Joint Concept for Logistics

Version 2.0
25 September 2015

Distribution Statement A
Approved for Public Release

This page intentionally left blank.

FOREWORD

This *Joint Concept for Logistics* considers how an evolving Joint Logistics Enterprise (JLEnt) could better support joint operations in a future characterized by the challenge of meeting unremitting strategic requirements with constrained military resources. The *Capstone Concept for Joint Operations: Joint Force 2020* (2012) established globally integrated operations as the future joint operational concept designed to meet that challenge. With the requirement for rapid aggregation of globally distributed forces, globally integrated operations create a logistically demanding approach. This concept proposes globally integrated logistics (GIL) as a possible solution for meeting those demands.

Some readers will view some of the ideas contained here as controversial. That is by design. Stimulating dialogue about how joint forces will operate to meet the requirements of a complex and challenging future can only be beneficial.

This concept sees the continued maturation of the JLEnt. In an era of constrained resources, the nonmilitary elements of the enterprise will become more important than ever before. Critically, the concept also explores how to allocate and adjudicate limited logistics resources dynamically and responsively on a global scale without impinging on the directive authority of Combatant Commanders or the Services. If this concept does nothing more than stimulate discussion on that important topic alone, it will have served a valuable purpose.

Let the conversation begin.

PAUL J. SELVA
General, U.S. Air Force
Acting Chairman

This page intentionally left blank.

Table of Contents

Foreword i
Table of Contents iii
Executive Summary v

1. Introduction 1
2. Purpose 2
3. Scope 3
4. The Challenge: Increasingly Demanding Logistics Requirements in an Era of Constrained and Degraded Resources 3
5. The Solution: Globally Integrated Logistics 8
6. Required Capabilities 15
7. Risks of Adopting this Concept 18
8. Conclusion 20

Appendixes

A. Challenge-Solution-Capability Map A-1
B. Glossary B-1
C. Bibliography C-1

Figures

1. The Joint Logistics Enterprise 2
2. The Challenge: Increasingly Demanding Logistics Requirements in an Era of Constrained and Degraded Resources 4
3. Easing the Future Logistics Dilemma by Increasing Resources and Decreasing Demand 9

This page intentionally left blank.

EXECUTIVE SUMMARY

Introduction and Scope

This *Joint Concept for Logistics* (JCL) proposes a concept for how the Joint Logistics Enterprise (JLEnt) could support globally integrated operations in the 2020-2034 timeframe. It entertains three basic questions about the future:

- What if the challenges of globally integrated operations are fully implemented and the extrapolation of current trends into the future render the current approach to joint logistics inadequate?
- How might the JLEnt meet that challenge?
- What capabilities would it need beyond those that exist today?

The *Capstone Concept for Joint Operations: Joint Force 2020* (CCJO) establishes globally integrated operations as the overarching concept by which future joint forces will operate. Globally integrated operations are anticipated to be extremely logistics-intensive.

This document applies to logistics support provided globally rather than to one joint operation or within a single theater. It applies not only to all military elements of the JLEnt but also those that are the core of the enterprise and the interagency, foreign, nongovernmental, and commercial partners that may contribute situationally.

This concept encompasses the full range of military operations that could be ongoing globally in the future, including everything from routine engagement activities by relatively small units to major armed conflict with an enemy employing advanced weapons, including anti-access/area-denial weapons.

The Challenge: Increasingly Demanding Logistics Requirements in an Era of Constrained and Degraded Resources

The challenge for future joint logistics is to adequately support globally integrated operations given the combination of five ongoing trends:

- The increasing logistics demand of U.S. joint forces and operations
- Constrained resources, both overall and within the logistics force structure
- The growing complexity of logistics operations

- The proliferation of advanced anti-access/area-denial capabilities by adversaries that would degrade logistics capabilities and capacities
- Increasing cyber threats to joint and partner logistics networks and mission systems

The tension between increasingly demanding logistics requirements and constrained and degraded logistics resources within the context of globally integrated operations creates a dilemma that will be the essential challenge joint logistics will have to overcome for the foreseeable future. These trends have the potential to create a situation in which the disparity between logistics demand and logistics resources—the Logistics Gap—will demand a new conceptual approach to logistics.

The Solution: Globally Integrated Logistics

This paper proposes the concept of Globally Integrated Logistics (GIL) as an exercise in thinking about the future. *GIL is the capability to allocate and adjudicate logistics support on a global scale to maximize effectiveness and responsiveness, and to reconcile competing demands for limited logistics resources based on strategic priorities.* This concept envisions an **adequately resourced JLEnt** providing **modularized** logistics support to **leaner joint forces** worldwide. An **agile global logistics resource allocation and adjudication capability** will coordinate and integrate all elements of the JLEnt via a **resilient and comprehensive information environment.** The GIL will manage logistics capabilities effectively, efficiently, and dynamically across theaters to reconcile constrained logistics resources with competing operational demands. A **rapid and flexible transportation system able to move forces and supplies quickly between and within theaters**, augmented by **prepositioned capabilities and stocks that can be shifted between theaters**, will operate through a **flexible worldwide network of logistics nodes.** That will provide multiple options for lines of communication through potentially challenged global commons and forward regions.

The precepts of Globally Integrated Logistics are:

- An adequately resourced logistics enterprise
- An agile global logistics resource allocation and adjudication capability
- A resilient and comprehensive logistics information environment
- Highly modularized and interoperable logistics capabilities.
- Leaner forces and operations

- A rapid and flexible transportation system able to move forces and supplies quickly between and within theaters
- Prepositioned stocks and capabilities that can be selectively accessed and moved quickly to multiple theaters
- A flexible worldwide network of logistics nodes

Required Capabilities

The concept identifies 24 broad capabilities the JLEnt must possess in order to implement GIL fully. Those are discussed in detail in Section 6.

Risks

This concept is not without risks. These risks are identified in Section 7.

Conclusion

The essential challenge for the JLEnt in the future is to support globally integrated operations by meeting increasingly demanding logistics requirements with constrained resources in a potentially contested environment. This concept proposes that the JLEnt could meet that challenge through the concept of GIL, the capability to allocate and adjudicate joint logistics support on a global scale to maximize effectiveness and responsiveness, and to reconcile competing demands for limited logistics resources based on strategic priorities.

This page intentionally left blank.

1. Introduction

This *Joint Concept for Logistics* (JCL) proposes a concept for how the joint logistics enterprise (JLEnt) could support globally integrated operations in the 2020-2034 timeframe. It entertains three basic questions about the future:

- What if the challenges of globally integrated operations fully are implemented and the extrapolation of current trends into the future render the current approach to joint logistics inadequate?
- How might the JLEnt meet that challenge?
- What capabilities would it need beyond those that exist today?

The *Capstone Concept for Joint Operations: Joint Force 2020* (CCJO) establishes globally integrated operations as the overarching concept by which future joint forces will operate. Globally integrated operations are extremely demanding logistically.

This version of the JCL updates and supersedes the 2010 version, which introduced the JLEnt. The JLEnt is a multi-tiered matrix of key global logistics providers cooperatively structured to achieve a common purpose and bound by an assortment of collaborative agreements, contracts, doctrine, policy, legislation, or treaties designed to make it function in the best interests of the joint force commander. Figure 1 depicts the JLEnt. It is not meant to imply that the JLEnt is solely represented by those organizations, nor is it a particular structure or command relationship.

Moreover, this JCL is entirely compatible with the requirements identified in *Joint Force 2020: Logistics Imperatives*, published in 2013 to guide capability development.

This concept is an exercise in thinking about the future. It does not argue that the current approach to joint logistics, as laid out in Joint Publication 4-0, *Joint Logistics* (2013), is inadequate. This document is exploratory, suppositional, and aspirational. It is not authoritative as doctrine or constrained by current policy. Rather, it is intended to propose ideas that would result in changes to both. As a way of considering possible future requirements, it supposes an operating environment that does not exist today and an operating concept that is not current practice—although indicators of both certainly appear in current joint operations. To encourage thought and discussion, this JCL means to be provocative. The ideas contained here have not been validated and would require study, experimentation, and analysis to determine their value. While more specific than the CCJO, the JCL

remains highly conceptual and would require significant subsequent effort to develop implementation details.

Figure 1. The Joint Logistics Enterprise

2. Purpose

The purpose of this concept is to influence future JLEnt capabilities by:

- Proposing a common conceptual framework for military professionals, policymakers, and others interested in the challenges of modern logistics
- Providing a basis for subsequent joint, Service and Defense agency concepts and doctrine
- Exploring the broad logistics capabilities required to support future joint operations
- Informing and motivating study, evaluation, wargaming, and experimentation that will result in changes to policy, doctrine, organization, training, materiel, leadership and education, personnel, and facilities

3. Scope

Just as the CCJO looks at the conduct of all joint operations globally, this document applies to logistics support provided globally rather than to one joint operation or within a single theater. It applies to all elements of the JLEnt, including both the active and reserve military elements, such as Service logistics units, joint commands and the Defense Logistics Agency. These are the core of the enterprise and the interagency, foreign, nongovernmental and commercial partners that may contribute situationally.

This concept encompasses the full range of military operations that could occur in the future, ranging from humanitarian assistance disaster relief and homeland defense to routine engagement activities by relatively small units to major armed conflict with an enemy employing advanced weapons, including anti-access/area-denial weapons. While recognizing that U.S. joint forces must be prepared to operate unilaterally in the interest of national defense, this concept assumes that joint operations will take place within an interagency and multinational context, to include civil support of federal, state and local agencies, and other organizations in the case of domestic emergency.

4. The Challenge: Increasingly Demanding Logistics Requirements in an Era of Constrained and Degraded Resources

The challenge for future joint logistics is to adequately support globally integrated operations given the combination of five ongoing trends:

- The increasing logistics demand of U.S. joint forces and operations.
- Constrained resources, both overall and within the logistics force structure
- The growing complexity of logistics operations
- The proliferation of advanced anti-access/area-denial capabilities by adversaries, that would degrade logistics capabilities, capacities and responsiveness
- Increasing cyber threats to joint and partner logistics networks and mission systems

If the current approach to joint logistics were to prove inadequate in the future, likely it would be because of the continuation of those five trends within the context of globally integrated operations. The tension between increasingly demanding logistics requirements and constrained and degraded logistics resources creates a dilemma that will be the essential challenge that joint logistics will have to overcome for the

foreseeable future. The ongoing above trends have the potential to create a situation in which the disparity between logistics demand and logistics resources—the Logistics Gap—will demand a new conceptual approach to logistics. See Figure 2.

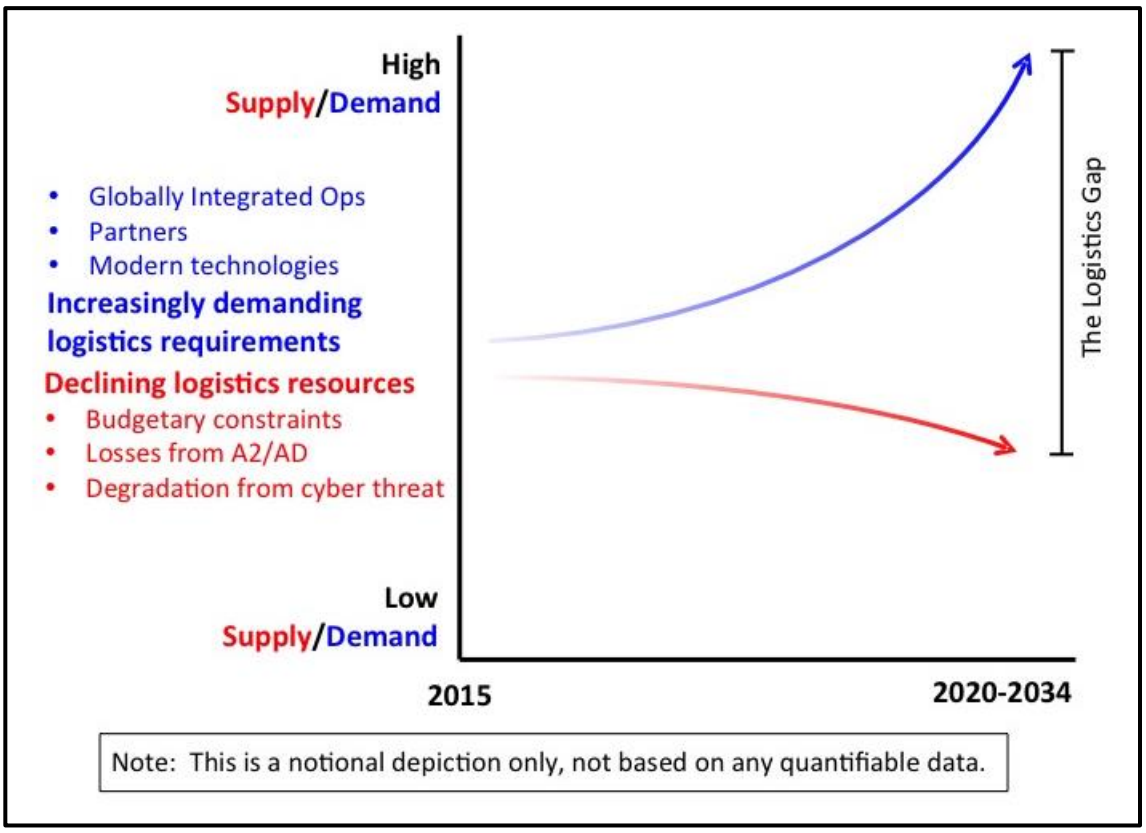

Figure 2. The Challenge: Increasingly Demanding Logistics Requirements in an Era of Constrained and Degraded Resources

A primary challenge for future logistics is GIO. These are joint operations during which joint force elements postured around the globe combine quickly with each other and mission partners to harmonize capabilities fluidly across domains, echelons, geographic boundaries, and organizational affiliations. Globally integrated operations demand intensive logistics—although it should be noted that some aspects of the operational concept actually might lessen the logistics burden, such as the emphasis on small-footprint forces or global capabilities that do not require the deployment of large amounts of logistics support to the operational area. The supporting concept of global agility—the ability to allocate, shift, and deconflict forces quickly among Combatant Commands—in particular may stress the logistics enterprise severely, both in the amount of logistics support required and the complexity of that support.

Globally integrated operations call for joint forces to be distributed widely across the globe, often in relatively small units conducting a wide variety of missions with different support requirements, ranging from peacetime engagement to major combat. Such distribution complicates logistics support because logistics tends to enjoy economy of scale—a division on a single line of communications, for example, is easier to support than the division's nine battalions operating on nine different lines of communications. Far more challenging, however, is that globally integrated operations call for those distributed units to be able to aggregate quickly—to converge and combine rapidly into larger formations, often across unit, Service, agency and geographical boundaries—in response to emerging crises and then to disaggregate and reconfigure again differently as the situation changes. This requirement places a huge burden on the JLEnt first to quickly move those units and then to sustain them.

Finally, the globally integrated operations concept envisions forces integrating across Service lines at dramatically lower echelons of command to create cross-domain synergy. This will require the JLEnt to provide joint logistics support at echelons that previously could be supported by a single Service's organic logistics capabilities. Joint integration at lower echelons will necessitate joint logistics integration at lower echelons.

Independent of the operational concept they employ, **U.S. Armed Forces are becoming increasingly demanding logistically** due in large part to the growing sophistication of weapons, vehicles, and other technologies—a trend that also applies to many of the advanced foreign militaries that may join U.S. forces in multinational operations. These advancements often will generate a greater demand for a wider variety of repair parts, in-theater maintenance efforts, logistics personnel, and contractor support. Combat vehicles and other platforms have tended to grow in size and weight, increasing their demand for operational energy and placing a greater burden on strategic, theater and tactical lift. Moreover, as other technologies have become increasingly capable, their energy requirements likewise have tended to increase, sometimes at an even greater rate. To date, greater military capability tends to beget greater logistics requirements. Similarly, the adoption of emerging technologies has tended to increase the requirement for contractor support. Some countering trends do exist, such as improved equipment reliability that lessens logistics impact and efforts to reduce fuel consumption, but the overall trend toward greater demand persists.

Even as the logistics demand of U.S. forces continues to increase, **logistics resources and military resources overall will diminish.** Barring a major war against a regional or global power, retrenchment in

defense spending likely will continue. The outcome will tend to be sacrifices in capacity rather than in capability, although investment cutbacks will result in forsaking some capability improvements. Historically, in such times, logistics capabilities have tended to suffer greater reductions than the combat capabilities they support, creating an even greater logistics capability gap. Capacity in the active component has tended to be hardest hit, making joint forces more dependent on Reserve component capacity, host-nation or partner capacity, and commercially-sourced support. Shortages will occur not only in logistics forces themselves but throughout the supply chain, including reductions in the national industrial base. War reserves, for example, may be depleted quickly in the event of a major contingency, and while some can be replenished quickly, others cannot.

The next trend in the operating environment that defines the future logistics challenge is **the increasing complexity of logistics operations.** Complexity is a function of the number and type of elements in a system and the interactions among them. The growing variety, sophistication and specialization of weapons and equipment mentioned above hugely complicate logistics support, especially the management of countless different logistics needs. Similarly, joint integration at significantly lower echelons, as envisioned by the CCJO, will complicate logistics by creating more support relationships of greater variety across Service lines and at lower levels than ever before.

Likewise, the growth of multinational and interagency operations will complicate logistics by introducing a wider variety of potential partners. This trend will be a part of both the challenge and the solution, as it will demand working with partners with a variety of requirements while also providing access to external resources and expertise. While some partners will contribute logistics support to the overall effort—whether in support of their own units or in lieu of other contributions—joint forces likely will provide more logistics support to partners than they will gain from those partners, placing additional demand on the logistics system. Partner logistics capabilities will vary, as will their specific materiel resources, procedures, and information systems. It will be necessary to integrate all the various partners' capabilities and requirements into the broader logistics effort, and it usually will fall to the United States to do the integration. Given the variety of materiel, procedural and information systems at work, this integration in itself will be no trivial effort. Information transfer and assurance becomes especially challenging given the variety of information systems, classifications, and organizational/national interface challenges.

Enemy employment of proliferating advanced anti-access/area-denial capabilities would greatly challenge future logistics operations. The requirement to provide logistics support in an environment contested through the use of increasingly lethal anti-access/area-denial capabilities is a game-changing factor that would jeopardize mission accomplishment in practically any situation. Future joint forces cannot assume the unhindered use of the global commons that U.S. forces have enjoyed for decades. Any lack of maritime or air supremacy will jeopardize logistics operations. Many future enemies will be able to threaten U.S. joint forces in transit or within final approach to the operational area through a variety of anti-access or area-denial weapons. Many also have the capability to interdict and are able to hold intermediate staging bases at risk, whether through missile or other long-range strike or through terrorist attack, denying joint forces the use of preferred bases and forcing them to establish longer, more circuitous lines of communications. Still others will take steps to deny the U.S. access to basing or overflight rights through diplomatic agreements, economic pressure, coercion, or threats of horizontal escalation. Finally, practically any enemy will consider logistics forces, supplies, or facilities to be lucrative and vulnerable targets. Against armed opposition by a capable enemy, U.S. logistics capabilities will have an increased risk of attrition.

One response to an anti-access/area-denial threat, as proposed in the *Joint Operational Access Concept* (JOAC), is to deploy and operate on multiple, independent lines of operations, creating operational redundancy and complicating enemy efforts. This approach, however, may also stress friendly logistics efforts by increasing the number of lines of communications that must be supported.

In the event that aerial and seaports of debarkation (A/SPODs) are denied use because of enemy operations, then maneuver from either strategic, or operational distances may be required; thus, further complicating the execution of logistics support in an anti-access/area-denial (A2/AD) environment.

Finally, a high-threat environment may limit the participation of some nonmilitary JLEnt elements—such as some nongovernmental organizations and commercial logistics providers—while those that do participate will require protection.

Like anti-access/area-denial threats, **increasing cyber threats to joint and partner logistics networks will degrade joint logistics operations.** Some enemies unwilling or unable to engage U.S. joint forces in armed combat will not hesitate to employ computer network attack to disrupt joint operations. Such attacks are attractive to many

adversaries because, in addition to being potentially highly effective and cost-efficient, they can be difficult to trace and even more difficult to attribute. Attacks may range from straightforward denial-of-service attacks to more sophisticated operations to corrupt or manipulate data or introduce malware into U.S. and friendly networks. Logistics forces and operations will be viewed as lucrative and vulnerable targets to cyber-attack, largely because the JLEnt is heavily dependent on nonmilitary networks that generally have less robust security protocols than Defense networks. Pursuit of resilient capabilities in partnership with critical infrastructure owners that fall outside the DoD authority will be critical to operation in a cyber-contested environment.

The continuation of the five trends described above within the context of globally integrated operations poses a serious dilemma for future logistics operations that exceeds the current approach and capabilities and therefore urges a new concept.

5. The Solution: Globally Integrated Logistics

To resolve the dilemma posed above, this paper proposes the concept of Globally Integrated Logistics (GIL) in much the same way that the CCJO proposes Globally Integrated Operations as the solution to meeting demanding strategic requirements with constrained military resources. *GIL is the capability to allocate and adjudicate logistics support on a global scale to optimize effectiveness and responsiveness, and to reconcile competing demands for limited logistics resources based on strategic priorities.* GIL pursues efficiency as a means to providing the most effective logistics support possible to competing priorities on a global scale with limited resources. This concept envisions an **adequately resourced JLEnt** providing **modularized** logistics support to **leaner joint forces** worldwide. An **agile global logistics resource allocation and adjudication capability** will coordinate and integrate all elements of the JLEnt via a **resilient and comprehensive information environment.** The GIL will manage logistics capabilities effectively, efficiently and dynamically across theaters to **reconcile constrained logistics resources with competing operational demands**. A **rapid and flexible transportation system able to move forces and supplies quickly between and within theaters**, augmented by **prepositioned capabilities and stocks that can be shifted between theaters**, will operate through a **flexible worldwide network of logistics nodes** that will **provide multiple options for lines of communication** through potentially challenged global commons and forward regions.

Implementing GIL will involve two complementary aspects. The first is institutional: influencing future force planning by advocating for both adequate resourcing of logistics capabilities and decreasing of logistics demands—in other words, working to “bend” both the resources

curve and the demand curve to narrow the Logistics Gap by 2020 and beyond. See Figure 3. The second aspect is operational: employing those capabilities that do exist as effectively, efficiently and dynamically as possible.

While GIL is a concept for the conduct of logistics operations, many required actions must occur well before the commencement of those operations. Examples include: strong representation of logistics issues in the research, development and acquisition process; engagement activities to gain access agreements and basing rights; advocacy for robust logistics force structure; adequate and flexible support contracts already in place; strong logistical input into force planning and operations planning to ensure supportable forces and operations; and re-engineering of joint and Service logistics processes to improve both efficiency and effectiveness.

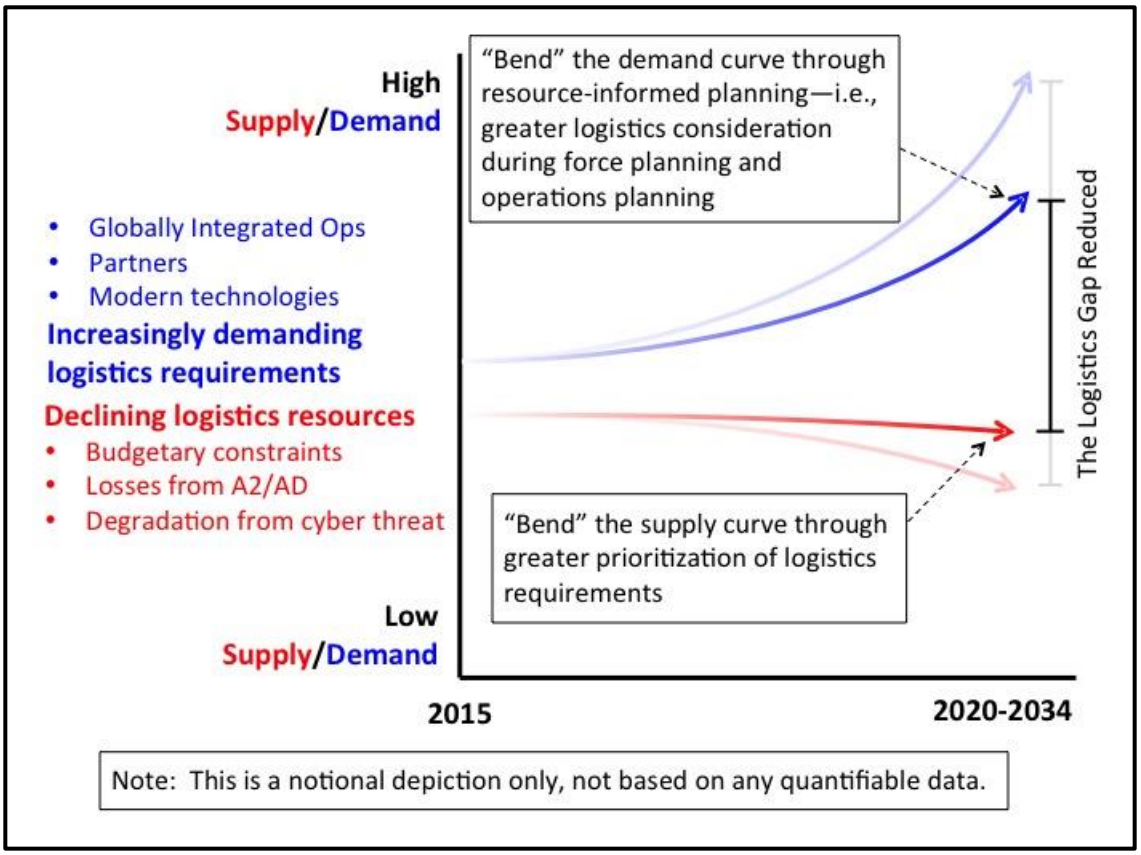

Figure 3. Easing the Future Logistics Dilemma by Increasing Resources and Decreasing Demand

As the **boldfaced** phrases above suggest, there are many ideas in need of explanation in this synopsis of GIL. These are the precepts of GIL.

An adequately resourced logistics enterprise. Globally integrated operations are anticipated to be extremely logistics-intensive. Global agility is the foundation of globally integrated operations. It rests principally upon logistics. This document asserts: globally integrated operations are infeasible without a strong logistics system. Therefore, while resource constraints arguably may be the dominant feature of the future operating environment, it is imperative that adequate logistics capabilities and capacities be maintained. This is not to ignore the reality of future constraints but to argue that logistics capabilities should be protected and prioritized relative to other functions, as logistics can prove to be the difference between victory and defeat, especially between peer enemies. It is imperative that the logistics community make this case strongly and repeatedly to influence the trajectory of the current trend so that logistics capabilities are sufficient to meet requirements in 2020 and beyond.

A key aspect of adequate resourcing, especially in contested environments, is some level of redundancy, the duplication of capability to prevent overall failure upon loss or failure of one element. Joint forces will have an increased risk of casualties in the face of advanced anti-access/area-denial capabilities, and any enemy is likely to consider logistics forces to be valuable and vulnerable targets. Redundancy and timely access to resources will allow U.S. logistics forces to absorb attrition. Moreover, logistical redundancy can allow joint forces to operate on multiple axes of advance and points of entry, thereby complicating an enemy's anti-access efforts.

Redundancy can be provided through a combination of organic capabilities, partner capabilities, and contracted support. Investment in operational contract support in particular can be a low-risk, high-return way to build logistics redundancy.

Intelligent investment in research and development to exploit emerging technological breakthroughs is another key aspect of a robustly resourced logistics enterprise. Robotics, miniaturization, autonomous platforms, and additive manufacturing are just a few examples of technologies that could transform logistics in the timeframe covered in this document. They could have an important impact on mission success while potentially also providing a significant return on investment in dollars and manpower, thereby helping to address the constrained resources issue.

An agile global logistics resource allocation and adjudication capability. As the name Globally Integrated Logistics indicates, some capability for integrating logistics effectively and quickly on a global scale in support of the operational needs of combatant commanders is

essential. This capability is an important part of the answer to the future challenges of achieving global agility and maximizing efficient use of limited resources if current methods prove insufficient to meet future demands. This capability should be able to anticipate logistics requirements when possible and be highly responsive to emerging requirements when not.

Globally integrated operations require an agile process for making logistics prioritization and allocation decisions informed by an assessment of global risk, which requires considerations that extend beyond a single theater. Understanding how logistics actions in one operational area impact other ongoing or potential operations will be critical.

It is likely that different elements of the JLEnt would require different management mechanisms. The assignment, allocation, and apportionment of U.S. military logistics capabilities, while involving coordination and collaboration, ultimately would be directed by appropriate authority. That process will be integrated with the Global Force Management process. The involvement of non-U.S. military logistics capabilities would be a matter of standing support agreements, commercial contracts, and other negotiated arrangements. In the particular case of operational contract support, this will entail establishing preplanned requirements or creating mechanisms to develop those requirements quickly, as well as flexible contract vehicles to fulfill those requirements. This capability would require the oversight of all the different elements of the JLEnt in all their various relationships.

This capability would apply to the provision of logistics resources *to* the theaters and their allocation *between* theaters but not for their employment *within* a theater once allocated, which authority would remain with the combatant commander. Importantly, this concept reaffirms that the conduct of actual logistics operations remains the purview of combatant commanders through their directive authority for logistics (DAFL). The intent here is not to impinge on a combatant commander's authority but rather to ensure that commanders have better and timelier access to any logistics resources that could support their operations.

Global allocation and adjudication of logistics resources might, as an example, include visibility of and control over global resource pools, such as for spare parts or other common commodities, which would provide efficient management of limited resources. Such a process would require a rapid transportation system that could move those resources quickly enough to be responsive to the needs of globally integrated operations. As another example, global allocation and adjudication of

logistics might also proactively manage scheduled maintenance as a way of minimizing more-expensive unscheduled maintenance later.

A resilient and comprehensive logistics information environment. Critical to implementing agile global allocation and adjudication of logistics will be a logistics information environment that provides global visibility of both logistical requirements and resources, to include rates of expenditure and rates of production within the supply chain. This information environment will be comprehensive in the dual sense that it will include complete, accurate, and timely data on all parts of the JLEnt and will link the networks of all enterprise members, accounting for technical differences and various levels of security clearance.

The information environment also must be resilient to attack. Two broad responses exist to the threat of cyber-attack: make the network less vulnerable to the attack or continue to operate effectively when the network is degraded by the attack. It is critical that the information network be made highly resilient, a challenge only made more difficult given the proprietary and commercial nature of many of the enterprise's networks. In order to achieve the desired level of resiliency for the information environment, cleared defense contractors should achieve an equivalent commercial standard to protect the supply chain end to end. That said, forces must train to mitigate the effects of network degradation, realizing that these workarounds will not achieve the full level of effectiveness and responsiveness envisioned by GIL.

Highly modularized and interoperable logistics capabilities. Modularization here refers to the ability of logistics elements at increasingly lower echelons to detach from their parent headquarters and combine effectively with similar elements from other Services or organizations to form flexible tactical groupings. It also refers to the ability of these elements to be incrementally combinable to create logistics organizations of practically any size and composition. This ability is essential for supporting globally integrated operations, which call for the rapid aggregation of forces from distributed units and for devolving joint integration down to increasingly lower echelons. The idea of modularization applies to cargo and prepositioned stocks as well as to logistics units.

Key to achieving modularity is interoperability between units from different Services, other agencies, and with our coalition/multi-national partners to the extent that is possible. Interoperability itself is a function of some level of standardization of technologies, equipment, and procedures.

Leaner forces and operations. This precept addresses the challenge of constrained resources from the demand side of the issue. While other precepts focus on either increasing the supply of logistics or employing logistics resources more effectively, this precept includes actual reductions in the levels of logistics support demanded by the mission. While recognizing that logistics exist to support operational requirements, GIL envisions that both future forces and operations consciously will be designed as much as possible to impose less demand on the JLEnt. The influence works in both directions: logistics ultimately must support mission accomplishment, but operations also must be sensitive to logistics constraints. The realities of the future operating environment clearly show the need for austere and lighter logistics.

With respect to force planning, requirements and acquisition decision making should consider not only upfront costs but also downrange logistical issues like operational energy consumption, munitions expenditure rates, and maintenance and other support requirements. Foremost, an effective capability development process will thoroughly examine the logistics supportability of any proposed capability. This will require the Department of Defense and the Services to re-examine existing capability development and acquisition processes and make appropriate changes. Additionally, further research and development into technologies that reduce logistics demand is merited—for example, reducing operational energy demands. Up-front costs to reduce the logistics requirements of an end item or capability can be mitigated by the return on investment in lower logistics costs during the system's life-cycle.

With respect to operations, logistics supportability may weigh more heavily in operations planning. Certain plans and concepts, especially those designed to counter anti-access/area-denial threats, may strain the JLEnt and in extreme cases render a plan logistically unsupportable. Similarly, operations plans should consider the proposed levels of service at forward locations as a necessary concession to the reality of a constrained future operating environment. Moreover, it is an acknowledgement that, especially in the future operating environment, there is potential risk inherent in operations based on a large, time-consuming logistics buildup. This precept will involve greater and earlier logistics input into both force planning and operations planning.

A rapid and flexible transportation system able to move forces and supplies quickly between and within theaters. If an agile global allocation and adjudication capability provides the brains of GIL, a transportation system providing rapid lift is the connective tissue. Speed of movement in the transportation system will be critical to creating and maintaining global agility, as will be the ability to operate through

expeditionary or austere bases, thus providing more options for operations planners. This system should include a variety of routes and lift platforms, with varying capabilities and capacities that can be combined flexibly to meet situational requirements. A key aspect of this will be the ability to move force increments of different sizes since the idea of distributing forces in potentially smaller increments is an element of globally integrated operations. The system may include autonomous vehicles, a possible example of a materiel solution with greater upfront cost but greater downrange cost-efficiency.

Critical to this system will be not only rapid movement but also rapid receiving, staging and onward movement of forces and materiel, particularly in austere and contested environments in which the capacity of ports of debarkation may be limited.

In a contested environment, the enemy will view lift platforms as vulnerable and lucrative targets. Moreover, under such circumstances, this system, and the logistics enterprise more generally, will require protection by combat forces dedicated to that mission.

Prepositioned stocks and capabilities that can be selectively accessed and moved quickly to multiple theaters. GIL envisions a comprehensive array of afloat and land-based prepositioned stocks strategically positioned around the globe in such a manner that they would be quickly accessible by the Geographic Combatant Commanders. In addition, smaller, but more tailored prepositioned sets could become multifunctional in their use supporting both our allies/partners during joint exercises and supporting real-world Phase 0 and Phase 1 operations. Modularized afloat stocks could be moved quicker than land-based assets and through the use of selective offloading capabilities the port could avoid having to download an entire ship to obtain the desired cargo/equipment.

A flexible worldwide network of logistics nodes. GIL relies on an extensive network of logistics nodes to maximize options and provide redundancy and the ability to reroute in the event of interdiction. Moreover, foreign nations' decisions to provide access to bases may be highly contingent on circumstances, so it will be important to have a wide network of potential options from which to build a logistics system for any contingency. Building and maintaining this network so that it is accessible when needed will require extensive, ongoing engagement to negotiate access with foreign partners—another aspect of GIL that must occur well in advance of actual operations.

Some bases may be maintained as enduring bases, while others may be temporary, contingency, forward operating sites or cooperative

security locations operating at reduced capacity until required, making a rapidly deployable port-opening capability critical. To augment this network of bases, GIL also envisions improved capabilities for sea basing and over-the-shore logistics where existing bases do not exist or are not feasible options.

As with transportation platforms discussed earlier, these bases may require protection in a contested environment, likely necessitating the assignment of combat forces to that task.

These individual precepts taken together constitute the holistic concept of GIL proposed to meet the challenge of supporting globally integrated operations under conditions of increased logistics demand and constrained and degraded logistics resources. The following section identifies the capabilities required to implement that concept.

6. Required Capabilities

In order to implement GIL fully, future joint forces will require certain capabilities or enhancements to current capabilities. They include:

- **GIL-01: An improved ability to include consideration of logistics supportability in force planning.** This capability is essential for proactively managing the logistics demands of future joint capabilities through 2034.

- **GIL-02: An improved ability to include logistics considerations in operations and contingency planning earlier in the planning process.** This capability is essential for proactively addressing the growing demand for logistics support by joint forces and operations.

- **GIL-03: The ability to provide agile allocation and adjudication of all logistics resources globally.**

- **GIL-04: The ability to accurately access, track, collect, process, store, communicate and analyze all logistical data (i.e., asset visibility) from all elements of the JLEnt in near-real time.**

- **GIL-05: The ability to accurately access, track, collect, process, store, communicate and analyze the logistical status and requirements of all joint forces globally in near-real time.**

- **GIL-06: The improved ability to defend the logistics information environment against hostile computer network attack.** Given GIL's heavy reliance on a comprehensive logistics information environment, being able to protect that environment will be critical. This capability may not be organic to logistics forces but rather to specialized cyber defense units.

- **GIL-07: The improved ability to quickly repair and restore the logistics information environment after hostile computer network attack.** Again, given the importance of the logistics information environment, making it resilient to attack will be critical. Partnerships with commercial organizations will be crucial as large portions of the supply chain reside outside of the DoD. This capability may not be organic to logistics forces but rather to command, control, communications, and computer/cyber units.

- **GIL-08: An improved ability to quickly recognize when an information network is under attack or already corrupted and minimize disruption with workarounds.** Computer network defense will not be able to guarantee network protection and immediate recovery. This capability may not be organic to logistics forces but rather to specialized cyber defense units. That said, logisticians must constantly exercise system disruption mitigation.

- **GIL-09: The ability to continue logistics operations using analog communications and methods in the event of successful hostile computer network attack until the logistics information environment has been restored.**

- **GIL-10: An improved ability to rapidly aggregate, disaggregate, and re-aggregate joint forces anywhere in the world, including in a contested environment.**

- **GIL-11: The ability to rapidly move forces, supplies, and equipment strategic, operational, and tactical distances in small and large increments in a contested environment.**

- **GIL-12: An improved ability to preposition and maintain stocks and shift those stocks quickly in response to operational need.**

- **GIL-13: An improved ability to access selected items of prepositioned stocks quickly through selective offloading or removal from storage.**

- **GIL-14: An improved ability to maximize access to bases and other overseas logistics support through engagement activities with foreign partners to maximize deployment and distribution options.**

- **GIL-15: An improved ability to construct, improve, and maintain forward base infrastructure.**

- **GIL-16: An improved ability to open and repair ports and airports quickly or upgrade the capability and capacity of existing port facilities in a contested or austere environment.**

- **GIL-17: An improved ability to logistically support joint operations from sea bases.**

- **GIL-18: An improved ability to conduct logistics over-the-shore operations in a contested or austere environment.**

- **GIL-19: The ability to deploy and operate logistics units at much lower echelons than presently and to combine and interoperate at those echelons with partners from other Services, nations, or organizations.**

- **GIL-20: An improved ability to protect friendly logistics forces, bases and lines of communications in an anti-access/area-denial environment.** This capability may not reside in logistics forces themselves but instead in combat forces.

- **GIL-21: The ability to maximize the effectiveness and efficiency of commercial sources of support while minimizing cost by leveraging operational contract support.**

- **GIL-22: The ability to plan and coordinate logistics operations with all JLEnt partners while enroute to the objective area as well as at home station.**

- **GIL-23: An improved or accelerated ability to acquire new technologies such as 3D manufacturing, robotics, unmanned systems, power generation, etc.**

- **GIL-24: Improved interoperability, standardization, and maximum consideration of common-user logistics in sustainment planning.**

7. Risks of Adopting this Concept

Like the concept of globally integrated operations itself, GIL is not without risks. Some of these risks have already been realized and their effects could grow in severity without mitigation. They include:

- **Risk #1: The logistics information environment that undergirds GIL could be seriously degraded, whether by hostile computer network attack or other disruption, and the concept would collapse.** This heavy dependence on a resilient and comprehensive information environment is the single greatest vulnerability of the concept, and mitigating this risk would be a major challenge. Increasing reliance on non-U.S. military sources of support exacerbates this risk. The concept urges resilience to ensure network functioning, but it does not offer a solution for a seriously degraded network. If the network goes down, logistics planners may resort to traditional workarounds like alternate forms of communication or pushing quantities of logistic support based on rough estimates rather than actual requirements—the same methods that resulted in "iron mountains" of ammunition and supplies in past wars—but it will not be GIL. It will be something less efficient and less agile, and it certainly will not be globally integrated.

- **Risk #2: The massive challenge of allocating and adjudicating JLEnt resources globally could prove self-defeating.** Establishing a global logistics allocation and adjudicating capability may not create the effectiveness and agility desired. Depending on how it is implemented, such a new capability could make the current allocation and management process more cumbersome rather than less, while adding another level of bureaucracy. The mitigation is to be aware of such risks and guard against them during implementation.

- **Risk #3: The concept's call for an adequately resourced logistics enterprise could fail to become a reality because of budgetary constraints.** Part of the concept's response to a trend toward further resource constraints is to get ahead of that trend and change its trajectory through proactive efforts so that by 2020 the resource situation is not so dire that the JLEnt simply cannot meet the challenge. It may turn out, however, that the trend toward further constraints is too strong to be changed. Without adequate resources, the JLEnt cannot sufficiently support a demanding operational concept like globally integrated operations. At that point, mitigation will lie in maximal efficiency in the

management of the resources that are available—the other half of GIL's essential response to the demand-versus-constraints dilemma.

- **Risk #4: The rapid and flexible transportation system envisioned in the concept to undergird global agility might not succeed in defeating the "tyranny of distance," and the global agility envisioned in the CCJO might not be achievable.** GIL is predicated on being able to move resources rapidly over strategic distances. There are physical limits to how quickly forces and materiel can be moved by air or sea, however, and it may turn out that even a robust transportation system cannot match the operational tempo demanded by globally integrated operations. The mitigation to this is to forward deploy forces closer to the scene of anticipated employment, making those forces responsive to that situation but less responsive to others, an inefficiency in that it occupies limited resources that cannot then be employed elsewhere. Moreover, forward deployment in a potentially contested environment puts those forces at risk once hostilities start.

- **Risk #5: The temptation to eliminate logistics redundancies within or between Services to satisfy budgetary constraints, if acted upon, could adversely impact a joint force commander's options and flexibility.** While the concept actually calls for redundancy rather than its elimination, the theme of efficiency that runs through the concept may inadvertently give the impression that it is safe to eliminate redundancy in order to meet budgetary constraints. The mitigation to this risk is to ensure that the institutional effort to shape force structure alerts force planners to this danger.

- **Risk #6: The current trend of escalating logistics demand may be difficult to arrest, leading to less agile forces and increased operational risks.** Creating a lighter and leaner force requires a shift in both force planning and operations planning. If these shifts do not occur, logistics demands will continue to increase unabated, and GIL may be inexecutable.

- **Risk #7: The concept's emphasis on operational contract support could encourage overreliance on outsourcing to commercial sources.** While commercial sources can provide cost-effective support and services, they cannot replace all military logistics capabilities.

8. Conclusion

The essential challenge for the JLEnt in the future is to meet increasingly demanding logistics requirements with constrained resources in a potentially contested environment. This concept proposes that the JLEnt could meet that challenge through the concept of Globally Integrated Logistics, the allocation and management of joint logistics support on a global scale to maximize efficiency and responsiveness, and to reconcile competing demands for limited logistics resources based on strategic priorities.

The implementation of GIL will involve two complementary aspects. The first is institutional: influencing future force planning by advocating for both adequate resourcing of logistics capabilities and suppressing logistics demands—in other words, working to "bend" both the supply curve and the demand curve in order to narrow the Logistics Gap and ease the logistics dilemma by 2020. The rationale here is that globally integrated operations are logistically intensive and infeasible without robust logistics support. The second aspect is operational: employing those resources that do exist as effectively, efficiently and dynamically as possible. To realize this, GIL envisions, foremost among several precepts, a global logistics allocation and adjudication capability to prioritize logistics resources effectively and quickly along with a robust transportation system to move those resources anywhere in the world rapidly. Adopting GIL will have significant implications for force development.

This concept is not without risks—chief among them a heavy reliance on advanced communications networks the U.S. military does not completely control and cannot completely protect—but it may be one of the only viable ways of resolving the dilemma of future logistics.

APPENDIX A: CHALLENGE-SOLUTION-CAPABILITY MAP

Annex A. Challenge-solution-Capability Map

This annex shows the logical thread of the concept document by listing the elements of the military challenge described in Section 4, the precepts that address each of those challenge elements in Section 5, and the corresponding capabilities listing in Section 6.

Challenge Element	Relevant Precept	Corresponding Capability
GIO - Distributed Ops	Adequately resourced JLEnt Rapid & flexible transportation system Modularization	GIL-01 / 02 / 21 / 23 GIL-10 / 11 GIL-19 / 24
GIO - Rapid aggregation	Adequately resourced JLEnt Agile global logistics allocation and adjudication Rapid & flexible transportation system Prepositioning Flexible network of log nodes (seabasing, LOTS) Modularization	GIL-01 / 02 / 21 / 23 GIL-03 / 09/ 22 GIL-10 / 11 / 22 GIL-12 / 13 GIL-14 / 15 / 16 / 17/ 18/ 20 GIL-19 / 24
GIO-Low-level joint synergy	Modularization	GIL-19
Increasing logistics demands of joint forces	Adequately resourced JLEnt Leaner force and ops	GIL-01 / 02 / 21 / 23 GIL-01 / 02
Increasing resources constraints	Adequately resourced JLEnt Leaner force and ops Agile global logistics allocation and adjudication Resilient & Comprehensive logistics info environment	GIL-01 / 02 / 21 / 23 GIL-01 / 02 GIL-03 / 09 / 22 GIL-04 / 05
Increasingly interagency multinational nature of ops	Adequately resourced JLEnt Agile global logistics allocation and adjudication Resilient & Comprehensive logistics info environment	GIL-01 / 02 / 21 / 23 GIL-03 / 09/ 22 GIL-04 / 05
A2 / AD threat	Rapid & flexible transportation system Prepositioning Flexible network of log nodes (seabasing, LOTS) Modularization	GIL-09 / 10 GIL-12 / 13 GIL-14 / 15 / 16 / 17/ 18/ 20 GIL-18
Cyber threat	Resilient & Comprehensive logistics info environment	GIL-06 / 07 / 08 / 09

This page intentionally left blank.

APPENDIX B: ABBREVIATIONS AND ACRONYMS

3D	three-dimensional
A2/AD	anti-access/area-denial
CCJO	Capstone Concept for Joint Operations
DAFL	directive authority for logistics
GIL	globally integrated logistics
GIO	globally integrated operations
JCL	Joint Concept for Logistics
JLEnt	Joint Logistics Enterprise
JOAC	Joint Operational Access Concept
LOTS	Logistics Over the Shore

Terms and Definitions

additive manufacturing--The process of joining materials to make objects from 3D model data, usually layer upon layer, as opposed to subtractive manufacturing methodologies.

air supremacy--(DoD) That degree of air superiority wherein the opposing force is incapable of effective interference within the operational area using air and missile threats. (JP 1-02)

anti-access--Those capabilities, usually long-range, designed to prevent an advancing enemy from entering an operational area. (JOAC)

area-denial--Those capabilities, usually of shorter range, designed not to keep the enemy out but to limit his freedom of action within the operational area. (JOAC)

axis of advance--(DoD) A line of advance assigned for purposes of control; often a road or a group of roads, or a designated series of locations, extending in the direction of the enemy. (JP 1-02)

coalition--(DoD) An arrangement between two or more nations for common action. (JP 1-02)

command and control--(DoD) The exercise of authority and direction by a properly designated commander over assigned and attached forces in accomplishment of the mission. Command and control functions are performed through an arrangement of personnel, equipment, communications, facilities, and procedures employed by a commander in planning, directing, coordinating, and controlling forces and operations in the accomplishment of the mission. (JP 1-02)

computer network attack--(DoD) Actions taken through the use of computer networks to disrupt, deny, degrade, or destroy information resident in computers and computer networks, or the computers and networks themselves. Also called CNA. (JP 1-02)

concept--(DoD, NATO) A notion or statement of an idea, expressing how something might be done or accomplished, that may lead to an accepted procedure. (JP 1-02 1989)

cooperative security location--(DoD) A facility located outside the United States and US territories with little or no permanent US presence, maintained with periodic Service, contractor, or host-nation support. Cooperative security locations provide contingency access, logistic support, and rotational use by operating forces and are a focal point for security cooperation activities. (JP 1-02)

coordinating authority--(DoD) The commander or individual who has the authority to require consultation between the specific functions or activities involving forces of two or more Services, joint force components, or forces of the same Service or agencies, but does not have the authority to compel agreement. (JP 1-02)

cross-domain synergy--The complementary vice merely additive employment of capabilities in different domains such that each enhances the effectiveness and compensates for the vulnerabilities of the others. (JOAC)

cyberspace--(DoD) A global domain within the information environment consisting of the interdependent network of information technology infrastructures, including the Internet, telecommunications networks, computer systems, and embedded processors band controllers. (JP 1-02)

deployment--(DoD) The rotation of forces into and out of an operational area. (JP 1-02)

directive authority for logistics--(DoD) Combatant commander authority to issue directives to subordinate commanders to ensure the effective execution of approved operation plans, optimize the use or reallocation of available resources, and prevent or eliminate redundant facilities and/or overlapping functions among the Service component commands. Also called DAFL. (JP 1-02)

distribution--(DoD) That functional phase of military logistics that embraces the act of dispensing materiel, facilities, and services. (JP 1-02 1989)

distribution system--(DoD) That complex of facilities, installations, methods, and procedures designed to receive, store, maintain, distribute, and control the flow of military materiel between the point of receipt into the military system and the point of issue to using activities and units. (JP 1-02)

doctrine--(DoD) Fundamental principles by which the military forces or elements thereof guide their actions in support of national objectives. It is authoritative but requires judgment in application. (JP 1-02)

force planning--(DoD) Planning associated with the creation and maintenance of military capabilities by the Military Departments, Services, and US Special Operations Command. (JP 1-02)

forward operating site--(DoD) A scalable location outside the United States and US territories intended for rotational use by operating forces. Such expandable "warm facilities" may be maintained with a limited US military support presence and possibly prepositioned equipment. Forward operating sites support rotational rather than permanently stationed forces and are a focus for bilateral and regional training. Also called FOS. (JP 1-02)

global agility--A quality of military forces that allow them to be allocated, shifted and deconflicted among combatant commands quickly through a combination of nimble command and control, swift and adaptable response, increased use of prepositioned stocks and expeditionary basing, and employment of global capabilities such as cyber and global strike. (Derived from CCJO)

global commons--Areas of air, sea, space, and cyberspace not belonging to any one state. (JOAC)

global force management--A Department of Defense process that integrates the force apportionment, assignment, and allocation processes; assesses force sourcing risks globally and addresses mitigation options; and enables global sourcing with the best force sourcing option. (Derived from multiple sources.)

globally integrated operations--A joint operating concept according to which joint force elements postured around the globe combine quickly with each other and mission partners to harmonize capabilities fluidly across domains, echelons, geographic boundaries, and organizational affiliations. (CCJO)

information assurance--(DoD) Actions that protect and defend information systems by ensuring availability, integrity, authentication, confidentiality, and nonrepudiation. Also called IA. (JP 1-02)

information environment--(DoD) The aggregate of individuals, organizations, and systems that collect, process, disseminate, or act on information. (JP 1-02)

intermediate staging base--(DoD) A tailorable, temporary location used for staging forces, sustainment, and/or extraction into and out of an operational area. Also called ISB. (JP 1-02)

in-transit visibility--(DoD) The ability to track the identity, status, and location of Department of Defense units, and non-unit cargo (excluding bulk petroleum, oils, and lubricants) and passengers; patients; and personal property from origin to consignee or destination across the range of military operations. Also called ITV. (JP 1-02)

joint logistics--(DoD) The coordinated use, synchronization, and sharing of two or more Military Departments' logistic resources to support the joint force. (JP 1-02)

joint logistics enterprise--A multi-tiered matrix of key global logistics providers cooperatively engaged or structured to achieve a common purpose without jeopardizing the integrity of their own organizational missions and goals. Also called JLEnt. (JP 1-02)

line of communications--(DoD) A route, either land, water, and/or air, that connects an operating military force with a base of operations and along which supplies and military forces move. (JP 1-02)

logistics--(DoD) Planning and executing the movement and support of forces. (JP 1-02)

logistics over-the-shore operations--(DoD) The loading and unloading of ships without the benefit of deep draft-capable, fixed port facilities; or as a means of moving forces closer to tactical assembly areas dependent on threat force capabilities. (JP 1-02)

logistics resources--(DoD) Logistics resources are the logistics forces, materiel, and other assets or capabilities apportioned or allocated to the commanders of a unified or specified command. The core logistics functions that comprise these resources are: deployment and distribution, supply, maintenance, logistics services, operational contract support (OCS), engineering, and health services (HS). (JP 1-02)

maritime supremacy--(DoD) That degree of maritime superiority wherein the opposing force is incapable of effective interference. (JP 1-02)

mission command--(DoD) The conduct of military operations through decentralized execution based upon mission-type orders. (JP 1-02)

multinational force--(DoD) A force composed of military elements of nations who have formed an alliance or coalition for some specific purpose. Also called MNF. (JP 1-02)

multinational logistics--(DoD) Any coordinated logistic activity involving two or more nations supporting a multinational force conducting military operations under the auspices of an alliance or coalition, including those conducted under United Nations mandate. Also called MNL. (JP 1-02)

multinational operations--(DoD) A collective term to describe military actions conducted by forces of two or more nations, usually undertaken within the structure of a coalition or alliance. (JP 1-02)

nongovernmental organization--(DoD) A private, self-governing, not-for-profit organization dedicated to alleviating human suffering; and/or promoting education, health care, economic development, environmental protection, human rights, and conflict resolution; and/or encouraging the establishment of democratic institutions and civil society. Also called NGO. (JP 1-02)

operational contract support--(DoD) The process of planning for and obtaining supplies, services, and construction from commercial sources in support of joint operations. Also called OCS. (JP 1-02)

operational energy--(DoD) The energy required for training, moving, and sustaining military forces and weapons platforms for military operations. (JP 1-02)

port of debarkation--(DoD) The geographic point at which cargo or personnel are discharged. Also called POD. (JP 1-02)

preposition--(DoD) To place military units, equipment, or supplies at or near the point of planned use or at a designated location to reduce reaction time, and to ensure timely support of a specific force during initial phases of an operation. (JP 1-02)

seabasing--(DoD) The deployment, assembly, command, projection, reconstitution, sustainment, and re-employment of joint power from the sea without reliance on land bases within the operational area. (JP 1-02)

security cooperation--(DoD) All Department of Defense interactions with foreign defense establishments to build defense relationships that promote specific US security interests, develop allied and friendly military capabilities for self-defense and multinational operations, and provide US forces with peacetime and contingency access to a host nation. Also called SC.

selective offloading--(DoD) The capability to access and off-load vehicles, supplies, and equipment without having to conduct a major reconfiguration or total off-load; influenced by the number and types of ships allocated, and the space made available for the embarkation of the landing force. (JP 1-02)

strategic mobility--(DoD) The capability to deploy and sustain military forces worldwide in support of national strategy. (JP 1-02)

strategic sealift--(DoD) The afloat prepositioning and ocean movement of military materiel in support of US and multinational forces.

supplies--(DoD) In logistics, all materiel and items used in the equipment, support, and maintenance of military forces. (JP 1-02)

supply--(DoD) The procurement, distribution, maintenance while in storage, and salvage of supplies, including the determination of kind and quantity of supplies. a. producer phase—That phase of military supply that extends from determination of procurement schedules to acceptance of finished supplies by the Services. b. consumer phase—That phase of military supply that extends from receipt of finished supplies by the Services through issue for use or consumption. (JP 1-02)

supply chain--(DoD) The linked activities associated with providing materiel from a raw materiel stage to an end user as a finished product. (JP 1-02)

transportation system--(DoD) All the land, water, and air routes and transportation assets engaged in the movement of United States forces and their supplies during military operations, involving both mature and immature theaters and at the strategic, operational, and tactical levels of war. (JP 1-02)

war reserves--(DoD) Stocks of materiel amassed in peacetime to meet the increase in military requirements consequent upon an outbreak of war. (JP 1-02)

APPENDIX C: BIBLIOGRAPHY

Capstone Concept for Joint Operations, v3.0 (15 Jan 09)
Capstone Concept for Joint Operations: Joint Force 2020 (10 Sep 12)
JP 1-02, *Department of Defense Dictionary of Military and Associated Terms* (12 Apr 01, as amended through 5 Jan 07)
Joint Concept for Logistics, v1.0 (6 Aug 10)
Joint Force 2020: Logistics Imperatives (1 May 13)
JP 4-0, *Joint Logistics* (16 Oct 13)
Joint Operational Access Concept, v1.0 (17 Jan 12)
Operational Contract Support Joint Concept (7 Oct 13)

This page intentionally left blank.