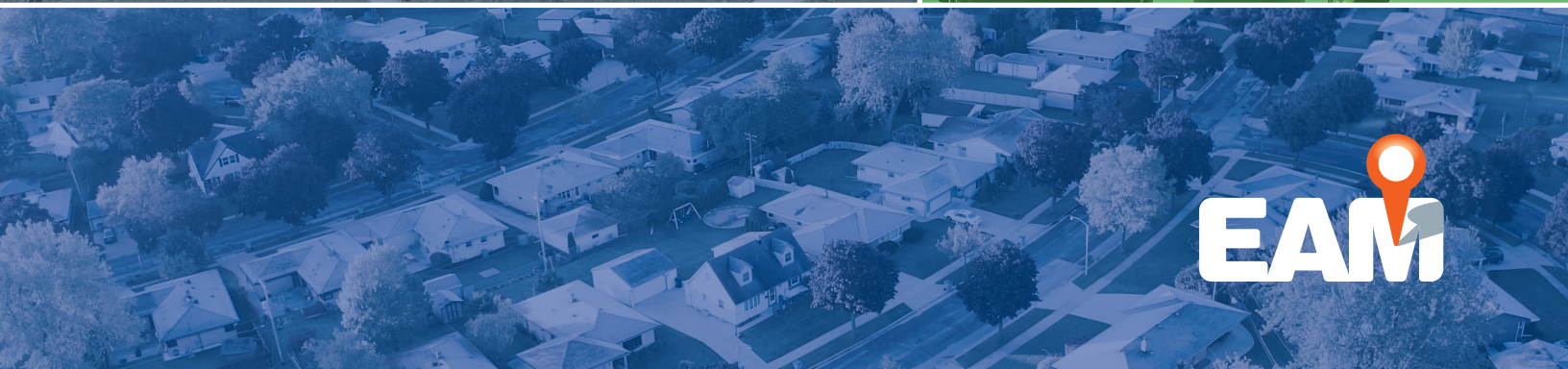
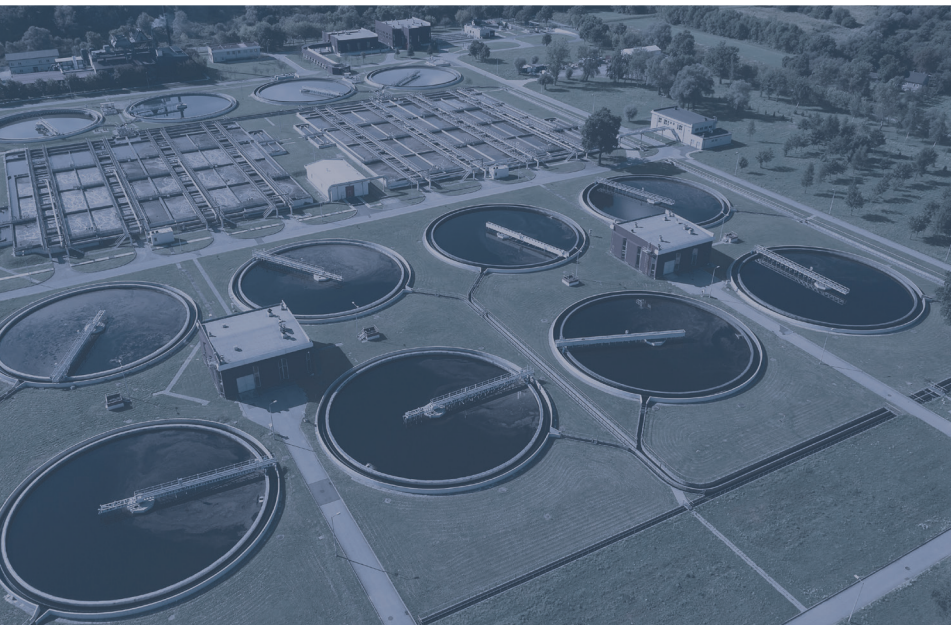




# ENTERPRISE ASSET MANAGEMENT

The Road to Improvement



# Creating Value with EAM

Do you think that Enterprise Asset Management is out of reach for your agency? Infrastructure assets such as roads and sidewalks, water, drainage, and sewer infrastructure, parks and public buildings deliver important services to our communities, and it has never been easier to ensure the long-term sustainability of these services. Significant research into adopting sustainable and effective business processes and the technology to support them now provides the ability to manage assets in a way that supports better service delivery at a lower cost and with less risk.



## EAM BENEFITS



Improved service levels of aging infrastructure meets customer demands



Heightened resilience in a changing environment



Meeting increased regulatory reporting requirements



Enhanced data transparency



Better safety for health and the environment



Conserving funds with productivity and efficiency



Better decision support and understanding of assets

# The Road to Improvement

Where do you find yourself on the road to implementing an effective Enterprise Asset Management System?



The first stop on the journey needs to be the collection and inventory of asset data.

Whether through aerial or drone collection, or through ground-based field collection, completing your inventory of assets should be your first stop.

Determining how and where to store all the vital asset data can be a daunting task. Many data models exist with some being proprietary to specific systems. Also, choosing an on-premises or cloud-based solution will affect availability, accessibility, and integration with other systems.

Knowing the current health of your assets will show you where they are on their individual lifecycles.

Having good data for your assets takes you only

so far on your road to improvement. In order to get the most value requires access to rich data visualizations that give decision-makers the information they need, when and where they need it.

Finally, you arrive at the leg of the journey where you can utilize the power of EAM to develop lifecycle strategies, evaluate risk management, perform demand forecasting and management, optimize decision making and maintenance strategies.

*Find out more about where you fall on the roadmap. Follow the QR Code to contact an expert and take our free EAM Maturity Assessment.*





## Asset Data Collection:

### SUBSURFACE UTILITY ENGINEERING (SUE)



SUE is a set of specialized utility locating methods that results in the identification of underground utility assets which utilizes several technologies, including vacuum excavation and surface geophysics. For asset management, Psomas translates the location data to CAD or GIS to meet agency needs. The use of SUE has become a routine requirement on highway projects in many states, and since 1991, the FHWA has been encouraging the use of SUE on Federal-aid and Federal Lands Highway projects as an integral part of the preliminary engineering process.

### Did You Know?

SUE is an important component of EAM because it:

- ▶ Reduces costly relocations
- ▶ Reduces delays to the capital projects
- ▶ Eliminates unexpected conflicts with utilities are eliminated.
- ▶ Precise locations of virtually all utilities can be shown accurately in 3D in BIM, CAD, and GIS
- ▶ Safety is enhanced when excavation is shifted away from existing utilities

### Psomas Performs

- ▶ Subsurface utility designating and locating
- ▶ Vacuum excavation
- ▶ Condition Assessment
- ▶ Repair and maintenance
- ▶ Subsurface utility mapping
- ▶ Ground penetrating radar (GPR)
- ▶ Underground utility locating



### Subsurface Storm Drain Inspection

City of Torrance, CA



### East San Fernando Valley Light Rail

Los Angeles, CA



### Pipeline Relocation

Walnut  
Creek, CA



## Asset Data Collection: GIS FIELD INVENTORY



To complete an inventory, assets are located using traditional survey methods and with GPS locating. For use in an agency's EAMS, deliverables must include a geospatial (x,y,z) coordinate, a feature code (fire hydrant, pole, etc.), and may include the collection of physical configuration and inverts (storm and sewer manholes) and condition. Data provided as sketched, field notes, a data file, a CAD drawing or any combination can be digitally converted for inclusion in both GIS and an EAMS.

### Did You Know?

GIS field inventory & condition assessment:

- ▶ Creates authoritative asset registry
- ▶ Various methodologies adapt to needs
- ▶ Verifiable results provide confidence
- ▶ Inventory supports EAM, GIS, and all business intelligence needs

### Psomas Performs

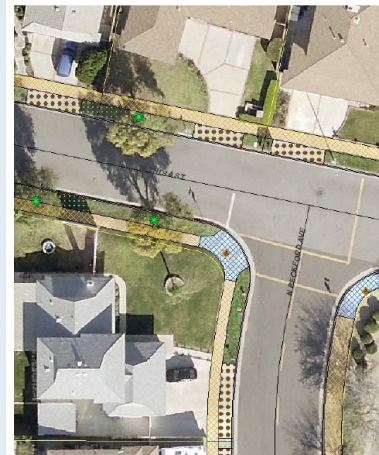
- ▶ GPS and tablet-based collection
- ▶ High reliability asset repositories
- ▶ Systematic asset collection procedures
- ▶ Incremental acquisition through field workforce
- ▶ Digitalization from native sources
- ▶ Aerial and ground based mobile imaging with AI/visual extraction

### Storm Drain Manhole Inventory

Alameda County Public Works



Flood control and roads Enterprise GIS and EAMS development support, storm drain asset validation, supporting GIS, capacity modeling, asset management optimization, manhole inspection, digital 360 photo documentation.



### Asset Verification and Collection

City of Milpitas



Verification of record documents, water, sewer, and storm drain public works infrastructure assets, GIS data integration, as-built drawing conversion, mapped street intersection signals and interconnects, as-needed supplemental field asset location.

### Citywide Sidewalk Inventory

City of Los Angeles,  
Bureau of Engineering

11,000 mile sidewalk inventory (sidewalk, ADA ramps, curbs, driveways, and trees), optimizing \$1.4 billion capital program for 2.9 million sidewalk assets.



# GIS Data Management and Analytics



“Location” is a critical factor in how agencies optimally plan, maintain and manage public infrastructure systems making GIS data foundational in an effective EAMS. GIS provides advanced spatial analytics and visualization capabilities while GIS data acts as the authoritative data source. Access to accurate GIS data provides a higher level of operational awareness of asset location, condition, risk, and performance.

Managing asset data effectively is the engine that powers EAM capabilities. The asset data must be organized for digital access and integration with EAM and other business systems, and define the characteristics of the assets, maintenance processes, tools, and quality control processes in place to assure the asset data is current and reliable to support automated processing and decision making. The result of effective asset data management is a data store representing the comprehensive characteristics of the data that is characterized as the authoritative representation of the asset.

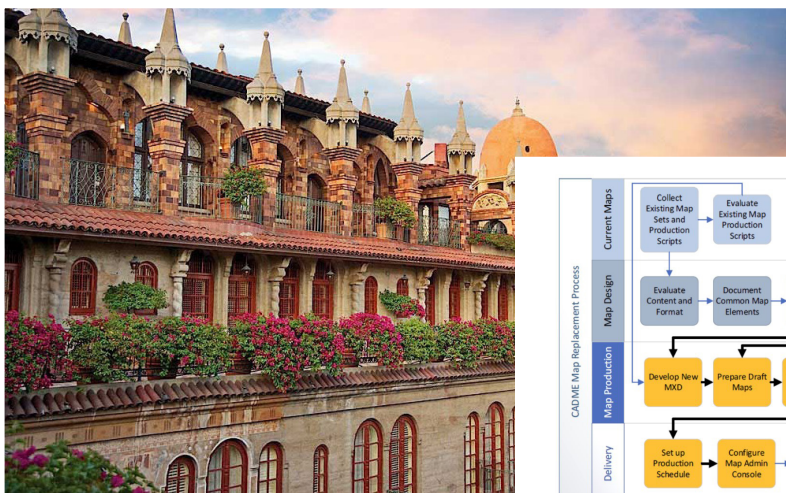
## Did You Know?

These activities are important to agencies because they:

- ▶ GIS data forms a solid foundation for EAM
- ▶ Spatial analysis and mapping provide actionable information for better decisions
- ▶ GIS mapping, especially with online and mobile tools provide greater asset accessibility and transparency

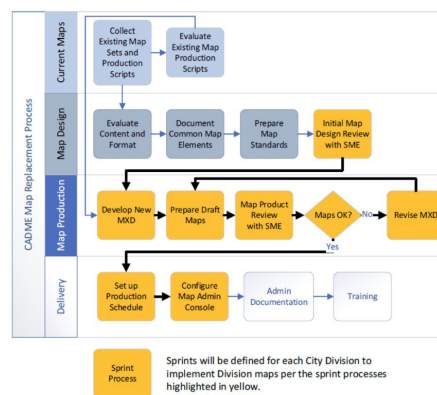
## Psomas Performs

- ▶ GIS assessment, planning, and governance
- ▶ Geodatabase Design and Data Acceptance
- ▶ Systematic Asset Data Updating
- ▶ Data Quality Management
- ▶ Systems Integration including Business Systems and IoT Sensors
- ▶ Data Security



## Enterprise GIS Migration and Enhancement

City of Riverside



Data transformation from legacy systems to eGIS including data architecture, migration, modern web-map viewer, and map production system.



## EAMS and eGIS Development/ Support Services

### StreetsLA

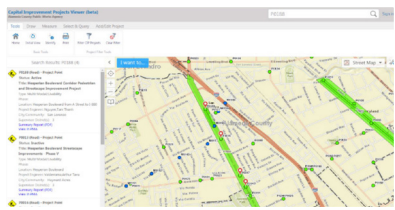
EAM and GIS support services, documented existing business processes and data, requirements and strategy documents, executive dashboard, Enterprise Document Management (EDM) integration, and roadmap for advancing StreetsLA.



## GIS Development, Data Modeling, and Managed GIS Services

### City of El Monte

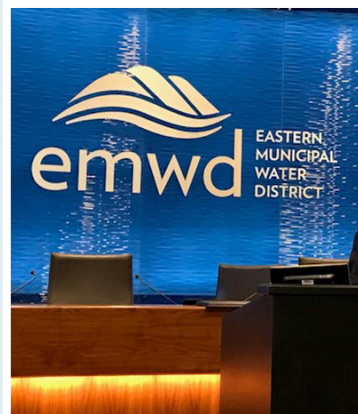
eGIS design, development, and implementation, cloud-based ArcGIS platform, Esri Web App Builder requirements, development, testing and deployment (public and city use).



## GIS and Asset Management Data Implementation and Support

### County of Alameda

Esri Geodatabase design, local government information model (LGIM), Integration of EDM, engineering modeling, and CMMS, field GPS collection web-map viewer, Latitude Geographics Geocortex, capital improvement viewer, overseas data conversion management, documentation, and training.



## GIS and EAM Consulting Services

### Eastern Municipal Water District (EMWD)

Strategic vision and initiatives for GIS and EAM, system design, technology infrastructure planning, EAM road map development, functional requirements, review commercial vendor/service providers.



## Asset Condition Assessment



Asset condition and how condition changes over time is a key factor influencing asset maintenance and replacement planning. Asset condition evaluation and ratings must be systematic and follow industry standard practices and specifications associated with classes of assets (water, streets, storm drain, etc.). Condition assessment involves many methods of asset inspection, including visual assessment, CCTV inspection, electronic inspection (smart pigs), surface deflection, operational status, and other measures of functional and physical condition.

Often, mobile applications are used to collect raw data or record condition observations in a structured format, enforcing business rules and data integrity. Post processing then generates condition characteristics using human interpretation or AI and programmatic algorithms. Continuous real time monitoring of assets with electronic sensors (IoT/SCADA) can feed automated processes triggering alerts or automatically adjusting asset performance. Measurements can be almost anything – water quality, turbidity, flow rate and volume, cars per day, run time, vibrations, or location for movable assets. Real time sensing is just one component of a Digital Twin that enables enhanced understanding and optimization of the asset lifecycle.

### Did You Know?

These activities are important to agencies because they:

- ▶ Established AI models vastly improve assets alert metrics
- ▶ Smart Pigs can detect corrosion, wall loss, obstructions, and deformations
- ▶ IoT helps create a highly responsive smart ecosystem
- ▶ Collecting data over time provides for better decisions

### Psomas Performs

- ▶ Field inspection and data collection
- ▶ CCTV inspection
- ▶ Asset engineering modelling
- ▶ IoT sensor integration and data analysis



#### Manhole Inspection, Measurements, and 360 Photos

Alameda County



#### Pipeline Condition Assessment with CCTV

City of Torrance



#### Sidewalk Condition Assessment

City of Long Beach, CA





# Visualization



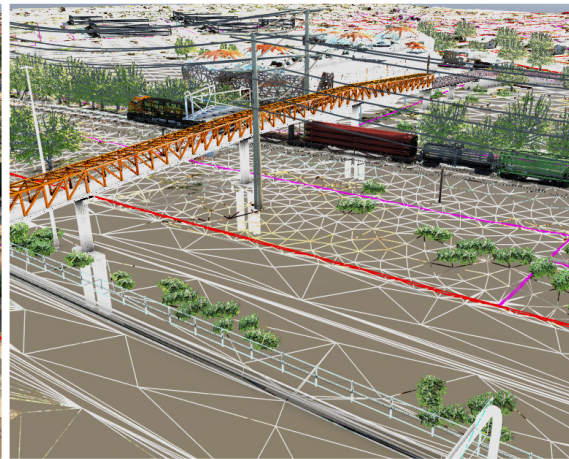
Visualization of EAMS information includes analytics which asks questions of the data collected and focuses on exploring and interpreting data or reports to glean valuable insight into why certain trends happened the way they did. Reporting takes factual data and tells you what is happening, allows comparisons and makes information easier to understand by summarizing the data in tables, charts, and dashboards.

## Did You Know?

- ▶ Visualization helps the human brain process large amounts of complex information for better decisions
- ▶ Dashboards quickly identify areas needing attention or improvement
- ▶ 3D modelling and digital twins give insights into the most important aspects of the data

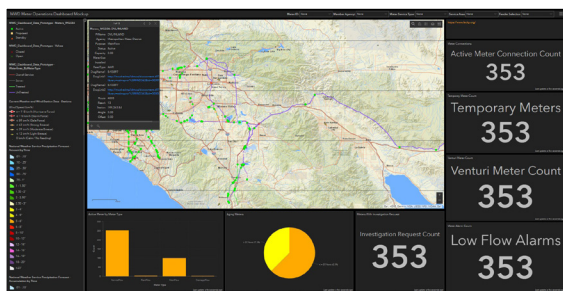
## Psomas Performs

- ▶ Web based GIS viewer for office and field
- ▶ Executive and Operational Dashboards
- ▶ Custom Reporting
- ▶ 3D modeling and digital twins
- ▶ Subsurface visualization using Augmented Reality (AR)



## 3D Visualization (Design, GIS, & Reality Capture)

Union Pacific Rail Road



Meter Operations Dashboard



## Underground Utility Mapping

vGIS



## EAM Program Management



Enterprise asset management (EAM) is a process of managing the lifecycle of physical assets in order to maximize its lifetime, reduce costs, improve quality and efficiency, health of assets and environmental safety. This may include the aggregation of multiple systems used to manage assets from all phases of work.

### Did You Know?

These activities are important to agencies because they:

- ▶ Prolong asset life to achieve the maximum return on investment
- ▶ Promote the move from reactive to predictive maintenance activities
- ▶ Aid decision making related to asset rehabilitation, repair, or replacement
- ▶ Support regulatory requirements reporting

### Psomas Performs

- ▶ strategic asset management planning,
- ▶ needs assessment
- ▶ business process optimization
- ▶ governance (policies/procedures)
- ▶ operations and maintenance management
- ▶ software systems evaluation and selection



### Enterprise Asset Management Consulting Services

#### City of Santa Ana

Asset Management policy development, asset inventory, condition assessment, business process and workflow, systems integration, and capital improvement planning, Enterprise Asset Management System selection.

### Enterprise Asset Management Selection and Implementation Consulting

#### StreetsLA

Needs assessment, business process and technology review, data review, executive dashboards, requirements and strategy documents (EAMS, GIS, EDM), EAMS software selection support.





## Asset Management Needs Assessment

### Jurupa Community Services District

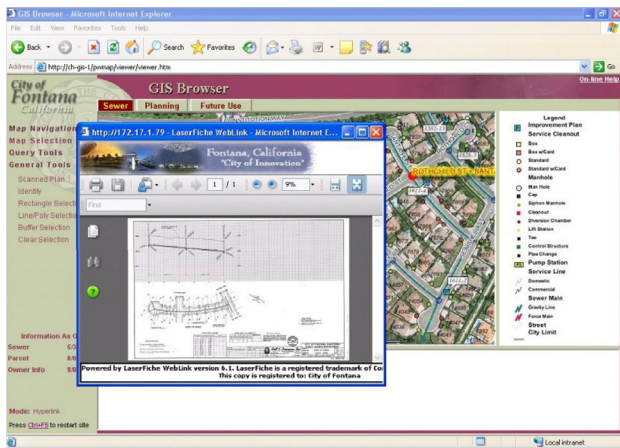
Asset Management Program development, EAM needs assessment, functional and system requirements, GIS data assets review, SCADA, water quality, and inspection systems integration.



## Technology Services Consulting for GIS and Asset Management

### Eastern Municipal Water District

Strategic vision and initiatives for GIS and EAM, system design, technology infrastructure planning, EAM road map development, functional requirements, review commercial vendor/service providers.



## Asset Management Services

### City of Fontana

GIS based data model, full infrastructure management, data driven prioritization of rehabilitation and maintenance activities, infrastructure lifecycle optimization, operational risk reduction, capital budgeting.



## Enterprise Asset Management GIS Integration

### Alameda County Public Works

GIS modeling, CMMS integration, Esri GIS integration, Geodatabase design mobile asset management viewer, CIP system integration, CIP Viewer.



EAM consulting services complement and extend EAM benefits. Consulting services cover a range of EAM planning and management processes including interrelated services contributing to long term financial and asset management planning. These services include Asset Performance Modeling considering condition and demand variables and defining deficiencies. Asset Master Planning can recommend system improvements and phasing plans help address deficiencies. Capital and operational forecasting and budgeting align with Asset Master Plan recommendations and asset operational management practices and can address an asset portfolio investment and define a level of service. Capital Projects Planning defines and tracks approved capital projects using dashboards and other visualization tools, comparing against key performance metrics (KPIs) for internal and public users. Grant writing services can assist in obtaining funding support for both EAM projects and infrastructure improvements. Finally, an asset resilience and emergency management review helps identify asset risks and disaster/emergency response plans to restore service levels.

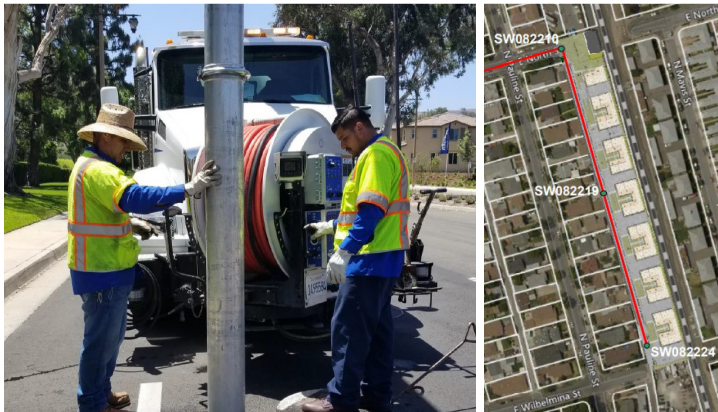
## Did You Know?

These activities are important to agencies because they:

- ▶ Clarify and quantify asset deficiencies
- ▶ Establish proactive asset improvement programs
- ▶ Data driven financial plans
- ▶ Identify funding sources
- ▶ Reduce risks from disasters and emergency events

## Psomas Performs

- ▶ Engineering Modeling
- ▶ CapEx and OpEx Forecasting and Management
- ▶ Infrastructure Master Planning
- ▶ CIP Tracking and Visualization
- ▶ Grant Writing
- ▶ Resilience and Emergency Management



## Central Anaheim Master Plan of Sewers

City of Anaheim

Hydraulic model generating Capital Improvement Program (CIP), capital cost estimates, and Financial Implementation Plan.



## Capital Improvement Project Tracker

Alameda County, CA

Map based CIP viewer to track and share capital projects.

# PSOMAS OVERVIEW



Dedicated to balancing the natural and built environment, Psomas provides sustainably engineered solutions to public and private clients worldwide. As a full-service consulting firm, we help our clients create value and deliver complex projects. Founded in 1946, Psomas provides services from offices throughout California, Arizona, and Utah.

## Enterprise Asset Management

Our EAM Services Division serves the unique needs of our public works and utility clients with staff members truly specialized in EAM data collection and inventory projects; the unique requirements of asset data management and condition assessment, visualization and information access in the office and field, as well as in design and implementation of Enterprise Asset Management Systems.



## Psomas Services

Additional markets served include transportation, water, site development and energy with the following services offered:

- ▶ Civil engineering
- ▶ Transportation and traffic engineering
- ▶ Water and wastewater engineering
- ▶ Land surveying including 3D laser scanning
- ▶ Geographic Information Systems
- ▶ Environmental planning and resource management
- ▶ CEQA consulting
- ▶ Land planning and urban design
- ▶ Land use entitlements
- ▶ Construction management

**616**  
Employees

**15** Offices

**200+** EAM Support Projects

Contact us at  
[EAM@Psomas.com](mailto:EAM@Psomas.com)



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