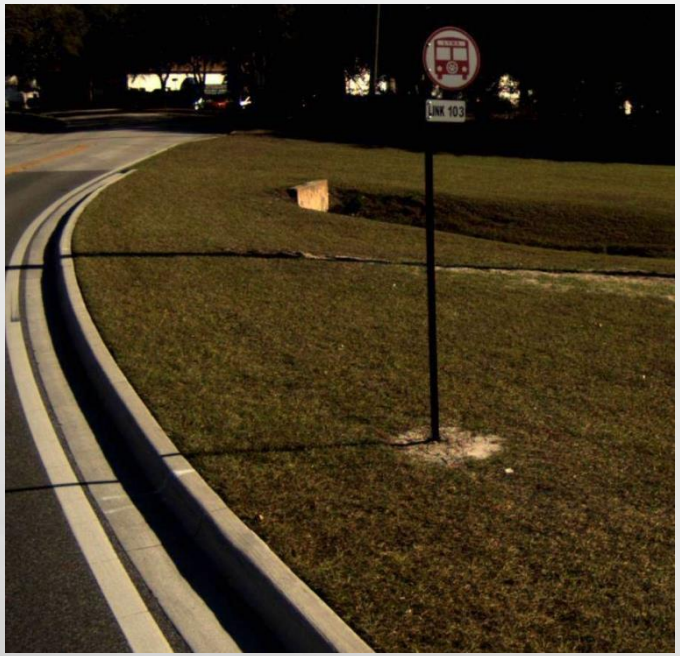
vueworks.

TAM / NTD Crosswalk

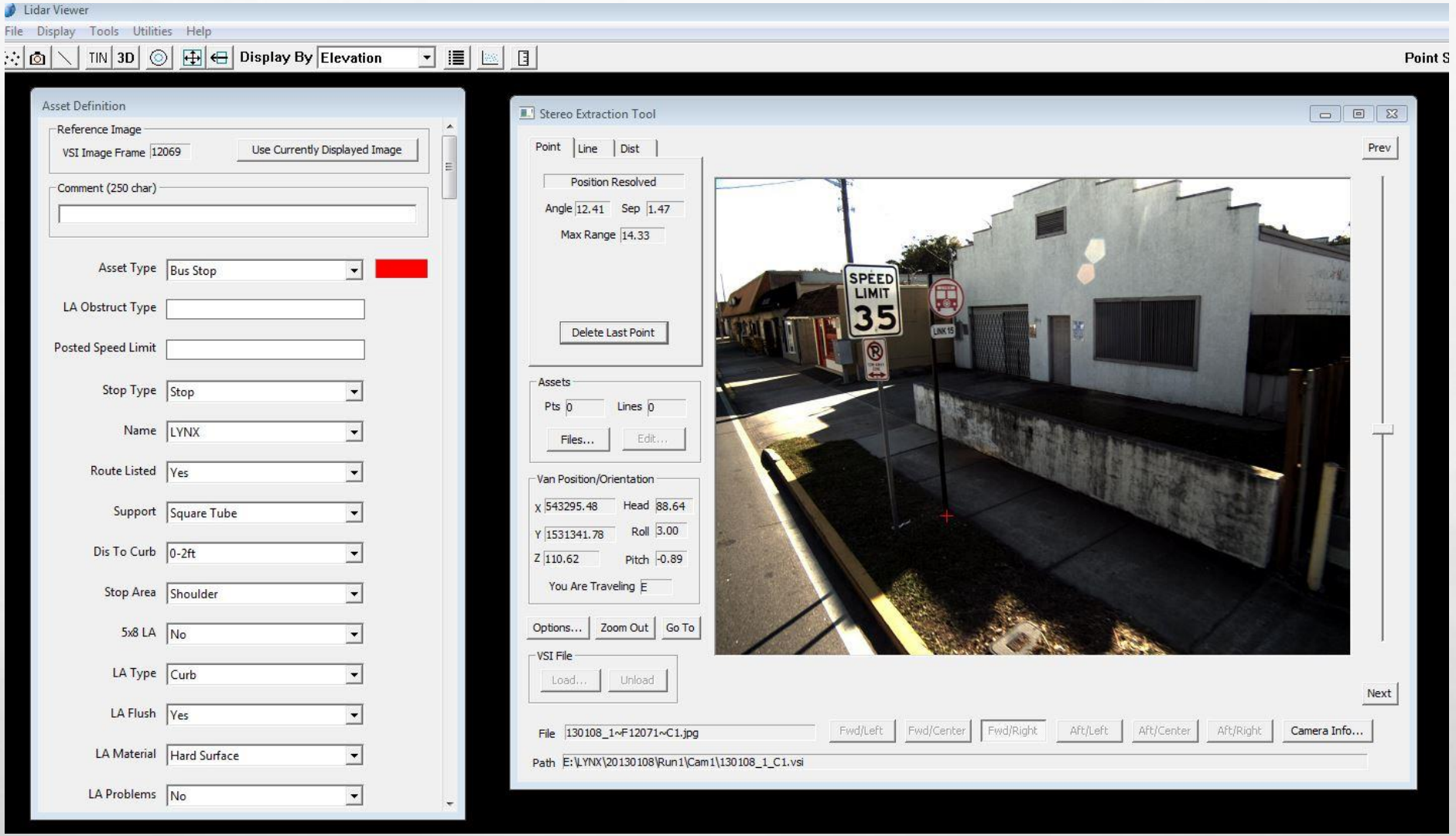
Asset Inventory (Bus Stops, Signs, etc.)

SEMINOLE COUNTY

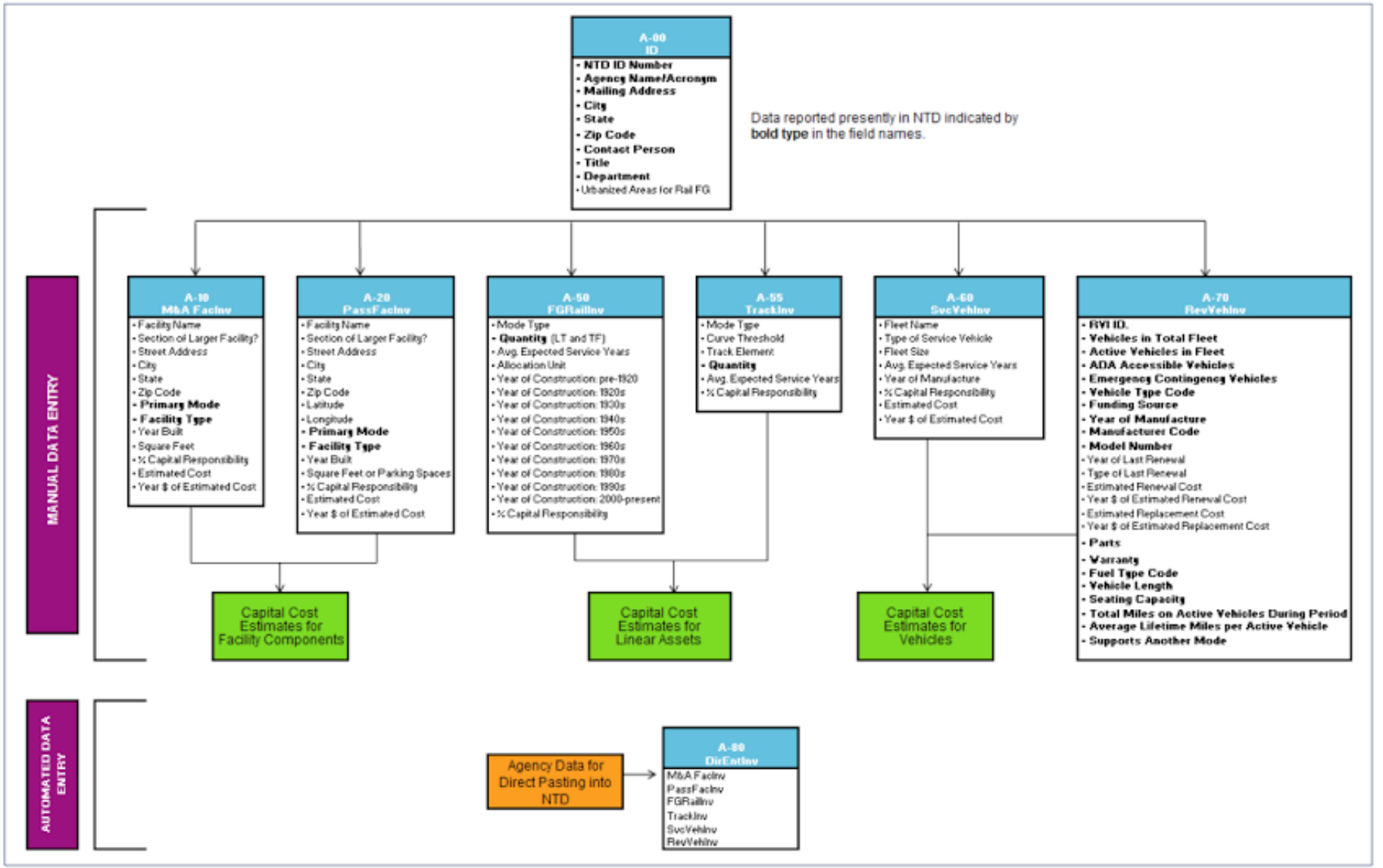
GOLDEN WOK
HUNGRY?
WIC CAN HELP
(407) 665-3705


LINK 103

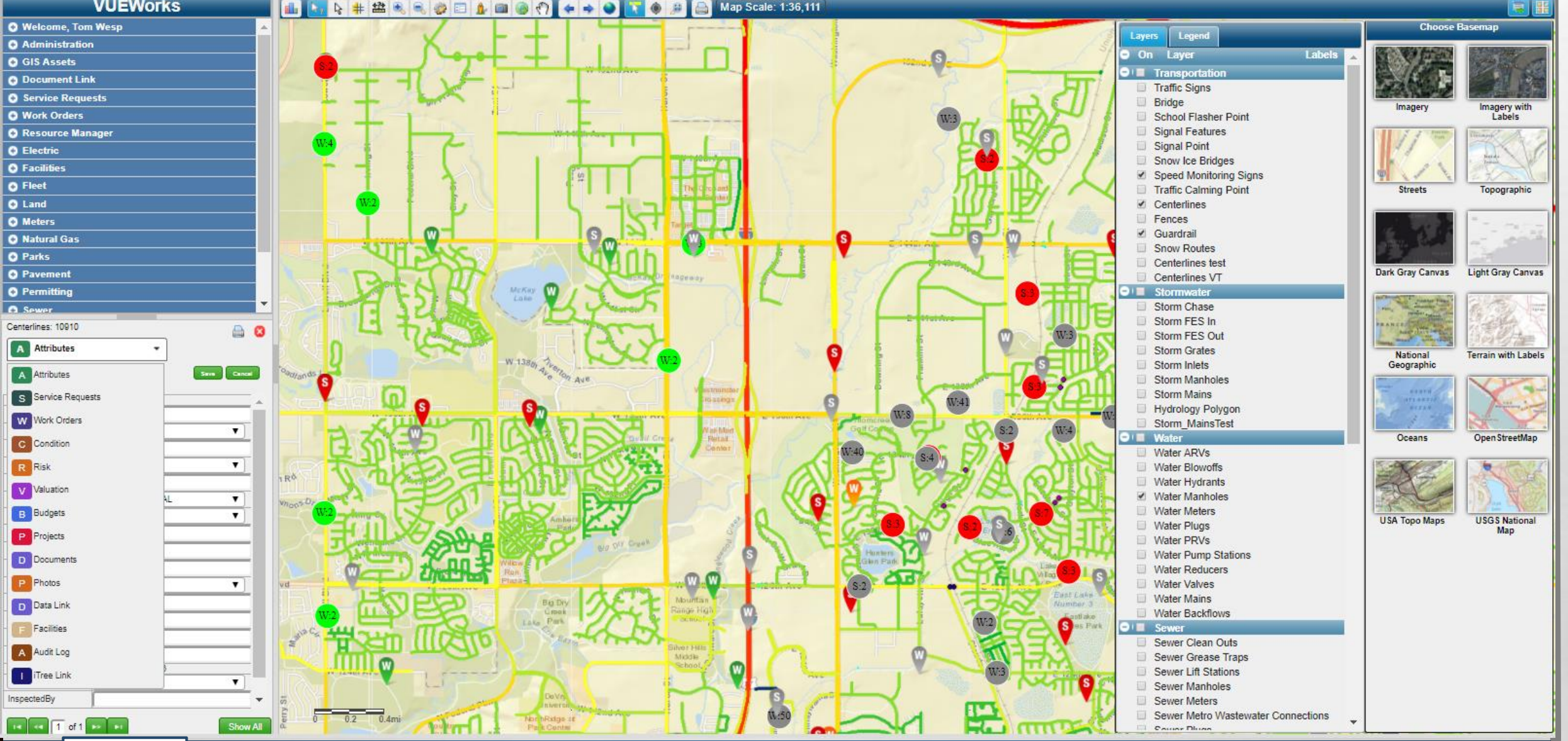
Inventory



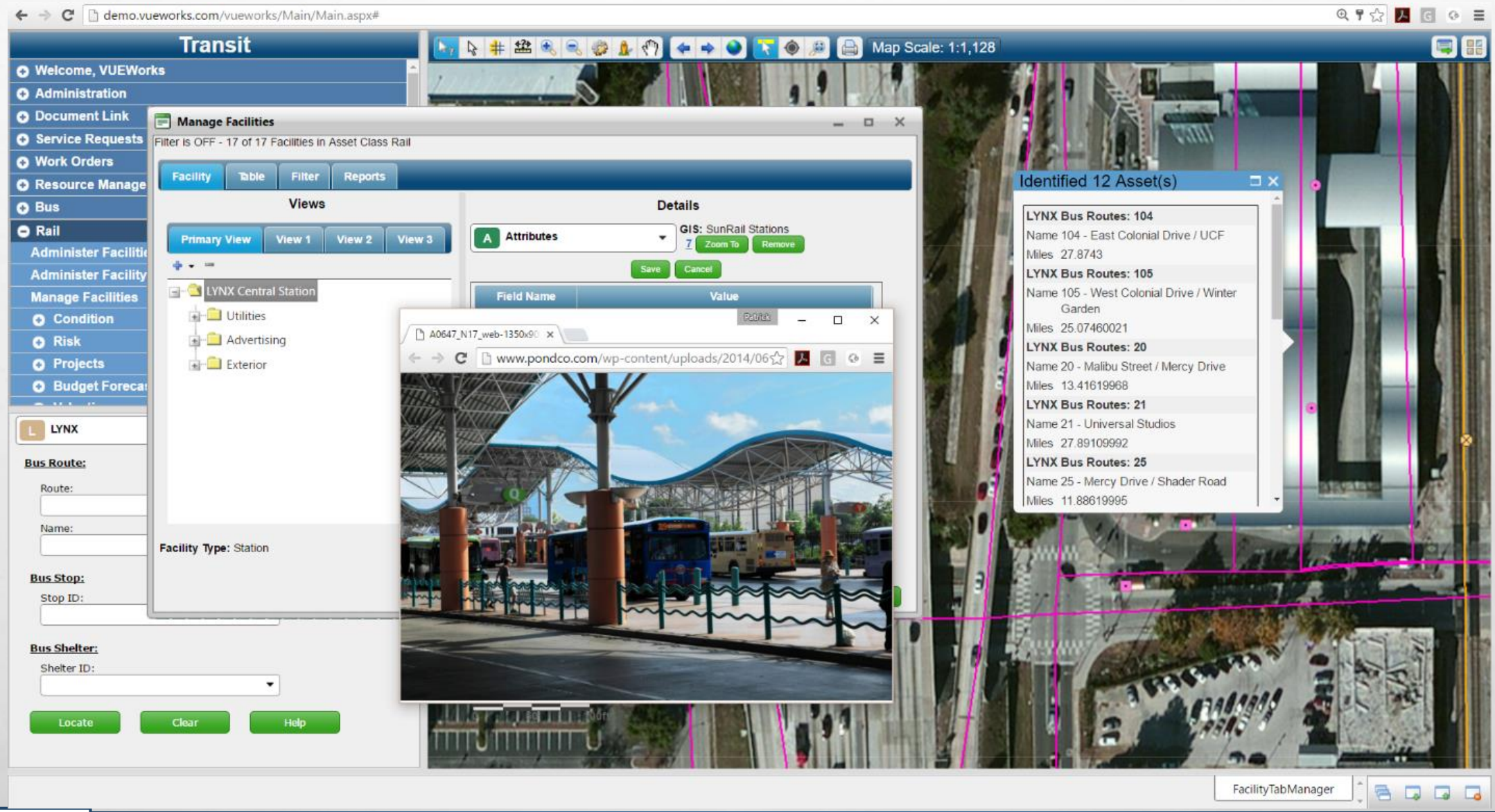
Classification for Data Structure



Facility Module Data Structure for NTD Reporting

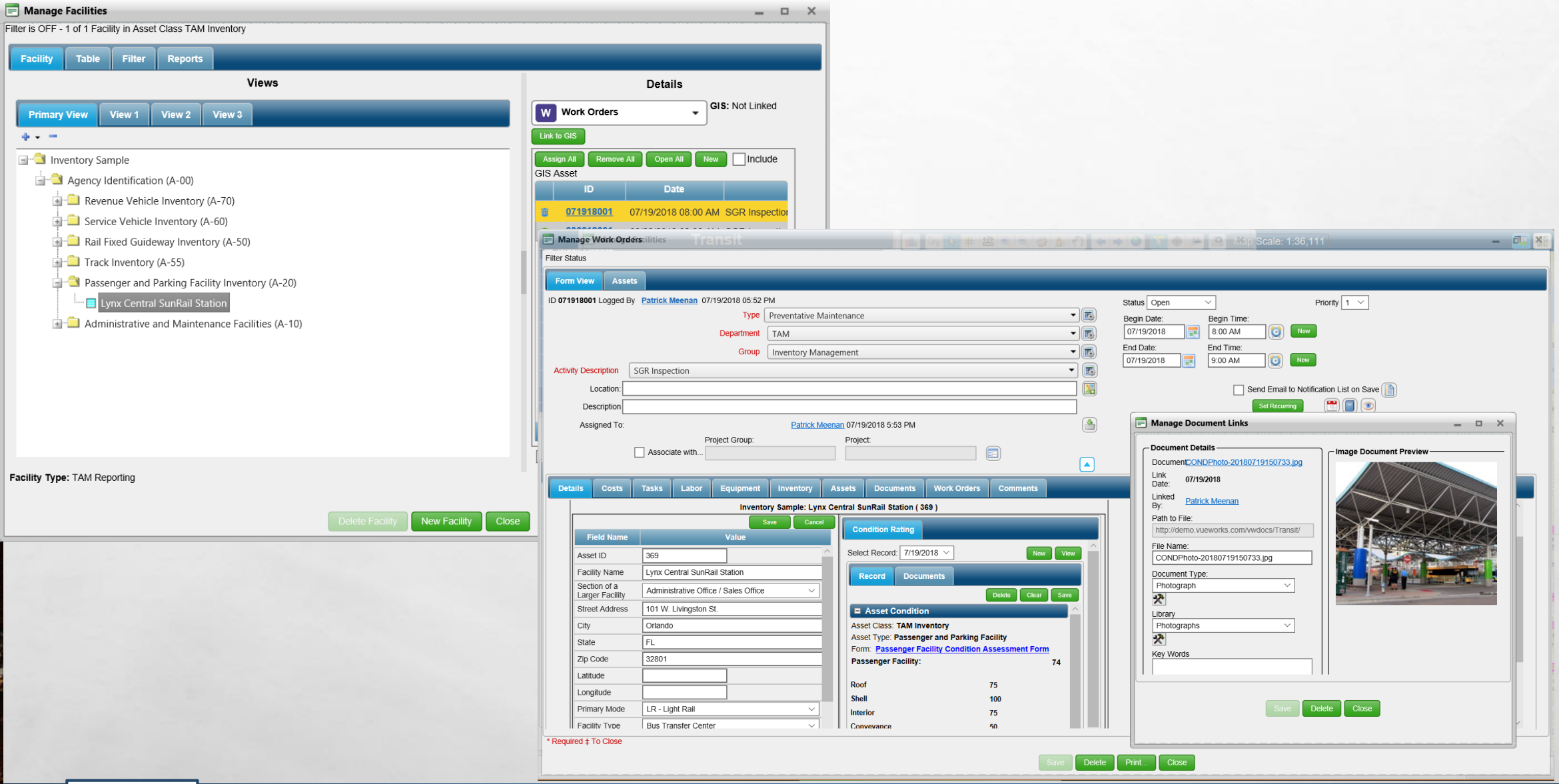


Interoperable Framework – pulling everything together

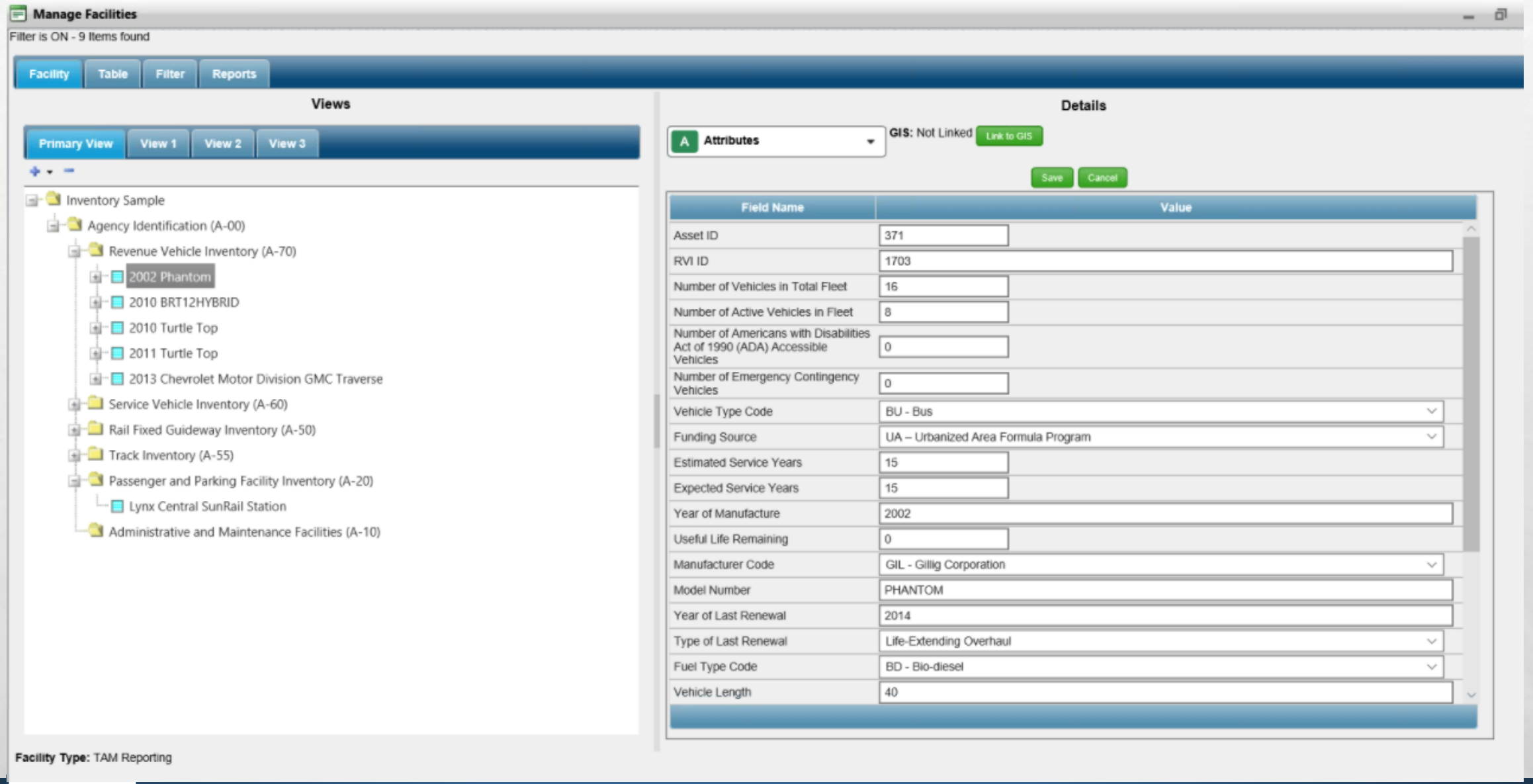


vueworks.

Asset Registry - GIS and Hierarchical Assets

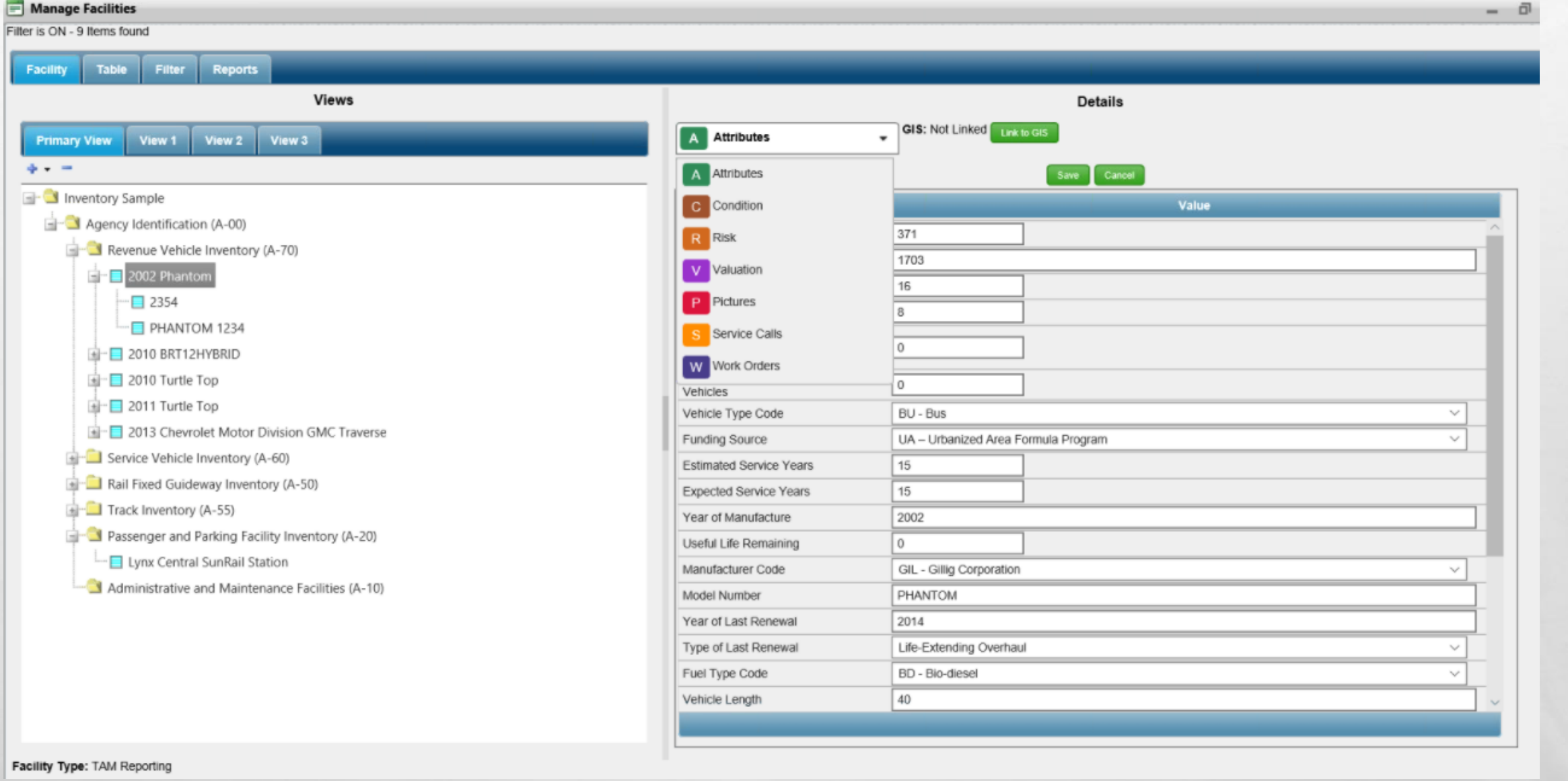


Asset Registry - Hierarchical Asset Model



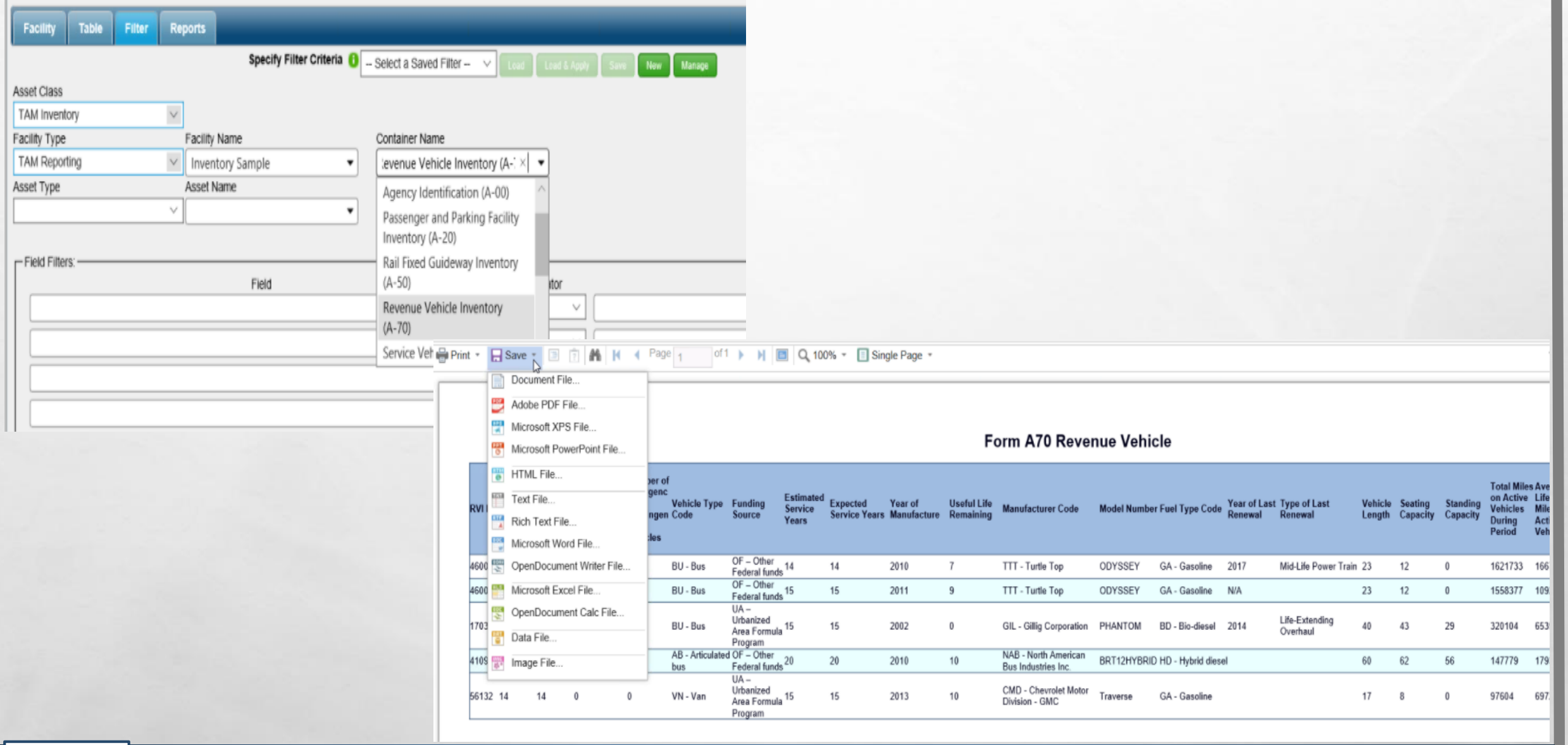
vueworks.

Asset Registry - Hierarchical Asset Model



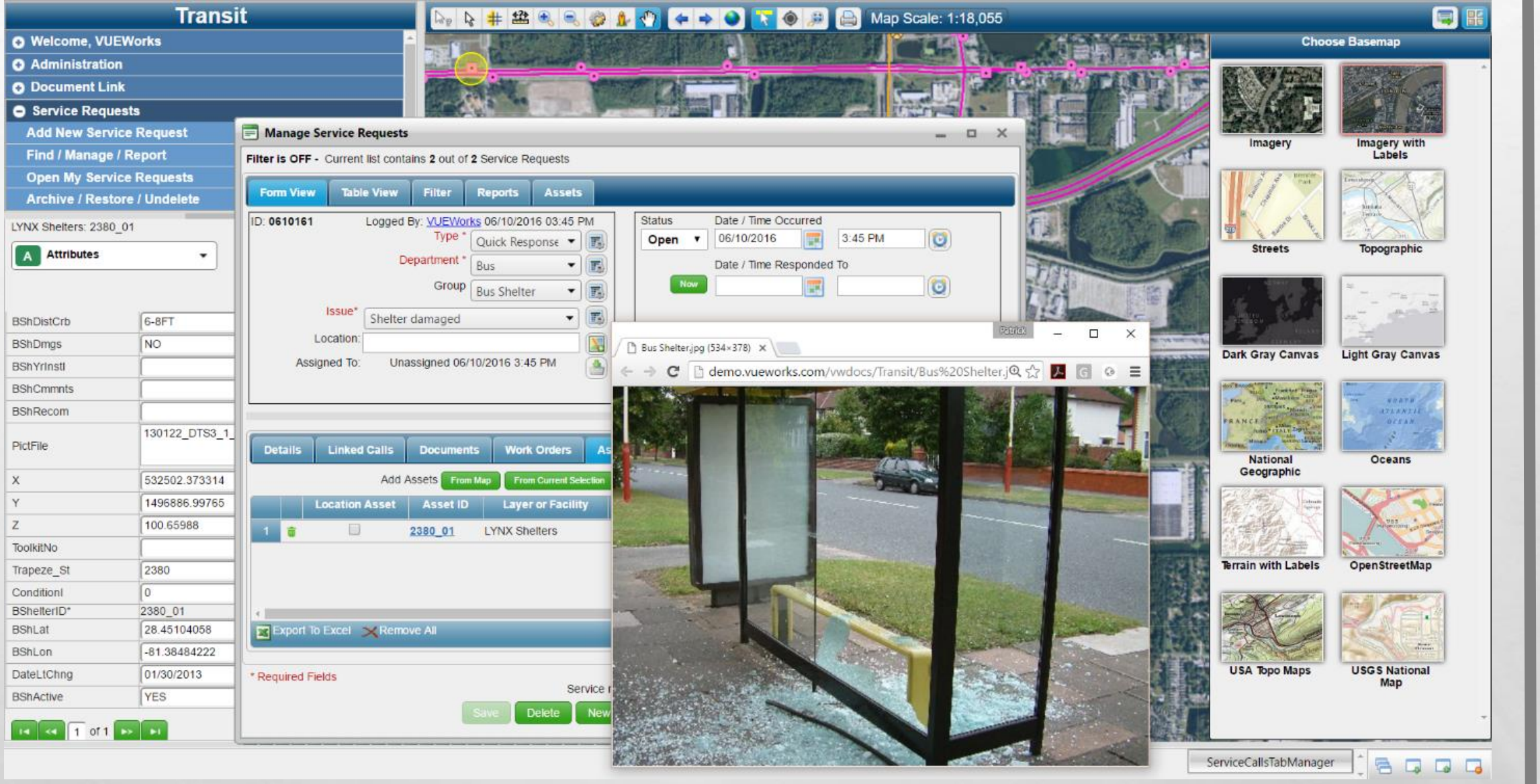
vueworks.

Asset Registry - Hierarchical Asset Model

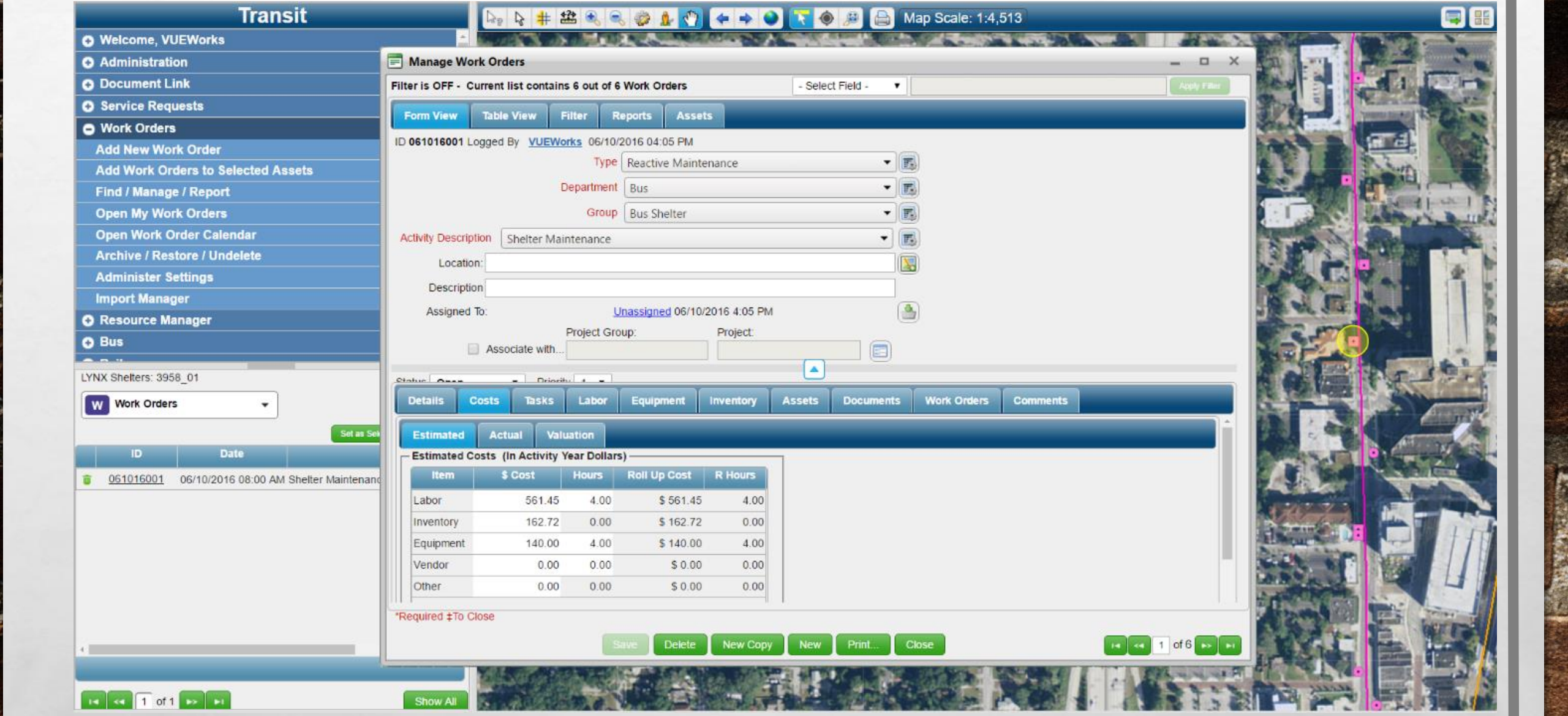


vueworks.

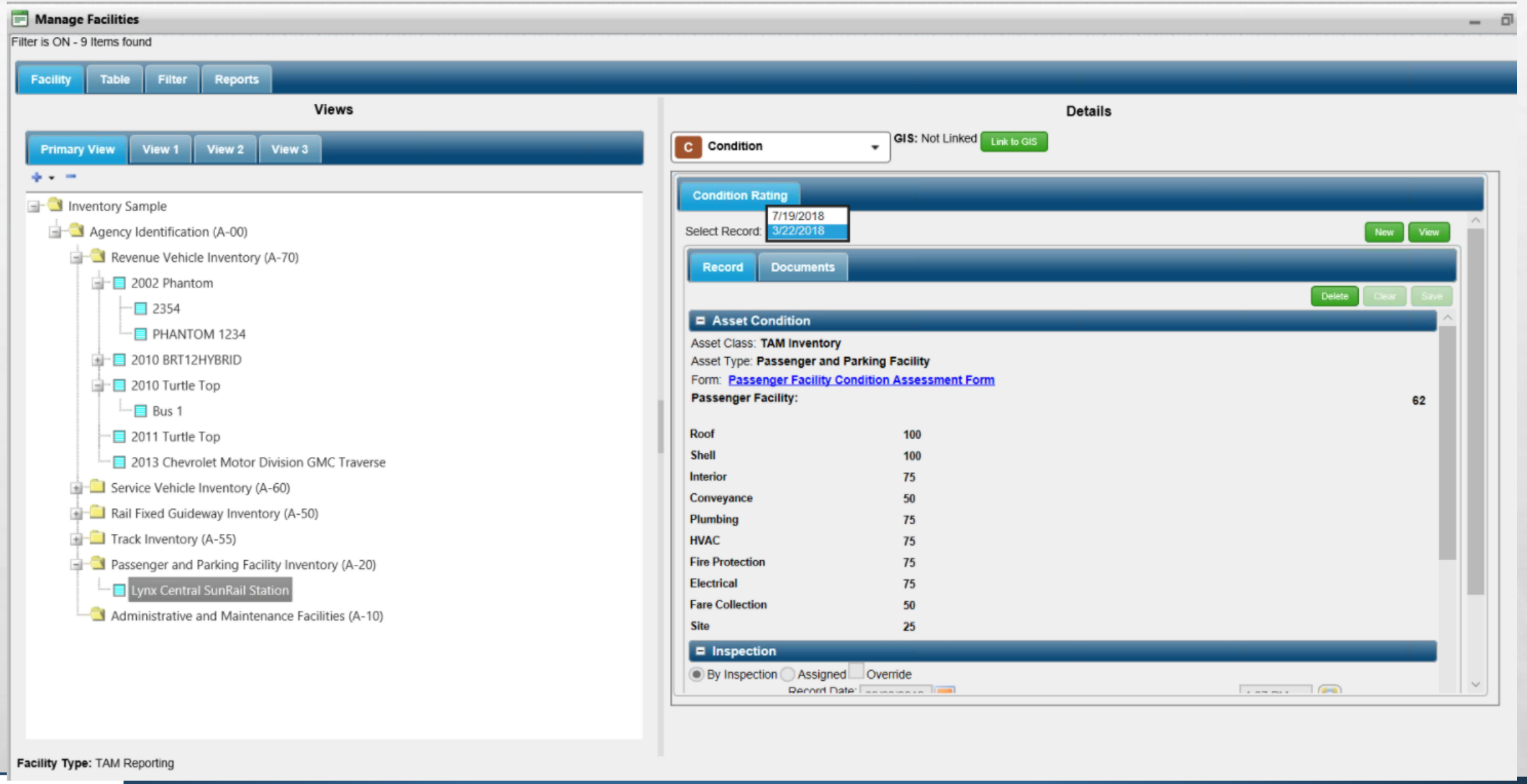
Easy Query and Report generation – we have the federal ones already



Service Requests

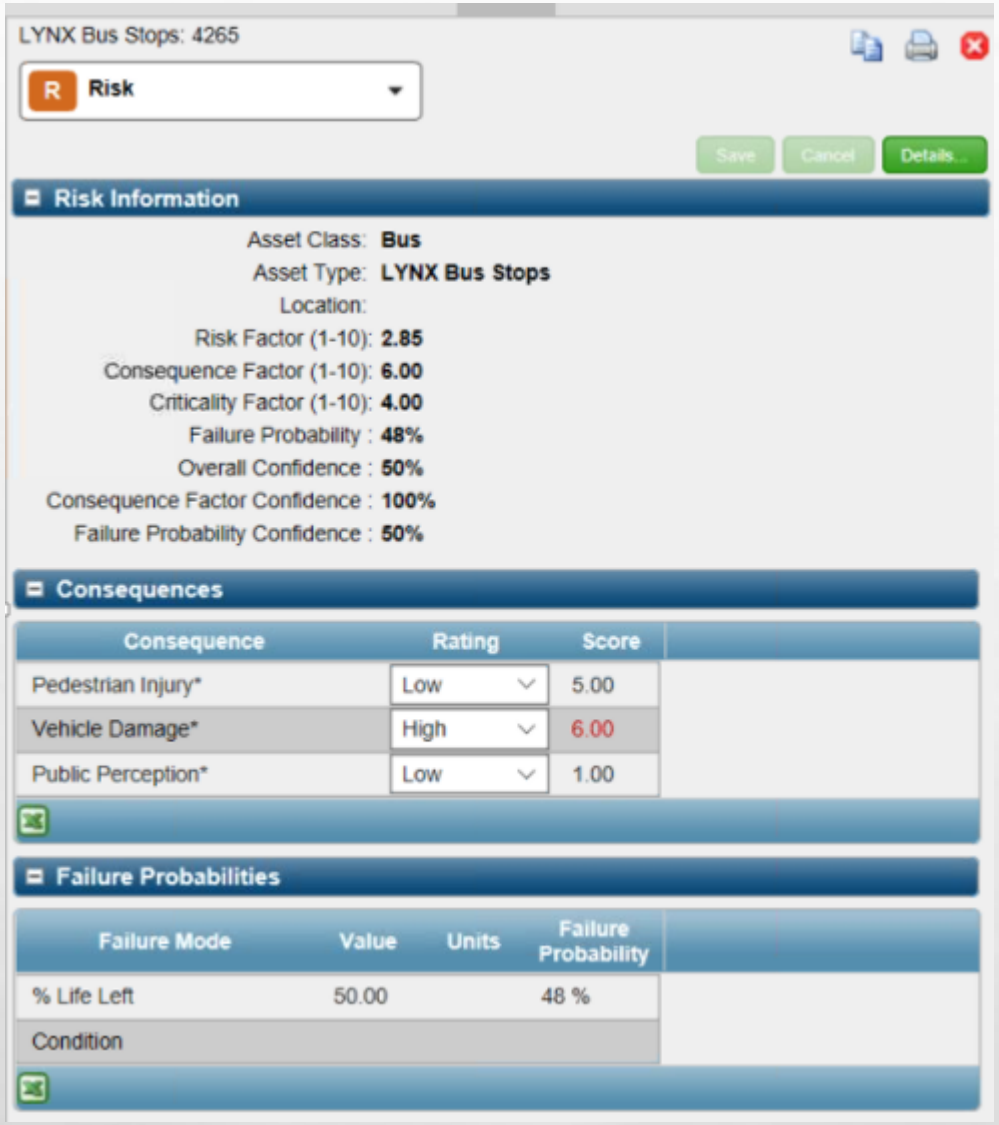


Work Management

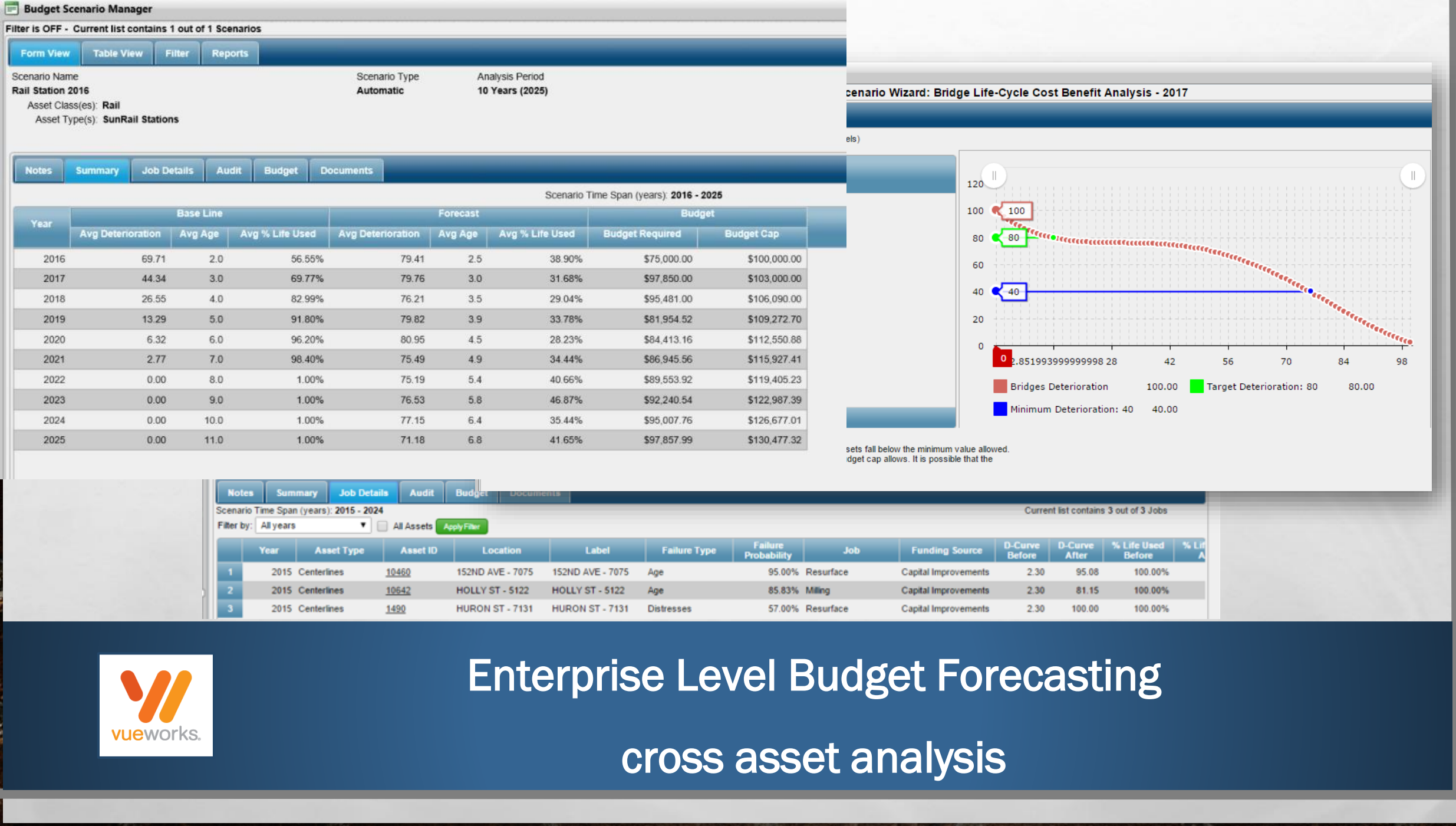


vueworks.

Condition


LYNX Bus Stops: 4265
R Risk
Save
Cancel
Details...
Risk Information
Asset Class: Bus
Asset Type: LYNX Bus Stops
Location:
Risk Factor (1-10): 2.85
Consequence Factor (1-10): 6.00
Criticality Factor (1-10): 4.00
Failure Probability : 48%
Overall Confidence : 50%
Consequence Factor Confidence : 100%
Failure Probability Confidence : 50%
Consequences
Consequence
Rating
Score
Pedestrian Injury*
Low
5.00
Vehicle Damage*
High
6.00
Public Perception*
Low
1.00
Failure Probabilities
Failure Mode
Value
Units
Failure Probability
% Life Left
50.00
48 %
Condition

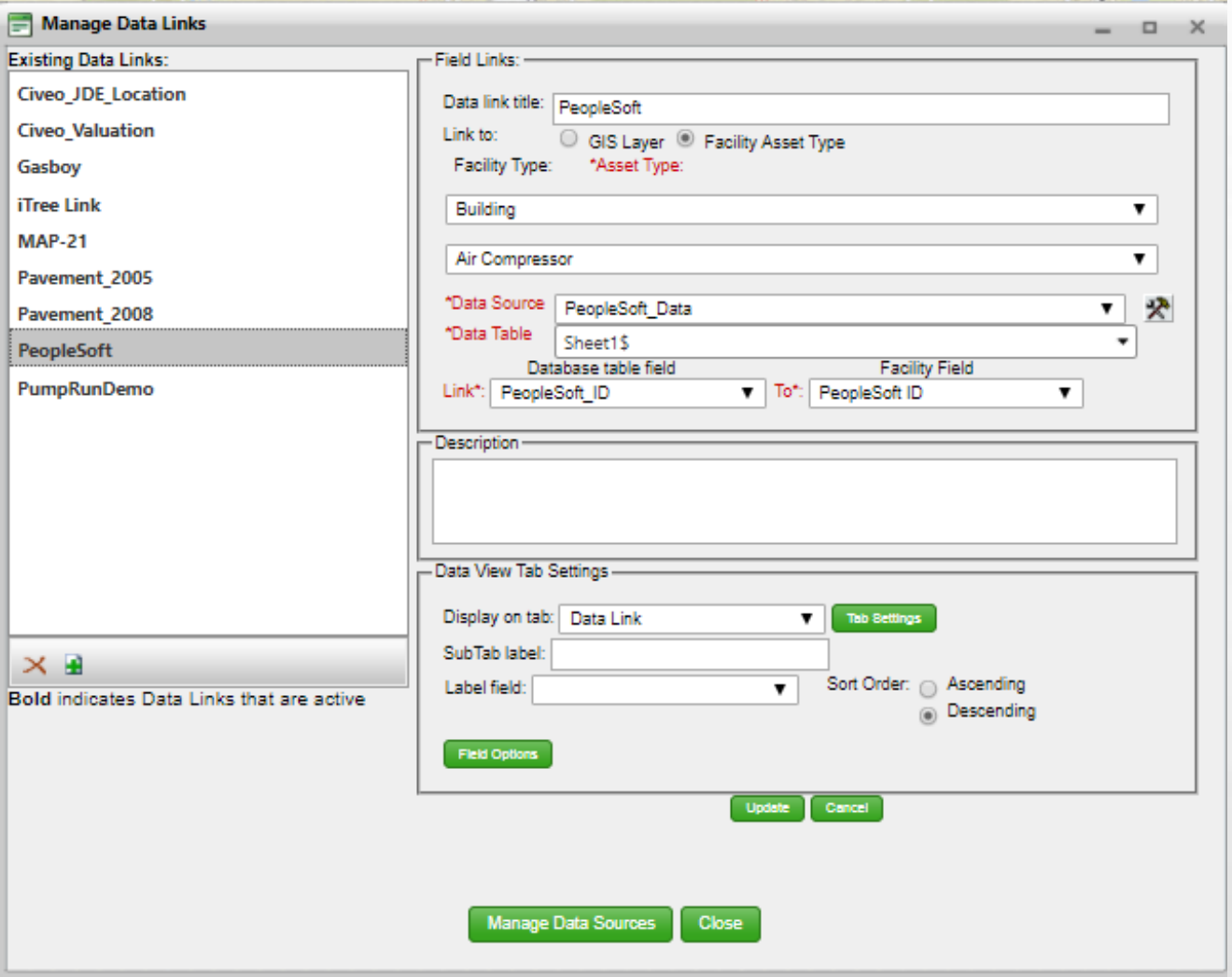
Risk

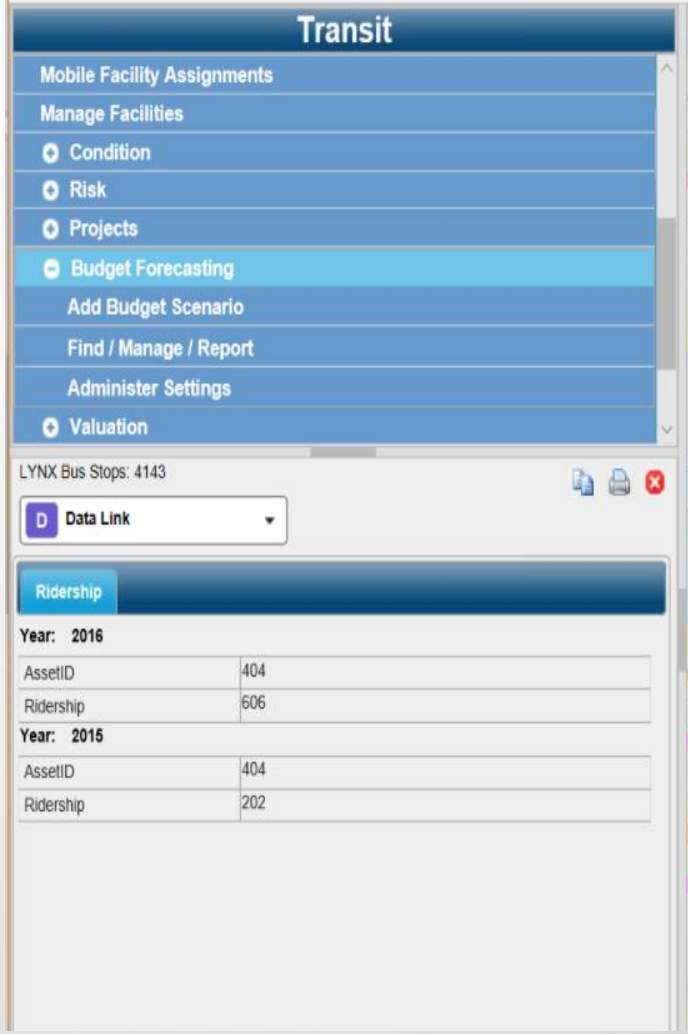


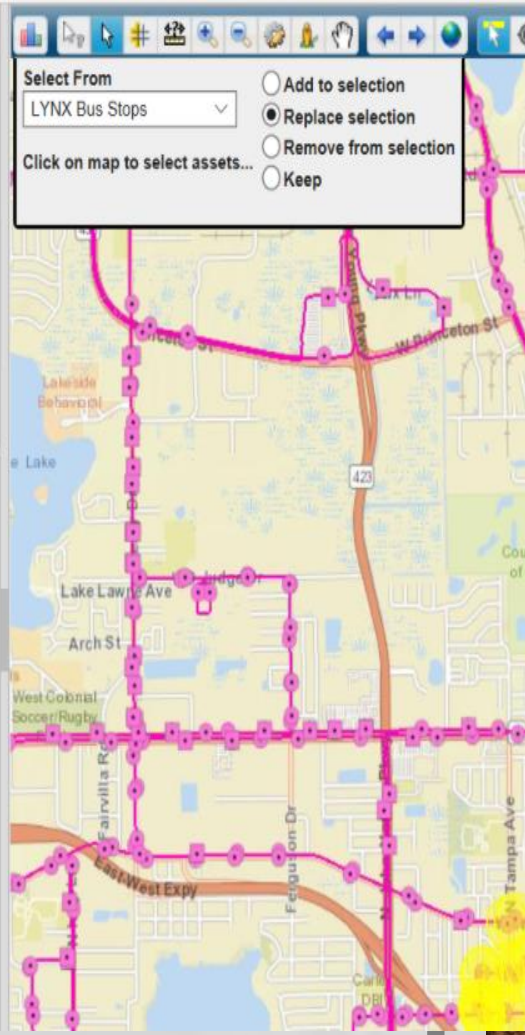
vueworks.

Enterprise Level Budget Forecasting

cross asset analysis







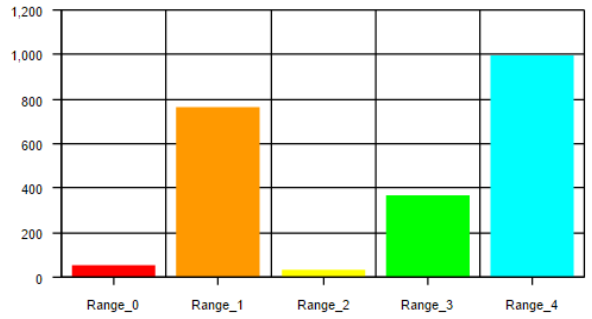
vueworks.

Enterprise Integration

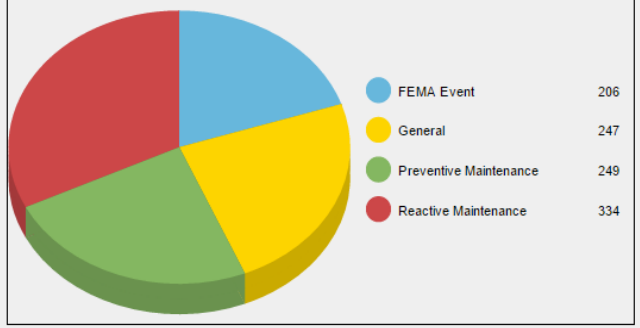
Web Services, APIs, Data Connect, Import/Export

VUEWorks State of Good Repair Dashboard

Count of Condition by Value Ranges



Work Orders Grouped by Type

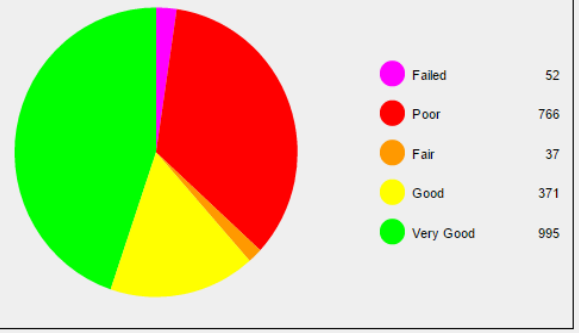


My Service Requests

ID	Issue Occurred	Issue	Location
476	01/03/2017 04:41 PM	Cracking on Road	
479	01/05/2017 01:02 PM	Pothole	112TH AVE - 10843
480	01/05/2017 01:07 PM	Potholes	41 Hutchins Drive, Portland, ME, United States
477	01/05/2017 08:32 AM	Cracking on Road	302

Showing 1 to 4 of 50 entries Previous 1

Rolling Stock Condition Summary



Total Open Work Orders

8 8 10 8 8

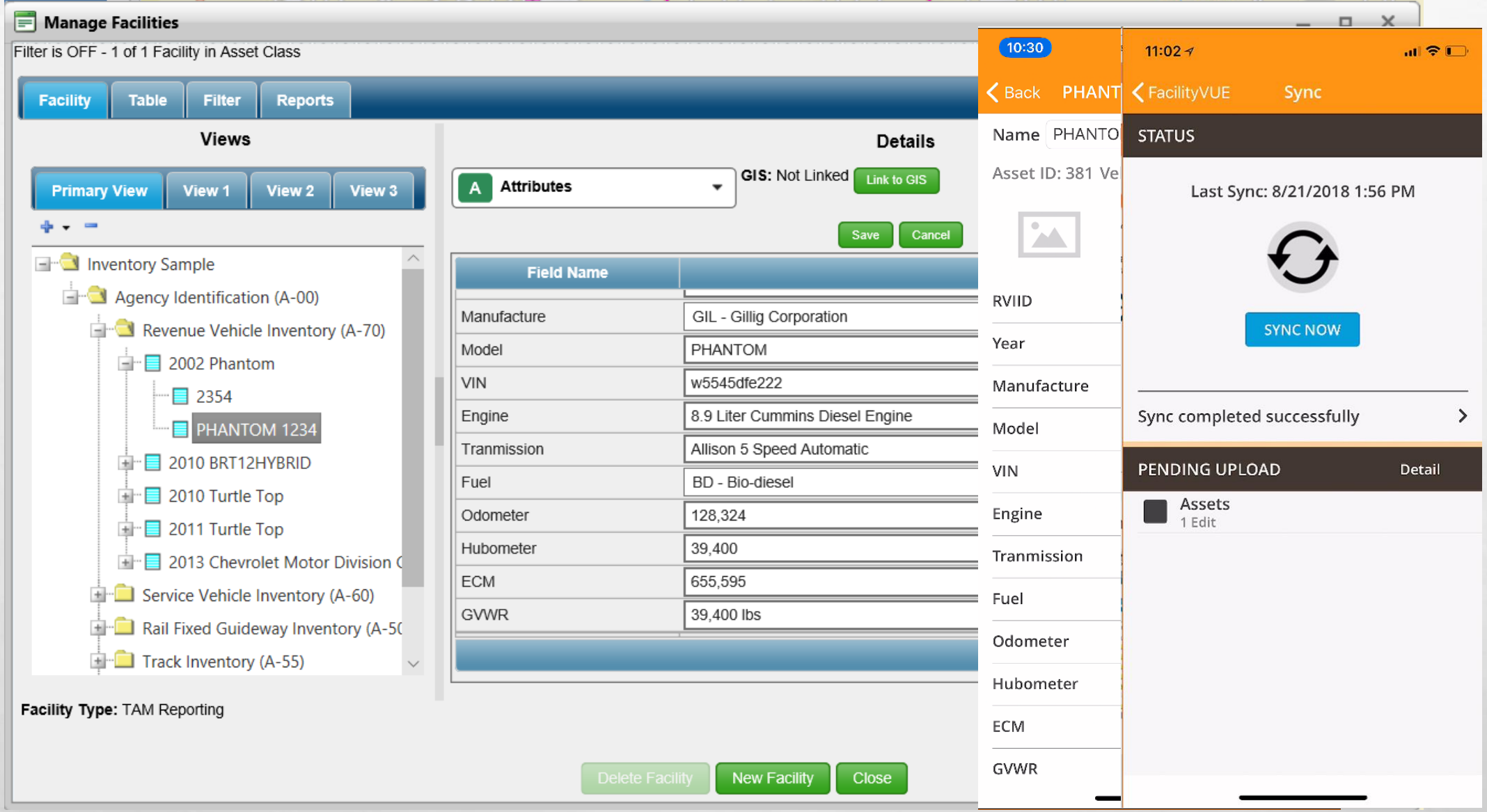
My Work Orders

ID	Begin Date/Time	Activity	Location
012617-001	02/09/2017 11:12 AM	Pothole Filling	Orlando, FL, USA
040916-002	04/11/2016 02:35 PM	Pothole Filling	
120816-024	12/08/2016 08:00 AM	Inspections	On the west corner of Main Street

Showing 1 to 3 of 3 entries

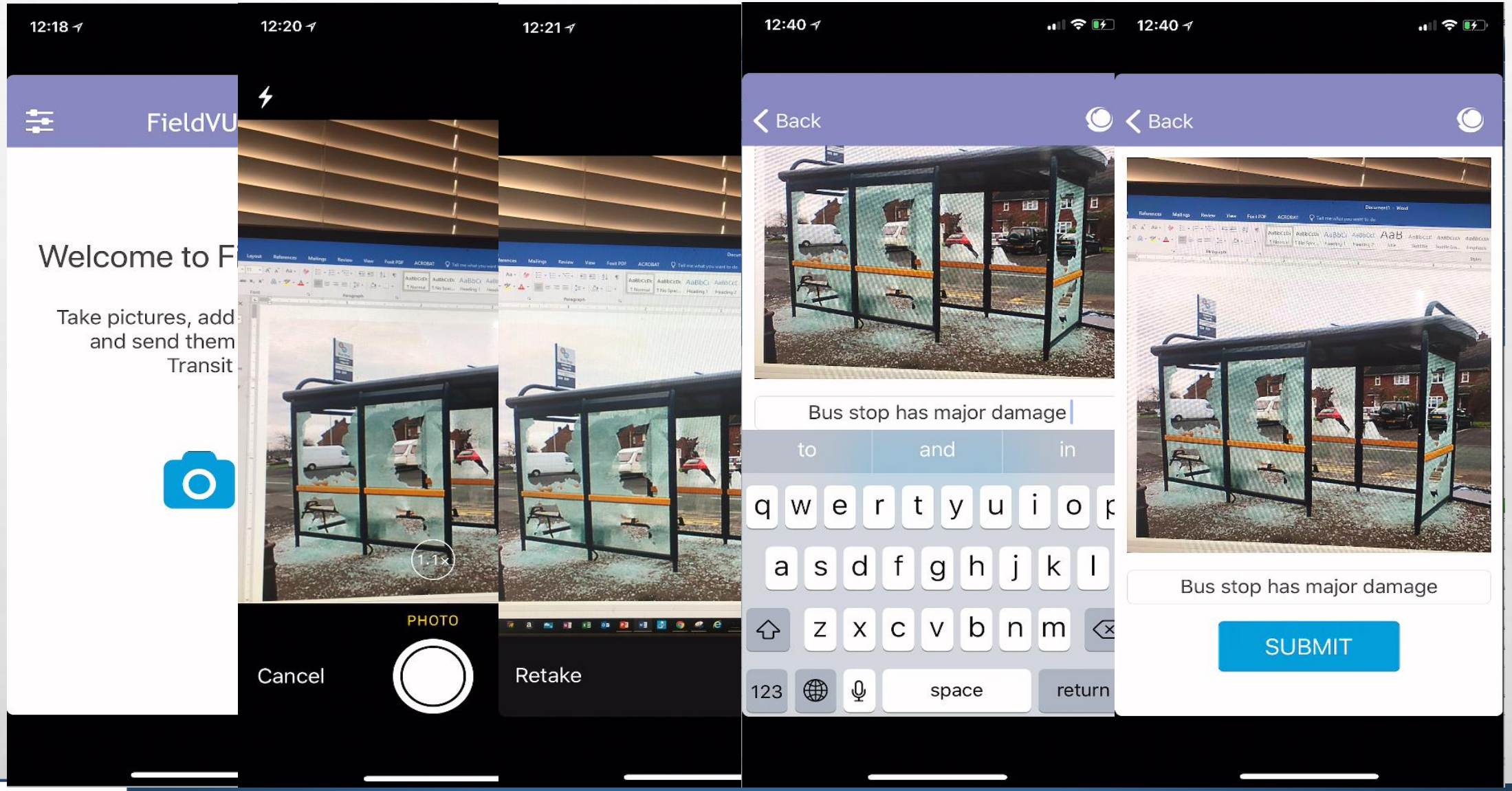
vueworks.

Data Driven Dashboards



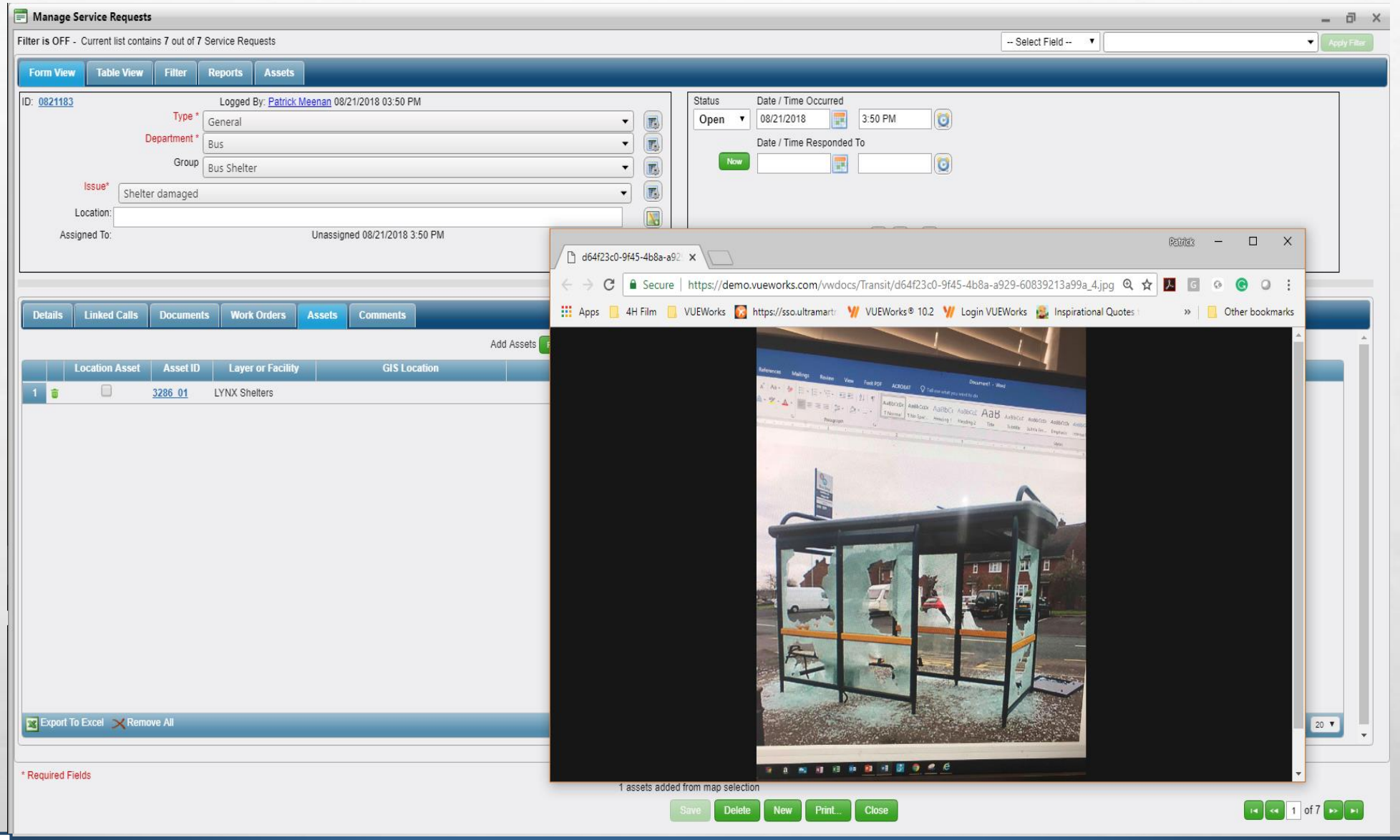
vueworks.

Mobile Condition Inspection: FacilityVUE

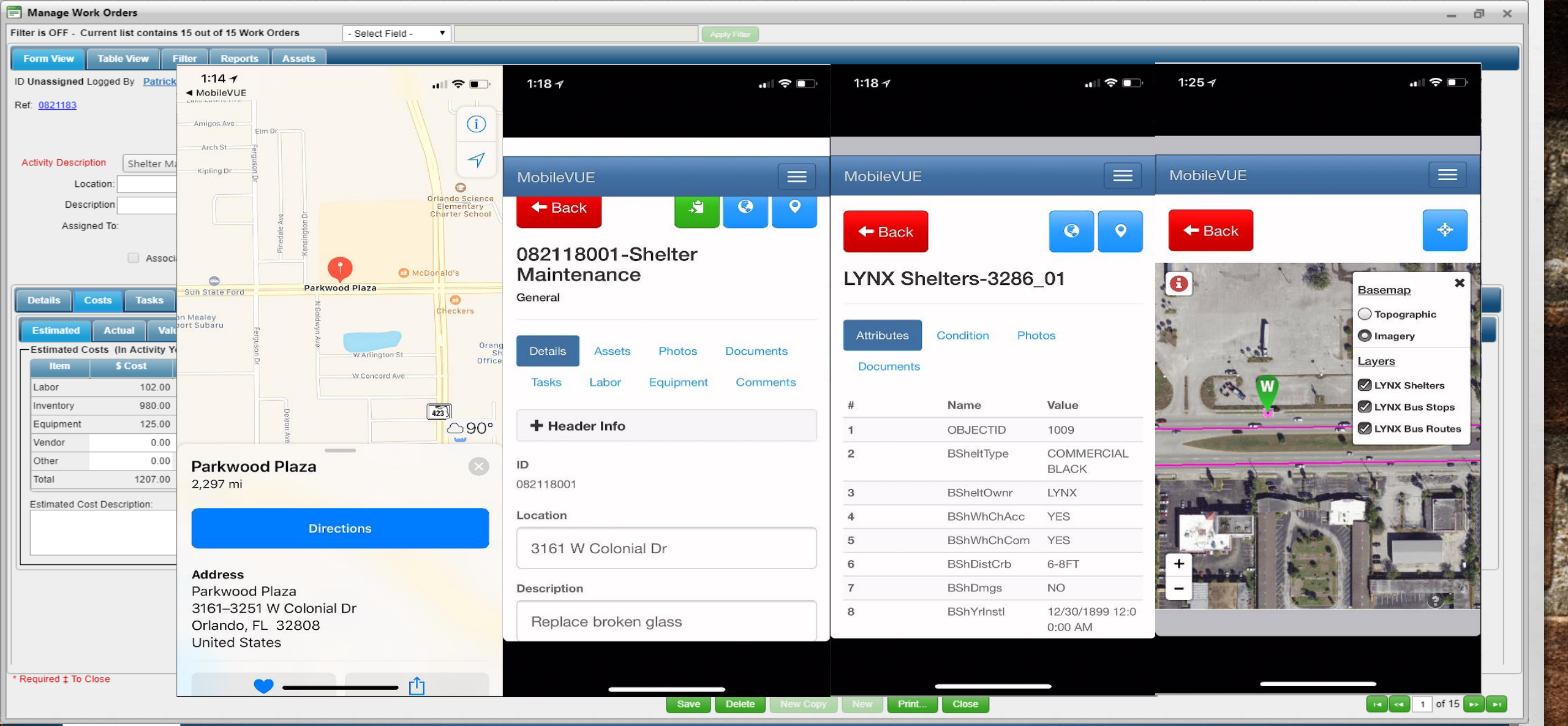


vueworks.

FieldVUE: Field Issue Identification

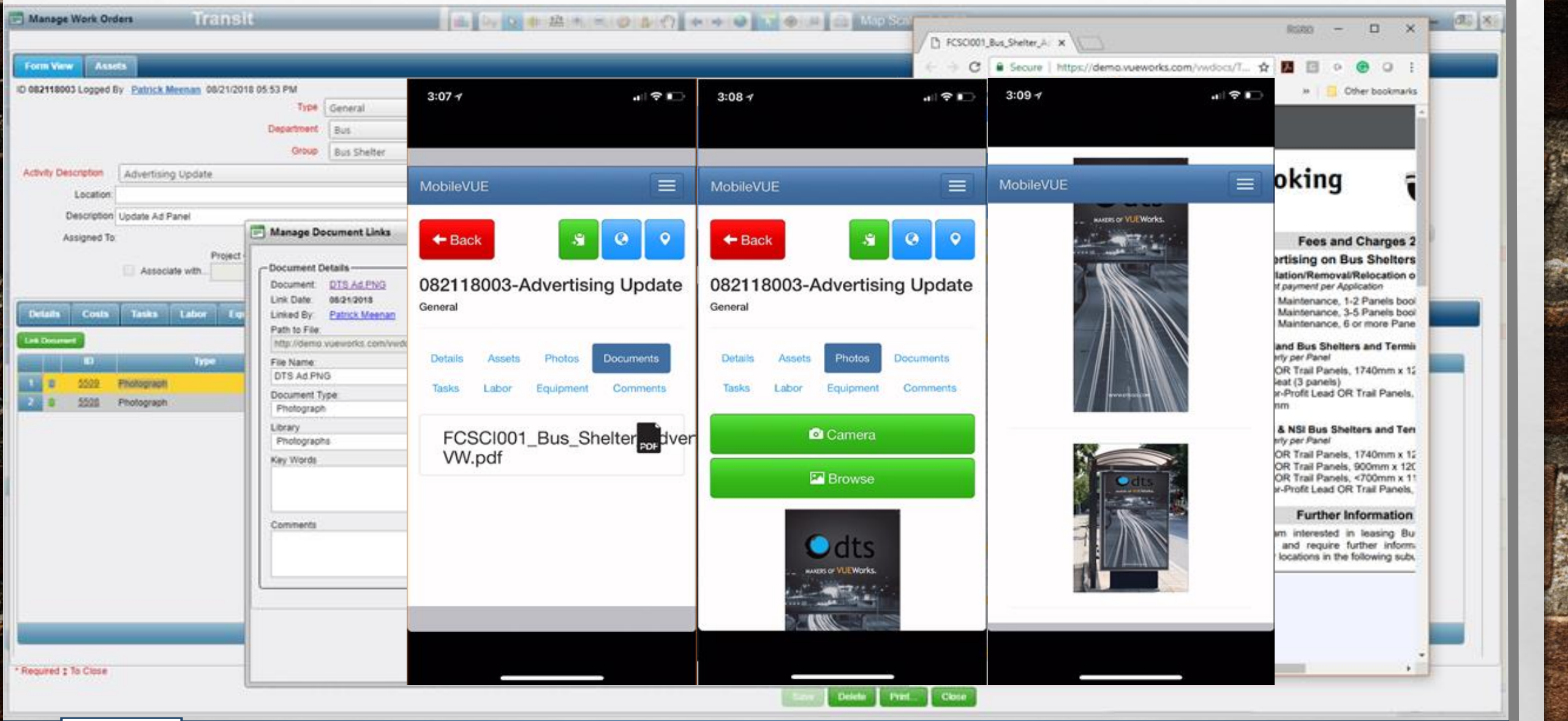


FieldVUE and VUEWorks Work Seamless Together



vueworks.

MobileVUE – Work Orders



vueworks.

Managing Transit Advertising

dts
questions?

© 2017 Esri. All rights reserved.