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Optimizing Contracting Strategies for Medium Unmanned Aerial System (mUAS) Acquisition: A Comparative Analysis of FAR and Non-FAR Approaches for the U.S. Coast Guard

December 2025

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ABSTRACT

This thesis examines how FAR and non-FAR contracting mechanisms support the U.S. Coast Guard's acquisition of medium unmanned aerial systems (mUAS) as technology evolves faster than traditional procurement processes. The study finds that a phased, life-cycle contracting strategy, leveraging non-FAR tools for early prototyping and FAR mechanisms for production and sustainment—best aligns with Coast Guard mission demands and institutional constraints. The research employs qualitative analysis of statutory authorities, GAO audits, policy documents, and case studies from the Department of Defense, NASA, and Customs and Border Protection. Decision matrices assess FAR Part 15, FAR Part 12, and non-FAR instruments such as OTAs, CSOs, and CRADAs across timeliness, flexibility, discipline and rigor, vendor accessibility, and oversight. Results show non-FAR tools provide superior agility during early development, FAR Part 12 supports commercial integration, and FAR Part 15 ensures transparency and accountability for long-term sustainment. The analysis confirms that no single pathway is optimal across the acquisition life cycle and that the Coast Guard's limited OTA authority constrains rapid innovation. The thesis concludes that a hybrid strategy, expansion of OTA authority, and establishment of a dedicated OTA office would improve agility, reduce acquisition timelines, and strengthen alignment between emerging mUAS technology and operational readiness.

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From the Authors:

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From Zachary Brown:

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LIST OF ACRONYMS AND ABBREVIATIONS

AoA	analysis of alternatives
CBA	capabilities-based assessment
CBP	Customs and Border Protection
CER	cost estimating relationship
COCO	contractor-owned, contractor-operated
CRADA	cooperative research and development agreement
CSO	commercial solutions opening
DHS	Department of Homeland Security
DIU	Defense Innovation Unit
DOD	Department of Defense
FAR	Federal Acquisition Regulation
GAO	Government Accountability Office
MDA	Milestone Decision Authority
mUAS	medium unmanned aerial system
NASA	National Aeronautics and Space Administration
NPS	Naval Postgraduate School
OTA	Other Transaction Authority
OT	Other Transaction
PoR	program of record
PPBE	Planning, Programming, Budgeting, and Execution
R&D	research and development
RDT&E	research, development, test, and evaluation
UAS	unmanned aerial system
USCG	United States Coast Guard

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I. INTRODUCTION

The accelerating pace of technological innovation in the unmanned aerial systems (UAS) sector poses both an opportunity and a challenge for the United States Coast Guard (USCG). Medium-range UAS (mUAS) offer capabilities for persistent surveillance, enhanced maritime domain awareness, and operational flexibility across a wide spectrum of missions. Yet, while the commercial market for unmanned systems has advanced rapidly, federal acquisition processes have often proven too rigid and slow to adapt. This tension between technological evolution and institutional procurement structures underscores the need for a tailored acquisition framework for the Coast Guard.

The Coast Guard occupies a distinctive place within the U.S. federal structure. It is simultaneously one of the nation's six armed Services and a federal law enforcement agency. In peacetime, the Coast Guard operates under the Department of Homeland Security (DHS), but upon the declaration of war (if Congress so directs) or by presidential order, 'the Coast Guard shall operate as a service in the Navy', subject to direction from the Secretary of the Navy (14 U.S.C. § 103, 2018) This dual character creates both opportunities and constraints in the acquisition domain. Unlike the Department of Defense (DOD), which manages a robust and mature acquisition enterprise, the Coast Guard must navigate DHS oversight processes that are often not optimized for military-grade systems. Furthermore, the Service has limited organic research and development (R&D) authority, reducing its ability to prototype and experiment with emerging technologies. These institutional realities complicate the Coast Guard's ability to acquire mUAS in a timely and flexible manner.

The Coast Guard's broad portfolio of statutory missions adds urgency to this challenge. The Service is responsible for search and rescue, maritime law enforcement, drug interdiction, migrant interdiction, Arctic operations, environmental protection, port and waterway security, and defense readiness (National Academies of Sciences, Engineering, and Medicine, 2020, p. 15). Many of these missions require persistent surveillance over vast maritime regions, rapid deployment of sensors, and the ability to adapt quickly to dynamic operational environments. The Coast Guard's manned aviation

fleet is increasingly constrained by age and capacity limitations, creating widening capability gaps. As Henkel (2023) notes, mUAS offer a viable means to mitigate these shortfalls through enhanced endurance, affordability, and mission responsiveness (pp. 1–3).

Traditional acquisition pathways available to the Coast Guard have not proven fully sufficient to meet these needs. FAR Part 15 (negotiated procurements) provides rigorous oversight and suitability for complex systems but is procedurally intensive and slow. FAR Part 12 (commercial item acquisitions) offers streamlined access to commercial technologies but is often constrained by the difficulty of aligning military requirements with strict definitions of "commerciality." Non-FAR mechanisms, such as Other Transaction Authority (OTA), Commercial Solutions Openings (CSOs), and Cooperative Research and Development Agreements (CRADAs), have been employed successfully by other federal agencies to accelerate technology adoption and broaden vendor participation. However, these instruments remain underutilized or structurally inaccessible within the Coast Guard's current acquisition framework.

A. RESEARCH QUESTIONS

This study is guided by two central research questions:

- Primary Research Question: How do FAR Part 15, FAR Part 12, and non-FAR instruments compare in supporting the Coast Guard's ability to acquire medium UAS in a timely, innovative, and operationally responsive manner?
- Secondary Research Question: What insights from other federal agencies' use of FAR Part 15, FAR Part 12, and non-FAR approaches can inform the Coast Guard's development of a more flexible and responsive contracting framework for current and future UAS acquisitions?

B. PROJECT OBJECTIVES

To address these questions, the research pursues three specific objectives:

Evaluate the Effectiveness of Contracting Mechanisms for mUAS Acquisition. Assess how FAR Part 15, FAR Part 12, and non-FAR instruments (such as OTA)

align with the Coast Guard's need for timely, innovative, and mission-responsive procurement of mUAS. This includes analyzing legal structures, procedural complexity, and vendor accessibility.

Identify Lessons from Peer Agencies' Acquisition Practices. Examine how other federal agencies, such as the DOD, National Aeronautics and Space Administration (NASA), and Customs and Border Patrol (CBP) have successfully leveraged various acquisition strategies (FAR and non-FAR) to procure rapidly evolving technologies. The objective is to extract actionable insights that can inform Coast Guard acquisition reform and improve adaptability.

Develop a Comparative Framework for Contract Strategy Selection. Design a tailored decision-making framework to guide Coast Guard acquisition personnel in selecting the most appropriate contract type for mUAS procurement. This framework synthesizes findings into a practical tool for balancing speed, cost, oversight, and operational effectiveness in future acquisitions.

C. SCOPE AND LIMITATIONS

The scope of this study is limited to mUAS acquisition within the Coast Guard. While insights may be broadly applicable to other categories of emerging technology, the analysis is deliberately centered on mUAS due to its operational relevance and rapidly advancing commercial marketplace. The methodology is qualitative in nature, drawing upon statutory and policy documents, GAO reports, prior academic and professional studies, and case comparisons from peer agencies. Constraints include limited Coast Guard–specific acquisition data and the evolving nature of UAS technology and federal procurement policy.

D. ORGANIZATION OF THE THESIS

This thesis is organized into five chapters. Chapter I introduces the research problem, explains the Coast Guard's institutional context, and outlines the research questions, objectives, and scope. Chapter II provides background on the Coast Guard's operational drivers, institutional acquisition environment, and the statutory authorities that

shape its procurement posture, situating the mUAS requirement within these broader dynamics. Chapter III reviews the relevant literature on acquisition strategies for rapidly evolving technologies, with particular attention to the advantages and limitations of FAR Part 15, FAR Part 12, and non-FAR mechanisms. This literature review draws on academic research, GAO reports, and prior Naval Postgraduate School theses to highlight recurring themes such as speed to fielding, vendor accessibility, bureaucratic burden, regulatory flexibility, and suitability for commercial technology acquisition. Chapter IV presents the analysis, comparing the relative strengths and weaknesses of FAR and non-FAR approaches against Coast Guard needs and incorporating lessons from peer agencies such as the DOD, NASA, and CBP. Finally, Chapter V outlines the key findings and provides recommendations for the Coast Guard's future acquisition strategy, emphasizing that different contracting tools are most appropriate at different stages of a program's evolution and that no single method is ideally suited across the entire acquisition life cycle.

Together, these chapters move from context to evidence to application. Chapter II establishes why mUAS acquisition poses unique challenges for the Coast Guard. Chapter III demonstrates how various acquisition strategies have been treated in the broader literature, setting the analytical foundation. Chapter IV applies these insights through a comparative framework and supplements the analysis with lessons drawn from peer agencies. Chapter V integrates these results to answer the research questions and propose a decision-making framework for Coast Guard acquisition personnel.

E. SUMMARY

The Coast Guard faces a confluence of operational challenges and acquisition barriers that hinder the timely adoption of mUAS. While these systems offer significant potential to close persistent capability gaps, current procurement pathways, particularly under FAR Part 15, may not deliver the required responsiveness. A comparative analysis of FAR-based and non-FAR-based contracting approaches provides the insights necessary to align acquisition processes with mission-critical needs.

II. BACKGROUND

Having outlined the research problem and objectives in Chapter I, it is essential to establish the broader context in which the Coast Guard conducts acquisitions of rapidly evolving technologies. Unlike the DOD, which operates within a well-developed acquisition enterprise, the Coast Guard functions within a hybrid institutional posture that blends military, law enforcement, and regulatory responsibilities. This unique position shapes both the operational drivers that create demand for new capabilities and the institutional constraints that affect how those capabilities are acquired.

This chapter provides the foundation for the analysis that follows. It begins by describing the Coast Guard's mission demands and operational environment, highlighting the gaps in persistent surveillance and maritime domain awareness that motivate the search for effective mUAS. It then examines the Coast Guard's acquisition environment, including its statutory authorities, organizational oversight under DHS, and historical challenges in executing complex procurement programs. From there, the discussion turns to an overview of the principal acquisition mechanisms, FAR Part 12, FAR Part 15, and selected non-FAR instruments, establishing the baseline understanding of how these tools function and where their limitations lie. Finally, the chapter situates these mechanisms within the broader technology evolution context, emphasizing the pace of commercial innovation and the challenges of integrating dual-use technologies into Coast Guard operations.

Together, these sections set the stage for the literature review in Chapter III and the comparative analysis in Chapter IV by grounding the study in the Coast Guard's operational realities and institutional constraints.

A. OPERATIONAL DRIVERS FOR MUAS

The Coast Guard's diverse mission set creates a persistent demand for flexible, affordable, and enduring airborne surveillance platforms (Gaudio, 2022). Unlike the Navy, which primarily focuses on command of the seas, or the Air Force, which emphasizes air dominance, the Coast Guard operates across an extraordinary range of environments by

nearly every definition. It is simultaneously tasked with maintaining safety and security in the most congested domestic ports and waterways such as New York Harbor and the Port of Los Angeles, patrolling remote Arctic regions where infrastructure is scarce and environmental conditions are extreme, and deploying forces to conflict-prone areas such as the Persian Gulf to support U.S. Central Command operations. In between, the Service is also responsible for vast stretches of the Pacific approaches to Guam and Hawaii, migrant flows in the Caribbean, narcotics interdiction in the Eastern Pacific transit zone, and fisheries enforcement in the Bering Sea. Many of these missions arise emergently and are temporary in nature, disaster response, surge deployments for counter-smuggling, or contingency operations abroad, making large-scale infrastructure investments or permanent surveillance networks both impractical and cost prohibitive. In many of these regions, meaningful surveillance capacity is absent, shore-based radar coverage is limited, and aviation infrastructure is minimal (GAO, 2020). The result is a reliance on cutters and manned aircraft that are stretched thin across expansive operating areas, leaving persistent gaps in maritime domain awareness.

Current aviation assets are insufficient to fully meet USCG mission demands. The Coast Guard's fixed-wing fleet, centered on the HC-130 and HC-144, is aging and heavily tasked. Rotary-wing platforms such as the MH-65 and MH-60 have been the mainstay of Coast Guard aviation for decades, but their sustainability is rapidly approaching its terminus. As a Forbes article noted,

> The Coast Guard needs to move fast. The crisis in the Coast Guard's rotary wing community not going away. As of early December [2024], almost 18 percent of the Coast Guard's 45-strong MH-60T "Jayhawk" medium range recovery fleet is out of service. Eight helicopters with over 19,000 flight hours are, as of now, permanently grounded…. The flight hour restrictions have jolted the service. In a real-world sense, a cut of a thousand hours clips almost two years of service from each Jayhawk. And the likelihood that the big helicopters will never be able to run beyond 20,000 hours, matching the incredible 30,000 hours the Coast Guard is forcing out of their smaller MH-65E Dolphin helicopters, is shaking the Coast Guard's Headquarter's dogged support for an aviation recapitalization strategy that has, of late, faced a steady drumbeat of delay and several harsh doses of reality. Coast Guard leadership is finally showing signs of throwing in the towel and recognizing reality. A new aviation strategy is under development. In a December 10th email, a Coast Guard spokesperson wrote, "We are

> developing a comprehensive strategy for the future of Coast Guard Aviation," that "will outline aircraft transitions across our rotary and fixed-wing fleets, as well as the potential development of an uncrewed fleet." (Hooper, 2024).

These aging platforms are highly effective in discrete operations but are often unavailable for long-duration or unanticipated contingencies because of finite airframe availability and maintenance cycles. The result is a widening capability gap in maritime domain awareness, particularly in regions where emergent operations cannot be supported by pre-positioned infrastructure or enduring aviation detachments. As a platform class, mUAS offer an attractive option to close this gap (Henkel, 2023). With greater endurance than rotary-wing platforms, lower operating costs than manned fixed-wing aircraft, and the ability to integrate a wide array of sensors, mUAS can provide persistent coverage without requiring the heavy infrastructure footprint that would otherwise be necessary for larger aviation forces (Henkel, 2023).

Strategic dynamics further intensify the need for expanded unmanned capability. Near-peer competitors such as China and Russia have increased activity in the Arctic and other maritime regions, challenging U.S. presence and freedom of navigation (Gaudio, 2022). Transnational criminal organizations likewise continue to adapt smuggling routes and methods, frequently shifting operations to exploit weak points in maritime surveillance (GAO, 2019a). Simultaneously, the frequency of severe weather events and natural disasters has increased significantly in recent decades, heightening the demand for Coast Guard surge capacity across multiple, unpredictable contingencies (Shenoy et al., 2022).

From 2007 through 2020, the Coast Guard conducted more than twenty major surge operations, high-intensity, and short-notice deployments in response to catastrophic events such as hurricanes, oil spills, and humanitarian crises (GAO, 2021). These operations required rapid mobilization of aircraft, cutters, and personnel, with asset levels scaled to each event's severity and duration (GAO, 2021). Such mission sets are typically temporary, lasting days to months, but their recurrence is constant, requiring scalable and flexible tools that can be surged quickly and withdrawn once the immediate need passes. In each of these contexts, mUAS provide a deployable surveillance option that extends the reach of surface

forces, delivers persistent coverage without major infrastructure, and improves the speed and accuracy of operational decision-making.

The demand for persistent maritime domain awareness is therefore not an abstract or future-facing requirement; it is a recurring operational reality shaped by the Coast Guard's extraordinarily diverse and often temporary missions. Without expanded unmanned capability, the service risks overstretching its manned aviation fleet, reducing coverage in critical regions, and falling behind both adversaries and partners in the integration of rapidly evolving technologies. These operational drivers underscore why the Coast Guard requires acquisition strategies that allow it to access and integrate mUAS capabilities more quickly and flexibly than traditional procurement approaches have historically allowed.

B. COAST GUARD ACQUISITION ENVIRONMENT

These constraints are compounded by the Coast Guard's limited resourcing for research, development, test, and evaluation (RDT&E). Whereas the DOD dedicates approximately sixteen percent of its total budget to RDT&E, amounting to about $143 billion in fiscal year 2025, the Coast Guard's comparable investment represents only about one-tenth of one percent of its annual appropriation (Department of Defense [DOD], 2024; U.S. Coast Guard [USCG], 2024; National Defense Authorization Act for Fiscal Year 2025 [NDAA], 2024). This disparity underscores not merely a difference in scale but a structural imbalance in research infrastructure.

Unlike the DOD, which operates a mature innovation ecosystem anchored by extensive laboratory networks and technology-transition pathways, the Coast Guard maintains only a modest RDT&E infrastructure. The National Academies of Sciences, Engineering, and Medicine concluded that the Service lacks a formal means for identifying, investigating, and integrating new technologies, emphasizing that its research capacity is modest compared to other federal agencies (National Academies of Sciences, Engineering, and Medicine [NASEM], 2020,). The Coast Guard's Research and Development Center serves as its single dedicated facility, relying on cooperative research with DOD laboratories, the Defense Innovation Unit, and industry to explore and adapt new

technologies (U.S. Coast Guard, 2023). These structural limitations restrict the Service's ability to transition promising technologies, such as unmanned systems, from experimentation to operational employment. The Coast Guard's limited research and prototyping infrastructure has not only constrained its ability to innovate but has also influenced the structure of its acquisition programs. Nowhere was this more evident than in the Service's attempt to modernize its fleet through the Integrated Deepwater System Program, a case that illustrates the risks of large, inflexible acquisition models within an underdeveloped institutional framework.

The history of the Coast Guard's Integrated Deepwater System Program illustrates the risks of pursuing large and inflexible acquisition strategies within this environment. Initiated in 2002 as a 20-year recapitalization effort for cutters, aircraft, and supporting systems, Deepwater sought to modernize the Service's aging fleet through an ambitious "system-of-systems" approach managed by a single prime integrator (Hertzler et al., 2014). Under this structure, the Coast Guard awarded a $17 billion contract to Integrated Coast Guard Systems (ICGS), a joint venture between Lockheed Martin and Northrop Grumman, to serve simultaneously as the developer, systems engineer, and overseer of its own work (Hertzler Waller, Ahmed, 2014). The intent was to "outsource" much of the program's management, allowing the contractor to coordinate multiple assets and subsystems under one umbrella rather than managing dozens of separate contracts. However, as Hertzler et al. explain, "through mismanagement and lack of oversight, the Deepwater program to modernize the fleet was scrutinized and reexamined," ultimately compelling the Coast Guard to assume direct ownership of modernization in 2007 (p. 1). This experience underscored the dangers of delegating oversight authority to the same entity responsible for execution and highlighted the enduring need for transparent, government-led management in complex procurement programs.

Together, these institutional constraints and historical experiences define the Coast Guard's acquisition environment. Oversight by DHS introduces additional layers of review compared to DOD pathways. Limited acquisition infrastructure and workforce capacity restrict the service's ability to prototype or experiment with new technologies. Historical missteps such as Deepwater reinforce the risks of relying on rigid, high-risk procurement

models. Against this backdrop, the Coast Guard's ability to procure mUAS depends on identifying acquisition approaches that minimize the bureaucratic burden, encourage innovation, and avoid the pitfalls of past major programs.

C. STATUTORY AUTHORITIES FOR OTHER TRANSACTION USE

Statutory authorities form the legal backbone that either enable or constrain the Coast Guard's use of non-FAR instruments. Among these, OTAs provides federal agencies with flexible agreements that bypass many procurement statutes, accelerating access to emerging technologies and nontraditional vendors. For the Coast Guard, three statutory regimes are most relevant: its organic authority codified in Title 14, the DHS's authority under Title 6, and the DOD's mature framework under Title 10. Each contains distinct scope, limitations, and operational implications, particularly with respect to the ability to transition prototypes into production. Table 1 summarizes these authorities:

Table 1. USCG Non-FAR Contracting Authority Summary (14 U.S.C. § 1158, 2023)

Dimension	14 U.S.C. § 1158 (Coast Guard)	6 U.S.C. § 391 (DHS)	10 U.S.C. §§ 4021-4022 (DOD)
Authority Holder	Commandant, USCG	Secretary, DHS	Secretary, DOD
Scope	Mission-critical advanced technologies	Research, development, prototypes	Research, prototypes, production
Prototype Authorization	Implicit (advanced tech testing)	Explicit	Explicit
Follow-On Production	Not authorized	Not authorized	Explicitly authorized (non-competitive)
Competition Requirement	Must recompete under FAR	Must recompete under FAR	Waived if statutory conditions met
Operational Infrastructure	Minimal; ad hoc agreements	DHS S&T managed	Mature enterprise with OTA offices
Utilization	Sparse	Moderate (CBP, TSA)	Extensive; billions annually

The Coast Guard's organic OTA authority is established in 14 U.S.C. § 1158 (14 U.S.C. § 1158, 2023), which permits the Commandant to enter into transactions "to operate, test, and acquire cost-effective technology for the purpose of meeting the mission needs of the Coast Guard." This provision represents Congressional recognition that the Service must have access to flexible, non-FAR acquisition instruments to keep pace with rapidly evolving operational needs. However, its scope is carefully bounded. Transactions under section 1158 must align with Coast Guard policies, comply with cybersecurity standards, and avoid foreign sourcing risks such as entities connected to the People's Republic of China. The statute also mandates training programs to prepare Coast Guard personnel for administering these agreements and directs the Commandant to promulgate implementing regulations. Despite this authority, the Coast Guard has only minimally operationalized section 1158. Unlike the DOD, it lacks a dedicated OTA office or institutional infrastructure, and agreements are generally executed on a case-by-case basis. Thus, while the statute provides a valuable tool for targeted technology testing and acquisition, its application remains narrow and underdeveloped.

Broader OTA authority exists at the Department of Homeland Security (DHS) level under 6 U.S.C. § 391, enacted as part of the Homeland Security Act of 2002 (6 U.S.C. § 391, 2022). This provision grants the Secretary of Homeland Security the authority to enter into other transactions for research, development, and prototype projects across DHS components (6 U.S.C. § 391, 2022). In practice, this authority is primarily managed through the DHS Science and Technology Directorate and overseen by the DHS Chief Procurement Officer (Barringer & Miles, 2021). The Coast Guard, as a DHS component, may access this authority, but only through DHS structures and oversight processes (Barringer & Miles, 2021). While broader in scope than section 1158, the DHS regime is less tailored to service-specific mission needs and imposes additional layers of approval that undercut the speed advantage OTAs are intended to provide (Barringer & Miles, 2021; Weinig, 2019). Importantly, Title 6 does not authorize follow-on production agreements, meaning that any prototype project reaching maturity must transition into a separate FAR-based procurement process for production (research and development projects, 2022; Office of the Under Secretary of Defense for Acquisition and Sustainment [OUSD (A&S)],

2023). The DOD operates under an expansive and mature OTA framework, codified in 10 U.S.C. §§ 4021–4022 (10 U.S.C. § 4021, 2023, 10 U.S.C. § 4022, 2023). Section 4021 authorizes OTAs for basic, applied, and advanced research, while section 4022 authorizes OTAs for prototype projects. Figure 1 below shows how non-FAR authorities are situated within the various contracting methods available to the DOD.

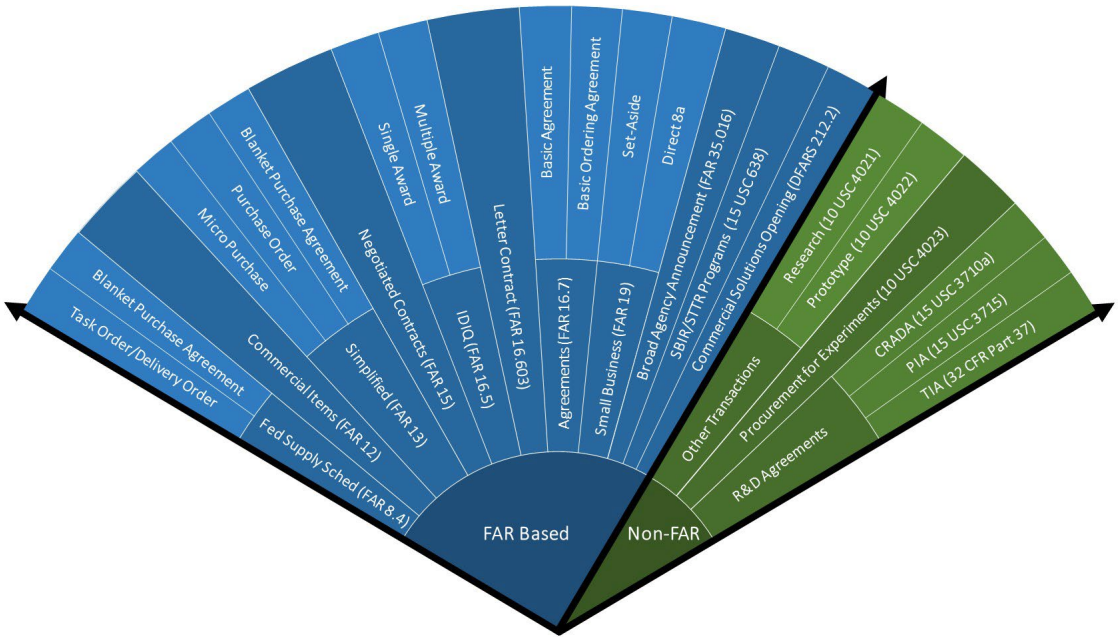

Figure 1. The Contracting Cone. Source: Defense Acquisition University, (n.d.)

Most critically, section 4022(f) provides explicit authority for follow-on production agreements (PPTOTCPG, 2023). This provision permits the government to move directly from a prototype OTA into a production OTA without conducting a new FAR Part 15 competition, provided that three conditions are met: (1) the prototype OTA was competitively awarded, (2) the prototype was successfully completed, and (3) the original solicitation or award indicated the potential for a follow-on production effort (PPTOTCPG, 2023). This statutory bridge between prototype and production is unique to the DOD and has proven transformative. It allows successful innovations developed through the Defense Innovation Unit or service-level OTA offices to scale rapidly into programs of record, closing the so-called "valley of death" that often strands promising technologies between

experimentation and fielding. Billions of dollars in obligations have flowed through this pathway, demonstrating its utility and institutional acceptance (GAO, 2025a).

When compared side by side, the Coast Guard's OTA authority under 14 U.S.C. § 1158 is considerably narrower than the DOD's framework and, in practice, less autonomous than the DHS's Title 6 authority. Both sections 1158 and 391 lack explicit statutory provisions for follow-on production, forcing Coast Guard projects to reenter traditional FAR competitions when moving from prototype to fielding. Figure 2 shows how these authorities vary by stages:

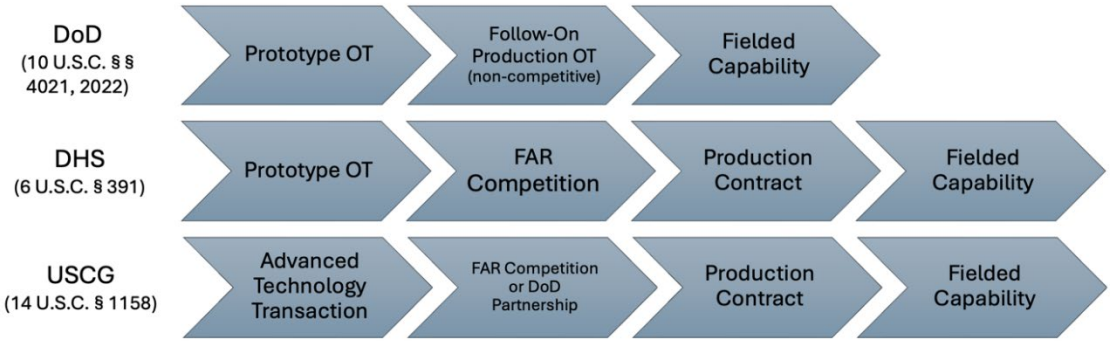

Figure 2. Composition by Contract Authority (GAO, 2025a)

This requirement introduces delays of months or even years and diminishes the incentives for nontraditional vendors to engage, as they cannot rely on a streamlined pathway to production. By contrast, the DOD's statutory ability to waive further competition under section 4022(f) fundamentally reshapes the acquisition cycle, enabling continuity from prototype through deployment (PPTOTCG, 2023). Figure 3 summarizes these authorities by scope:

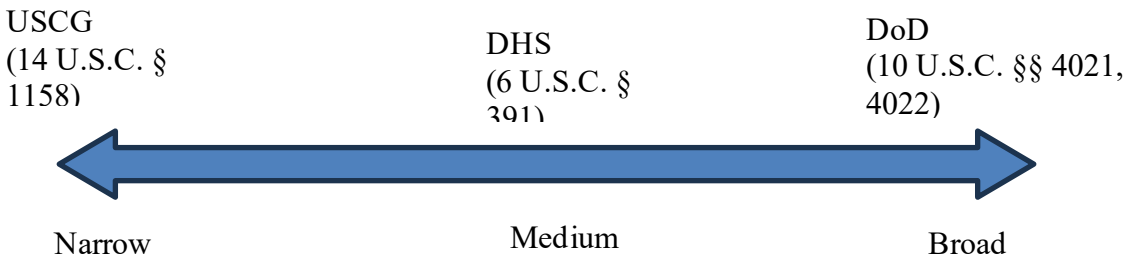

Figure 3. Spectrum of OTA Authorities Available to USCG

For the Coast Guard, the absence of follow-on production authority is a structural limitation that undercuts the potential impact of its OTA framework. The Service must either compete production efforts anew under FAR Part 12 or 15 or seek partnership with the DOD to leverage Title 10 authority. Both options diminish speed and flexibility. From a policy perspective, amending 14 U.S.C. § 1158 to mirror the DOD's section 4022(f) could provide the Coast Guard with an equally powerful mechanism to bridge prototyping and production. Such a reform would align Coast Guard acquisition tools with the realities of a technology market characterized by rapid innovation cycles, particularly in domains like UAS and cybersecurity.

In sum, statutory authority for OTAs exists in all three domains, Title 14 for the Coast Guard, Title 6 for DHS, and Title 10 for the DOD, but only the DOD possesses the full spectrum of authority to move seamlessly from research to prototyping to production. The Coast Guard's limited application of section 1158 reflects both structural oversight constraints and the absence of a statutory production pathway. Without reform, the service will remain dependent on either DHS processes or DOD partnerships to bridge the innovation-to-fielding gap, perpetuating a slower and less agile acquisition posture.

D. COOPERATIVE RESEARCH AND DEVELOPMENT AGREEMENTS

In addition to OTAs, the Coast Guard and DHS may also employ CRADAs under 15 U.S.C. § 3710a. CRADAs are statutory instruments created under the Stevenson–Wydler Technology Innovation Act of 1980, as amended, to facilitate collaborative research between federal laboratories and non-federal partners. Under these agreements, a federal agency may provide personnel, facilities, equipment, or other resources, while the

non-federal partner contributes funding, equipment, or intellectual property (15 U.S.C. § 3710a, 2023). Unlike OTAs, CRADAs are not procurement vehicles and do not obligate appropriated funds; rather, they provide a cooperative framework for early experimentation and knowledge sharing (15 U.S.C. § 3710a, 2023).

Scholarly analyses of non-FAR acquisition authorities describe CRADAs as part of the same family of "alternative" mechanisms as OTAs, Partnership Intermediary Agreements (PIAs), and Technology Investment Agreements (TIAs), all of which are designed to broaden the government's engagement with nontraditional actors (Barringer & Miles, 2021). While CRADAs do not serve the same role as OTAs in acquiring prototypes, they are often integrated into the acquisition ecosystem as a means to "burn down" the risks of emerging technologies by allowing early testing and collaboration without triggering full FAR-based contracting requirements. In this sense, CRADAs complement OTAs: they establish a collaborative foundation that may set the stage for subsequent prototype or acquisition activities under OTA or traditional contracting frameworks. Figure 4 illustrates how CRADAs and OTAs can be sequenced to accelerate the transition of an emerging technology into operational service. Rather than moving directly from laboratory research into a full FAR-based procurement, these mechanisms enable phased collaboration, prototyping, and scaling proven solutions.

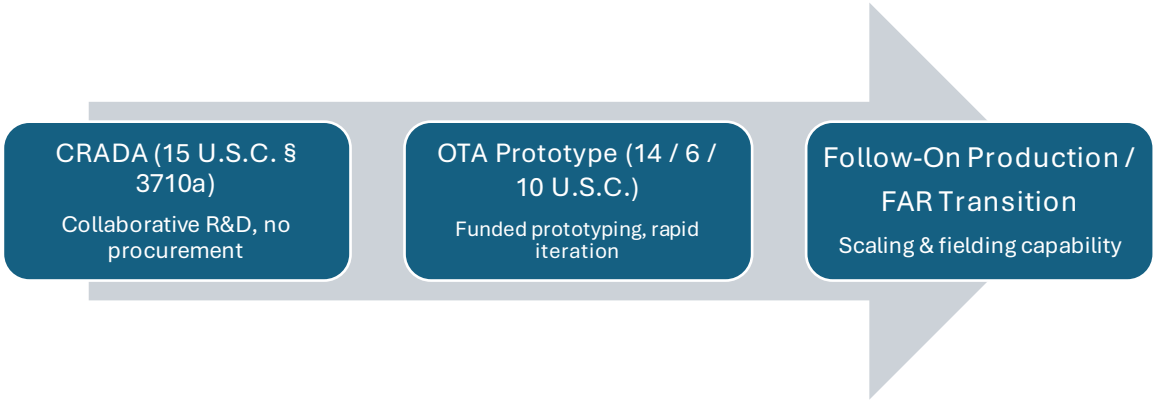

Figure 4. Integration of Non-FAR Mechanisms to Field Emerging Technology

E. ILLUSTRATIVE USE-CASE: DEVELOPING A MARITIME UAS SENSOR

Imagine the Coast Guard identifies a promising commercial sensor capable of autonomously detecting oil spills from a medium unmanned aerial system (mUAS). The path from concept to fleet deployment could unfold in three phases, as was shown in Figure 4.

1. CRADA Phase (15 U.S.C. § 3710a)

The Coast Guard Research and Development Center enters into a CRADA with a technology firm and a university laboratory. The Coast Guard provides access to cutters and maritime test ranges, while partners contribute prototype sensors and analytic expertise. No procurement occurs in this phase, but the CRADA enables collaborative testing and iterative refinement of the technology in real-world conditions.

2. OTA Prototype Phase (14 U.S.C. § 1158 / 6 U.S.C. § 391 / 10 U.S.C. § 4022)

If the concept demonstrates technical promise, the Coast Guard may transition to an OTA prototype agreement under its own Title 14 authority, access DHS authority under Title 6, or partner with the DOD under Title 10. This agreement would fund multiple prototypes, integrate the sensor with Coast Guard sUAS, and support operational demonstrations. The flexibility of the OTA framework allows rapid iteration without the constraints of FAR-based contracting.

3. Follow-On Production or Transition to FAR

If the project is managed under the DOD's Title 10 authority, a successful prototype OTA may move directly into a follow-on production OTA under 10 U.S.C. § 4022(f), permitting immediate scaling without a new competition. The Coast Guard, lacking explicit follow-on production authority, must either partner with the DOD to leverage Title 10 provisions or revert to a FAR Part 12 or Part 15 procurement, informed by data gathered during the prototype phase.

Sequenced together, CRADAs and OTAs give the Coast Guard a pragmatic pathway to identify, test, and refine commercial technologies such as maritime UAS sensors. This stepwise approach allows the Service to validate concepts at low cost before committing resources to more formal prototype or procurement efforts.

In broader terms, CRADAs and OTAs are complementary instruments for bridging the gap between research and fielded capability. CRADAs provide the cooperative foundation for early experimentation, while OTAs enable rapid prototyping and limited acquisition. For the Coast Guard, which lacks a robust research and development infrastructure, combining these mechanisms offers a practical means of accessing innovation, mitigating risk, and accelerating the transition of technologies like mUAS into operational service without relying solely on protracted FAR-based procurement.

F. SUMMARY

This chapter has outlined the Coast Guard's unique operational and institutional context for acquiring rapidly evolving technologies such as mUAS. Subchapter A highlighted the service's extraordinarily diverse operating environments, ranging from congested domestic ports to remote Arctic regions and overseas contingency zones, and underscored the emergent, often temporary nature of many missions. These conditions create persistent demands for flexible and scalable surveillance capabilities that cannot be met solely by traditional aviation assets. Subchapter B examined the Coast Guard's acquisition environment under DHS oversight, noting the service's limited acquisition infrastructure, lack of dedicated research and development capacity, and historical challenges exemplified by the Deepwater Program. Together, these factors underscore the structural constraints that shape how the service pursues new technology.

Subchapters C and D turned to the statutory authorities and alternative mechanisms available to the Coast Guard. Although the service possesses organic Other Transaction Authority under Title 14 and may access DHS authority under Title 6, these frameworks lack the robust follow-on production provisions available under the DOD's Title 10 regime. CRADAs were shown to offer a complementary, low-cost means of collaborative experimentation, particularly valuable for a service without extensive in-house R&D

infrastructure. When used in combination, CRADAs and OTAs present a pathway to reduce risk, broaden engagement with nontraditional vendors, and accelerate the transition of commercial technologies into operational use.

Taken together, these sections demonstrate that the Coast Guard operates within a demanding mission environment and under institutional constraints that make agility and innovation essential. Yet its acquisition tools remain fragmented and underdeveloped compared to peer agencies. This tension provides the foundation for the analysis that follows. Chapter III surveys the academic and policy literature on acquisition strategies for rapidly evolving technologies, identifying the strengths and limitations of FAR Part 12, FAR Part 15, and non-FAR instruments. These insights establish the evaluative criteria applied in Chapter IV to assess how different contracting approaches can best support Coast Guard mUAS acquisition.

III. LITERATURE REVIEW: ACQUISITION STRATEGIES FOR RAPIDLY EVOLVING TECHNOLOGIES

This chapter reviews the existing body of literature on acquisition strategies for rapidly evolving technologies, with particular emphasis on their application to mUAS. It distinguishes between traditional Federal Acquisition Regulation (FAR) approaches and alternative, non-FAR authorities, and examines how each framework aligns with the competing imperatives of speed, vendor accessibility, bureaucratic manageability, regulatory flexibility, and suitability for commercial technology integration. The discussion is grounded in a wide range of sources, including Government Accountability Office (GAO) audits, DOD policy guides, statutory authorities, and prior Naval Postgraduate School (NPS) theses.

The chapter is structured as follows. Section III.A introduces the contrast between FAR Part 15 (negotiated contracting), FAR Part 12 (commercial item acquisition), and non-FAR mechanisms such as OTAs and CSOs. Sections III.A.1 through III.A.5 address key comparative themes identified across the literature: (1) speed to fielding, (2) vendor accessibility and nontraditional participation, (3) bureaucratic burden and administrative complexity, (4) legal and regulatory flexibility, and (5) suitability for commercial technology acquisition. Each subsection synthesizes findings from GAO reports, federal guidance, and academic research, highlighting both the advantages and risks of each approach. Section III.A.6 concludes with an integrated assessment of how these strategies collectively shape acquisition outcomes for rapidly evolving technologies.

By surveying these five thematic dimensions, the literature establishes the analytical foundation for subsequent chapters. In particular, it demonstrates that no single acquisition strategy is universally optimal; rather, each offers distinct trade-offs that must be balanced in light of Coast Guard mission demands and institutional constraints. This sets the stage for the thesis analysis in Chapter IV, which applies these insights to the Coast Guard's prospective mUAS acquisition strategy.

Defense acquisition literature distinguishes between traditional FAR-based methods and alternative non-FAR authorities when procuring rapidly evolving

technologies. FAR Part 15 governs negotiated contracting (often used for complex development programs), and FAR Part 12 provides streamlined procedures for commercial product. FAR Part 12 was introduced by the Federal Acquisition Streamlining Act of 1994 to prioritize use of commercial items with simplified terms (Federal Acquisition Streamlining Act of 1994, 1994). However, even these FAR frameworks carry procedural and legal complexities that can slow procurement or deter innovative vendors. In contrast, non-FAR mechanisms, notably OTA agreements and CSO, operate outside most standard procurement laws. These alternative instruments have been employed by agencies like the DOD and NASA to tap into emerging commercial technology markets with greater speed and flexibility. The fundamental question in current research is how these disparate approaches compare in enabling timely, innovative, and responsive acquisition of technologies such as mUAS. This literature review synthesizes findings across several key themes, speed to fielding, vendor accessibility, bureaucratic burden, legal/regulatory flexibility, and suitability for commercial technology, to provide context on the efficacy of FAR Part 12, FAR Part 15, and non-FAR strategies in acquiring rapidly evolving tech. Throughout, studies from both academic and practitioner perspectives (including DOD guides and Naval Postgraduate School theses) are referenced to illustrate consensus and debate in the field.

1. Speed to Fielding

A recurring theme in acquisition reform literature is the need for speed in acquiring cutting-edge technology before it becomes obsolete or an adversary gains advantage. Traditional FAR Part 15 processes are often criticized for lengthy timelines resulting from rigid milestones, extensive documentation, and formalized competition and negotiation requirements. These procedures, though intended to ensure fairness and accountability, frequently delay the fielding of operational capabilities. For example, the U.S. Coast Guard's reliance on standard DHS/FAR procurement structures has produced protracted acquisition schedules, echoing what the Government Accountability Office recently described as "rigid, sequential processes" that hinder adaptation to evolving threats and the integration of emerging innovation (Government Accountability Office [GAO], 2025b, p. 2).

As shown in Figure 5, the GAO found that major defense acquisition programs now take nearly 12 years on average to deliver an initial operational capability, underscoring the systemic inefficiency of legacy, linear models. This figure, adapted from the GAO's 2025 testimony to Congress, visually captures how traditional milestone-based development continues to delay capability delivery across DOD's largest programs, despite decades of reform initiatives.

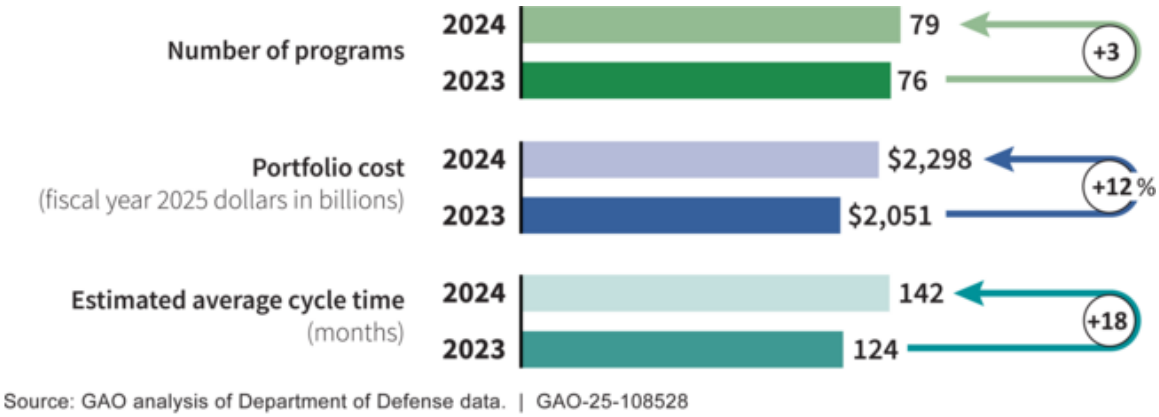

Figure 5. Major Defense Acquisition Programs Continue to Delay Capability Deliveries (GAO, 2025b)

To address urgent needs, the DOD has increasingly turned to OTA-based prototyping and similar rapid acquisition pathways. Other Transaction (OT) agreements, used under 10 U.S.C. § 4022 authority, allow agencies to carry out prototype projects with far fewer procedural hurdles than FAR contracts. According to Weinig (2019), OTs "sidestep the vast majority of existing laws and regulations" governing federal contracts, placing minimal restrictions on how projects are executed. This freedom enables faster award and execution of prototype projects, in effect, trading the assurance of exhaustive oversight for speed and agility. Empirical examples support the speed advantage: the Defense Innovation Unit (DIU), using OTA-like CSO procedures, has awarded prototype contracts for commercial tech companies "in as little as 60 days," far faster than traditional procurement could achieve (Defense Innovation Unit, 2022).

Over the past five years, the Defense Innovation Unit (DIU) transitioned 20 commercial solutions to DOD users and partnered with approximately 120 nontraditional vendors, demonstrating the pace at which innovation can be fielded through flexible acquisition mechanisms (Defense Innovation Unit, 2023). Gibson (2023) observes that new authorities like the CSO under 10 U.S.C. § 3458 can "shift the current contracting paradigm," yielding "better, faster, and stronger capabilities, and at a lower cost to the taxpayer" (p. 447). The literature thus strongly indicates that non-FAR approaches, by design, prioritize speed to fielding, a critical attribute for rapidly evolving technologies, whereas FAR-governed approaches often struggle to keep up with the needed tempo.

At the same time, researchers caution that speed must be balanced with due diligence. Rapid vehicles like OTAs lack many of the review checkpoints of FAR acquisitions, potentially increasing risk if not managed wisely. Some studies note that fast-tracking acquisition can succeed only with proper safeguards and clear objectives. For instance, the DOD's own *Other Transactions Guide* (updated in 2023) emphasizes that OTA success depends on planning and oversight commensurate with project risk, even as formal processes are minimized (DOD, 2023). Legal analysts likewise observed that the 2023 update reflects a more mature understanding of the OT landscape, emphasizing that successfully leveraging OT authorities requires thoughtful planning, sound documentation, and tailored internal controls to manage flexibility responsibly (Bell, 2023). Overall, however, the consensus is that for emerging technologies such as mUAS, where development cycles are short and threats evolve quickly, the ability to compress acquisition timelines is a decisive benefit of alternative approaches. By expediting prototyping and field evaluations, these methods can deliver operational capabilities while they are still technologically relevant. This rapid fielding imperative sets the stage for comparing how different acquisition strategies perform on other criteria such as industry participation and administrative burden. Vendor Accessibility and Nontraditional Participation

Another critical issue in the literature concerns access to innovative vendors, particularly nontraditional contractors and commercial startups that drive technological advancement. Traditional FAR-based procurement, especially under Part 15, has been widely characterized as cumbersome, compliance-heavy, and discouraging to firms

unfamiliar with government contracting. Barringer and Miles (2021) observe that the United States remains "tied down by regulation, laws, and bureaucracy," with acquisition offices increasingly turning to non–FAR-based instruments to "find risk-appropriate deregulated solutions" (p. v). Similarly, Weinig (2019) describes the defense acquisition system as operating under a "staggering amount of rules and regulations, inversely proportional to the level of trust extended by the public" (p. 110). These layers of oversight and procedural rigidity tend to favor large, incumbent contractors equipped with compliance infrastructure and experienced proposal teams, while deterring smaller technology firms from participation. As a result, the DOD often struggles to access cutting-edge commercial innovation. Gibson (2023) echoes this concern, noting that the FAR process can be "complex and bureaucratic, leading to significant delays and cost overruns" that make it "difficult for industry to innovate" (p. 447). Collectively, these studies suggest that the traditional regulatory framework, though designed to safeguard public resources, has the unintended consequence of narrowing the defense industrial base by excluding agile, nontraditional suppliers.

The literature finds that FAR Part 12 was a step toward improving accessibility by treating suppliers more like commercial customers. FAR 12 acquisitions use market terms and simplify requirements (for example, fewer unique government clauses), theoretically lowering barriers for commercial firms to bid. However, FAR-based solicitations still involve formal advertising, detailed contracting officer oversight, and often lengthy evaluation, which can be discouraging to companies used to the commercial marketplace pace. In practice, FAR 12 has not fully bridged the gap for nontraditional participation in fast-moving tech areas.

By contrast, non-FAR approaches (OTs and CSOs) are frequently credited with expanding the vendor base. OT agreements allow the government to craft agreements "unique and tailored" to each project and partner, which makes it easier to accommodate a firm's commercial business practices, intellectual property (IP) rights, and timeline. Weinig (2019) notes that OTs enable creative business arrangements with nontraditional contractors, bringing a "potential for rapid advancement of critical technologies into defense systems" by leveraging firms that would otherwise avoid federal contracts (p. 123).

The DIU example above vividly illustrates this: over 60 companies that had never worked with the DOD were enticed to submit solutions via the DIU's CSO/OTA process (Defense Innovation Unit, 2023). Those firms were likely drawn by the simpler solicitations (often just a short proposal or pitch instead of a complex RFP response) and by flexible terms that could be negotiated to mutual benefit.

Literature also highlights the success of CSOs in widening the competitive field. A CSO is essentially an open invitation for industry to propose innovative commercial products or services, evaluated with streamlined procedures. Gibson (2023) argues that the CSO authority, especially when combined with the follow-on production capability of OTAs, can bring in fresh commercial solutions and accelerate their transition to the field (Gibson, 2023). In the absence of such mechanisms, agencies like the Coast Guard, which operate under similar federal acquisition constraints, risk relying on the same limited pool of defense contractors, missing fast-moving startups. While specific Coast Guard analyses are limited, the broader literature suggests that heavy reliance on FAR-based processes "ties down" acquisition offices with regulation and bureaucracy, hindering innovative, vendor-competitive solutions (Barringer & Miles, 2021).

In summary, current research suggests that alternative acquisition strategies markedly improve vendor accessibility, encouraging participation from nontraditional and commercial companies that are often the source of cutting-edge tech. By reducing the procedural burden on offerors and allowing more flexible negotiation, OTAs and CSOs help defense agencies tap into a broader innovation ecosystem than the one reachable through standard FAR contracting. This broadening of the industrial base is viewed as essential for keeping pace with rapid technological change.

2. Discipline and Rigor as a Structural Feature of Traditional Contracting

While traditional acquisition pathways are often criticized for their bureaucratic weight, the literature also underscores the critical value of the discipline and rigor they impose. FAR-based acquisitions, particularly major procurements executed under Part 15, embed extensive statutory and regulatory controls designed to ensure transparency,

accountability, and defensible stewardship of public funds. This structured environment establishes predictable processes, reinforces compliance, and provides well-understood guardrails for decision-makers. As Weinig (2019) notes, the Defense Acquisition System is intentionally built upon layers of statutory and policy requirements that safeguard competition, fairness, and responsible expenditure of taxpayer resources. Barringer and Miles (2021) similarly observe that these formal controls, though sometimes viewed as restrictive, create a framework that anchors acquisition programs in traceable documentation, standardized procedures, and enforceable oversight, attributes essential for long-term program stability and audit readiness.

This emphasis on discipline is especially visible in the FAR/DFARS regime's detailed review cycles, milestone documentation, and integrated oversight mechanisms, such as justification and approval requirements, source-selection procedures, and audit trails. Such measures ensure that acquisition teams maintain rigorous accountability throughout the procurement process. Analysts acknowledge that this level of structure may slow adaptation to rapidly evolving technology markets, particularly in areas like unmanned systems (Dew, 2012; Jones, 2014), yet they also emphasize that the underlying framework promotes defensibility, cost control, and high-integrity program execution over the life cycle.

By contrast, Non-FAR acquisition approaches, such as Other Transaction (OT) agreements and Commercial Solutions Openings (CSOs), offer significantly more freedom to shape business arrangements and iterate rapidly. Freed from most FAR clauses, Competition in Contracting Act provisions, and socioeconomic mandates, OT agreements enable teams to negotiate terms directly and tailor agreements with exceptional agility (DOD, 2023). This flexibility reduces procedural friction and accelerates award timelines, supporting faster technology maturation and broader engagement with nontraditional vendors. However, the absence of structured processes means these tools do not inherently provide the same guardrails that FAR pathways do.

For that reason, the literature urges caution: when discipline is removed from the framework, it must be recreated by the workforce. Barringer and Miles (2021) find that although non-FAR tools eliminate procedural rigidity, they also elevate the importance of

practitioner expertise, team cohesion, and internal governance. Without standardized templates or prescriptive guidance, acquisition teams must apply their own judgment to ensure responsible execution, risk management, and documentation. The Defense Acquisition University's "Contracting Cone" underscores this point, noting that OT agreements demand strong, experienced contracting, legal, technical, and financial personnel to design and manage agreements effectively. As one respondent in Barringer and Miles's (2021) research described it, success in the non-FAR environment requires comfort operating in a space with fewer predefined rules, a realm that some practitioners termed a "lawless land" (p. 19), not because it lacks accountability, but because it requires internal discipline rather than externally imposed structure.

Taken together, the literature describes a clear trade-off: FAR-based pathways institutionalize discipline and rigor through formal controls, while OTAs and CSOs shift the responsibility for discipline onto the acquisition workforce. Organizations that excel with non-FAR methods, such as the Defense Innovation Unit, do so by investing in training, cultivating empowered teams, and building internal best practices that compensate for the absence of mandated processes. For rapidly evolving technology areas such as unmanned systems, reducing unnecessary procedural steps is valuable and can accelerate innovation, but it must be balanced with deliberate, workforce-driven rigor to ensure programs remain accountable, well-managed, and aligned with statutory obligations.

B. LEGAL AND REGULATORY FLEXIBILITY

Hand in hand with reducing bureaucracy is the legal flexibility that different acquisition strategies offer. FAR-based contracting is constrained by a myriad of statutes, competition requirements, procurement integrity, contract cost principles, and others, that ensure fairness but limit adaptability. The literature frequently notes that emerging commercial technologies often do not fit neatly into FAR's categories or benefit–cost tradeoffs. For instance, intellectual property (IP) and data rights for new technologies can be a sticking point: FAR and DFARS contain standard clauses that many commercial firms find onerous, such as granting the government broad rights to technical data.

Alternative approaches provide more leeway. An OTA can include bespoke IP or licensing terms that are mutually agreeable, since it is essentially a commercial-style agreement negotiated under private law principles. This legal flexibility extends to other areas as well, project milestones, payment arrangements (e.g., fixed-price milestone payments versus cost reimbursement under FAR), and even contract modifications can be handled more fluidly. Weinig (2019) emphasizes that OT agreements "place significant discretion into the hands of the government when spending taxpayer funds," enabling business arrangements "not possible under standard contracts" (pp. 108–109). In effect, the government is freer to exercise business judgment and common sense rather than adhering to one-size-fits-all rules.

Another form of flexibility is the Commercial Solutions Opening (CSO) process, codified in 10 U.S.C. § 3458 (2023), which is designed to be far more adaptable than FAR Part 15 competitions. As Gibson (2023) explains, the CSO authority is "broadly worded" and intentionally lacks detailed implementing regulations, which "need not scare the acquisition community" (p. 447). Rather, this flexibility allows solicitations and evaluations to be tailored to the innovation at hand. The absence of exhaustive official guidance has been cast as an opportunity: acquisition teams can experiment with simplified evaluation methods, such as oral pitches or merit-based criteria focused on technical feasibility, and adjust iteratively as they learn (Gibson, 2023). This flexibility is critical when interfacing with the commercial tech sector, where speed and adaptability are valued over procedural formality.

The literature also cautions that with greater flexibility comes greater responsibility and risk. Legal analysts point out that because OTs bypass most procurement laws, they carry potential for misuse or inconsistency if not properly managed. Accountability in the expenditure of public funds remains essential. The DOD's *Other Transactions Guide* (2023) underscores this point, outlining best practices such as maintaining competition to the maximum extent practicable and using milestones or deliverables to preserve oversight (DOD, 2023, pp. 5–6). Another statutory constraint is that OT awards for prototypes must ultimately transition to a follow-on production OT or contract, or produce a tangible prototype; they are not intended for open-ended service arrangements. Despite these

guardrails, most authors conclude that legal flexibility is a net enabler for innovation. When rules can be adapted to fit the technology, the government can negotiate more attractive terms and remove legal barriers to adopting commercial solutions. A concrete example is software or UAS licensing: under FAR, such terms might be deemed non-standard, but under an OTA or CSO, the government can accept commercial terms if they deliver faster or more comprehensive access to the capability.

Barringer and Miles (2021) further highlight that leveraging such flexibility often demands a cultural transformation in the acquisition workforce. As they note, citing Dunn (2017), "Nothing short of culture change is required" for organizations to embrace non-FAR innovation methods (as cited in Barringer & Miles, 2021, p. v). Traditional training emphasizes compliance with the FAR; by contrast, success with flexible instruments requires comfort with ambiguity and informed risk-taking. Their interviews revealed that many Air Force contracting officers felt outside their comfort zones when using authorities with minimal regulatory scaffolding, reinforcing that training and education must evolve alongside statutory flexibility.

In summary, regulatory flexibility is a double-edged sword: it provides the means to craft better, faster contracts for emerging technologies, but it places the onus on acquisition professionals to exercise sound judgment and integrity in the absence of rigid procedural checklists.

1. Suitability for Commercial Technology Acquisition

Finally, scholars examine which strategies are most suitable for acquiring commercial technology, as opposed to developmental, defense-unique systems. Like many modern capabilities, mUAS often originate from commercial innovation sectors such as drone manufacturing, electronics, sensors, and software. The federal acquisition system has historically struggled to integrate such commercial off-the-shelf (COTS) or rapidly evolving products in a timely manner.

FAR Part 12 was the principal reform intended to address this issue by allowing agencies to buy commercial products on commercial terms. As defined in FAR 2.101 (2023), a commercial product is an item "of a type customarily used by the general public

or by non-governmental entities for purposes other than governmental purposes." Moreover, FAR 12.101(a) directs agencies to "acquire commercial products or commercial services, or nondevelopmental items when available," and Subpart 12.6 establishes streamlined solicitation and evaluation procedures, including the use of commercial item descriptions, warranties, and financing provisions. These features make Part 12 acquisitions generally more suitable than FAR Part 15 for readily available technologies such as drones or sensor packages.

Accordingly, procurements of non-developmental UAS for the Coast Guard or DOD should employ Part 12 whenever feasible to avoid military-unique specifications that inflate cost and extend schedules (Collins Aerospace, 2022). A recent Naval Postgraduate School study by Henkel (2023) on long-range UAS options for the Coast Guard found that a COTS or government off-the-shelf solution could meet operational needs at lower cost and with faster delivery than developing a new system, underscoring the importance of acquisition pathways that harness commercially available technology. When a capability gap can be filled by the market, the acquisition process should facilitate rapid integration rather than defaulting to protracted development cycles.

However, the literature also notes that not all commercial technologies neatly fit FAR Part 12. Cutting-edge products may require limited prototyping or customization before deployment. This is where Other Transaction Authorities (OTAs) and Commercial Solutions Openings (CSOs) become particularly effective. These approaches allow the government to experiment with commercial technologies through pilots or demonstrations without the formality of full FAR contracting. For example, a CSO can be used to solicit mUAS demonstrations from industry in operational scenarios, selecting the most promising through a simplified competition and then employing an OTA to refine or scale the chosen system for mission use.

This "Fast Following = CSO + OTA" model described by Gibson (2023) illustrates how the government can leverage commercial innovation through CSO competitions and rapidly transition the best solutions into production via follow-on OTAs. Such hybrid approaches are especially relevant in domains where the commercial sector outpaces government development cycles. Rather than dictating detailed specifications, the agency

defines the problem and invites industry to propose solutions, the guiding philosophy behind CSOs and other open innovation frameworks. The DOD's *Other Transactions Guide* (2023) explicitly encourages engagement with nontraditional suppliers for research and prototyping "to incorporate cutting-edge commercial science and technology into defense programs" (p. 5).

Another aspect of suitability involves adaptability to change. While FAR contracts can include options and incremental (spiral) development features, the formal change process often hinders rapid iteration. Non-FAR agreements, by contrast, operate more like commercial contracts and can be modified bilaterally to add scope, features, or technical improvements without requiring extensive justification or deviation approvals. This agility makes them particularly well-matched to fast-evolving fields such as unmanned systems, artificial intelligence, and cyber tools, where requirements are continuously refined. Moreover, partnering directly with the original commercial developers enables the government to benefit from ongoing vendor innovations, such as new sensors or improved power systems. Henkel's (2023) Coast Guard UAS study reinforces this point, concluding that collaboration with existing industry providers would allow the service to capitalize on continuous product improvement cycles with minimal delay.

In summary, the literature suggests that for commercially driven technologies, FAR Part 12 and non-FAR acquisition strategies are generally more suitable than traditional development contracts. FAR Part 12 provides an avenue to acquire proven products efficiently, provided a valid commercial-item determination is made. Non-FAR methods such as OTAs and CSOs, meanwhile, enable collaboration with commercial innovators in adapting technology for government use without imposing unnecessary procedural constraints. Many analysts argue that the DOD and agencies like the Coast Guard must embrace these methods if they are to maintain parity with the private sector's pace of innovation in unmanned and related technologies. The overarching goal, reflected across recent theses and policy analyses, is to bridge the gap between defense acquisition and the commercial technology cycle, ensuring that military and homeland security missions can field relevant capabilities while they remain at the leading edge of technological development.

2. Conclusion

Across the academic and policy literature on defense acquisitions, there is broad agreement that no single contracting approach is universally best for rapidly evolving technologies, each comes with trade-offs. Traditional FAR Part 15 contracting provides structure, rigor, and familiarity but often at the cost of speed and innovation. FAR Part 12 commercial item acquisitions streamline some rules to better leverage the market, yet still operate within the FAR framework that can limit agility. Non-FAR approaches, including OTAs and CSOs, offer unparalleled flexibility and speed, enabling the government to cut through red tape and engage nontraditional vendors on more commercial terms. Studies such as Barringer and Miles (2021) and Weinig (2019) laud these alternative methods for empowering faster prototyping and broader industry participation. Empirical evidence, from DIU's rapid drone acquisitions to successful prototyping of AI tools under OT agreements, validates the potential for improved outcomes in terms of speed to field and access to innovation.

At the same time, the literature is clear-eyed about the challenges and prerequisites for using flexible strategies effectively. A recurring conclusion is that organizations must invest in the people and processes to capitalize on new authorities. This includes training acquisition staff in OT/CSO execution, fostering a culture that rewards prudent risk-taking, and building multidisciplinary teams (contracting, legal, finance, and operational end-users) to manage projects without the safety net of detailed regulations. When those conditions are met, alternative acquisition strategies can significantly improve the government's ability to keep pace with technological change. For instance, the DOD's 2023 OT Guide and recent policy reforms encourage greater use of these approaches precisely because they have shown results in delivering prototypes quickly and attracting cutting-edge vendors (DAU, 2023).

To consolidate these insights, Table 2 provides a comparative summary of the acquisition strategies examined throughout the literature. It highlights the defining characteristics, advantages, and limitations of FAR Part 15, FAR Part 12, and non-FAR instruments, illustrating the situational contexts in which each approach is most effective. The table serves as a bridge between the conceptual review presented here and the

operational analysis that follows, distilling the key evaluative criteria later applied in Chapter IV's decision matrix.

Table 2. Summary of Acquisition Strategy Attributes

Theme	FAR Part 15	FAR Part 12	Non-FAR (OTA/CSO)
Speed to Fielding	Lengthy, milestone-driven processes; high risk of obsolescence (GAO, 2018a)	Somewhat faster but still constrained by FAR rules (GAO, 2017b)	Designed for rapid prototyping; awards in months not years (Weinig, 2019; GAO 2025b)
Vendor Accessibility	Complex proposals favor incumbents; deters small firms (Steinberg, 2020)	Streamlined but still requires FAR compliance (Barringer &Gibson, 2023; GAO, 2017b)	Broadens base to nontraditional firms; simplified solicitations (Barringer &Miles, 2021; Gibson, 2023)
Discipline and Rigor	Heavy compliance and reporting requirements; strong oversight (GAO, 2018a)	Moderately reduced but still significant. (GAO, 2018b)	Minimal structure; requires experienced teams to manage risk (Barringer &Miles, 2021)
Regulatory Flexibility	Rigid clauses on data rights, competition, and cost accounting (Barringer &Miles, 2021; GAO, 2017a)	Slightly more adaptable but still standardized (FASA, 1994.)	Highly flexible; bespoke terms and IP arrangements possible (OUSD[A&S], 2023)
Commercial Suitability	Poor fit for commercial innovation; favors bespoke development (GAO, 2017a)	Intended for commercial items, but hindered by definition disputes (GAO, 2018b)	Well aligned with commercial innovation cycles; supports adaptation and scaling (Henkel, 2023; GAO, 2025b)

In conclusion, this literature review establishes that the efficacy of an acquisition strategy is context dependent. For rapidly evolving, commercially driven technologies like mUAS, the consensus points toward integrating more flexible, streamlined acquisition pathways in order to minimize delay, invite innovation, and adapt to change. FAR-based and non-FAR approaches should not be seen as mutually exclusive but rather as tools to be carefully matched to the situation. The literature provides a contextual groundwork for the

thesis analysis that follows: it underlines why exploring a mix of FAR Part 12, FAR Part 15, and non-FAR instruments is critical for future U.S. Coast Guard acquisitions of mUAS. By synthesizing these studies and lessons from statutory authorities to case examples, we gain a clearer understanding of how each strategy can either hinder or enhance the rapid procurement of emerging technologies, and what steps can mitigate their downsides. This foundation supports the subsequent analytical chapters in evaluating real-world contracting options and formulating recommendations for an optimized acquisition strategy. These findings motivate the comparative analysis in Chapter IV, where the criteria derived from this literature are operationalized in a decision matrix tailored to USCG sUAS/mUAS acquisitions.

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IV. ANALYSIS

The preceding chapters established the Coast Guard's operational requirement for mUAS, reviewed relevant acquisition scholarship, and extracted lessons from peer federal agencies. Building upon that foundation, this analysis chapter evaluates the relative merits and limitations of three primary contracting pathways available to the Coast Guard: FAR Part 15 (2025), negotiated procurement; FAR Part 12 (2025), commercial item acquisition; and non-FAR instruments such as OTAs and CSOs. This evaluation is not undertaken in the abstract but is framed by the Coast Guard's unique institutional environment, namely, its position within the DHS, its constrained research and development authorities, and its reliance on traditional federal procurement structures that have historically inhibited rapid technology adoption.

The Coast Guard's challenge mirrors broader trends across the DOD and other federal agencies: balancing the need for timely and innovative procurement with the imperatives of accountability, oversight, and mission assurance. Previous NPS research underscores this tension. Jones (2014) observed that unmanned systems acquisition strategies are vulnerable to premature consolidation and rigid funding cycles that can suppress innovation. Henkel (2023) found that the Coast Guard's acquisition frameworks require adaptability to integrate commercial unmanned solutions into a service portfolio historically structured around manned aviation. Barringer and Miles (2021) further highlighted that non-FAR instruments are often misunderstood and underutilized due to training gaps and cultural resistance, despite their demonstrated ability to accelerate acquisition in other contexts.

A. DECISION FRAMEWORK AND MATRIX FOR MUAS CONTRACTING OPTIONS

Against this backdrop, the analysis proceeds in two steps. First, each contracting pathway is examined individually, highlighting its procedural characteristics, advantages, and limitations when applied to mUAS procurement. Second, the chapter applies a comparative framework, structured around five thematic criteria identified earlier in this

study: speed and timeliness, flexibility and innovation, discipline and rigor, vendor accessibility, and oversight and risk management. This thematic comparison is operationalized through a decision matrix that systematically differentiates each contracting option along these axes, enabling both qualitative discussion and structured evaluation.

The aim of this chapter is not to declare a single "optimal" pathway but to illuminate the trade-offs inherent in each approach. In doing so, it provides the Coast Guard acquisition community with a practical decision-making framework that accounts for institutional constraints, operational urgency, and the rapidly evolving commercial drone market. This comparative analysis thereby supports the broader objective of the thesis: to recommend a contracting strategy that is both mission-responsive and institutionally feasible for the Coast Guard's future mUAS acquisitions.

1. FAR Part 15: Traditional Negotiated Procurement

FAR Part 15 establishes the framework for negotiated procurements and remains the dominant contracting pathway for complex or high-value federal acquisitions.

a. Procedural Characteristics

FAR Part 15's defining characteristic is procedural rigor: requirements for comprehensive solicitations, source selection plans, detailed evaluation criteria, and extensive negotiation documentation. These mechanisms exist to ensure fairness, transparency, and legal defensibility in federal contracting decisions. For agencies subject to close scrutiny, such as the Coast Guard operating within DHS, this framework offers institutional credibility and a robust audit trail.

(1) Advantages

The strengths of Part 15 are evident. It provides transparent competition, a defensible record against bid protests, and avenues for resolving disputes that reinforce public trust in procurement decisions. These features are especially attractive to agencies like the Coast Guard that have faced congressional criticism and oversight following past acquisition challenges such as Deepwater. The GAO has repeatedly underscored that Part

15's rigor can protect agencies from accusations of favoritism or waste, making it a valuable tool for programs expected to face high political and institutional scrutiny (GAO, 2018b).

(2) Limitations

Yet these very features also impose significant burdens. The GAO's reviews of DOD acquisitions have shown that negotiated procurements frequently experience "delays tied to extensive documentation and review cycles," creating gaps between operational demand and fielded capability (GAO, 2025c, p. 18). Similarly, the GAO's assessments of Coast Guard recapitalization programs found that complex design and oversight requirements contributed to prolonged timelines and escalating costs for major shipbuilding efforts, undermining readiness and budget stability (GAO, 2023, pp. 7–8). These findings echo Jones's (2014) observation that unmanned systems acquisitions are particularly vulnerable to premature lock-in when subjected to inflexible funding and procedural frameworks.

Vendor accessibility further illustrates the trade-off. The compliance costs associated with responding to a Part 15 solicitation, long proposal timelines, disclosure requirements, and complex pricing models, can discourage participation by small businesses and nontraditional firms. The GAO (2017a) found that such burdens limit competition, disproportionately excluding innovative companies new to government contracting. Their report explained:

> According to representatives from 12 innovative companies that do not typically do business with the Department of Defense (DOD), there are several challenges that deter them from selling their products and services to DOD or further developing their products and services for military use. These challenges can be grouped into the six areas shown in the table below.

Challenges That Deter Companies from Developing Products for Military Use	
Complexity of DOD's process	Intellectual property rights concerns
Unstable budget environment	Government-specific contract terms and conditions
Long contracting timelines	Inexperienced DOD contracting workforce

Source: GAO presentation of company observations. | GAO-17-644

> According to these company representatives, collectively these challenges have created an environment where companies choose to either not pursue

> DOD business or believe that their resources could be better spent pursuing commercial business where the cost to compete is lower and selection decisions are made faster. For example, 1 of the 12 companies GAO spoke with conducted a cost comparison study and found that it took 25 full time employees, 12 months and millions of dollars to prepare a proposal for a DOD contract. In contrast, the study found that the company used 3 part time employees, 2 months, and only thousands of dollars to prepare a commercial contract for a similar product. (GAO, 2017a, p. 2)

For the Coast Guard, which must tap into commercial UAS markets dominated by small and mid-sized firms, this exclusionary effect is problematic. Instead of opening the aperture to novel solutions, Part 15 risks narrowing the field to established defense primes more comfortable with compliance regimes.

The Coast Guard's own acquisition history reinforces this point. The GAO has long documented the service's difficulties with major procurements, citing fragmented oversight, requirements instability, and protracted review processes (GAO, 2018c, pp. 11–12; GAO, 2023, pp. 5–9). These findings suggest that reliance on Part 15 for emerging technology like mUAS may replicate past patterns of delay and complexity, particularly when paired with DHS's layered acquisition governance.

(3) Applicability to Coast Guard mUAS Procurement

Applied to mUAS procurement, the implications of Part 15 are mixed. For highly specialized payloads requiring certification, integration with Coast Guard aviation assets, or long-term sustainment arrangements, the transparency and defensibility of Part 15 are likely necessary. Its record-keeping and structured evaluation processes align well with the DHS's risk-averse culture and congressional oversight expectations. However, when the requirement involves rapid adoption of commercial mUAS platforms or iterative prototyping, the slow tempo and high barriers of Part 15 are ill-suited.

GAO has explicitly warned that acquisition systems unable to shorten front-end processes risk falling behind commercial innovation cycles, which often operate on 12- to 18-month clocks (GAO, 2025b, p. 19). In its Weapon Systems Annual Assessment, the GAO observed that even programs using "streamlined" acquisition pathways suffered from prolonged documentation and approval requirements that undermined agility, resulting in

average development timelines approaching 12 years from initiation to initial operational capability (GAO, 2025c, pp. 18–20).

In short, FAR Part 15 offers the Coast Guard maximum transparency, defensibility, and oversight assurance. Yet it does so at the cost of timeliness, industrial-base diversity, and adaptability. For mUAS acquisitions, its use should therefore be targeted, reserved for phases where requirements are mature, the vendor base is stable, and the political or oversight stakes demand procedural rigor. Premature reliance risks constraining innovation and delaying capability delivery in a mission area where speed and flexibility are paramount.

2. FAR Part 12: Commercial Item Procurement

FAR Part 12 (2025) was established to streamline the government's ability to acquire products and services that are already available in the commercial marketplace, colloquially known as COTS, or *commercial off-the-shelf*.

a. Procedural Characteristics

FAR Part 12 is predicated on the assumption that leveraging commercial practices, terms, and conditions reduces acquisition timelines and costs while broadening access to innovation emerging outside the traditional defense industrial base. For the Coast Guard, whose mUAS requirements overlap substantially with commercial drone technologies, Part 12 offers a pathway that could capitalize on the speed and innovation of the private sector while retaining the protections of a FAR-based framework.

(1) Advantages

The primary strength of Part 12 lies in its potential for timeliness and market alignment. The GAO has emphasized that commercial item procedures can "expedite acquisition cycles by reducing the need for government-unique specifications and clauses" (GAO, 2017), thereby enabling agencies to benefit from ongoing industry investments in product development. This approach has been successfully employed across the DOD and DHS for the procurement of COTS systems, particularly in information technology and small unmanned systems. For Coast Guard mUAS procurement, where many Group 1 and

2 platforms are widely available in the commercial market, Part 12 offers the opportunity to meet operational demand signals more rapidly than traditional negotiated procurement.

Another benefit of Part 12 is its relative accessibility to nontraditional vendors. By reducing compliance burdens such as cost and pricing data requirements and detailed government-unique reporting, it lowers barriers for small firms and commercial drone manufacturers that may otherwise be deterred by the complexity of Part 15 solicitations. The GAO has noted that commercial item acquisitions can "expand the competitive field" when agencies craft solicitations that mirror commercial practices and avoid over-customization (GAO, 2017b). This dynamic aligns with the Coast Guard's stated need to tap into a more diverse industrial base, particularly as emerging drone technologies are frequently developed by small companies outside the defense ecosystem.

(2) Limitations

However, FAR Part 12 also presents important limitations. Chief among these is the challenge of defining true commerciality. The GAO (2018b) found that "market research is a key component that informs commercial item and price reasonableness determinations. However, obtaining market-related information can be challenging because the products DOD requires may not be widely available in the commercial marketplace" (p. i).

This uncertainty is amplified when prior determinations are inaccurate or incomplete. The GAO (2018b) reported that "contracting officers may presume that an item is commercial if a DOD component had previously made that determination. However, the GAO found that, in some cases, contracting officers reviewing a prior determination discovered that it was based on inaccurate information" (p. i). Such findings illustrate how the boundary between commercial and developmental systems can blur—particularly when items require modification or integration with mission-specific systems.

Once an item is labeled commercial, oversight and cost visibility often diminish. The GAO (2018b) noted that "several contracting officers told us that once an item is determined commercial, contractors are less willing to provide any pricing data," even though "the government can request uncertified data if needed to make a price

reasonableness determination" (p. 12). Earlier analysis similarly observed that DOD's contracting workforce "was requesting significantly more documentation than in the past to make determinations of commerciality and price reasonableness," partly because many officials "are inexperienced in these processes" (GAO, 2017b, p. 22).

(3) Applicability to Coast Guard mUAS Procurement

For the Coast Guard, whose acquisition workforce is far smaller than that of the DOD, these challenges are magnified. Limited personnel capacity and constrained market-research resources heighten the risk of misclassifying developmental systems as commercial. Such missteps can obscure life-cycle costs, restrict access to technical data rights, and complicate long-term sustainment planning. Consequently, while FAR Part 12 can accelerate access to proven commercial technologies, its application demands especially disciplined analysis within a lean acquisition workforce to avoid eroding oversight and accountability. The implications of Part 12 are therefore nuanced. It is most effective when acquiring commoditized platforms or services, for example, contractor-owned/contractor-operated (COCO) surveillance services using small UAS, or commercial imaging payloads that require minimal customization. In such cases, Part 12 allows the Coast Guard to quickly procure capabilities that already exist in the marketplace, reducing lead times and capitalizing on industry innovation. Conversely, when requirements extend beyond the commercial baseline into developmental integration, such as unique command-and-control links, maritime survivability features, or endurance extensions, Part 12 risks becoming a "half measure," offering neither the speed of non-FAR tools nor the rigor of Part 15.

In short, FAR Part 12 represents a middle path between the procedural rigor of negotiated procurement and the flexibility of non-FAR instruments. For the Coast Guard, it should be viewed as a targeted tool: valuable for acquisitions that map closely to commercial offerings, but less effective where requirements demand extensive adaptation or long-term sustainment under government control. When used appropriately, it offers a means of bridging the commercial innovation base into Coast Guard operations while

mitigating, though not eliminating, the risks of underdeveloped or noncompetitive solutions.

3. Non-FAR Contracting Mechanisms

Non-FAR acquisition instruments, including OTAs, CSOs, CRADAs, and Partnership Intermediary Agreements (PIAs), represent the most flexible contracting approaches available to federal agencies. Unlike FAR Part 12 or Part 15, these mechanisms are not bound by the prescriptive rules of the FAR. Instead, they are rooted in statutory authorities that empower agencies to bypass traditional constraints in order to accelerate technology adoption, expand the industrial base, and engage nontraditional vendors.

a. Procedural Characteristics

The defining feature of non-FAR mechanisms is their departure from the regulatory framework that governs most federal procurements. OTAs, codified under 10 U.S.C. §§ 4021–4022, allow agencies to structure agreements more akin to commercial contracts, emphasizing collaborative risk-sharing and flexible terms of payment, intellectual property rights, and cost sharing. CSOs, codified under 10 U.S.C. § 3458, provide a broad solicitation vehicle for innovative commercial solutions and are frequently paired with OTAs to streamline prototyping and transition to production. Other mechanisms, such as CRADAs and PIAs, are narrower in scope but similarly emphasize collaborative development and rapid experimentation.

For the Coast Guard, the legal landscape complicates direct adoption of OTAs or CSOs, since these authorities reside within the DOD and select civilian agencies. Nevertheless, as Barringer and Miles (2021) argued, the growing reliance on non-FAR tools across the DOD and agencies like NASA reflects a systemic push to mitigate the very bureaucratic and procedural constraints that hamper innovation. The Coast Guard's position within DHS limits its ability to employ OTAs directly, but it may leverage interagency agreements or explore legislative avenues to expand its authority.

(1) Advantages

The principal advantage of non-FAR tools is speed and flexibility. By sidestepping the rigid requirements of FAR Part 15 and the limited scope of FAR Part 12, non-FAR mechanisms can enable near-real-time acquisition of emerging technologies. The DOD has used OTAs to reduce prototyping timelines significantly, cutting development cycles for emerging robotics, unmanned systems, and advanced software from years to months. For rapidly evolving markets such as UAS, where commercial R&D outpaces government-driven development, such flexibility is critical.

Non-FAR pathways also broaden the defense industrial base. GAO reports consistently highlight that nontraditional vendors are reluctant to participate in traditional FAR-based acquisitions due to compliance burdens and cost-accounting requirements (GAO, 2025a). OTAs and CSOs provide tailored agreements that lower these barriers, thereby expanding access to innovative commercial firms that dominate the UAS sector.

Finally, non-FAR instruments facilitate risk-sharing. Agreements can be structured to require cost sharing by industry or to tailor intellectual property terms that incentivize vendor participation while still meeting government mission needs.

(2) Limitations

The advantages of flexibility come with corresponding risks. Oversight mechanisms are far less robust than in FAR-based procurements, creating greater potential for mismanagement, inconsistent outcomes, or failure to deliver operational capability. The GAO has repeatedly warned that OTAs, while powerful, lack standardized data reporting and thus hinder Congress's ability to exercise oversight over obligations and outcomes (GAO, 2016). Barringer and Miles (2021) similarly found that fewer than half of acquisition professionals engaged in non-FAR contracting had received adequate training, underscoring the steep learning curve associated with these instruments.

In addition, statutory limits constrain their applicability. The Coast Guard, operating under DHS, cannot directly employ the DOD's OTA authorities. As Henkel (2023) observed in his Coast Guard UAS study, the service's reliance on DHS acquisition pathways restricts its ability to capitalize on the DOD's experimental contracting practices.

Without congressional action or DHS delegation, non-FAR tools remain largely aspirational for Coast Guard mUAS acquisition.

(3) Applicability to Coast Guard mUAS Procurement

Non-FAR mechanisms align closely with the Coast Guard's operational need for agility and responsiveness in mUAS acquisition. The service faces a rapidly shifting commercial market, evolving mission demands, and limited R&D budgets. Non-FAR contracting offers the potential to integrate commercial solutions faster, access a broader vendor base, and avoid the pitfalls of protracted FAR Part 15 negotiations.
However, absent direct statutory authority, the Coast Guard must navigate interagency pathways, such as partnering with the DOD's Defense Innovation Unit or NASA, to gain access to these tools. Alternatively, legislative change could extend OTA or CSO authority to DHS, as has been proposed in past acquisition reform debates. Until such changes occur, the Coast Guard must weigh the benefits of pursuing non-FAR solutions through indirect channels against the risks of delay and diminished control.

B. DECISION MATRIX

The preceding sections have demonstrated that FAR Part 15, FAR Part 12, and non-FAR instruments each offer distinct benefits while also imposing meaningful limitations. No single contracting pathway emerges as universally optimal for Coast Guard mUAS procurement. Instead, the evidence suggests that each mechanism is most effective when applied under specific conditions: Part 15 when oversight and defensibility are paramount, Part 12 when commercial technologies can be adopted with minimal modification, and non-FAR authorities when speed, flexibility, and access to nontraditional vendors are the dominant priorities.

Because the Coast Guard must balance operational urgency, institutional oversight, and long-term sustainment considerations, contracting strategies cannot be reduced to a binary choice. The more appropriate approach is to employ a structured comparison that highlights trade-offs and supports context-specific decision-making. To accomplish this, the analysis now turns to a decision matrix that evaluates each contracting pathway against a common set of criteria derived from the literature review, peer-agency case studies, and

Coast Guard operational requirements. This matrix enables a systematic and transparent assessment of the relative merits and limitations of each contracting option, thereby bridging the gap between qualitative discussion and practical application.

The decision matrix incorporates three principal elements:

1. Contracting Pathways Assessed

- **FAR Part 15:** Negotiated procurement, emphasizing transparency, best-value trade-offs, and defensibility
- **FAR Part 12:** Commercial item procurement, leveraging commercial practices to streamline timelines and reduce administrative burden
- **Non-FAR Instruments:** Flexible mechanisms such as OTA, CSOs, CRADAs, and PIAs

2. Evaluation Criteria

The criteria are derived from the thematic categories established earlier in this study, with attention to Coast Guard–specific acquisition challenges:

- **Speed and Timeliness:** The degree to which each mechanism enables rapid progression from solicitation to operational capability
- **Flexibility and Innovation:** The capacity to incorporate evolving requirements, foster iterative development, and engage emerging technologies
- **Discipline and Rigor:** The strength of institutional controls embedded in the contracting pathway, including prescribed documentation standards, mandated review cycles, audit and reporting requirements, and the enforceability of statutory and regulatory compliance.
- **Vendor Accessibility:** The openness of each pathway to nontraditional firms, small businesses, and commercial entrants
- **Oversight and Risk Management:** The strength of each mechanism's auditability, transparency, and built-in controls for mitigating programmatic risk

3. Scoring and Weighting

Each criterion is rated on a five-point ordinal scale, ranging from 1 (poor alignment) to 5 (strong alignment). Weighting may be adjusted depending on the Coast Guard's priorities in a given acquisition context, for example, privileging timeliness during urgent operational demands or oversight when transitioning to a program of record. Each score is supported by narrative justification and references to ensure analytic rigor and transparency.

The decision matrix that follows transforms the preceding narrative analysis into a structured, side-by-side comparison. By doing so, it makes visible the relative strengths and weaknesses of each contracting pathway, clarifies the trade-offs inherent in different approaches, and provides the Coast Guard with a practical decision-support tool. This framework does not seek to prescribe a single solution but rather to equip decision-makers with the means to align contracting choices with mission urgency, institutional oversight requirements, and the realities of the rapidly evolving commercial UAS market.

C. SCORING THE DECISION MATRICES

The decision matrices in this chapter evaluate FAR Part 15, FAR Part 12, and non-FAR instruments against five comparative criteria: speed and timeliness, flexibility and innovation, discipline and rigor, vendor accessibility, and oversight and risk management. Each criterion represents a dimension of strategic relevance to Coast Guard acquisition decision-making, derived from prior NPS research (e.g., Barringer & Miles, 2021; Henkel, 2023) and DOD guidance emphasizing the trade-offs between agility, accountability, and risk.

Table 3 introduces the qualitative decision matrix framework baseline used to systematically assess these attributes. The framework employs a structured, evidence-based approach consistent with qualitative content analysis methodology. Each cell reflects a qualitative score ranging from 1 (poor alignment) to 5 (strong alignment). These scores are not intended to convey mathematical precision, but to provide a disciplined means of comparison grounded in authoritative literature, case studies, and Coast Guard acquisition experience.

Table 3. Qualitative Decision Matrix Baseline

Decision Matrix Baseline (Qualitative Scoring of Options)							Option Scores	
		Speed and Timeliness	Flexibility and Innovation	Discipline and Rigor	Vendor Accessibility	Oversight and Risk Management	***Note that higher is "better"***	
Criteria Weight -->							Unweighted	Weighted
FAR Part 12	unweighted ranking -->	3	3	4	4	4	18	
	weighted ranking -->							
FAR Part 15	unweighted ranking -->	1	1	5	1	5	13	
	weighted ranking -->							
Non-FAR	unweighted ranking -->	5	5	2	4	1	17	
	weighted ranking -->							

1. Speed and Timeliness

- FAR Part 15 receives low marks for timeliness. GAO has documented that DHS and Coast Guard procurements conducted under negotiated procurement often face extensive delays due to layered reviews, documentation burdens, and protest exposure (GAO, 2020).
- FAR Part 12 is more favorable, since commercial item procedures shorten award timelines, though its efficiency declines when systems diverge from commercial market offerings (GAO, 2017b).
- Non-FAR instruments such as OTAs and CSOs score highest, with numerous DOD case studies demonstrating awards within weeks or months rather than years (DOD, 2023).

2. Flexibility and Innovation

- FAR Part 15 scores low because of its rigid front-end requirements and difficulty accommodating iterative adaptation.

- FAR Part 12 performs moderately, as it allows greater alignment with evolving commercial offerings but becomes restrictive if government-specific integration is required.
- Non-FAR mechanisms score highest, as they are explicitly designed to foster iterative prototyping and risk-sharing. The GAO noted in its review of rapid innovation programs that non-FAR instruments often accelerated technology maturation more effectively than FAR-based methods (GAO, 2018a).

3. Discipline and Rigor

- FAR Part 15 demonstrates the highest level of discipline and rigor, as its layered statutory reviews, formal source-selection procedures, and extensive documentation requirements impose strong process controls and auditability (GAO, 2018b). These mechanisms ensure traceability and defensibility but also create significant administrative burden.
- FAR Part 12 provides moderate discipline and rigor, allowing the use of commercial terms and conditions that reduce administrative steps while still retaining FAR-based reporting, oversight, and compliance requirements. This makes it more streamlined than Part 15 but still grounded in formal acquisition governance.
- Non-FAR instruments exhibit the lowest degree of formal discipline and rigor, as their procedural simplicity reduces documentation, milestone reviews, and audit requirements. While this flexibility accelerates prototyping and experimentation, GAO has warned that the limited reporting and data-collection requirements inherent to OTAs reduce transparency and constrain the government's ability to assess outcomes or provide oversight to Congress (GAO, 2016).

4. Vendor Accessibility

- FAR Part 15 scores lowest, as compliance costs and administrative burdens deter small and nontraditional vendors (GAO, 2025a).

- FAR Part 12 offers greater accessibility, particularly for firms already accustomed to competing in commercial markets.
- Non-FAR mechanisms score moderate, since CSOs and OTAs are structured to solicit brief solution pitches and lower barriers to entry, attracting startups and nontraditional firms that dominate the UAS sector (Gibson, 2023).

5. Oversight and Risk Management

- FAR Part 15 earns the highest score due to its strong auditability, competition requirements, and well-established protest channels, which provide defensibility under congressional and DHS oversight (GAO, 2023).
- FAR Part 12 offers moderate oversight but carries risks of misclassification, as the GAO has noted in cases where developmental systems were incorrectly procured as commercial (GAO, 2017b).
- Non-FAR instruments score lowest because they lack standardized oversight structures. The GAO cautioned that while OTAs provide speed and flexibility, their reduced transparency can expose the government to risks if not paired with deliberate governance measures (GAO, 2016).

D. SENSITIVITY ANALYSIS ACROSS THE ACQUISITION LIFE CYCLE

While the initial decision matrix provides a static comparison of contracting pathways against common criteria, acquisition programs are not static undertakings. The relative utility of FAR Part 15, FAR Part 12, and non-FAR instruments changes substantially as a system advances through its life cycle, from early prototyping to long-term sustainment. A sensitivity analysis was therefore conducted to evaluate how each mechanism's suitability varies across major phases of the defense acquisition life cycle, with particular emphasis on the Coast Guard's anticipated progression in mUAS procurement.

For purposes of this analysis, the life cycle was divided into four broad phases consistent with both DOD and DHS acquisition frameworks:

1. **Concept Exploration and Prototyping:** Activities include market research, initial experimentation, and proof-of-concept demonstrations.
2. **Technology Development and Operational Demonstration:** Activities focus on maturing selected technologies, integrating payloads, and validating operational concepts.
3. **Production and Deployment:** Activities involve procurement of fielded systems at scale, with emphasis on assured performance, transparency, and sustainment planning.
4. **Operations and Support:** Activities center on long-term sustainment, upgrades, contractor logistics support, and life-cycle cost management.

In each phase, the same five thematic criteria (speed and timeliness, flexibility and innovation, discipline and rigor, vendor accessibility, and oversight and risk management) remain relevant, but their relative weight shifts. For example, in the prototyping phase, timeliness and innovation dominate decision-making, while in the operations and support phase, oversight and risk management are weighted more heavily. By reweighting the criteria in alignment with life-cycle priorities, the sensitivity analysis produces a dynamic view of each contracting pathway's effectiveness over time.

The analysis anticipates the following general trends:

- Non-FAR instruments demonstrate the highest utility in the concept exploration and prototyping phase, when speed and innovation are paramount. Their effectiveness diminishes in later phases unless paired with rigorous transition planning and documentation.
- FAR Part 12 offers moderate-to-high utility during technology development and limited production, particularly when commercial systems can be adapted with minimal modification. Its applicability declines as requirements move beyond commercial configurations.

- FAR Part 15 has limited value in early stages but becomes increasingly advantageous during full production and sustainment, where oversight, defensibility, and life-cycle cost management outweigh the need for rapid iteration.

In Phase 1, Concept Exploration and Prototyping, early acquisition efforts are characterized by rapid experimentation, market scanning, and proof-of-concept trials. Here, time and adaptability are decisive. Non-FAR instruments offer clear advantages, enabling rapid exploration of new designs, payloads, and operational concepts. These qualities are expressed in Table 4.

Table 4. Concept Exploration and Prototyping Phase Qualitative Decision Matrix

Sensativity Matrix Concept Exploration & Prototyping Phase (Qualitative Scoring of Options)							Option Scores	
		Speed and Timeliness	Flexibility and Innovation	Discipline and Rigor	Vendor Accessibility	Oversight and Risk Management	***Note that higher is "better"***	
Criteria Weight -->		10	10	2	7	1	Unweighted	Weighted
FAR Part 12	unweighted ranking -->	3	3	4	4	4	18	
	weighted ranking -->	30	30	8	28	4		100
FAR Part 15	unweighted ranking -->	1	1	5	1	5	13	
	weighted ranking -->	10	10	10	7	5		42
Non-FAR	unweighted ranking -->	5	5	2	4	1	17	
	weighted ranking -->	50	50	4	28	1		133

- **Non-FAR:** Scored highest for speed, flexibility, and minimal bureaucracy. These agreements bypass formal source-selection and protest procedures, fostering creative collaboration with commercial innovators.
- **FAR Part 12:** Moderate across categories; some agility from commercial item provisions but still burdened by FAR clauses and reporting.
- **FAR Part 15:** Lowest in this phase due to exhaustive competition and documentation demands; its procedural rigor impedes fast iteration.

- **Reasoning:** Concept exploration values discovery over defensibility; thus, leaner agreements maximize innovation velocity.

In Phase 2, as prototypes mature, integration testing begins. FAR Part 12 offers moderate-to-high utility, particularly when commercial systems can be adapted with minimal modification. These qualities are expressed in Table 5.

Table 5. Technology Development and Operational Demonstration Phase Qualitative Decision Matrix

Decision Matrix Technology Development & Operational Demonstration (Qualitative Scoring of Options)							Option Scores	
		Speed and Timeliness	Flexibility and Innovation	Discipline and Rigor	Vendor Accessibility	Oversight and Risk Management	***Note that higher is "better"***	
Criteria Weight -->		8	8	4	6	3	Unweighted	Weighted
FAR Part 12	unweighted ranking -->	3	3	4	4	4	18	
	weighted ranking -->	24	24	16	24	12		100
FAR Part 15	unweighted ranking -->	1	1	5	1	5	13	
	weighted ranking -->	8	8	20	6	15		57
Non-FAR	unweighted ranking -->	5	5	2	4	1	17	
	weighted ranking -->	40	40	8	24	3		115

- **Non-FAR:** Still superior for flexibility and low bureaucracy; it supports spiral development and concurrent evaluation.
- **FAR Part 12:** Improves in relevance as technology stabilizes, balancing innovation with traceability.
- **FAR Part 15:** Remains least suited because detailed source-selection and milestone documentation slow down test cycles.
- **Reasoning:** This phase rewards mechanisms that accommodate configuration change and mixed public–private teaming while managing manageable compliance overhead.

In Phase 3, when production is established at scale, the priority shifts to assurance, standardization, and sustainment planning. As the program transitions into large-scale production, the procedural rigor of Part 15 becomes an asset. These qualities are expressed in Table 6.

Table 6. Production and Deployment Phase Qualitative Decision Matrix

Decision Matrix Production & Deployment (Qualitative Scoring of Options)							Option Scores	
		Speed and Timeliness	Flexibility and Innovation	Discipline and Rigor	Vendor Accessibility	Oversight and Risk Management	***Note that higher is "better"***	
Criteria Weight -->		3	3	12	5	10	Unweighted	Weighted
FAR Part 12	unweighted ranking -->	3	3	4	4	4	18	
	weighted ranking -->	9	9	48	20	40		126
FAR Part 15	unweighted ranking -->	1	1	5	1	5	13	
	weighted ranking -->	3	3	60	5	50		121
Non-FAR	unweighted ranking -->	5	5	2	4	1	17	
	weighted ranking -->	15	15	24	20	10		84

- **Non-FAR:** Scores moderately, excellent for limited production but constrained by statutory limits on follow-on authority without partnering under 10 U.S.C. § 4022(f).
- **FAR Part 12:** Performs well when commercial variants dominate procurement, allowing efficiency within compliance bounds.
- **FAR Part 15:** Now strongest; its structured oversight and auditability safeguard cost realism and performance accountability.
- **Reasoning:** Discipline and rigor become features, not flaws: they institutionalize transparency and ensure defensibility to Congress, DHS, and auditors.

In Phase 4, sustainment, life cycle cost control, configuration management, and long-term logistics dominate. Oversight and risk management are weighted more heavily as programs mature. These qualities are expressed in Table 7.

Table 7. Operations and Support Phase Qualitative Decision Matrix

Decision Matrix Operations & Support (Qualitative Scoring of Options)							Option Scores	
		Speed and Timeliness	Flexibility and Innovation	Discipline and Rigor	Vendor Accessibility	Oversight and Risk Management	***Note that higher is "better"***	
Criteria Weight -->		1	1	15	3	15	Unweighted	Weighted
FAR Part 12	unweighted ranking -->	3	3	4	4	4	18	
	weighted ranking -->	3	3	60	12	60		138
FAR Part 15	unweighted ranking -->	1	1	5	1	5	13	
	weighted ranking -->	1	1	75	3	75		155
Non-FAR	unweighted ranking -->	5	5	2	4	1	17	
	weighted ranking -->	5	5	30	12	15		67

- **Non-FAR:** Limited use; poor fit for long-term maintenance because of weak cost-accounting controls and minimal audit provisions.
- **FAR Part 12:** Strong suitability; it supports recurring service contracts, incremental upgrades, and contractor logistics under transparent terms.
- **FAR Part 15:** Still viable for complex sustainment or recapitalization efforts but slower and costlier to administer.
- **Reasoning:** This phase values predictability and governance. FAR Part 15 offers the best blend of flexibility for upgrades with sufficient structure for compliance and funding visibility.

This sensitivity analysis complements the baseline decision matrix by situating contracting choices within the temporal realities of Coast Guard acquisitions. It underscores that no mechanism is universally superior, but each can be optimally applied when matched to the appropriate phase of the system life cycle. The following section presents the life cycle–adjusted decision matrices and discusses their implications for structuring a phased acquisition strategy for Coast Guard mUAS.

1. Life Cycle Sensitivity: Cyclical Shifts in Contracting Utility

The comparative analysis highlights that the relative utility of contracting mechanisms is not fixed but evolves as a program moves from concept development through sustainment. For Coast Guard mUAS acquisition, this dynamic produces not only a shift but also a cycle in which different pathways rise and fall in relevance depending on where the program stands in both its own maturity and the broader technological environment, as shown by Figure 6.

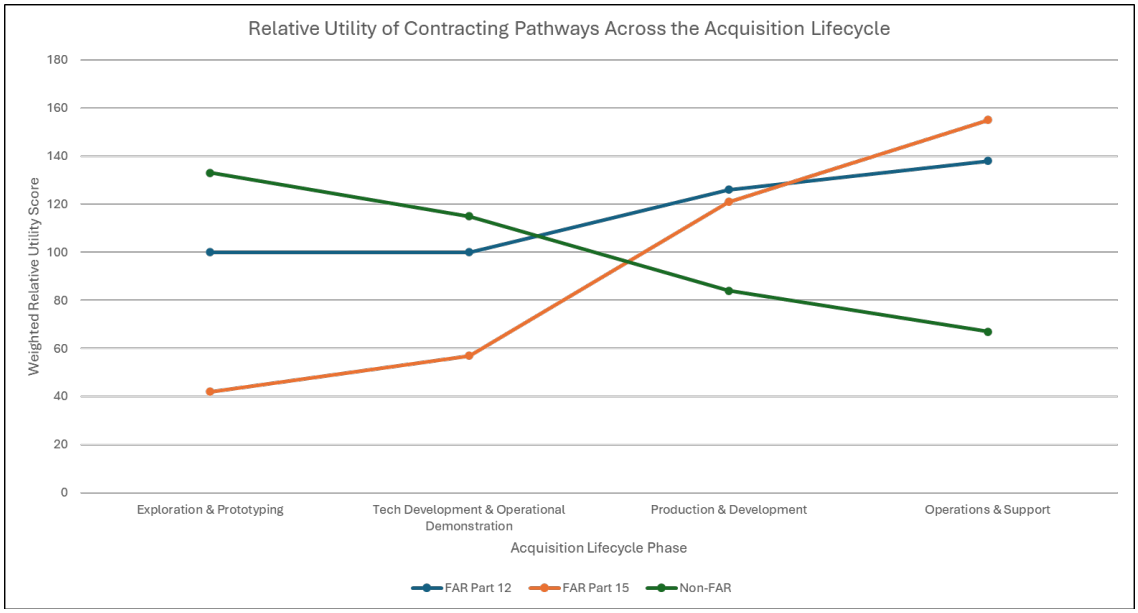

Figure 6. Comparative Analysis Graph Over the Acquisition Life Cycle

In the early prototyping phase, non-FAR instruments such as OTAs and CSOs offer clear advantages. Their speed, reduced procedural burden, and ability to engage nontraditional vendors enable rapid exploration of new designs, payloads, and operational concepts. For a technology field like mUAS, where commercial research and development outpaces government cycles, this capacity to move quickly and adapt to emerging market offerings is indispensable. Non-FAR agreements allow the Coast Guard to evaluate multiple approaches in parallel and to adapt incrementally as risks are retired.

As systems demonstrate operational viability and requirements begin to stabilize, FAR Part 12 becomes more advantageous. It provides the ability to leverage commercial practices and terms while still operating within the FAR framework. For mUAS, this might involve using Part 12 to contract for COCO services or for platforms that have become commoditized in the marketplace. Here, the goal is to capitalize on commercial availability while ensuring that the acquisition remains auditable and defensible.

In later phases, FAR Part 15 gains relevance, especially as the program transitions into large-scale production and sustainment. At this stage, the emphasis shifts from rapid innovation to reliability, long-term supportability, and institutional oversight. The procedural rigor of Part 15, once a liability in the exploratory phase, becomes an asset as Congress, DHS, and internal auditors demand clear records of competition, evaluation, and negotiation. This oversight is especially important when sustainment costs over decades may far exceed the initial procurement investment.

Yet unlike more stable acquisition domains, Coast Guard mUAS procurement does not follow a one-way trajectory from non-FAR to Part 12 to Part 15. Instead, the rapid pace of technological change makes the process cyclical. Once a system fielded under Part 15 begins to encounter obsolescence, whether through advances in sensor payloads, endurance technologies, or autonomy software, the Coast Guard may need to reenter a prototyping cycle using non-FAR tools to evaluate emerging alternatives. These prototypes may once again progress into commercial adaptation under Part 12 before being folded into a new long-term sustainment framework under Part 15.

This cyclical pattern reflects the dynamic nature of the unmanned systems market. Unlike major shipbuilding or aircraft programs, where technology evolves incrementally over decades, mUAS technologies evolve on timelines closer to the commercial electronics sector, often measured in months or years rather than decades. As Henkel (2023) noted in his study of Coast Guard long-range UAS, the service faces an enduring capability gap in surveillance hours that can only be met by continuously leveraging commercial and dual-use innovation. In such a context, contracting strategies must be designed not only for linear progression but also for iterative return to earlier phases.

The implication for Coast Guard acquisition is clear: contracting strategy should be conceived as a cycle rather than a straight line. Programs will need to oscillate between flexible non-FAR agreements, streamlined FAR Part 12 procurement, and rigorous Part 15 oversight as technologies advance, mature, and are eventually displaced by newer systems. This cyclical model ensures that the service remains agile in the face of rapid technological change while still maintaining the governance structures necessary for long-term sustainment and accountability.

2. Leveraging Non-FAR Instruments in Parallel with FAR Part 15 Programs

The cyclical nature of acquisition contracting underscores that the adoption of a FAR Part 15 vehicle does not terminate the usefulness of alternative pathways. Once a program enters into a Part 15 contract, whether for full-rate production, sustainment, or life-cycle support, the Coast Guard may still employ non-FAR instruments such as OTAs, CSOs, and CRADAs to enhance flexibility and preserve access to innovation. These instruments can be layered alongside the core Part 15 contract, functioning as complementary tools rather than substitutes.

a. Parallel Prototyping and Risk Reduction

Non-FAR mechanisms provide opportunities to pursue incremental or exploratory development efforts in parallel with a mature Part 15 contract. For example, an OTA can be used to prototype new payloads, autonomy algorithms, or communication subsystems without reopening or renegotiating the baseline program. CSOs may likewise solicit proposals for innovative data analytics or sensor integration concepts from commercial firms. If these prototypes prove successful, the results can be transitioned into the existing Part 15 framework through engineering change proposals or future increments. This approach allows the Coast Guard to hedge against technological obsolescence while retaining the stability of its core contractual relationship.

b. Technology Refresh and Block Upgrades

Long-term sustainment contracts under Part 15 frequently face challenges in incorporating technology refreshes. Non-FAR tools can serve as feeders for block upgrades. Cooperative agreements, such as CRADAs with academic institutions or private industry, provide a venue to advance enabling technologies, such as artificial intelligence for object detection or cyber-resilient control links, that can later be integrated into the program of record. Similarly, prototype OTAs offer a structured pathway for transitioning subsystem advancements directly into follow-on production contracts without additional competition, provided statutory requirements are satisfied.

c. Bridging Urgent Capability Gaps

Programs in development or early fielding often reveal operational gaps that cannot be addressed within the scope or tempo of a Part 15 contract. In such cases, non-FAR pathways can deliver temporary or supplemental capabilities. For instance, the Coast Guard might use a CSO paired with an OTA to procure short-term COCO UAS services to meet immediate mission needs. This "bridge" approach enables responsiveness without disrupting the primary program of record, and it mitigates risk by buying time for the Part 15 contract to mature.

d. Expanding the Industrial Base

One recurring risk in mature Part 15 programs is vendor lock-in, where incumbents dominate sustainment and upgrade work. Non-FAR tools can counterbalance this effect by broadening the competitive field. CSOs, for example, can solicit from nontraditional firms that would not normally bid under a FAR Part 15 solicitation due to compliance costs. These demonstrations create opportunities for emerging vendors to shape government requirements and inject competitive pressure into later phases of the program.

e. Experimentation with Concepts of Operations

The operational environment for mUAS is dynamic, requiring frequent adaptation of tactics, techniques, and procedures. Even after systems are fielded under Part 15, non-FAR agreements can be used to experiment with alternative concepts of operations. OTA-

based demonstrations of swarming behaviors, autonomous navigation, or payload deployment methods allow the Coast Guard to test novel approaches in a controlled environment. Such experimentation informs future program decisions while keeping innovation cycles distinct from the contractual rigidity of the primary Part 15 framework.

3. Implications for Coast Guard mUAS Strategy

For the Coast Guard, this analysis reinforces that contracting pathways should not be viewed as mutually exclusive or sequential in a strictly linear sense. Even once the service has committed to a FAR Part 15 program of record, non-FAR mechanisms should remain active as parallel innovation pipelines. These tools provide the agility needed to adapt to commercial market shifts, retire technical risk, and expand the industrial base, while Part 15 ensures that oversight, sustainment, and congressional defensibility remain intact. The cyclical interplay between FAR-based and non-FAR approaches therefore provides a model for contracting strategies that are both institutionally credible and operationally responsive in the face of rapid technological change.

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V. CONCLUSION

A. SUMMARY OF FINDINGS

This thesis examined how Federal Acquisition Regulation (FAR) and non-FAR contracting mechanisms compare in supporting the United States Coast Guard's ability to acquire medium unmanned aerial systems (mUAS) in a timely, innovative, and operationally responsive manner. Through qualitative analysis of statutory frameworks, policy documents, and lessons from peer agencies, the study evaluated the relative effectiveness of FAR Part 15, FAR Part 12, and non-FAR instruments, specifically Other Transaction Authority (OTA), Commercial Solutions Openings (CSO), and Cooperative Research and Development Agreements (CRADA), in addressing the Coast Guard's evolving mission demands.

The study's findings underscore a clear trend: FAR-based approaches provide procedural rigor and accountability but impose significant delays and administrative burdens that are misaligned with the pace of mUAS technology development. Non-FAR mechanisms, by contrast, are explicitly designed to accelerate innovation, attract nontraditional vendors, and reduce cycle times between prototype and fielded capability. The Coast Guard's current acquisition posture, operating within the Department of Homeland Security (DHS) framework and under limited Research, Development, Test, and Evaluation (RDT&E) authority, restricts its ability to fully leverage these instruments.

Comparative analysis across the four acquisition phases, concept exploration and prototyping, technology development and operational demonstration, production and deployment, and operations and support, showed that no single contracting strategy is optimal across the entire life cycle. Rather, each approach provides distinct advantages depending on phase-specific objectives:

- FAR Part 15 proved strongest in ensuring oversight, configuration control, and legal defensibility during production and sustainment, but weakest in the early stages when flexibility and speed are paramount.

- FAR Part 12 offered a practical middle ground for commercial off-the-shelf integration but was limited by narrow definitions of "commerciality" and recurring GAO concerns regarding misclassification of developmental systems.
- Non-FAR mechanisms scored highest for adaptability, rapid iteration, and risk-sharing, particularly during prototyping and early demonstration phases, though they require institutional support structures that the Coast Guard has yet to develop.

Overall, the study finds that the Coast Guard's limited statutory and institutional capacity to employ OTAs or CRADAs meaningfully constrains its ability to keep pace with evolving UAS markets. A hybrid strategy that sequences non-FAR instruments in the early phases, followed by transition to FAR Part 12 or 15 for production and sustainment, best aligns with the Coast Guard's mission and organizational realities.

B. ANSWERS TO RESEARCH QUESTIONS

Primary Research Question: How do FAR Part 15, FAR Part 12, and non-FAR instruments compare in supporting the Coast Guard's ability to acquire medium UAS in a timely, innovative, and operationally responsive manner?

FAR Part 15 remains the most comprehensive contracting framework for complex or high-risk acquisitions but is the least responsive in terms of speed. FAR Part 12 facilitates more agile access to commercially available technology but is hindered by restrictive definitions of commercial items and limited suitability for developmental systems. Non-FAR mechanisms, such as OTA and CSO, demonstrate the greatest potential to improve responsiveness, foster innovation, and attract a broader vendor base. However, the Coast Guard's statutory authority under 14 U.S.C. § 1158 does not include follow-on production, thereby limiting the full benefits realized by peer agencies under Title 10 authorities. Consequently, while non-FAR instruments are theoretically superior for early-stage innovation, their practical application within the Coast Guard remains constrained without institutional reform.

Secondary Research Question: What insights from other federal agencies' use of FAR Part 15, FAR Part 12, and non-FAR approaches can inform the Coast Guard's development of a more flexible and responsive contracting framework for current and future UAS acquisitions?

Lessons from the Department of Defense (DOD), National Aeronautics and Space Administration (NASA), and Customs and Border Protection (CBP) reveal that the greatest gains in acquisition agility stem not from wholesale rejection of the FAR, but from selective application of non-FAR tools within an integrated strategy. The DOD's use of OTA for prototype projects, with statutory authority for direct transition to production under 10 U.S.C. § 4022(f), illustrates how policy reform can bridge the gap between experimentation and fielding. NASA's flexible use of Space Act Agreements and its reliance on modular open system architectures demonstrate the importance of pairing contractual flexibility with technical adaptability. CBP's employment of CSOs within DHS's oversight structure highlights how incremental adoption of non-FAR tools can occur even within constrained bureaucratic environments. Together, these cases suggest that the Coast Guard should expand its use of non-FAR instruments through formal institutionalization of an OTA office, targeted policy reform to enable follow-on production, and enhanced collaboration with DOD innovation entities such as the Defense Innovation Unit (DIU).

C. IMPLICATIONS AND RECOMMENDATIONS

Based on the analysis, three primary recommendations emerge:

1. Institutionalize a Coast Guard OTA Program Office

Establish a dedicated OTA management function within the Coast Guard's acquisition enterprise to develop expertise, standardize processes, and coordinate with DHS and DOD counterparts. This office would serve as the focal point for CRADA, OTA, and CSO activity, enabling consistent governance and risk management.

2. Pursue Statutory Reform to Expand OTA Authority

Seek congressional amendment to 14 U.S.C. § 1158 to include explicit follow-on production authority comparable to 10 U.S.C. § 4022(f). This change would enable the Coast Guard to transition successful prototypes directly into production without reentering FAR-based competition, closing the current innovation-to-fielding gap and aligning with peer-agency best practices.

3. Adopt a Phased, Hybrid Contracting Framework

Implement a lifecycle-based acquisition model that aligns contracting mechanisms to program maturity: Use CRADAs for early research and technology assessment; employ OTAs or CSOs for rapid prototyping and demonstration; transition to FAR Part 12 for mature commercial integration; and apply FAR Part 15 for full-rate production and sustainment. This phased approach leverages the strengths of each contracting regime while mitigating their weaknesses across the acquisition continuum.

D. LIMITATIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH

This study's scope was limited by the availability of Coast Guard–specific acquisition data, reliance on secondary sources, and the qualitative nature of analysis. The absence of empirical case data on Coast Guard OTA or CSO use constrained quantitative comparison of cost and schedule performance. Additionally, the rapidly evolving policy landscape, particularly potential legislative changes to DHS and Coast Guard authorities, may affect the applicability of findings over time.

Future research should expand in three areas:

1. Empirical Assessment of OTA Implementation

Conduct a longitudinal study comparing program outcomes across DOD, DHS, and Coast Guard OTA projects to quantify efficiency gains and cost reductions.

2. Integration of Industry Perspectives

Interview nontraditional vendors to identify barriers to Coast Guard engagement and evaluate how contractual flexibility affects participation.

3. Modeling Lifecycle Cost Implications

Develop a cost-estimating relationship (CER) model to assess long-term budget impacts of hybrid contracting approaches across the acquisition life cycle.

Such research would provide data-driven validation of the comparative framework introduced in this thesis and inform institutional reform efforts aimed at accelerating innovation within the Coast Guard acquisition enterprise.

E. CONCLUDING REMARKS

The Coast Guard stands at an inflection point similar to that described by Henkel (2023) in his analysis of long-range UAS integration: the convergence of aging fleets, expanding mission demands, and rapidly advancing commercial technology requires bold reform. Traditional acquisition processes, while legally sound and procedurally rigorous, no longer match the velocity of technological change. To remain *Semper Paratus*, the Service must embrace a balanced strategy that preserves accountability while enabling innovation.

By adopting a hybrid contracting framework and strengthening its statutory authorities, the Coast Guard can position itself to acquire and field mUAS capabilities that enhance maritime domain awareness, expand operational reach, and sustain readiness in an increasingly complex global environment. In doing so, it will align with broader Department of Defense and national security objectives to modernize the nation's integrated maritime forces, ensuring that America's Coast Guard remains both agile and resilient in the decades ahead.

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