

**Healthcare Infrastructure  
Sector Asset Leadership Success Structure  
November 12, 2020**

**Introduction**

The Asset Leadership Network (ALN) advocates for a structured approach to improve asset management in the United States. In 2019, the ALN developed a National Asset Leadership Strategy (NALS) to establish foundational concepts for advancing asset management for the nation.

In 2020, the ALN approach evolved to include an implementation structure focused on specific asset sectors, including federal facilities, healthcare, pharmaceuticals, water and others.

To assist sector-based adoption of a national asset management strategy, the ALN developed a template for capturing information that builds a framework for asset management improvement. This template is called the Sector Asset Leadership Success Structure (SALSS), which provides 22 questions to guide industry leaders through initial discussions on a sector-based approach to national asset management. The SALSS is described in the attached presentation.

The template can be used for any asset category. For the healthcare sector, real property (infrastructure) and personal property (equipment) are equally important. Here, the ALN chose to focus on healthcare infrastructure for development of a SALSS.

Specifically, this SALSS addresses real property – buildings, structures and the utility support systems that enable healthcare facilities to safely and efficaciously function. In the following sections the questions posed in the SALSS template are addressed. This is a working document, subject to constant revision and improvement from healthcare sector and other asset management professionals.

**What sector is being addressed?**

Healthcare physical infrastructure – buildings, structures, and utility support systems (excluding land)

**What is the scope of responsibility for this sector?**

Healthcare infrastructure includes all the facilities that house and support staff and equipment necessary to deliver safe and efficacious healthcare to patients.

**What is the scale of the sector?**

The asset management and service provision scale of this sector is critical to the nation. There are over 6,000 public and private hospitals in the United States, and this is exclusive of surgery centers, outpatient clinics, psychiatric clinics, long-term care and specialty care (e.g., endoscopy diagnostic centers). The

scope and magnitude are annually 36 million admissions; \$1.1 trillion in revenues; 924K staffed beds.

By itself, the U.S. Department of Veterans Affairs comprises about 155 million square feet in 172 medical centers; this federal infrastructure is critical to safe healthcare delivery in the United States. Additionally, the Defense Health Agency comprises its own infrastructure where service members are treated.

### **What are the national objectives associated with this sector?**

The objective is to provide safe, timely and efficacious healthcare for the nation.

### **How well are the assets in this sector achieving their national objectives?**

Mixed results – requires more research to break down performance against defined objectives in multiple categories.

### **What are the most pressing problems facing this sector?**

- Aged infrastructure
- Infrastructure incapable of providing sufficient utility capacity or quality (e.g., electrical, HVAC) considering new technologies that increase requirements
- Inadequate sustainment funding
- Inadequate capital funding
- Rapid technological improvements >> difficulty hiring qualified staff to maintain facilities (e.g., building control systems with sophisticated software-hardware control interfaces)

### **What are the strengths of this sector?**

Despite manifold challenges, through the dedicated work of those responsible for maintaining the infrastructure healthcare is being delivered with a certain reliability

### **American Society of Civil Engineers (ASCE) Report Card Score (or other independent assessment, such as GAO Report) for the sector?**

- Medical Centers and hospitals, especially those in a Hahn campus-like setting, are a microcosm of the overall national infrastructure status. The ASCE overall infrastructure grade for the nation is a D+
- GAO report 19-332 highlights electrical grid cyber security vulnerabilities and potential negative impacts
- Average grid circuit is 40 years old (some are 100 years old)
- Real-time monitoring of the grid is limited
- Many utilities are running COBOL language code from the 1950s

- Impact of electric vehicles will be the equivalent of a commercial building moving and reconnecting to the grid; demand usage will become more difficult to predict
- Today the average utility collects 60 million annual data points (five million customers and a dozen annual bills)
- In the future the average utility may have to handle up to 5 billion data points per day in order to efficiently distribute electricity

### **What laws and regulations impact and guide this sector?**

The laws and regulations that impact and guide this sector are too numerous to cite here. However, with respect to the infrastructure, there are federal laws and regulations that are required for federal healthcare sites and where applicable recommended for all others. Using the combined expansive footprint of healthcare facilities in the Department of Veterans Affairs and the Department of Defense as a starting point for addressing national healthcare, applicable federal citations are included below.

The Joint Commission (TJC) is a key voluntary compliance factor that applies to virtually all hospital and clinic healthcare providers. While it is voluntary, passing the TJC survey and achieving accreditation is critical. The revocation of a hospital's accreditation can result in cutting off Medicare funding and many private insurers' funding. The triennial cycle (two years for laboratories) includes a review of approximately 250 standards to address a spectrum of services and policies, including patient rights and education infection control, medication management and credentialing.

- The Joint Commission (voluntary agreement to comply)
- All National Fire Protection Codes (e.g., NFPA 70) that pertain to the infrastructure
- National Fire Protection Association, Life Safety Code 101 (called-out for its scope and impact to any healthcare facility)
- OSHA Occupational Safety and Health Standards 29 CFR 191
- OSHA General Duty Clause. 29 USC 654 5 (a) 1
- Public Law 89-665. National Historic Preservation Act of 1966, as amended
- Public Law 91-190. National Environmental Policy Act of 1970, as amended
- ANSI Building Owners and Managers Association (BOMA) Z65.1, 2017. Standard Methods of Measurement
- Public Law 114-287. Federal Assets Sale and Transfer Act (FASTA) of 2016
- Public Law 111-308. Federal Buildings Personnel Training Act of 2010
- Public Law 114-318. Federal Real Property Management Reform Act of 2016.
- Public Law 97-258. The Antideficiency Act of 1982.
- Public Law 93-400. The Office of Federal Procurement Policy Act of 1974.
- Public Law 81- 152. Federal Property and Administrative Services Act of 1949

- Public Law 106-400. McKinney-Vento Homeless Assistance Act of 2000, as amended
- Public Law 112-154. Honoring America's Veterans and Caring for Camp Lejeune Families Act of 2012
- EO 13327, February 2004. Federal Real Property Asset Management
- EO 12893, February 1994. Principles for Federal Infrastructure Investments
- Federal Acquisition Regulations (FAR), 48 C.F.R. 1
- FAR Contracting Officer Responsibilities, FAR 48 CFR § 1.602-2
- OMB Circular No. A-11 (2018). Appendix 7, V 3.0 Supplement to Planning, Budgeting and Acquisition of Capital Assets
- OMB Memorandum M-18-21, July 2018. Designation and Responsibilities of Agency Senior Real Property Officers
- OMB Memorandum M-19-16, April 2019. Centralized Mission Support Capabilities for the Federal Government
- OMB Memorandum, Spring 2015. National Strategy for the Efficient Use of Real Property
- FAR Part 46 Quality Assurance

**What other boundaries are important? For example, what are their overlaps with other SALSS's?**

Healthcare infrastructure overlaps all other initial SALSS sectors, with emphasis on the *italicized* categories below. For example, water is necessary to bath, feed and treat patients.

- *Water Asset Management*
- *Healthcare Asset Management*
- *Defense and Intelligence Asset Management*
- *Infrastructure Asset Management*
- *Federal Facilities Asset Management*
- Federal Law Enforcement Asset Management
- Pharma Asset Management

**What categories of assets are included?**

Durable constructed assets such as buildings, storage structures and all the related utility systems that enable expected use of the constructed asset:

- Hospitals
- Clinics
- Parking facilities
- Storage structures
- Medical Office buildings
- Normal and emergency electrical power distribution
- Potable and non-potable water
- Sewage
- Sanitary sewer systems

- HVAC, including specialty systems for air changes (surgery), positive and negative pressure (isolation, sterile supply processing)
- Pneumatic controls
- Medical air
- Vacuum
- Bulk liquid oxygen
- Anesthetic gases
- Horizontal and vertical (elevators, dumbwaiters) transport
- Security systems

### **Who owns/controls those assets?**

Ownership and control are widely variable:

- Federal Government (e.g., DOD, VA, Indian Health Service)
- State Governments
- Local Governments
- Religious organizations
- Universities
- Public/Private for-profit entities
- Public/Private not-for-profit entities

### **Who are the stakeholders (reference stakeholder chart on next slide)?**

- Federal agencies
- State agencies
- Local agencies
- All U.S Citizens and visitors
- Patients
- Legislators (federal, state and local)
- Executive branch policy promulgation
- Regulatory agencies
- Professional organizations

### **How will social responsibility be addressed?**

Adhering to the ISO 55001 4.2 guidelines for involving all “relevant stakeholders” will be extremely beneficial in addressing social responsibility. Also, adherence to laws and regulations and established healthcare standards for providing necessary care in life-saving instances.

### **How will stakeholders be included in the development of this document?**

\*\* This requires more discussion \*\*

A core team has drafted the first version of this document. Team members will reach out to experts and related associations for input as the document evolves.

## **What are the objectives for asset management activities in this sector?**

- Assist mission success of U.S. healthcare organizations
- To establish clear governance across the entire real property lifecycle
- To ensure capability in order to successfully perform each function across the entire lifecycle
- To ensure that appropriate organizational voices are heard and considered when setting priorities and allocating funds
- To achieve mission success at the lowest cost and with minimized risk
- Utility systems (electrical, water, HVAC, pneumatic, medical air, vacuum, bulk liquid oxygen, anaesthetic gases) that are safe, current, reliable, well maintained and resilient
- Structurally sound facilities
- Facilities that ensure personal (physical) safety
- Facilities or components thereof should not be in service beyond their useful life (measured from date placed in service) absent a critical state-of-repair review; this would include an updated monitoring and preventive maintenance plan
- Avoid costly, ineffective, short-sighted emergent repairs and replacements
- Maintain Facility Condition Assessments (Facility Condition Indexes) to a metric-defined acceptable level with stratified risk factors considered
- Energy efficiency against established metrics

## **How are these objectives linked to Sector National Objectives?**

The asset management objectives establish the framework, policies and practices that enable successful achievement of the Sector National Objectives.

## **What is the desired end state?**

- Accomplishment of the sector objectives in a consistent, reliable manner
- Establish a cadence of continuous improvement in performance and achieving objectives
- Performance includes both financial and non-financial metrics
- In providing healthcare, patient safety is paramount and must be accounted

## **How will ISO 55000 standards support this effort?**

The ISO 55000 standards provide a structure for governance and clear definition of roles, responsibilities and authorities across the entire asset lifecycle. It also accounts for the promulgation of policy and the support required by various responsible departments in order to perform their duties. Therefore, it will be instrumental in finding ways to leverage real property information with information about personal property and overall healthcare organization mission success. For example, understanding the Personal Protective Equipment inventory at individual healthcare facilities in different regions could help quickly allocate redistribution to regions in greater need.

## **What other voluntary consensus standards and other best practice documents are relevant?**

- International Organization for Standardization ISO 55000, 2014. Asset management – Overview, principles and terminology
- International Organization for Standardization ISO 55001, 2014. Asset management – Management systems: Requirements
- International Organization for Standardization ISO 55002, 2014. Asset management – Asset Management – Management systems – Guidelines for the application of ISO 55001
- International Organization for Standardization ISO 41001, Facility Management
- International Organization for Standardization ISO 9001, Quality Management System
- Construction Industry Institute. Best Practices – Constructability
- Project Management Training Institute. Project Management Plan
- ANSI SAE EIA 748D-2019 Earned Value Management Systems
- Construction Industry Institute. RR291 Improving Accuracy and Timeliness of Project Outcome Predictions
- Department of Energy. Federal Energy Management Program, Operations and Maintenance Best Practices, 2010
- Federal Acquisition Institute (FAI). Project Manager's Guidebook, 2015
- GAO-16-648, July 1996. Federal Real Property
- GAO-16-275, March 2016. Federal Real Property
- General Services Administration (GSA). Facilities Standards for the Public Building Service, P100, April 2018
- GAO-18-420, May 2018. Federal Buildings
- GAO-19-57, November 2018. Federal Real Property Asset Management
- GAO-16-89G, December 2015. Schedule Assessment Guide

## **What are important obstacles to address for the sector asset management system?**

- Institutions
- Laws, Regulations, and Executive Orders
- Cultural
- Inadequate human and capital Resources
- Short-term political thinking
- The common marginalization of infrastructure maintenance to other priorities with real or perceived organizational reward

## **How will adoption of ISO 55000, use of ISO 55000, compliance with ISO 55000, and overall success be measured in this sector?**

The ISO 55000 standard includes the principle of measurable performance. To that end, achievable, meaningful metrics must be generated so that a before-and-after comparison can be made.

These can fall into many categories. Examples:

- The parametric cost to eliminate Facility Condition Assessment/Facility condition Index identified deficiencies
- Number of untoward, unplanned losses of a major utility
- Number and cost of emergent repair/replacement to typical systems such as HVAC chillers and air handlers, roof systems, building envelopes
- Number of postponed surgical procedures due to facility-related failures
- Number of facility-related nosocomial infections (e.g., Legionnaires Disease caused by HVAC or Hot Water systems failure)
- Number of surgical infections due to sterile processing systems failure (e.g., positive/negative pressure; cart washer system failures)
- Number of failed timely execution of preventive maintenance procedures

### **Next Steps**

Open discussion.

D - R - A - E - T