



Designation: E3221 – 19

Standard Guide for Motorized Equipment¹

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1. Scope

1.1 This guide addresses considerations for effectively managing fleets of motorized mobile equipment assets.

1.2 This guide primarily addresses nontactical motorized equipment but may also include other commodity groups such as aircraft and waterborne vessels.

1.3 This guide does not override requirements specific to governmental authorities. However, to the greatest extent practicable, entities should consider the guidance in this standard where the opportunity to realize efficiencies is evident.

1.4 *This standard does not purport to address all of the safety concerns, if any, associated with its use. It is the responsibility of the user of this standard to establish appropriate safety, health, and environmental practices and determine the applicability of regulatory limitations prior to use.*

1.5 *This international standard was developed in accordance with internationally recognized principles on standardization established in the Decision on Principles for the Development of International Standards, Guides and Recommendations issued by the World Trade Organization Technical Barriers to Trade (TBT) Committee.*

2. Referenced Documents

2.1 *ASTM Standards:*²

E2135 Terminology for Property and Asset Management

E2279 Practice for Establishing the Guiding Principles of Property Asset Management

E2306 Guide for Disposal of Personal Property Assets

E2608 Practice for Equipment Control Matrix (ECM)

E2962 Guide for Fleet Management

2.2 *GAO Document:*³

GAO-18-295 Heavy Equipment

¹ This guide is under the jurisdiction of ASTM Committee E53 on Asset Management and is the direct responsibility of Subcommittee E53.08 on Management of Fleet Assets.

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² For referenced ASTM standards, visit the ASTM website, www.astm.org, or contact ASTM Customer Service at service@astm.org. For *Annual Book of ASTM Standards* volume information, refer to the standard's Document Summary page on the ASTM website.

³ Available from U.S. Government Accountability Office (GAO), 441 G St., NW, Washington, DC 20548, <https://www.gao.gov>.

3. Terminology

3.1 *Definitions*—For definitions related to property and asset management, refer to Terminology E2135. For definitions related to fleet management, refer to Terminology E2962.

3.1.1 *motorized equipment, n*—grouping of similar, powered, operated assets designed for off-road and construction purposes.

3.1.1.1 *Discussion*—Typical groups include nontactical, motorized, off-road, and construction assets other than commercially designed highway motor vehicles. Such an asset group may be restricted to one location or may be national or international. Excluded from this definition are assets that have features ordinarily associated with military combat or tactical vehicles such as armor or weaponry, or both. Also excluded are stationary powered equipment such as pumps, compressors, and generators. The assets may be wheeled or tracked and generally have an operator. Included are material handling and construction equipment not designed and used primarily for highway operation (that is, if it must be trailered or towed to be transported on public highways); equipment powered by internal combustion engines or electric motors with combined horsepower ≥ 23 , or both. Examples are: construction, material handling, well-drilling, and aircraft support equipment (for example, de-icers, tugs, baggage carts, stairs); cranes (including hydraulic boom and truck crane units); all-terrain vehicles and mobile generators (usually trailer-mounted).

3.1.1.2 *fleet, n*—grouping of similar assets that are designed to be mobile.

3.1.1.3 *heavy equipment, n*—assets characterized as nontactical heavy equipment fall under this standard within the Federal government, which has no generally accepted definition for heavy or motorized equipment. However, most Federal government heavy equipment fit into one of five categories: (1) construction, mining, excavating, and highway maintenance equipment; (2) airfield-specialized trucks and trailers; (3) self-propelled warehouse trucks and tractors; (4) tractors; and (5) soil preparation and harvesting equipment. (See GAO-18-295.)

3.1.1.4 *yellow iron, n*—assets that fit this common nontechnical (slang) industry description fall under this standard.

3.2 *Abbreviations and Acronyms:*

3.2.1 *CDL*—Commercial driver's license

3.2.2 *FMIS*—Fleet management information system

3.2.3 *GHG*—Greenhouse gas

3.2.4 *OSHA*—Occupational Safety and Health Administration

3.2.5 *TCO*—Total cost of ownership (may also refer to as LCC; Life Cycle Cost)

4. Summary of Guide

4.1 Organizations are able to realize significant cost savings and increases in efficiency when motorized equipment assets are managed strategically and holistically.

4.2 Organizations are able to realize significant cost savings and increases in efficiency when management of a motor vehicle fleet and management of motorized equipment assets fall under the same management group.

4.3 Effective management of motorized equipment assets is multi-faceted. An organization can choose the effort and resources dedicated to its management program based on factors such as investment in the assets, the complexity of the assets themselves, and the risks correlated with the availability of the assets.

4.4 The goal of effective motorized equipment asset management is to maximize the value to the organization while ensuring availability to fulfill the mission and minimizing exposure to risks.

4.5 Management of motorized equipment may differ from motorized equipment operation. Effective management of motorized equipment incorporates appropriate operational policies (communicates “what” must be done) and procedures (communicates “how” to do what must be done).

5. Significance and Use

5.1 Measuring and managing the effectiveness of a motorized equipment program will result in improved accountability and enhanced operational performance. Accountability will be evident through standard performance measures, such as cost savings, increased asset visibility and utilization, extended asset life, petroleum and greenhouse gas (GHG) reductions, and increased mission effectiveness.

6. Decision Process

6.1 *Assets*—To best meet their goals and fulfill missions, organizations will consider which management methods and tools to apply and the level of effort to exert in managing their motorized equipment. Decision points are reached at each phase of the asset lifecycle:

6.1.1 *Acquisition Phase*—Determine appropriate type of motorized equipment asset, acquisition or financing method, procurement procedure, and manage funds needed to acquire assets best suited to meet the organization’s requirement;

6.1.2 *Use Phase*—Manage the operation, utilization, and deployment of motorized equipment assets, including fueling, maintenance, and repairs; and

6.1.3 *Disposal Phase*—Manage disposal to recover any residual value in the motorized equipment asset(s) or to minimize the cost for disposal.

6.2 *Personnel*—Organizations should determine the level of knowledge, expertise, licensing, and training required for the management of motorized equipment to succeed. Management responsibilities should be identified and defined, lines of reporting clear and not complex or conflicting. Personnel decision points are reached during the hiring or promotion stages.

7. Aspects of a Motorized Equipment Management Program

7.1 *Operational Aspects for Consideration:*

7.1.1 *Reasons for and Benefits of an Efficient Motorized Equipment Management System*—The organization must define and assess its current equipment management program and what it is seeking from an effective system for management of its motorized equipment. A statement of mission, goals, objectives, and strategies should be in place to guide the comprehensive program. The statement should be reviewed annually.

7.1.2 *Fleet Management Information System (FMIS)*—In whatever form, the recordkeeping component of the motorized equipment management program must be able to support the organization’s data requirements, as well as furnish information for making informed decisions that will improve the management program. The requirements for a property management system differ from the requirements for an FMIS, which captures operational, maintenance, and repair (including a shop, if applicable) information in addition to asset data. Informational needs for management, operations, and maintenance (including a shop, if applicable) should be identified and guide functionality requirements. Information needs for motorized equipment may exceed what is required for on-road fleet assets. Telematics may be useful for high-cost equipment to track location, utilization, and key operating factors such as engine-idling time, temperature, oil pressure, etc. -19

7.1.3 *Safety*—The organization must consider the safety of the asset operator, the general public, and the people who service, repair, and maintain the assets. Safety should extend to risk management, mitigating exposure to risk and subsequent accidents through effective management and sound inspection protocols, as applicable. Manage the safety inspection program so that each unit is inspected annually, at a minimum.

7.1.4 *Sustainability/Environment*—The organization should consider the impact its motorized equipment has on sustainability and the environment in terms of legal and regulatory compliance, public relations, the desire to be environmental stewards, and ensuring the capability of powering the motorized equipment for the foreseeable future. Fuel consumption and greenhouse gas (GHG) emissions may be considerably higher per unit than for a highway motor vehicle fleet. The organization should be aware that timely replacement with more fuel-efficient and lower GHG-emission equipment can have a significant positive impact.

7.1.5 *Replacement/Acquisition*—All financial options for acquiring and replacing fleet assets should be considered. A lease versus ownership comparison should always be performed. Timing of replacement should be based upon total cost analysis over the lifecycle of the asset, particularly total cost of