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PLA Logistics and Sustainment: PLA Conference 2022

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PLA LOGISTICS AND SUSTAINMENT PLA CONFERENCE 2022

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Contributors

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Foreword

Throughout the past few years, we have been reminded, almost daily, of the challenges of sustainment and logistics. The COVID-19 pandemic unleashed numerous shocks on domestic and international production and distribution of goods that continue to this day. Be it shortages of paper products, medicines, automobiles, or semiconductor chips, we have experienced firsthand the immense difficulties of sustaining modern daily life. Russia's invasion of Ukraine in February this year and the Russian military's well-publicized struggles to sustain its combat operations have plainly illustrated the harsh realities of maintaining a fighting force in the era of modern warfare.

As the PLA watching community convened again this year for the Carlisle Conference, it was fitting the event focused on the sustainment and logistics capabilities of the PRC and its military. As our keynote speaker, General Charles Flynn, commander of US Army-Pacific, stated, "Logistics is the oxygen of battle." The United States and its allies and partners know from many years of hard-fought experience in the Indo-Pacific and other theaters that General Flynn is correct. Victory in a conflict across the vast distances, unforgiving oceans, and often-treacherous terrain of the Indo-Pacific will turn on delivering the right forces at the right time with the right capabilities. Doing so will depend on sustaining and supplying these forces during and well beyond the first battle.

As the PLA continues to build and modernize its combat forces, it is vital to assess if the capabilities meant to support combat operations are also being developed. This assessment will better illuminate the PLA's true operational reach and how it might be curtailed. It will also inform US efforts to improve its own sustainment and logistics capabilities in the region—an essential condition to deterring conflict.

Carol V. Evans

Dr. Carol V. Evans
Director, Strategic Studies Institute
and US Army War College Press

Executive Summary

The US Army War College People's Liberation Army (PLA) Conference was held from March 31 to April 2, 2022, at Carlisle Barracks, Pennsylvania. The Strategic Studies Institute has been organizing and hosting the event since 1999. This year, the Strategic Studies Institute was excited to have the National Ground Intelligence Center as a cosponsor, enabling the conference to involve more members from the intelligence community.

The focus of the conference was PLA logistics and sustainment. As the PLA continues to build and modernize its combat forces, it is important to examine if the capabilities meant to support combat operations are also being developed. A state can build great combat power, but if it cannot sustain or move it to where it must be, then that combat power will not survive long.

The conference had several great papers and presentations on a variety of topics such as China's national-level logistics, including how China mobilizes national resources for the military and provides joint logistics support to the PLA Theater Commands. Other papers and presentations looked at the logistics capabilities of the different PLA services, especially the Army, Navy, and Air Force. The conference also considered PLA logistics in China's remote regions, looking specifically at air-power projection in the Western Theater Command along the Indian border, and examined the PLA's ability to sustain overseas operations using the PLA base in Djibouti as a case example.

The conference revealed several very relevant points:

- There are real questions about the command relationships between the PLA theater commanders and the Joint Logistics Support Force that could lead to an inefficient transition to a wartime logistics structure.
- At the national level, there are different views within China about the chain of command of the defense mobilization system. If these divergent views are serious enough, they could undermine China's ability to sustain a large-scale operation over the longer-term.

- There seem to be shortfalls in logistics support elements for the PLA Army's combat battalions. Additionally, the PLA makes little use of containerized goods at brigade and lower levels. This observation casts doubt on how long the PLA can keep operating at the tactical unit level.
- The PLA Navy has a low number of replenishment ships given the size of the combatant fleet. Also, PLA Air Force facilities often seem to lack enough apron space for maintenance operations.

The conference did not judge the PLA incapable of sustaining large-scale military operations. Despite notable potential shortfalls and points of friction, the PLA has successfully sustained counterpiracy maritime operations for many years and conducted noncombatant evacuation operations well-distant from China. They are also increasingly able to move forces across the vast distances of China and conduct large training exercises. Far more must be known about PLA sustainment and logistics before the hard questions about PLA operational reach and endurance can be answered.

Introduction

There is no issue more critical to US security than the expansive and long-term challenge posed by the People's Republic of China (PRC). The Russian war in Ukraine is deservedly receiving great attention. But where Russia is a persistent subversive threat operating from a position of weakness, the PRC poses a much more substantial and robust threat operating from an ever-increasing position of strength. With the PRC posing the larger strategic threat, the Department of Defense recently termed it the United States' "pacing challenge." If the US Joint Force is to meet this challenge, it must become expert in understanding the Chinese People's Liberation Army (PLA) logistics capacity and how it intends to sustain itself in operations throughout the region.

The Strategic Studies Institute of the US Army War College held its annual conference on the PLA from March 31 to April 2, 2022, in Carlisle, Pennsylvania. The conference focused on logistics and sustainment in the PLA and consisted of a day and a half of unclassified paper presentations and discussions followed by a day of classified presentations. A summary of the classified discussions is available to those with proper clearance.

The logistics challenge of operating in the Indo-Pacific is unlike anywhere else in the world. Geography and distance are obvious factors but so are underdeveloped lines of communication, especially outside northeast Asia, which constrain the movement of modern equipment that requires larger and longer sustainment tails. The PLA understands this constraint and is hard at work rehearsing live fires and joint coordination with its theater commands. As their operations have become more complex, their sustainment operations have become more robust. Sustainment and logistics efforts and posture will be a strong indicator of PLA intent in exercise and war.

Still, the view into the PRC and PLA remains opaque. Definitive sources on PLA capabilities are, of course, hard to uncover. Additionally, the PLA has a limited record of conducting large-scale operations this century and no combat experience since the 1970s from which to gauge how it would sustain a campaign against a peer adversary. What is more, the PLA itself may not have a firm grasp on the true extent of its capabilities or the depth of its limitations, hence, the reason why this conference was important to continue to sharpen a blurry picture.

National-level Logistics

In the volume's first chapter, Kenneth W. Allen provides a valuable and handy guide to the history and recent changes in the PLA structure. Understanding these points will help readers better appreciate the context of the succeeding chapters. Importantly, Allen points out the many efforts over the years to either separate out or merge logistics organizations with various parts of the PLA structure. These efforts have created some notable potential organizational gaps, or seams at least, for the sustainment enterprise overall. For example, theater commands lack subordinate logistics or equipment departments. It is also unclear where some former organizations and their functions were moved and what the resulting realignments meant for the leadership of these organizations. What begins to emerge is a sense the PLA is still experiencing significant growing pains as it tries to shake free of legacy structures that might have been adequate to sustain a premodern or non-digital force but are ill-suited for today's operating environment. How, and if, the PLA can settle into an effective structure for sustainment will be a deciding factor in its ability to meet national missions.

The PLA established the Joint Logistics Support Force (JLSF) in 2016 to centralize strategic logistics elements and their support to the new joint theater commands. In chapter two, Joel Wuthnow assesses the implementation and development of the JSLF and its contribution to PLA readiness. Among other findings, he notes that while the organizational reforms implemented by the PLA in 2015–17 have given theater commanders operational control over all ground, naval, air force, and some PLA Rocket Force units in their theaters, the creation of the JLSF took control over logistics within the theaters away from the theater commanders. Some PLA sources, however, suggest there would be a realignment of relations during wartime, with joint logistics assets in the theater being placed under the theater command. Such a transition from normal peacetime operations to wartime operations might provide an indication the PLA was planning to engage in wartime operations and a moment of vulnerability that could be exploited by an adversary. Wuthnow cautions against exaggerating potential problems in the JLSF structure though, since it does have mechanisms in place for routine coordination with the theater commands.

In chapter three, Erin Richter and Benjamin Rosen examine a vital component of China's national defense strategy—the PRC's national defense mobilization system. This system touches almost all aspects of the

organizational infrastructure that supports the PLA. Mobilization of civilian resources is critical to PLA logistics and the sustainment of military operations. China's national defense mobilization system is a centrally planned, systematic effort to leverage the nation's entire resource potential to prepare for and sustain national defense operations in war or emergencies. It encompasses civil air defense, transportation, economic, information, and political dimensions. Despite recent military and State Council reforms, however, Richter and Rosen observe the national defense mobilization system remains hampered by unclear definition of powers and responsibilities for wartime mobilization, inefficient operational support linkages, and insufficient connections between the theater commands and mobilization offices. While the Chinese government has attempted to address these issues, it seems unlikely the PLA has yet to establish a holistic nationwide system for mobilizing and dispatching logistic resources.

Service-level Logistics

This section examines the logistics capabilities of the PLA Army, Navy, and Air Force. Like at the national level, logistics within the PLA services appear to still be in a transition period following the reforms of several years ago.

In chapter four, Joshua Arostegui and James R. (J. R.) Sessions consider PLA Army logistics throughout each echelon of command. They find that comprehensive logistics support continues to remain a weakness for the PLA Army five years after the completion of the 2015–17 reforms. These problems include: inadequate staff sizes, low transportation equipment numbers, inefficient logistics processes, a lack of containerization, and challenged civil-military integration. Despite those gaps, the PLA Army has used its new organizational construct to support forces adequately along the Sino-Indian border and in other remote locations. However, it still likely lacks the ability to conduct and sustain expeditionary ground operations. Based on PLA writings, Arostegui and Sessions assess the PLA Army will be challenged to operate at much distance from China in the near and midterm.

Justin Boggess and Travis Dolney describe, in chapter five, the dominant aspects of PLA Navy at-sea sustainment capability. They find that the PLA Navy logistics operations are best characterized by flexibility—leveraging overseas commercial port access and military base development, using civilian vessels for underway replenishment, and maximizing the use of the PLA Navy's modest modern replenishment fleet. They show the PLA Navy is highly

proficient in conducting underway replenishment and is developing a capability to transfer missile systems while underway. They note the PLA Navy lacks the numbers of underway replenishment ships needed to sustain a global presence, especially when compared with the US Navy, but counter that the PLA Navy has demonstrated the ability to overcome and adapt to perceived shortfalls in at-sea logistics. As a result, they assess the PLA Navy at-sea replenishment fleet to have evolved into a highly proficient force capable of supporting China's peacetime blue-water ambitions.

Similarly, in chapter six, Eli Tirk finds the PLA Air Forces evince adaptability in meeting mission demands. The PLA has built out a redundant logistics support and maintenance structure that has become capable of supporting frequent air combat training missions while maintaining a high level of day-to-day readiness and sustaining operations for an extended period of time within an established network of airfields. With their modern combat aircraft, PLA Air Force and Navy aviation forces train to conduct multiple daily sorties and claim to be able to maintain a high level of readiness. General observations of PLA airfields, however, indicate many locations have limited fuel-storage capacity adjacent to runways or on-site. The airfields also seem to lack sufficient support infrastructure in important ways, which Tirk assesses to mean the PLA's ability to sustain operations within a broader network of airfields in a contested environment is vulnerable.

Logistics in Remote Regions and Overseas

The third section examines the PLA's ability to sustain operations at significant distances from the Chinese heartland.

In chapter seven, Brian Hart, Bonny Lin, and Matthew P. Funaiolo profile the PLA's air power projection capabilities in the Western Theater Command. They find that China has embarked on sweeping expansions and upgrades of infrastructure within areas under the PLA Western Theater Command in recent years. In particular, China has invested heavily in constructing and upgrading military and dual-use airfields within the autonomous regions of Tibet and Xinjiang. From an economic perspective, China's infrastructure buildup in Tibet and Xinjiang is intended to better facilitate the flow of goods and people within Tibet and Xinjiang and into and out of the regions. From a security perspective, it is intended to better prepare forces within the region to deter and respond to external and internal security threats and to project power beyond China's borders. Based on analysis of satellite imagery and other open-source material, the authors identify

dozens of airports and heliports within Tibet and Xinjiang that have been newly constructed or upgraded since 2017. Observing how China is improving its ability to operate along its remote borders could indicate how it might do the same abroad.

Managing the logistics and sustainment issues for the PLA base in Djibouti is another test case for how the PRC is dealing with maintaining an expeditionary force. In chapter eight, Christopher D. Yung assesses that China's base in Djibouti is intended primarily as a naval logistics hub given its inability to receive and support fixed-wing aircraft readily. He also doubts it will be used as a staging area for a PLA Army build-up in Africa, as the government of Djibouti is unlikely to allow the extensive expansion of the base this use would require. The base does, however, have facilities for storing fuel, weapons, and equipment and maintenance for ships and rotary-wing aircraft. In addition, a newly added pier can accommodate the largest of China's surface combatants. Nonetheless, the base lacks some key capabilities and facilities and the necessary space that would be required for it to be developed into a major naval base—though the possibility of future expansion cannot be ruled out.

Closing Thoughts

The final chapter features an assessment of the overall findings of the conference by Lonnie D. Henley. He notes that observers of the PLA know more about its sustainment capabilities than 10 years ago but that the state of knowledge is insufficient to answer tough questions for US planners and policymakers. In particular, he contends that PLA observers do not know: how well the PLA logistics system will work in a conflict; how well it can sustain long-duration, high-intensity operations; how long China could withstand a blockade; how China's mobilization system and militia fit into the PLA's logistics apparatus; or how the PLA would support distant overseas operations. He recommends a greater depth of study on the provincial military district system and militia system, as they are key elements of PLA logistics.

The overall findings of the conference were that the PLA has made significant strides in its ability to sustain operations and continues to build capabilities and capacity to address shortfalls. The centralization of PLA control and its internal command structure has sought to streamline decision making and delivery, but it is unclear how well this approach will fare in wartime. The PLA continues to refine its mobilization and

deployment mechanisms, while expanding its support infrastructure at home and abroad. Its ability to sustain large-scale operations at greater distances for longer periods of time is untested and unknown. While PLA sustainment and logistics may not operate at the same level or in the same way as those of the US military, the PLA's ability to satisfy its logistics and sustainment needs should not be underestimated.

Overview of the Organizational Structure of PLA Logistics, Equipment, and Support

Kenneth W. Allen

This chapter provides a brief overview of the PLA's overall structure and the logistics and equipment management structure since 1949.¹ Of particular importance, the logistics structure has been separated and merged with the equipment and armaments structure a few times. The chapter begins with a brief comparison of the PLA's Central Military Commission's (CMC) organizational structure prior to, and after, the major reorganization that began in 2016. The Commission has been in existence since the Red Army was created in 1927 and was identified in English as the Military Affairs Commission (MAC) until the late 1980s, when it was renamed the Central Military Commission. The chapter then provides a brief history of the PLA services. It finishes by discussing the current logistics, equipment, and support structure.

History of the Organizational Structure of the PLA's Central Military Commission

Between October 1949 and mid-1957, the CMC created a total of eight subordinate PLA General Departments (General Staff, Training Inspector General, Armed Forces Inspection, General Political, General Cadre,

1. James C. Mulvenon and Andrew N. D. Yang, eds., *The People's Liberation Army as Organization: Reference Volume v1.0* (Santa Monica, CA: RAND National Security Research Division, 2002), 1–58, https://www.rand.org/pubs/conf_proceedings/CF182.html.

General Logistics, General Finance, and General Armament) and the second-level departments and bureaus.² Between mid-1957 and late 1958, the eight general departments underwent a major reorganization, and by the end of 1958, there were three general departments—General Staff Department, General Political Department, and General Logistics Department (GLD). The General Armament Department (GAD) was added in 1998 by merging the military personnel in the existing Commission for Science, Technology, and Industry for National Defense with the General Staff Department’s Equipment Department and the General Logistics Department’s Ordnance/Armament Department, along with the relevant weapons and equipment research-and-development organizations. Of note, though the Chinese term *zhuangbei* is translated as “equipment,” the PLA translates it as “armament.” Every lower-level organization, however, is translated as “equipment department.” The GLD and GAD both had a director and a political commissar (PC). Although the director of the GLD and GAD were CMC members with the equivalent grade, the GLD and GAD and their PCs had the grade of Military Region (MR) leader.³

Historically, every organization and officer has been assigned a grade, as shown in table 1-1. The PLA did not have an officer rank system until 1955, but that was abolished in 1965. The current rank system was implemented in 1988. The PLA had 20 officer grades from 1955–65, a 27-grade system from 1965–72, a 23-grade system from 1972–79, an 18-grade system from 1979–88, and adopted the current 15-grade system in 1988. Historically, excluding new officers who are assigned to remote areas and pilots who have just completed their flight training at a flight academy, all other new officers must serve their first year on probation (见习). Every grade for officers from MR (or present-day Theater Command, or TC) leader down to platoon leader has two ranks assigned to it. Unlike the US military, which assigns numbers to each rank (such as O-6 for colonel), the PLA does not assign numbers. On average, officers up to the rank of colonel are promoted in grade every three years, while they are promoted in rank approximately every four years.⁴ It is common for someone to be a regiment, brigade, or division commander for up to five years. Rarely do personnel receive a rank and grade promotion at the same time. However, it appears this may be changing in a step-by-step process since 2021, as the PLA announced a shift to a rank-centric system.

2. Mulvenon and Yang, *People's Liberation Army as Organization*, 45–61.

3. US Department of Defense (DoD), *Defense Intelligence Agency Directory of PRC Military Personalities* (Washington, DC: DoD, 2015), xxii; and DoD, *Defense Intelligence Agency Directory of PRC Military Personalities* (Washington, DC: DoD, 2017), xiv.

4. “System of Military Ranks” [军官军衔制度], in Xu Yaoyuan, Lin Xianghai, and Mu Song, eds. *Military Cadre Work* [军队干部工作], 2nd ed., vol. 39 (Beijing: Encyclopedia of China Publishing House, 2006), 50–53.

Table 1-1. PLA 15-grade structure

Grade	Primary Rank	Secondary Rank
CMC Chairman (军委主席) Vice Chairman (军委副主席)	N/A General/Admiral (上将)	N/A
CMC Member (军委委员)	General/Admiral (上将)	
TC Leader (正战区职) Former MR Leader (正大军区职)	General/Admiral (上将)	Lieutenant General/ Vice Admiral (中将)
TC Deputy Leader (副战区职) Former MR Deputy Leader (副大军区职)	Lieutenant General/ Vice Admiral (中将)	Major General/Rear Admiral (少将)
Corps Leader (正军职)	Major General/Rear Admiral (少将)	Lieutenant General/ Vice Admiral (中将)
Corps Deputy Leader (副军职)	Major General/Rear Admiral (少将)	Senior Colonel/ Senior Captain (大校)
Division Leader (正师职)	Senior Colonel/ Senior Captain (大校)	Major General/Rear Admiral (少将)
Division Deputy Leader/ Brigade Leader (副师职)	Colonel/Captain (上校)	Senior Colonel/ Senior Captain (大校)
Regiment Leader/ Brigade Deputy Leader (正团职)	Colonel/Captain (上校)	Lieutenant Colonel/ Commander (中校)
Regiment Deputy Leader (副团职)	Lieutenant Colonel/ Commander (中校)	Major/Lieutenant Commander (少校)
Battalion Leader (正营职)	Major/Lieutenant Commander (少校)	Lieutenant Colonel/ Commander (中校)
Battalion Deputy Leader (副营职)	Captain/Lieutenant (上尉)	Major/Lieutenant Commander (少校)
Company Leader (正连职)	Captain/Lieutenant (上尉)	First Lieutenant/Lieutenant Junior Grade (中尉)
Company Deputy Leader (副连职)	First Lieutenant/Lieutenant Junior Grade (中尉)	Captain/Lieutenant (上尉)
Platoon (排职)	Second Lieutenant/Ensign (少尉)	First Lieutenant/Lieutenant Junior Grade (中尉)

In 2016, the PLA reorganized the CMC into 15 organizations and created a separate Army Headquarters. The 15 organizations in protocol order, along

with their grade, are shown below.⁵ As of May 2022, Army officers serve as the leader for all 15 CMC organizations.

- General Office (TC Deputy Leader)
- Joint Staff Department (CMC Member)
- Political Work Department (CMC Member)
- Logistic Support Department (TC Leader)
- Equipment Development Department (TC Leader)
- Training and Administration Department (TC Deputy Leader)
- National Defense Mobilization Department (TC Deputy Leader)
- Discipline Inspection Commission (CMC Member)
- Politics and Law Commission (TC Deputy Leader)
- Science and Technology Commission (TC Deputy Leader)
- Office for Strategic Planning (Corps Leader)
- Office for Reform and Organizational Structure (Corps Leader)
- Office for International Military Cooperation (Corps Leader)
- Audit Office (Corps Leader)
- Agency for Offices Administration (Corps Leader)

In 2016, the CMC also reduced the number of MRs and MR Air Forces to five and renamed them Theater Commands (TC) and TC Air Forces (TCAF), respectively, which are listed in protocol order as Eastern, Southern, Western,

5. "CMC," Ministry of National Defense: The People's Republic of China (website), <http://eng.mod.gov.cn/cmc/index.htm>.

Northern, and Central.⁶ In 2018, the PLAN renamed the three fleets as the Eastern TCN, Southern TCN, and Northern TCN, however, they are sometimes still referred to as fleets.⁷

Figures 1-1 and 1-2 provide an overview of the PLA’s organizational structure prior to and after 2016.⁸ The PLA organizes all organizations in protocol order, including the CMC organizations, services, and regional commands.

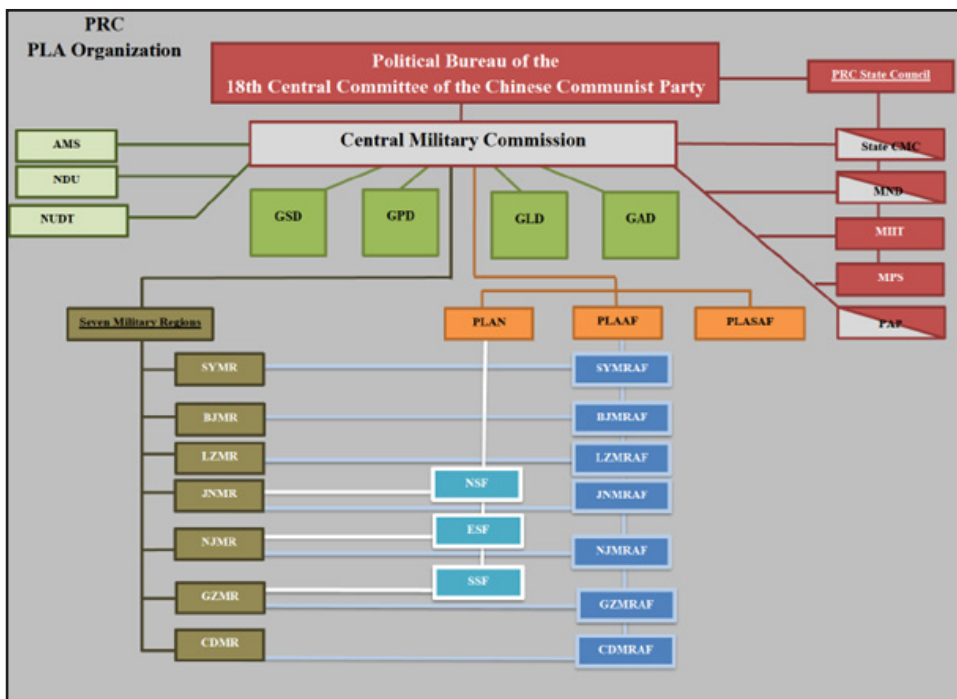


Figure 1-1. PLA organizational structure in 2015

6. “Theater Commands,” Ministry of National Defense: The People’s Republic of China (website), <http://eng.mod.gov.cn/theater-commands/index.htm>.

7. People’s Navy [人民海军], January 16, 2018, 1.

8. DoD, *Directory of PRC Military Personalities*, 2015; and DoD, *Directory of PRC Military Personalities*, 2017.

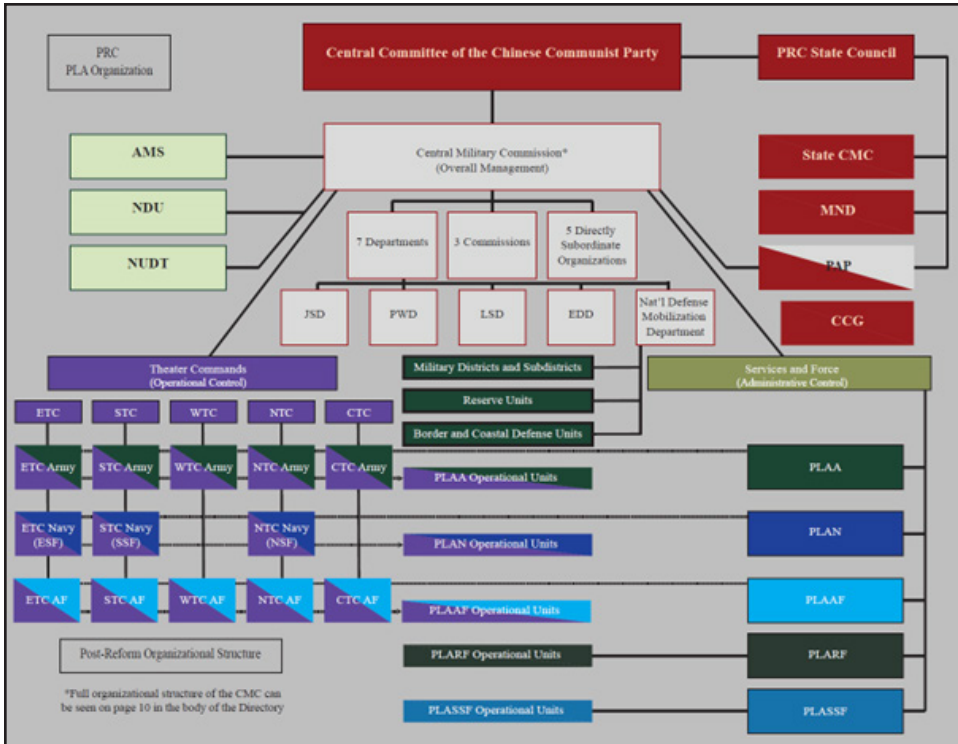


Figure 1-2. PLA organizational structure in 2016

Brief History of the Organizational Structure of the PLA Services

From 1949 to 2016, the PLA was organized into three services (Army, Navy, and Air Force).⁹ In 1966, the PLA created the Second Artillery Force (PLASAF) as an independent branch under the Army. The Army (PLAA), Navy (PLAN), and Air Force (PLAAF) each have various subordinate branches/arms and specialty units, some of which have merged or changed over the years. Prior to 2016, the CMC served as the Army Headquarters and as the joint headquarters for all of the services and branches. In 2016, the PLA created a separate PLAA Headquarters and upgraded the PLASAF to a full service and renamed it the PLA Rocket Force (PLARF). It also created the PLA Strategic Support Force (PLASSF), which is a force, not a service.

Regionally, the PLA began creating military regions in the 1950s. Although the PLA called these Military Area Commands, the US government called them military regions. Each had a subordinate Military Region Air Force (MRAF). In 1985, the number of MRs and MRAFs was reduced from 11 to seven (Shenyang,

9. Kevin Pollpeter and Kenneth W. Allen, eds., *The PLA as Organization v2.0* (Vienna, VA: Defense Group Inc., 2015), https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/Other-Topics/2015%20Old%20PLA_as_Organization_v2.pdf.

Beijing, Lanzhou, Jinan, Nanjing, Guangzhou, and Chengdu). In 1949, the PLAN also created three fleets (North Sea, East Sea, and South Sea).

Overview of the Structure of the PLA's Logistics, Equipment, and Support

Prior to the 2016 reorganization, the GLD was responsible for the management of logistics and logistics support work for the entire PLA under the leadership of the CMC to include military finance, supply, subsistence, transportation, fuel, infrastructure construction, facilities management, health services, and auditing.¹⁰ The department's basic missions were to: plan and lead the implementation of logistics work for the entire military; draft rules, ordinances, and regulations for logistics work; recommend organization of logistics forces; organize logistics war preparations and mobilization; train logistics personnel; equip units with logistics equipment; draft the PLA's budget; and supervise approved budget execution.

Prior to the 2016 reorganization, the GAD was responsible for the PLA's weapons and equipment research, development, acquisition, and maintenance. It determined, formulated, supervised, and implemented the policies, laws, and regulations regarding weapons and equipment for the entire military. The GAD was also responsible for weapons and equipment budgeting, including oversight and auditing. In conducting these tasks, the GAD operated China's test, evaluation, and training bases and a network of military representative bureaus and offices. Finally, the GAD guided the direction of PLA modernization through its Science and Technology Committee.

Prior to the 2016 reorganization, the general overall structure for logistics and equipment is shown in table 1-2.

10. Pollpeter and Allen, *PLA as Organization v2.0*.

Table 1-2. Pre-2016 logistics, equipment, and support department structure(Source: DoD, *Directory of PRC Military Personalities*, 2015.)

Level	Logistics Department	Equipment Department	Support Department
CMC	Yes	Yes	
Service HQ (Navy, Air Force, Second Artillery Force)	Yes	Yes	
Military Region HQ	Yes	Yes	
Navy Fleets and Military Region Air Force HQ	Yes	Yes	
Corps (Military Districts, Garrisons, Group Armies, Bases, Command Posts)	Yes	Yes	
Division (Navy <i>Zhidui</i>)	Yes	Yes	
Brigade	Yes	Yes	Yes
Regiment (Navy <i>Dadui</i>)	Yes	Yes	

Regarding table 1-2, there are several points worth keeping in mind. Prior to 2016, the CMC served as the PLA Army Headquarters. The Second Artillery Force (PLASAF) was an independent branch under the Army but was treated as a service. The MRs served primarily as the regional army headquarters. Each MR had a Joint Logistics Department. Corp-level organizations include both corps leader and corps deputy leader grades. Garrisons include Tianjin, Chongqing, Shanghai, Macao, and Hong Kong. A *zhidui* is sometimes translated as “flotilla.” Some support departments were identified in group armies as early as 2013. They replaced the logistics and equipment departments, which merged as the support department. Regiments did not have a logistics department or an equipment department, but they had relevant organizations with those responsibilities. For example, aviation units have airfield stations that are responsible for both logistics and aircraft maintenance. See Eli Tirk’s chapter six on “PLA Capability to Sustain Air Combat Operations.” Finally, a *dadui* is sometimes translated as “squadron.”

Of particular importance, as shown in table 1-3, the commander and PC for each organization had the same grade that was assigned to the organization, while the deputy commanders and deputy PC(s), the Chief of Staff (Director of the Headquarters Department), and the Director of the Political Department had one grade lower; however, the Director and PC

of the Logistics Department and the Equipment Department were one grade below them. For example, the Commander and PC of a Group Army had the grade of corps leader, the deputies, Chief of Staff, and Director of the Political Department had the grade of corps deputy leader, and the Director and PC of the Logistics Department and Equipment Department had the grade of division leader. Concerning the unit’s Party Standing Committee, only the directors were members; however, each department had its own Party Standing Committee, whereby the PC was the secretary, and the director was the deputy secretary.

Table 1-3. Current PLA leadership grades

Grade	CMC	Service	Theater Commander Service	JLSF	Corps Leader Grade Orgs	Brigade
Theater Commander Leader	LSD/ EDD Director/ Political Commissar	Commander/ Political Commissar				
Theater Commander Deputy Leader		Deputy Commander/ Deputy Political Commissar/ Chief of Staff/ Director PWD	Commander/ Political Commissar	JLSF Commander Political Commissar		
Corps Leader		Logistics/ Equipment Deputy Director/ Political Commissar	Deputy Commander/ Deputy Political Commissar/ Chief of Staff/ Director PWD		Commander/ Political Commissar	
Corps Deputy Leader			Logistics/ Equipment Deputy Director/ Political Commissar		Deputy Commander/ Deputy Political Commissar/ Director PWD	
Division Leader					Support Department Director/ Political Commissar	

Grade	CMC	Service	Theater Commander Service	JLSF	Corps Leader Grade Orgs	Brigade
Division Deputy Leader						Commander/ Political Commissar
Regiment Leader						Deputy Commander/ Deputy Political Commissar/ Chief of Staff/ Director PWD
Regiment Deputy Leader						Support Department Director/ Political Commissar

As part of the PLA’s 11th force reduction and major reorganization that began in 2016, the PLA continued to make major changes to the logistics and equipment structures that began around 2012, when some logistics departments and equipment departments were merged into a support department. The following bullets provide the key changes.¹¹

- Part of the GLD was renamed the CMC Logistic Support Department (LSD), and the GAD was renamed the CMC Equipment Development Department (EDD) with the grade of Theater Command (TC) leader, which replaced the former MR leader grade. Although the director for each department remained on the CMC, they were both downgraded to TC leader grade and were not added as CMC members during the Chinese Communist Party’s (CCP) 19th Party Congress in 2017.¹²

11. DoD, *Directory of PRC Military Personalities* (Washington, DC: DoD, 2021).

12. DoD, *Directory of PRC Military Personalities* (Washington, DC: DoD, 2018).

- The PLA created a PLAA Headquarters and upgraded the Second Artillery Force to a full service known as the PLARF. It also created a PLASSF as a force, not a service. As before, each of the four services and the PLASSF has a subordinate logistics department and an equipment department, which are two grades below the commander and PC and one grade below the deputy commanders and PC and the Chief of Staff (Director of the Staff Department, which replaced the former Headquarters Department) and Director of the Political Work Department (which replaced the former Political Department), which is the last level with these organizations.
- Whereas the former seven MRs each had a joint logistics department and an equipment department, the newly created five TCs do not have either department. However, the CMC did create a JLSF as a corps leader-grade organization to support each of the TCs. The JLSF has five Joint Logistics Support Centers, each of which has the grade of corps deputy leader. In 2018, however, the CMC raised the grade of the JLSF to TC deputy leader, most likely so that it could coordinate on an equal basis with the TC Service Headquarters.¹³ See Joel Wuthnow's chapter two on "Joint Logistics Force Support to Theater Commands" for details.
- Besides creating a PLAA Headquarters, the CMC created five TC Army Headquarters and renamed the former three Navy Fleets as TC Navies. Each TC also has a TC Air Force Headquarters. There is no TC Rocket Force Headquarters. Each TC Army, Navy, and Air Force Headquarters combined the former logistics department and equipment department into a single support department.

13. DoD, *Directory of PRC Military Personalities*, 2015; and DoD, *Directory of PRC Military Personalities*, 2018.

- Although information was found for support departments in Army, Air Force, Rocket Force, MD, and Garrison corps-, division-, and brigade-level headquarters, no information was found concerning the PLA Navy's headquarters at those levels.¹⁴ Some support departments were identified in group armies as early as 2013. They apparently replaced the logistics and equipment departments which merged as the support department.

- Certain units, such as PLARF bases, also began creating operations support regiments and comprehensive support regiments around 2012 by taking several disparate support functions and consolidating them under a single regiment.¹⁵ Base support functions handled by the operational support regiments include security, engineering, meteorology, survey and mapping, and nuclear, biological, and chemical defense. Comprehensive support regiments were established in 2017 by combining the Base Repair Factory with the Technical Service Regiment and taking on the responsibilities of both. Thus, this regiment is responsible for repair and maintenance of base vehicles and equipment, as well as storage of missiles, fuel, munitions, and other supplies, and transport of these assets via road and rail to base units. It may also be in charge of other miscellaneous support missions, such as vehicle driving, food preparation, cultural/media work, and training of certain support personnel. Integrating vehicle, transport, repair, and logistical support missions into a single unit is designed to improve logistical efficiency and coordination. While all bases now have comprehensive support regiments, Base 61 still maintains a technical service brigade (upgraded from a regiment). Base 63 also maintains a "Service Regiment," which may now only be responsible for management, transport, and loading of missile propellants for the Base's liquid-fueled rockets.

Table 1-4 shows the current structure compared with that of table 1-2.

14. Ma Xiu, "PLA Rocket Force Organization" (Montgomery, AL: China Aerospace Studies Institute/Air University, January 5, 2022), <https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/PLARF/2022-01-05%20PLARF%20Organization%20ExecSum.pdf>.

15. Ma, "PLA Rocket Force Organization."

Table 1-4: Current logistics, equipment, and support department structure(Source: DoD, *Directory of PRC Military Personalities*, 2015.)

Level	Logistics Department	Equipment Department	Support Department
CMC	Yes	Yes	No
Service HQ (Navy, Air Force, Second Artillery Force)	Yes	Yes	No
Theater Command HQ	No	No	No
TC Service HQ	No	No	Yes
Joint Logistics Support Force	No	No	
Corps (Military Districts, Garrisons, Group Armies, Bases, Command Posts)	No	No	Yes
Division (Navy <i>Zhidui</i>) ¹⁶	No	No	Yes
Brigade	No	No	Yes
Regiment (Navy <i>Dadui</i>) ¹⁷	No, but have organizations with these responsibilities	No, but have organizations with these responsibilities	Yes ¹⁸

The following information from 2017 provides a good example of how the PLA dealt with the merger of logistics and equipment organizations in military district (MD) headquarters.¹⁹ Among the 84 corps-level units that were established in April 2017, the 25 provincial MDs, which are corps leader-grade organizations, accounted for one-third. In this round of military reform, the seven MRs were reorganized as five TCs with the same grade, and the provincial MDs originally subordinate to the MRs were resubordinated to the newly established CMC National Defense Mobilization Department. Note that the Xinjiang and Tibet MDs are directly subordinate to the PLAA

16. Navy *Zhidui* have a Coast Service Department [岸勤部]. “Awesome! These naval doctors have insisted on providing free consultations for the resident nursing home for 12 years” [赞! 这些海军军医12年坚持为驻地敬老院义诊], sina.cn (website), March 5, 2018, accessed at <https://mil.sina.cn/2018-03-05/detail-ifyrztfz8488992.d.html>.

17. Navy *Dadui* have a Coast Support Division [岸勤处]. “2011 Side Notes on the Awards Ceremony of News Figures for Practicing the Core Values of Contemporary Revolutionary Soldiers” [中国海军出动军舰与地方接力抢救孕妇生命], chinanews.com (website), May 5, 2016, accessed at <https://www.chinanews.com.cn/mil/2016/05-05/7859584.shtml>.

18. Support organizations at the regiment level are divisions [处].

19. Shi Yahui, “Changes to the Military District’s Four Departments ‘1 Office 4 Bureaus’” [“省军区四部改一办四局”], July 26, 2017, http://news.takungpao.com/mainland/focus/2017-07/3476853_wap.html.

Headquarters. Their grade is TC deputy leader, so they cannot be subordinate to the CMC National Defense Mobilization Department, which is the same grade. However, their administrative organizations most likely match those of the remaining MDs.

Today, the TCs now serve as truly joint headquarters. In addition, the four administrative departments (headquarters, political, logistics, and equipment) of the former MDs were adjusted as “one office and four bureaus,” including the General Office, Political Work Bureau, Combat Readiness Construction Bureau, National Defense Mobilization Bureau, and Security Bureau. The MDs no longer have jurisdiction over the combat troops, and the combat troops originally under their jurisdiction have been reassigned to their respective TC Army Headquarters. Finally, at the military subdistrict level, which are division leader-grade organizations under the jurisdiction of each provincial MD, corresponding reforms have also been carried out. The former Headquarters Department, Political Department, and Logistics Department for each Military Sub-district were reorganized into a General Office, Political Division, Mobilization Division, Combat Readiness Division, and Support (that is, support to logistics and equipment) Division.

In conclusion, the current structure for logistics and equipment organizations is still somewhat confusing. For example, no TCs have a subordinate logistics department or equipment department, and it is not clear what happened to the former MR headquarters equipment departments. For example, were they merged into the JLSF? In addition, when the PLA merged its logistics departments and equipment departments into a single support department, one of the directors, one PC, and some of the deputy directors lost their job as part of the 300,000-man force reduction, of which one-half were officers. The question is whether the directors for the new support departments are career logistics officers or equipment officers. It appears that the next step may be to merge the logistics department and equipment department into a support department in each of the four service and PLASSF headquarters. In addition, the PLAA, PLAN, and PLAAF each have separate logistics/service and equipment/engineering academic institutions.²⁰ One change in the future may be to merge them together as a support academic institution, so officers learn how to manage both components together.

20. Kenneth Allen and Mingzhi Chen, *The People's Liberation Army's 37 Academic Institutions* (Montgomery, AL: China Aerospace Studies Institute/Air University, 2019), https://www.airuniversity.af.edu/Portals/10/CASI/Books/CASI_Academic_Institutions_Encyclopedia_web_final.pdf.

Finally, prior to 2021, the PLA's officer corps was organized into five career tracks shown in the following bullets. Unlike the US military, PLA officers are not assigned alphanumeric military occupation/occupational specialty codes or Air Force specialty codes. The PLA combined the first four career tracks together and identified them as non-special technical officers.

- Military/operational officer
- Political officer
- Logistics officer
- Equipment/armament officer
- Special technical officer

However, in 2021, the PLA apparently lumped them together even further and has renamed them “command and administrative officers.”²¹ It still has the special technical officer track as a separate track.

21. “Ministry of National Defense: The New Officer System Is Adjusted from Position-based to Rank-based” [国防部: 新的军官制度由基于职务等级调整为基于军衔等级来源: 国防部网 发布], http://www.81.cn/fb/2021-01/28/content_9976143.htm; and Wu Qian, “Regular Press Conference of the Ministry of National Defense on January 28,” Ministry of National Defense of the People's Republic of China (website), http://english.chinamil.com.cn/view/2021-02/01/content_9978281.htm.

Joint Logistics Force Support to Theater Commands

Joel Wuthnow

Introduction

A hallmark of Chinese military reforms under Xi Jinping was the consolidation of authority at the theater level.¹ Prior to the reforms, Military Region commanders only had control over ground forces and not naval or air forces. In wartime, a joint headquarters would have been established on an *ad hoc* basis, creating a time-consuming transition from peacetime to wartime operations. Under the new Theater Command system, commanders have assumed control over ground, naval, and air forces, with some conventional Rocket Force units likely at their disposal as well.² The system is better postured to pivot to combat operations as the wartime structure is already largely in place.

In this light, reforms to the People's Liberation Army (PLA) logistics system have been an aberration. Prior to 2016, the Military Regions each possessed a Joint Logistics Department that unified control over general supplies within the theaters. The creation of the Joint Logistic Support Force (JLSF) that year took control away from the theater commanders by placing

1. Joel Wuthnow, "A Brave New World for Joint Operations," *Journal of Strategic Studies* 40, no. 1–2 (2017): 169–95.

2. Roderick Lee, "Integrating the PLA Rocket Force into Conventional Theater Operations," *China Brief* 20, no. 14 (August 2020), <https://jamestown.org/program/integrating-the-pla-rocket-force-into-conventional-theater-operations/>.

those resources under central control. The reason for this shift can be explained by the need for supply-chain efficiency and an architecture that would allow scarce resources to be deployed quickly across theater boundaries—as they were during the 2020 COVID-19 outbreak in Wuhan, which required the JLSF to surge specialized medical supplies from multiple parts of China.³ Yet, in wartime, the PLA must now undergo a different transition. Logistics assets under the JLSF would have to be reintegrated into the theater for use in joint operations.

This situation raises several questions. What is the relationship between the JLSF and the theaters in peacetime? How do they strengthen coordination in the absence of theater control? How do PLA sources describe theater logistics arrangements in wartime? What problems could be introduced as the PLA executes a shift from a centralized model to a theater model? Does the system that has emerged provide China's opponents' opportunities to slow or complicate that transition?

This chapter addresses these questions in four parts. The first describes the new system and the likely goals of the reformers. The second documents peacetime coordination between the JLSF and the theaters in terms of liaisons and communications, direct support to units, and exercises. The third argues that while JLSF units will return to theater control during a conflict, there is no clear model for theater logistics support. This section also speculates on several problems that could be created during the transition, including tensions between those who favor centralized versus theater control. The conclusion discusses implications for the effectiveness of PLA operations in wartime and how China's adversaries might leverage new frictions in the logistics system to undermine PLA confidence in its performance in a conflict.

The chapter draws from a variety of PLA publications, including books, authoritative media, and articles in professional logistics journals. The discussion also benefits from a comprehensive review of publicized PLA activities and exercises from 2017–21 conducted with the assistance of the consulting firm, TextTore, for which the author is grateful.

3. Heidi Holz and Brian Waidelich, *RX PLA: The PLA Medical System's Role in China's Efforts to Fight COVID-19* (Arlington, VA: Center for Naval Analyses, April 2022), <https://www.cna.org/reports/2022/04/Rx-PLA-The-PLA-Medical-Systems-Role-in%20Chinas-Efforts-to-Fight-COVID-19.pdf>.

A New Joint Logistics Structure

During the Xi era, joint logistics forces transitioned from direct control by the theaters to a hub-and-spokes model under central command. Prior to the recent reforms, Joint Logistics Departments had been established in each of the former Military Regions by 2002, consolidating control over “general purpose” (通用) supplies such as fuel and grain. This was intended to reduce inefficiency and increase standardization as those items had been previously handled by the services; however, “service-specific” (专用) materials (such as specialized weapons parts) continued to be procured and maintained by the services.⁴ A 2004 experiment in the Jinan Military Region further sought to consolidate service and joint logistics into a single entity, but this system was never adopted on a wider scale.

In September 2016, the PLA overhauled the system by creating the JLSF. A new central JLSF headquarters was established at the Wuhan Rear Area Support Base, which occupies a strategic location in central China at the intersection of several major rail lines. The JLSF oversees a system of five Joint Logistic Support Centers (JLSCs), each geographically aligned with one of the five Theater Commands but reporting to JLSF headquarters (see figure 2-1). Built on the former Joint Logistics Departments, the JLSCs manage a massive network of supply depots, pipelines, warehouses, hospitals, and mobile logistics brigades that can be deployed to support units in the field.⁵ According to one JLSF officer, while the JLSCs maintain “fraternal” (兄弟) relations with supported units, they do not hold a “subordinate relationship” (隶属关系) with the theaters themselves.⁶ The reforms retained separate service-specific supply chains.

4. Susan M. Puska, “Taming the Hydra: Trends in China’s Military Logistics Since 2000,” in *The PLA at Home and Abroad: Assessing the Operational Capabilities of China’s Military*, ed. Roy Kamphausen, David Lai, and Andrew Scobell (Carlisle, PA: US Army War College Press, 2010), 570–78.

5. Joel Wuthnow, “A New Era for Chinese Military Logistics,” *Asian Security* 17, no. 3 (2021): 281–84; and Kevin McCauley, *Modernization of PLA Logistics: Joint Logistic Support Force before the US-China Economic and Security Review Commission*, 115th Cong. (statement of Kevin McCauley, February 15, 2018), 5, https://www.uscc.gov/sites/default/files/McCauley_Written%20Testimony.pdf/.

6. “从‘部’到‘部队’：我军联勤改革要跨越啥” [“From ‘Unit’ to ‘Force’”: What Has Our Joint Logistics Reforms Overcome?], 中国军网 [China Military Online], April 18, 2017, http://m.china.com.cn/wm/doc_1_8_339665.html.

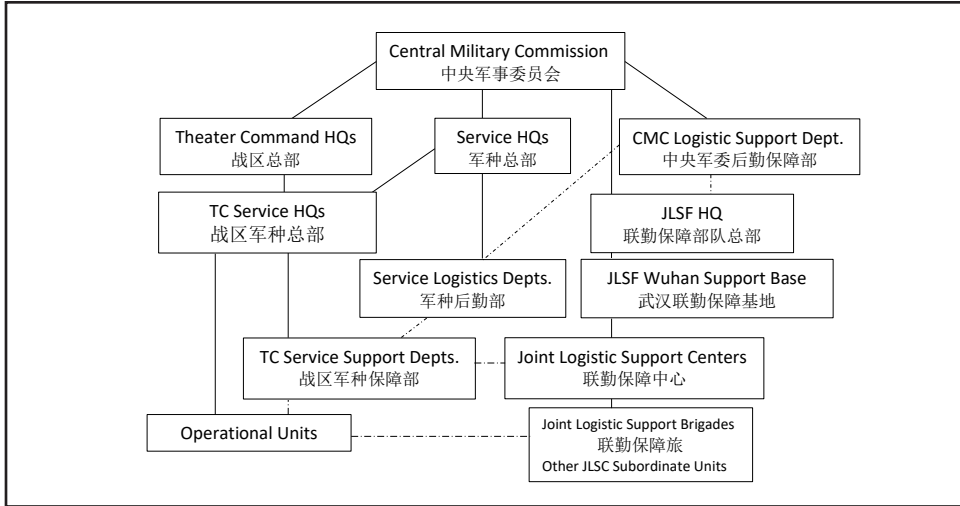


Figure 2-1. Overall PLA logistics structure

(Legend: Solid line – superior/subordinate relations and dotted lines – coordinating or supporting relations)

In practice, there is now a division of labor between the JLSCs, the theater service Support Departments (保障部), and other logistics assets, including organic logistics capabilities within operational units and civilian suppliers. As an illustration, scholars from the Armored Force Engineering Academy describe the differentiated functions of these forces in supporting ground force equipment (see table 1). This source also confirms that JLSCs play a role in equipment maintenance, which was unclear at the outset of the reforms.⁷

Centralization of joint logistics forces served two purposes. The first purpose was improving management. The 2020 *Science of Military Strategy*, the first edition of that volume to include a chapter on joint logistics, noted the JLSF “solved the problem of theater and below units developing their own logistics support and equipment support.”⁸ JLSF headquarters would likely be able to support this goal by creating logistics standards, monitoring the status of resources across a nationwide supply network, facilitating payments for supplies from civilian vendors, developing logistics information systems, and encouraging the creation of more efficient cross-national supply chains.

7. LeighAnn Luce and Erin Richter, “Handling Logistics in a Reformed PLA,” in *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms*, ed. Phillip C. Saunders et al. (Washington, DC: National Defense University Press, 2019), 275.

8. Xiao Tianling [肖天亮], ed., *战略学 [Science of Military Strategy]* (Beijing: National Defense University Press, 2020), 413.

Table 2-1. Division of labor for Theater Command ground force equipment support

(Source: Liu Wenkai [刘文开] et al., “战区陆军装备保障体系建设总体构想” [“Overall Conception of Theater Army Equipment Support Classification”], 装甲兵工程学院学报 [Journal of the Academy of Armored Force Engineering] 32, no. 6 [2018]: 4.)

Support Main Body	Support Missions	Mission Details
Theater Army Specialized Support Forces	Base-level specialized equipment support	Collection, reserve, supply, management, and maintenance of specialized army equipment in peacetime and wartime.
Regional Joint Logistic Support Center Forces	Base-level general equipment support	Collection, reserve, supply, management, and maintenance of army general-purpose (通用) ammunition, ordnance, fuel, and equipment in peacetime and wartime.
Unit Organic Support Forces	Unit-level comprehensive support	Comprehensive equipment support tasks for units in peacetime and wartime.
Civilian Support Forces	Non-core support or specialized support for high-tech equipment	Non-core (非核心) army equipment support at all levels or specialized high-tech equipment support tasks that cannot be completed by organic support forces.
Other Support Forces	Implement support as needed at all levels	Complete support tasks at all levels during wartime according to changes in army equipment support in the theaters.

The second purpose was facilitating logistics support across theater boundaries. The 2020 *Science of Military Strategy* asserted the JLSF can “satisfy theater support,” and “dynamically handle multiple directions, support coordinated actions, and cover the entire domain.”⁹ Overseeing a national network of logistics assets, a central headquarters would be able to direct the flow of resources from one theater to another in the event of an escalating conflict or humanitarian emergency (and reduce the likelihood theater commanders would be able to hold onto assets that may be needed elsewhere). The JLSF performed this function during the 2020 response to the COVID-19 outbreak in Wuhan, managing the transportation and distribution of scarce medical equipment from multiple JLSCs.¹⁰ Even absent a crisis, the system would be better able to handle cross-theater requests (such as patient transfers).¹¹

9. Xiao Tianling [肖天亮], 《战略学》 [Science of Military Strategy].

10. Wuthnow, “New Era,” 284–87; and Elsa Kania and Ian Burns McCaslin, *People’s War against COVID-19: Testing China’s Military Medical and Defense Mobilization Capabilities*, Military Learning and the Future of War Series (Washington, DC: Institute for the Study of War, December 2020), <https://www.understandingwar.org/sites/default/files/ISW%20Report%20People%27s%20Warfare%20against%20COVID-19%20ISW%20China%20December%202020.pdf>.

11. “飞驰在新时代的‘联保快车’—来自联勤保障部队的代表委员热议努力建设强大的现代化联勤保障部队” [“Flying the ‘Joint Security Express’ in the New Era – JLSF Representatives Discuss Efforts to Build a Powerful and Modern Joint Logistics Support Force”], 解放军报 [PLA Daily], March 12, 2019, 6.

Achieving centralization, however, came at the expense of theater control. Under the previous system, Joint Logistics Departments were Corps Leader-grade organizations within the Military Region structure.¹² The JLSCs are Corps Deputy Leader-grade organizations that report to the JLSF.¹³ Thus, there is no high-level component in the theater structure responsible for supervising support activities and joint and service logistics forces. This system was a departure from other reforms that promoted unity of command at the theater level, such as the creation of theater Joint Operations Command Centers and the shift of peacetime operational control of air and naval forces from the services to the theaters.¹⁴ This shift suggests that, for reformers, the benefits of centralization outweighed the costs of unified theater command.

Joint Logistics-Theater Coordination in Peacetime

Despite the absence of direct theater control, JLSCs and other JLSF units have achieved some integration with the theaters since 2016. This section describes coordination in three areas—contacts with theater headquarters, mechanisms through which operational units can reach out directly for JLSF support, and joint logistics integration in theater exercises.

Coordination Mechanisms

There is no senior JLSF officer within the theater construct akin to the theater naval, ground, and air force component commanders who serve concurrently as theater deputy commanders. However, there are reports the JLSF maintains liaison officers at the theater headquarters, whose ostensible purpose is to improve the theater commander's visibility over JLSC activities and serve as a bridge with JLSF leadership.¹⁵ This is roughly analogous to the role that Rocket Force liaisons play within the theater headquarters.¹⁶

12. Department of Defense (DoD), *2015 Directory of PRC Military Personalities* (Washington, DC: DoD, 2015).

13. DoD, *2021 Directory of PRC Military Personalities* (Washington, DC: DoD, 2021), 62–63.

14. Edmund J. Burke and Arthur Chan, “Coming to a (New) Theater Near You: Command, Control, and Forces,” in *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms*, ed. Phillip C. Saunders et al. (Washington, DC: National Defense University Press, 2019), 227–55.

15. Office of the Secretary of Defense (OSD), *Annual Report to Congress: Military and Security Developments Involving the People's Republic of China 2019* (Washington, DC: OSD, 2019), 51.

16. “PLA Rocket Force Names 100 Officers to Commands,” *Global Times* (website), April 12, 2016, <https://www.globaltimes.cn/content/978291.shtml>; and “联合作战指挥平台咋搭建？到这里看看” [“How to Build a Joint Operations Command Platform? Look Here”], *中国军网* [China Military Online], September 21, 2017, http://www.81.cn/2017jj90/2017-09/21/content_7765599.htm.

A particular challenge is that four of the five JLSCs are not geographically colocated with the theater headquarters (see table 2-2). Noting this problem, scholars from the Military Transportation Academy argue that geographic separation can be overcome through a “command information system” (指挥信息系统) that promotes “remote, synchronous, joint planning” (异地,同步,联动筹划) between theater leadership, JLSCs, and others.¹⁷ Another PLA source discusses the development of a “joint combat command information system” in the Central Theater Command that integrates “more than ten” types of “information sources” (信源), including from the Central Military Commission (CMC), JLSF, and service forces.¹⁸ These sources strongly imply logistics information is integrated into the PLA’s primary command and control system, the Integrated Command Platform. The 2022 US Department of Defense China Military Power Report states, “The PRC is . . . fielding the Integrated Command Platform to units at multiple echelons across the force to enable lateral and cross-service communications required for joint operations.”¹⁹

Table 2-2. JLSC alignment with five Theater Commands

Theater	Theater HQ	Aligned JLSC	Theater HQ-JLSC Distance (miles)
Eastern	Nanjing	Wuxi	119
Southern	Guangzhou	Guilin	302
Northern	Shenyang	Shenyang	0
Western	Chengdu	Xining	738
Central	Beijing	Zhengzhou	432

Direct Support to Units

The JLSCs also directly support units within the theaters, sometimes bypassing the theater headquarters. A 2017 *PLA Daily* article confirmed the Shenyang JLSC had established data-sharing mechanisms with the five provincial military districts in the Northern Theater Command region,

17. Li Peng [李鹏], Sun Hao [孙浩], and Wang Yilin [王祎琳], “战区联合投送筹划基本问” [“Basic Problems in Joint Projection Planning for Theater Command”], *军事交通学院学报 (Journal of the Military Transportation University)* 21, no. 1 (2019): 4.

18. “尹璐: 联指中心能打胜仗的女总工” [“Yin Lu: A Female Chief Engineer Who Can Win the Battle at the Joint Command Center”], *Xinhua* (website), April 19, 2018, http://www.xinhuanet.com/politics/2018-04/19/c_1122710817.htm. Moreover, McCauley observes an integration of JLSF and theater transportation data networks. See McCauley, *Modernization of PLA Logistics*, 9–10.

19. OSD, *Military and Security Developments*, 85.

focusing on natural disasters, stability maintenance, and major accidents.²⁰ A 2018 *PLA Daily* article noted a mobile support brigade under the Wuxi JLSC had “begun to establish routine contacts” (初步建立定期联系) with both the theater joint command and other operational units in the Eastern Theater Command.²¹

Several PLA articles reference a “joint delivery command” (联合投送指挥) taking shape within the theaters that coordinates the transportation and delivery of supplies between service, JLSF, and civilian suppliers.²² Through this system, units can request support on a real-time basis. Normally, they must first coordinate with their own theater service Support Department, but for “emergency tasks” (紧急任务) can reach out to the JLSCs directly.²³ One example came after a 2017 typhoon, in which an Air Force unit based in the Eastern Theater Command needed 2,000 tons of aviation fuel. Using the emergency mechanism, the unit received the supplies directly from the Wuxi JLSC.²⁴ Nevertheless, one group of scholars at the PLA Military Transportation Academy argued in a 2018 article that the system “lacks an institutionalized information exchange mechanism,” blamed the JLSCs for not acting “in a timely manner,” and noted the division of labor is “not [yet] clear enough.”²⁵

Other examples of direct support involve military medicine. Overseeing the network of PLA hospitals, the JLSCs also provide direct medical support to personnel, both regularly and during contingencies. Similarly, in 2017, the Wuxi JLSC opened an inaugural Psychological Crisis

20. “‘粮草官’融入联合作战体系” [“‘Provisions Officers’ Integrated into the Joint Operations System”], *解放军报* [*PLA Daily*], February 24, 2017, http://www.81.cn/jfjmap/content/2017-02/24/content_170207.htm.

21. “无锡联勤保障中心某旅加速推进保障能力生成—联战先联训，联训更联心” [“A Brigade of Wuxi Joint Logistic Support Center Accelerates the Production of Support Capabilities – Joint Training Precedes Joint Battles, Joint Training is More Connected”], *解放军报* [*PLA Daily*], February 6, 2018, 2.

22. Li, Sun, and Wang, “Basic Problems in Joint Projection,” 2; and Wuthnow, “New Era,” 285–87.

23. “联勤保障部队探索建立新型军事运输投送机制” [“Joint Logistic Support Force Explores the Establishment of a New Military Transportation Delivery Mechanism”], *解放军报* [*PLA Daily*], December 31, 2019, 3.

24. “From ‘Unit’ to ‘Force.’”

25. Yu Xingtao [余兴涛], Liu Zhong [刘中], Guo Zhanwu [郭占武], and Wei Yingqiang [魏英强], “战区应急铁路运输投送存在的问题及对策” [“Solutions to Emergent Railway Transportation Problems in Theater Commands”], *军事交通学院学报* [*Journal of the Military Transportation University*] 20, no. 12 (2018): 3.

Intervention Center that provides mental-health services for deployed units, supplies on-call specialists at bases, and offers online treatment.²⁶

JLSF Participation in Theater Exercises

The most prominent joint logistics exercises focus on key “training brands” (演训品牌) such as the Jingwu Joint Logistics combat skills competition and the Joint Logistics Mission cross-theater exercise that mainly feature logistics units.²⁷ JLSF personnel have also participated in exercises with other forces. In October 2019, *Xinhua* reported that mobile joint logistics units had taken part in more than 50 exercises organized by the theaters and various services and branches, sharpening their skills through “full-dimensional participation” (全程全维参战) in these events.²⁸

Most common are references to JLSF involvement in ground force exercises.²⁹ This involvement includes facilitating oil resupply for combined arms brigades during cross-theater exercises (coordination being handled by communications between adjacent JLSCs, rather than through the supported units’ theater headquarters) and providing mobile logistics services during the “motorized march” phase of the exercise, such as “mobile repairs at fixed points” (定点巡修), vehicle repair at service areas, heavy equipment

26. “全军首个联勤心理危机干预中心成立” [“PLA’s First Joint Logistics Psychological Crisis Intervention Center Established”], 中国军网 [China Military Online], November 5, 2017, http://www.81.cn/jwsj/2017-11/05/content_7812707.htm. For background, see Zi Yang, “Assessing Mental Health Challenges in the People’s Liberation Army, Part 1: Psychological Factors Affecting Service Members, and Leadership Response,” *China Brief* 19, no. 14 (July 2019), <https://jamestown.org/program/assessing-mental-health-challenges-in-the-peoples-liberation-army-part-1-psychological-factors-affecting-service-members-and-the-leadership-response/>.

27. “国防部介绍联勤保障部队改革重塑以来建设发展情况” [“The Ministry of National Defense Introduces the Construction and Development of the Joint Logistic Support Force Since Reform and Restructuring”], PRC Ministry of National Defense, September 30, 2021, http://www.mod.gov.cn/jzhzt/2021-09/30/content_4896252.htm; “联勤保障部队组织‘精武联勤-2021’战斗体能比武” [“The Joint Logistics Support Force Organizes the ‘Jingwu Joint Logistics-2021’ Combat Skills Competition”], *Xinhua* (website), December 16, 2021, http://www.mod.gov.cn/power/2021-12/16/content_4901261.htm; and “探索新体制下联勤支援保障新模式新手段:‘联勤使命-2018B’实兵研究性演习举行” [“Exploring New Models and Means of Joint Logistics Support under the New System: The ‘Joint Logistics Mission-2018B’ Real-Force Research-Type Exercise Was Held”], *解放军报* [*PLA Daily*], August 1, 2018, 1.

28. “阔步强军新时代,建设打仗新联勤—联勤保障部队成立三年来建设发展纪实” [“Striving Toward a Strong Army in the New Era, Building a New Joint Logistics Force for Fighting Wars – A Record of the Construction and Development of the Joint Logistic Support Force in the Three Years Since its Establishment”], *Xinhua* (website), October 10, 2019, http://www.xinhuanet.com/politics/2019-10/16/c_1125112862.htm.

29. This encompassed army units only. No references of direct JLSF support to naval, air, or Rocket Force exercises were observed.

transport, and food resupply.³⁰ These reports suggest joint logistics support becomes most relevant when units are transiting or operating far away from their home garrisons and are beyond their organic logistics capabilities. Other reports, however, described JLSF units taking part in joint exercises relatively close to home.³¹

There is also anecdotal evidence of JLSF participation in theater-level exercises. For instance, a 2018 *PLA Daily* report mentioned the Wuxi JLSC alongside Rocket Force and military district units in the Eastern Theater Command's annual joint training plan (联合训练计划), suggesting these units likely participated in unpublicized events organized by the theater.³² JLSF officers were also invited to a “joint campaign staff competition” (联合战役参谋比武) offered by the Central Theater Command in 2017, developing skills such as “computerized map plotting” and “joint operations planning” with colleagues from other services.³³ Such activities are useful in building common frames of reference among personnel from different chains of command who may be required to work together in wartime or other situations.

Wartime Logistics: Who Takes Command?

Peacetime coordination mechanisms such as those described above are helpful in integrating joint logistics and theater activities in the absence of direct command relations. However, PLA sources suggest there would likely be a realignment of relations during wartime with JLSCs and their subordinate

30. “联勤保障部队成立一周年, 如何更好为兵为战服务?” [“The Joint Logistic Support Force Has Been Established for a Year, How Can It Provide Service for the Troops?”], 广军事 [China Radio International], September 25, 2017, http://military.cnr.cn/ztc/xqj/ysyd/20170925/t20170925_523964458.html; “联勤保障部队成立三年来建设发展纪实” [“Record of the Joint Logistic Support Force's Development over Three Years”], *Xinhua* (website), October 17, 2019, http://www.xinhuanet.com/2019-10/17/c_1210315319.htm; and “北部战区部队千里机动检验后装保障能力” [“Northern Theater Command Unit Conducts Thousand-Kilometer Maneuver to Test Logistic and Equipment Support Capabilities”], CCTV (website), June 23, 2019, <http://m.news.cctv.com/2019/06/23/ARTIqV5KuLooXdEzYLUHljty190623.shtml>.

31. “直击演训一线:第78集团军某旅 多兵种实战化联合对抗演练 探索作战新模式” [“Direct Attack Training on the Front Line of Brigade of the 78th Group Army, Multi-Branch Real-Combat Joint Confrontation Exercise, Seeking a New Operational Model”], CCTV-7 (website), December 14, 2020, <https://tv.cctv.com/2020/12/14/VIDEJG5RiBfhg8vUrmaKARZq201214.shtml?spm=C53074552346.P4BWJvVoMUKy.0.0>.

32. “东部战区: 联合训练, 在法治轨道运行” [“Eastern Theater Command: Joint Training Proceeds under Legal Routes”], 解放军报 [*PLA Daily*], January 2, 2018, http://www.mod.gov.cn/power/2018-01/02/content_4801252.htm.

33. “百名联合战役参谋同台比武竞技” [“100 Joint Campaign Staff Officers Compete in Top Competition”], 中国军网 [China Military Online], December 16, 2017, http://www.81.cn/jfbmap/content/2017-12/16/content_194521.htm. The program also involved officers from the Rocket Force.

units being placed within the theater structure. This section reviews relevant PLA writings and identifies challenges that could impede a smooth transition to theater control of joint logistics forces during a crisis.

Pre-reform sources (such as the 2006 edition of the *Science of Campaigns*) described a “war zone” command structure consisting of several functional elements. War zone commanders would directly oversee a “support department” (保障部门) that handles logistics and equipment support (foreshadowing the blending of these functions that appears to have taken place within the JLSCs and theater service support departments).³⁴ Some sources also suggested theater support departments would serve as a rear-area command post, potentially led by a theater deputy commander.³⁵ LeighAnn Luce and Erin Richter speculated the JLSCs could have been designated for this purpose: four are located at a major distance from the theater headquarters, and all are linked into national and theater command information systems.³⁶

Similar depictions of a wartime theater support function can be found in post-reform sources. The clearest indication the JLSCs would transfer from JLSF to theater authority came in November 2016 from a JLSF officer, who said that, in wartime, the CMC would place the JLSCs and their subordinate units (such as hospitals and vehicle maintenance centers) under the theaters to “carry out support activities for frontline troops.”³⁷ A similar claim was repeated in the 2022 US Department of Defense China military power report.³⁸

Other PLA writings also indicate joint logistics forces would be merged into the theater structure in wartime. The 2016 volume, *Theater Command Joint Operations Command*, published by the PLA National Defense University, includes a “logistics and equipment support center” (后装保障中心) alongside five other functional components of the theater structure (intelligence, communications, command, mobilization, and political work). This center would need to be established temporarily if there were no preexisting rear-area command posts; however, if a rear-area command

34. Jeffrey Engstrom, *Systems Confrontation and System Destruction Warfare* (Santa Monica, CA: RAND Corporation, 2018), 41.

35. Dean Cheng, “The PLA’s Wartime Structure,” in *The PLA as Organization v2.0*, ed. Kevin Pollpeter and Kenneth W. Allen (Vienna, VA: Digital Government Institute, 2015), 476.

36. Luce and Richter, “Handling Logistics in a Reformed PLA,” 274–75.

37. “专家详解军委联勤保障部队与军委后勤保障部是何种关系” [“Expert Explains the Relationship between the CMC Logistics Support Department and the CMC Joint Logistic Support Force”], 澎湃 [The Paper], November 27, 2016, https://www.thepaper.cn/newsDetail_forward_1569162.

38. OSD, *Military and Security Developments*, 74.

post already existed (perhaps in the form of the JLSCs), it would be designated as the support center.³⁹

PLA literature continues to discuss building a theater structure that effectively coordinates logistics and equipment support. A 2018 article argued that in wartime, the theater joint command should “directly command” joint logistics forces, while service logistics should be handled through “various operational sub-centers” (各种作战分中心).⁴⁰ A 2020 article from scholars at the Military Transportation Academy assessed three models of joint logistics integration into the wartime theater structure, titled “multi-integrated application,” “regional coordination and linkage,” and “flat force command.”⁴¹ Figure 2-2, drawn from that article, depicts the first approach. In this model, there would be a single “joint logistics sub-domain command center” that would control JLSF, service, and civilian forces (and potentially joint logistics forces assigned from other theaters).

In the other two models, the lines of authority are completely different. In the “regional coordination and linkage” model, the “joint logistics sub-domain command center” would only have direct control over joint logistics forces, while service logistics forces would be overseen by the land, sea, air, and conventional missile sub-domain command centers.⁴² In the “flat force command model,” the service sub-domain command centers would directly command not only service logistics forces, but also joint and civilian forces, leaving the “joint logistics sub-domain command center” in a weaker “coordinating” role.⁴³ The variation suggests that, as of writing, the PLA had not yet settled on a preferred structure.

39. Li Wei [李伟], 战区联合作战指挥 [*Theater Command Joint Operations Command*] (Beijing: National Defense University Press, 2016), 82–84.

40. Zhang Aimin [张爱民], “战区联合作战后勤与装备保障力量建设研究” [“Construction of Logistics and Equipment Support Force for Joint Operations in the Theater Commands”], 军事交通学院学报 [*Journal of the Military Transportation University*] 20, no. 10 (2018): 28.

41. Xun Ye [荀烨] et al., “新体制下战区战时联勤组织指挥模式研究” [“On Theater Joint Logistics Organization and Command Mode in Wartime Under the New System,” 军事交通学院学报 [*Journal of the Military Transportation University*] 22, no. 11 (2020): 68–72.

42. Xun Ye [荀烨] et al., “On Theater Joint Logistics,” 70–71.

43. Xun Ye [荀烨] et al., “On Theater Joint Logistics,” 71–72.

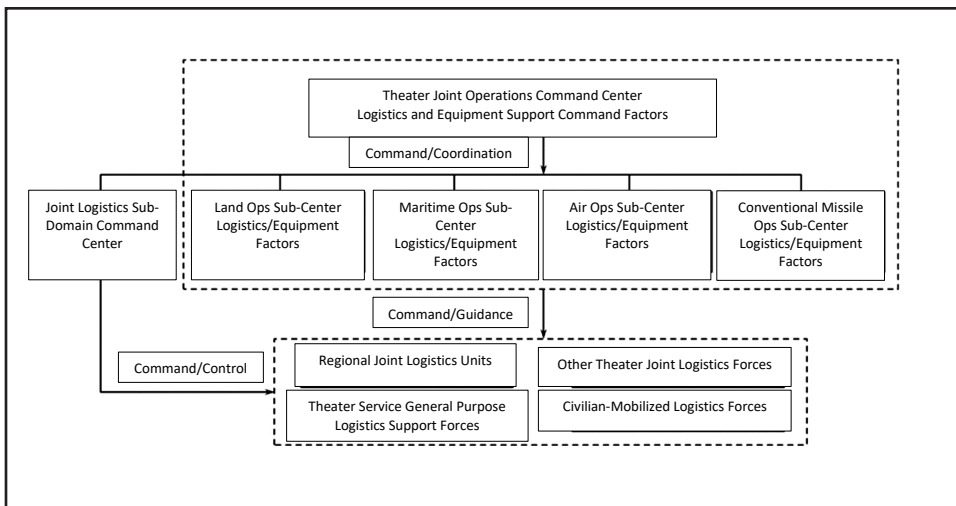


Figure 2-2. Multi-integrated application model of theater wartime logistics

(Source: Adapted from Xun Ye [荀焯], et al., “新体制下战区战时联勤组织指挥模式研究” [“On Theater Joint Logistics Organization and Command Mode in Wartime under the New System”] 军事交通学院学报 [Journal of the Military Transportation University] 22, no. 11 [2020]: 69.)

The most significant problem for wartime theater integration is that PLA sources do not discuss concerns about disputes between those who prefer central versus theater control. The virtue of the hub-and-spokes model is that central leadership can redirect resources across theater boundaries without needing the consent of the theaters. During a crisis, the JLSF could argue that logistics assets should remain centralized to permit quickly surging reinforcements to the frontlines. Nevertheless, theater commanders in secondary theaters, fearing “chain reaction warfare” (连锁反应战争), might seek authority over logistics assets in their geographic regions, leveraging their higher grade (one step above the JLSF commander) to press the issue.⁴⁴ Such disputes would likely have to be refereed by the CMC Joint Staff Department, which sits above the JLSF and the theaters, distracting the high command from other tasks.

A Taiwan scenario illustrates some potential frictions. In the preparatory phase of a major campaign, it is likely the Wuxi JLSC would be placed under the Eastern Theater Command and integrated into a theater support

44. M. Taylor Fravel, “Securing Borders: China’s Doctrine and Force Structure for Frontier Defense,” *Journal of Strategic Studies* 30, no. 4–5 (2007): 716; and Joel Wuthnow, *System Overload: Can China’s Military Be Distracted in a War over Taiwan?* (Washington, DC: National Defense University Press, 2020), 9–10.

department (or designated as the rear-area command post).⁴⁵ The tension would be with the other theaters. The JLSF headquarters might seek to retain control over other JLSCs, whose assets might be needed to support the main theater. But the other theaters—concerned about an expansion of the conflict to other border and coastal regions—could argue that logistics assets should be placed under their control to increase readiness and deter opportunism. Being directed to sacrifice forces to the Eastern Theater Command prior to or during a conflict could become a source of tension.

Neither did PLA sources address several practical challenges associated with organizational structure and human capital. One problem is that in the Northern Theater Command, the JLSC is colocated with the theater headquarters, making it difficult to utilize the former as a rear-area command post. A second is that the JLSCs are three grades below the theater commander, meaning it is likely at least one or two additional command layers would need to be added to convert a JLSC to a theater support department. That role could be provided by a theater deputy commander delegated to lead the rear area command post, though theater deputy commanders typically do not have expertise in support operations.⁴⁶ Third, the JLSCs are at the same grade as the theater service support departments, which would render it difficult for a JLSC commander to assume control over service logistics forces (or vice versa). Finally, it is unclear whether, in the absence of a unified arrangement of the sort experimented with in the former Jinan Military Region, the PLA has commanders qualified in both joint and service logistics and thus able to guide the activities of both.

Conclusion

Approaching the fifth anniversary of the JLSF in 2021, a Ministry of National Defense spokesman praised the new force for having achieved an “operational pattern that integrates peace and war” (平战一体的运行格局) among other feats.⁴⁷ This was a dubious claim. The essence of the theater reforms under Xi was to consolidate authority, reducing delays as the PLA transitioned from a peacetime to a wartime footing. Yet, in the support arena,

45. Michael Casey, “Firepower Strike, Blockade, Landing: PLA Campaigns for a Cross-Strait Conflict,” in *Crossing the Strait: China’s Military Prepares for War with Taiwan*, ed. Joel Wuthnow et al. (Washington, DC: National Defense University Press, 2022).

46. Joel Wuthnow, *Gray Dragons: Assessing China’s Senior Military Leadership* (Washington, DC: National Defense University Press, 2022), 21.

47. “The Ministry of National Defense Introduces the Construction and Development of the Joint Logistic Support Force Since Reform and Restructuring.”

the trend was in the opposite direction—centralizing authority over joint logistics forces at the expense of the theaters. The PLA thus prioritized efficiency and capacity to handle escalating crises over the need for unity of command by the theaters. PLA scholars were left to speculate about how those forces could be reintegrated in wartime, providing no firm solution.

On one hand, these problems should not be exaggerated. Like the Rocket Force, the JLSF has routine coordination mechanisms with the theaters, including liaisons and information-sharing systems. In practice, the JLSF has also strengthened horizontal relationships with supported units during contingencies and exercises. On the other hand, the absence of a theater-level logistics function in peacetime is hard to reconcile with PLA wartime doctrine. A delayed or difficult transition to a theater support department raises questions about whether the theater commander would be able to exercise firm control over logistics forces during the “fog of war” and could set the stage for disputes between the JLSF and the theaters, both of whom would argue for control over the same resources for competing purposes. Thus, while reducing friction in some areas, the reforms created the prospect of new friction in others. At worst, the delayed or incomplete establishment of unified theater logistics could contribute to a failure of the theater leadership to achieve adequately, prepare for, task, and adjust logistics forces in wartime, much as Russian forces struggled with synchronizing logistics and combat forces in the early stages of the 2022 Ukraine invasion.⁴⁸

Several signs could indicate a PLA effort to smooth the wartime transition. First would be theater or national exercises based on a wartime command structure. Setting up a theater support department or rear-area command post would give participants experience with new or revised roles and responsibilities. Second would be shifts in PLA officer assignment patterns that would encourage prospective joint commanders to gain experience in the support arena; this could mean rotational assignments in a JLSC or theater service support department. Crossover between logistics personnel in joint and service positions would also position them to lead a unified theater support department. This method would be especially useful for JLSF personnel who appear to have limited, if any, expertise in air or naval logistics. Third would be clues in professional logistics journals indicating PLA leadership has settled on a model for theater integration of logistics

48. Anne Marie Dailey, “What’s behind Russia’s Logistical Mess in Ukraine? A U.S. Army Engineer Looks at the Tactical Level,” *New Atlanticist* (blog), March 21, 2022, <https://www.atlanticcouncil.org/blogs/new-atlanticist/whats-behind-russias-logistical-mess-in-ukraine-a-us-army-engineer-looks-at-the-tactical-level/>.

forces in wartime, which might be inferred from the absence of future debates. Those articles might include diagnoses of Russia's struggles in combat in 2022 as references for what China should do differently.

An inefficient transition to the wartime structure could provide opportunities for China's adversaries. At a minimum, such a shift would indicate the PLA is putting the necessary pieces into place to enter a conflict. Moreover, the need to coordinate logistics through *ad hoc* structures, led by senior officers without expertise in this area, could undermine the PLA's confidence in its ability to support forces. Adversary steps to complicate PLA logistics could aggravate such perceptions. Information operations could highlight PLA weaknesses in logistics or contrast them with a greater ability of adversary forces to sustain forces in a contested environment. Offensive cyber operations might create doubts about the reliability of PLA logistics information systems. Indications that targeted strikes would focus on critical logistics facilities (such as JLSC headquarters) might also confound PLA decision making.⁴⁹

Adversaries might also consider amplifying tensions within the PLA that could create difficult choices for the high command in wartime. In the context of Taiwan, signaling that the conflict would likely expand to include other rivals, such as Japan, Australia, or even India (which might opportunistically seek to recover lost territory in the Himalayas) could become an argument for other theaters to seek tighter control of logistics forces ahead of a conflict. This action might require PLA leadership to decide whether to relinquish those assets or reserve them for the main theater. Demonstrating that the Eastern Theater Command might not prevail, from a logistics standpoint, in a conflict that escalates beyond its own resident capabilities could help to dissuade PLA leaders from entering the conflict. Thus, absent improvements, logistics could be a hindrance to PLA effectiveness and an opportune target for its opponents.

49. Wuthnow, *System Overload*, 30–33.

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China’s National Defense Mobilization System: Foundation for Military Logistics

Erin Richter and Benjamin Rosen

The People’s Republic of China’s (PRC’s) national defense mobilization system is a vital component of its national defense strategy. The national defense mobilization system touches almost all aspects of the organizational infrastructure that supports the People’s Liberation Army (PLA). This chapter provides an overview of this system at the national and provincial levels and details how the system is expressed in the economic mobilization and transportation mobilization sectors that are critical to PLA logistics support. Finally, the chapter discusses recent changes to national defense mobilization laws and the improvements to the national defense mobilization system that are anticipated to result from these changes.

China’s National Defense Mobilization System

China’s national defense mobilization (国防动员) system is a fundamental component of military-civilian fusion, whereby national military modernization, social, and economic development initiatives are symbiotic. National defense mobilization serves as an important mechanism for the Chinese Communist Party (CCP) to garner popular and commercial support for national defense activities, through propaganda, preferential incentives, and tangible military support for public welfare. These actions enable the Party to leverage China’s full human capital and industrial potential when necessary to defend its sovereignty, security, and strategic interests. The system also ensures that national defense is a whole-of-government

endeavor, controlled by the Chinese Communist Party and managed by the Central Military Commission (CMC) but involving all governance mechanisms. National defense mobilization is an extension of Mao Zedong's foundational concept of the "People's War" (人民战争), whereby the strength of the whole people is used to fight against the invaders and defend the nation, but has been adopted to support a broader range of national defense and emergency response activities.¹ It involves mobilization of China's manpower, material, financial, infrastructure, industrial, science, and technology resources and generating necessary political and popular support for mobilization activities.²

National defense mobilization is critical to PLA logistics and the sustainment of military operations. The People's Liberation Army's logistics system is not designed to be self-sufficient. It relies on relationships with government and private enterprises to fulfill material requirements, support military transportation, provide necessary communications and information management, and mobilize necessary manpower resources. While some of these requirements are met through direct commercial contracts and employment of military specialists and civilian cadres, most military operations rely on the army's ability to apply for resources to be mobilized by the national defense mobilization system's party and government mechanisms. The use of mobilized resources to fill PLA sustainment capability gaps is necessary for virtually all military operations, including wartime sustainment and support.

National Defense Mobilization Authorities

Responsibility for national defense mobilization formulation and implementation activities is divided between the State Council and the Central Military Commission. According to the 2020 National Defense Law of China (中华人民共和国国防法), the state is required to incorporate national defense mobilization readiness into its overall development programs and plans to increase its potential and capacity for national defense."³ The National

Note: The author's affiliation with the MITRE Corporation is provided for identification purposes only and is not intended to convey or imply MITRE's concurrence with, or support for, the positions, opinions, or viewpoints expressed by the author.

1. Mao Zedong, "On Protracted War," in *Selected Works of Mao Tse-Tung*, vol. 2 (Beijing: People's Publishing House, 1965); and Ren Min [任民], "国防动员学" [*The Science of National Defense Mobilization*], (Beijing: Military Science Publishing House, 2008).

2. Ren Min, *National Defense Mobilization*.

3. Law of the People's Republic of China on National Defense, December 26, 2020, <http://www.npc.gov.cn/englishnpc/c23934/202109/567129ffe3144ccb9ff358fed798b9e3.shtml>.

Defense Law directs the Commission to lead the armed forces of the People's Republic of China, including management of armed forces mobilization and reserve work. It also stipulates that on issues related to national defense mobilization, the State Council shall:

- Lead and administer national defense development, including planning, budgeting, research, and production
- Jointly with the Central Military Commission, lead the development of militias, conscription work, and administration of border defense, maritime defense, air defense, and defense of other critical security domains (for example, cybersecurity)
- Lead and administer economic mobilization and the development, organization, and implementation of civil air defense, national defense transportation, and other matters
- Lead and administer the work of supporting the military, providing preferential treatment to the families of servicepersons and martyrs and ensuring veterans benefits and services⁴

To implement the actions stipulated under the National Defense Law, the State Council and the Commission are required to establish a mechanism for coordinating the resolution of major national defense issues.⁵ The 2010 National Defense Mobilization Law of the PRC indicates that for national defense mobilization, this coordination mechanism shall be the National Defense Mobilization Commission (NDMC) (国家国防动员委员会).⁶ The Commission was initially established in 1994 under the leadership of the State Council and Central Military Commission to formulate defense mobilization policies and organize, direct, and coordinate national defense mobilization work for the PRC.⁷ Under the guidance of the Commission, governments down to the county level form their own National Defense Mobilization Commissions to incorporate national defense

4. Law of the People's Republic of China on National Defense.

5. Article 17, Law of the People's Republic of China on National Defense, December 26, 2020, <http://www.npc.gov.cn/englishnpc/c23934/202109/567129ffe3144ccb9ff358fed798b9e3.shtml>.

6. Article 12, National Defense Mobilization Law of the People's Republic of China, February 26, 2010, <http://www.chinanews.com.cn/gn/news/2010/02-26/2141912.shtml>.

7. National Defense Mobilization Law of the People's Republic of China.

mobilization requirements into their economic, social development, and war readiness plans.⁸

National Defense Mobilization Commission

As of early 2022, Premier of the State Council (中华人民共和国国务院) Li Keqiang (李克强) serves as the NDMC Director, Secretary-general of the State Council Xiao Jie (肖捷) and Minister of National Defense Wei Fenghe (魏凤和) serve as its deputy directors, and CMC National Defense Mobilization Department (NDMD) Director Lieutenant General Liu Faqing (刘发庆) likely serves as the NDMC Secretary-general, having replaced former NDMD Director Sheng Bin in 2022.⁹ The Secretary-general is responsible for assisting the NDMC leadership in planning, organizing, and coordinating national defense mobilization. In his capacity as NDMC Secretary-general, the CMC NDMD director also leads the NDMC General Office that is responsible for national defense mobilization planning, policy formulation, regulatory research, organization and coordination, and secretarial services.¹⁰ The NDMD director has the most active role in defense mobilization planning and coordination but likely relies on the more senior NDMC leaders for whole-of-government support. As of 2018, the National Defense Mobilization Commission likely included the following organizations outlined in table 3-1.¹¹

8. Articles 12 and 18, National Defense Mobilization Law of the People's Republic of China, February 26, 2010, <http://www.chinanews.com.cn/gn/news/2010/02-26/2141912.shtml>.

9. Website for the State Commission for National Defense Mobilization, <http://www.gfdy.gov.cn/>; “盛斌:首任国防动员部部长,49岁被授少将,58岁升中将军, 现今63岁” [Sheng Bin: First Director of National Defense Mobilization Department, Was Awarded Major General at the Age of 49, Promoted to Lieutenant General at the Age of 58, and Is Now 63 Years Old], December 2, 2021, accessed on January 6, 2022, <https://sunnews.cc/military/231312.html>; “军委国防动员部部长盛斌兼任国家国防动员委员会秘书长” [Sheng Bin, Director of the National Defense Mobilization Department of the Central Military Commission, Also Serves as the Secretary General of the National Defense Mobilization Committee], December 6, 2016, accessed December 13, 2021, https://www.thepaper.cn/newsDetail_forward_1574780; and “将军履新! 刘发庆、王东海已任中央军委国防动员部部长、政委” [General Takes Over! Liu Faqing and Wang Donghai Have Been Appointed as Ministers and Political Commissars of the National Defense Mobilization Department of the Central Military Commission], January 28, 2022, <https://www.163.com/dy/article/GUQJV29O0514TTKN.html>, accessed on April 2022.

10. Hua Hao [华昊], “改革开放以来我国国防动员法规建设的实践与启示” [Practice and Enlightenment of China's National Defense Mobilization Law Construction Since Reform and Opening Up], 国防 [National Defense].

11. “新建七部委 自然资源部担重责” [The Ministry of Natural Resources of the New Seven Ministries and Commissions Shoulders the Heavy Responsibility], *Takungpao* (website), March 14, 2018, <http://news.takungpao.com/paper/q/2018/0314/3551339.html> (Portions of this website, to include discussions of NDMC activities, have been subsequently deleted from the active page. It is unclear if this is the result of changes to the NDMC system or actions to improve information security); and “National Defense Mobilization Committee,” as described on the China National Defense Mobilization Network, the official website of the NDMC, July 14, 2017, accessed via the Wayback Machine, http://www.gfdy.gov.cn/organization/2017-07/14/content_7676149.htm.

Table 3-1. 2017–18 composition of the NDMC

Relevant Departments of the Central Military Commission	Central Organization Department (中国共产党中央委员会组织部)
Central Propaganda Department (中国共产党中央委员会宣传部) ¹²	State Commission Office for Public Sector Reform (中央机构编制委员会办公室)
National Development and Reform Commission (国家发展和改革委员会)	Ministry of Education (教育部)
Ministry of Science and Technology (科学技术部)	Ministry of Industry and Information Technology (工业和信息化部)
Ministry of Public Security (公安部)	Ministry of Civil Affairs (民政部)
Ministry of Justice (司法部)	Ministry of Finance (财政部)
Ministry of Human Resources and Social Security (人力资源和社会保障部)	Ministry of Natural Resources (中华人民共和国自然资源部) ¹³
Ministry of Housing and Urban-Rural Development (住房和城乡建设部)	Ministry of Transport (交通运输部)
Ministry of Commerce (商务部)	Ministry of Culture and Tourism (中华人民共和国文化和旅游部) ¹⁴
National Health Commission (国家卫生健康委员会) ¹⁵	State-owned Assets Supervision and Administration Commission (国务院国有资产监督管理委员会)
Ministry of Veterans Affairs (中华人民共和国退役军人事务部)	National Bureau of Statistics (国家统计局)
All-China Federation of Trade Unions (中华全国总工会)	Central Committee of the Communist Youth League (中国共产主义青年团)
All-China Women's Federation (中华全国妇女联合会)	Ministry of Emergency Management (中华人民共和国应急管理部) ¹⁶

12. "China's Central Propaganda Department Takes over Regulation of All Media," *Radio Free Asia* (website), March 21, 2018, <https://www.rfa.org/english/news/china/china-propaganda-03212018140841.html>. As of 2017, the NDMC included the State Administration of Press, Publication, Radio, Film, and Television, which was realigned to the Central Propaganda Department in 2018 as part of the 2018 State Council institutional reforms.

13. "新建七部委 自然资源部担重责" [The Ministry of Natural Resources of the New Seven Ministries and Commissions Shoulders the Heavy Responsibility], *Takungpao* (website), March 14, 2018, <http://news.takungpao.com/paper/q/2018/0314/3551339.html>, accessed in February 2022.

14. "New Chapter for Development of Tourism," *China Daily* (website), May 13, 2018.

15. "China to Set Up National Health Commission," *Xinhua*, March 13, 2018.

16. "New Authority Focuses on Emergency Response," *China Daily* (website), March 30, 2018, http://english.www.gov.cn/state_council/ministries/2018/03/30/content_281476095337420.htm.

National defense mobilization work under the National Defense Mobilization Commission is organized along functional lines of effort that include:

- People's Armed Forces mobilization (人民武装动员) – Reserve and militia force construction, training, and war readiness.¹⁷
- Civil air defense mobilization (人民防空) – Mobilization and command of forces to protect critical facilities and respond to natural disasters, industrial accidents, epidemics, and attacks, including supervision of civil air defense engineering and construction and construction of hardened government command facilities.¹⁸
- Transportation mobilization (交通战备) – Construction and use of transportation resources to support national defense requirements, including dual military-civilian use infrastructure and equipment, the security of national defense transportation routes and resources, and mobilization of transportation manpower and equipment resources.¹⁹
- National economic mobilization (国民经济动员) – Transfer of the State's economic capacity from a peacetime to a wartime state to meet the demands of a war, sudden incident, or emergency, including mobilization of industrial, agricultural, medical, information, science and technology, financial, industrial, material reserves, and associated manpower resources.²⁰

17. China National Defense Mobilization Network, the official website of the NDMC, http://www.gfdy.gov.cn/battle/node_96929.htm.

18. China National Defense Mobilization Network.

19. China National Defense Mobilization Network.

20. Ren, *National Defense Mobilization*.

- Information mobilization (信息动员) – Regulation of information resources, technology development, personnel training, infrastructure construction, and information management to support national defense requirements, including the appropriation and allocation of information resources, electromagnetic spectrum management, information security, and information networks.²¹
- Political mobilization (政治动员) – Activities to mobilize the people and the army to participate in and support national defense mobilization, including the use of mass media propaganda campaigns to “arouse the patriotic enthusiasm of the army and civilians and create a strong atmosphere for participating in the war,” as well as National Defense Education activities.²²

The National Defense Mobilization Commission has a number of working offices responsible for coordinating activities along each mobilization line of effort. The offices are managed by standing military and civilian government organizations, with the director of the managing organization also acting as the director of the NDMC office.²³ Each NDMC office likely has a small permanent staff to manage the military-civilian coordination activities associated with defense mobilization.²⁴ These activities include mobilization planning and data collection, pairing military mobilization requirements with mobilization potential, inspecting defense mobilization work, drafting regulations and guiding documents, and collaborating with relevant institutions on improvements to defense mobilization systems.

21. PLA Military Terminology, 40; China National Defense Mobilization Network, http://www.gfdy.gov.cn/information/node_96933.htm; and Ren, *National Defense Mobilization*.

22. Zhoukou Military Subregion [周口军分区], “省军区系统保障作战部队跨区机动问题初探” [A Preliminary Probe into the Cross-regional Mobility of the Provincial Military District System Support Combat Troops], 国防 [National Defense], February 1, 2019; and “Do You Know What Defense Obligations Need to Be Fulfilled?,” *Xinhuanet* (website) [China National Defense Daily], December 1, 2016, accessed in February 2022, http://www.xinhuanet.com/mil/2016-12/01/c_129386313_2.htm.

23. Zhang Jialei [张嘉雷], “国防动员指挥体系建设初探” [A Preliminary Study of the Building of the National Defense Mobilization Command System], 国防 [National Defense], July 1, 2019; and “全国人防战略理论集训暨京津冀人防指挥协同演练在石家庄举行” [Group Training in National People's Air Defense Strategic Theory and People's Air Defense Command Coordination Exercise for Beijing, Tianjin, and Hebei Province Held in Shijiazhuang], website of the People's Air Defense Office of Hefei City, June 14, 2017, accessed at <https://www.hfrfb.gov.cn>.

24. “四總部省軍區改”一辦四局 [The 4 General Departments of Military Districts Transformed into “1 Office 4 Bureaus”], *Takungpao* (website), July 26, 2017, accessed at <http://www.takungpao.com>.

Table 3-2. NDMC working offices

NDMC Office	Corresponding Military Managing Organization
NDMC General Office (国家国防动员委员会综合办公室)	CMC National Defense Mobilization Department General Office (中央军委国防动员部办公厅) ²⁵
National People's Armed Forces Mobilization Office (国家人民武装动员办公室)	CMC National Defense Mobilization Department General Office (中央军委国防动员部办公厅) ²⁶
National Civil Air Defense Office (国家人民防空办公室)	CMC National Defense Mobilization Department Civil Air Defense Bureau (中央军委国防动员部人防局) ²⁷
National Transportation War Readiness Office (国家交通战备办公室)	CMC Logistics Support Department Transportation and Delivery Bureau (中央军委后勤保障部运输投送局) ²⁸
National Economic Mobilization Office (国家经济动员办公室)	National Development and Reform Commission (NDRC) Economic and Defense Coordinated Development Department (国家发展和改革委员会经济与国防协调发展司) (Also known as NDRC National Defense Office [NDO]) (国家发改委国防司) ²⁹
National Defense Education Office (国家国防教育办公室)	CMC National Defense Mobilization Department Political Work Bureau (中央军委国防动员部政治工作局) ³⁰

25. Hua Hao [华昊], “改革开放以来我国国防动员法规建设的实践与启示” [Practice and Enlightenment of China's National Defense Mobilization Law Construction Since Reform and Opening Up], 国防 [National Defense], May 2019.

26. China National Defense Mobilization Network.

27. Pengpai, *Paper* (website), December 6, 2016, http://www.thepaper.cn/newsDetail_forward_1574780; and China National Defense Mobilization Network.

28. Liu Xing, Yang Shangqin, and Cao Haiquan, [刘兴, 杨尚钦, 曹海泉] “民用运力国防动员行政执法研究” [Administrative Enforcement in National Defense Mobilization of Civil Transportation Resources], *Journal of Military Transportation University*, August 1, 2018.

29. “国家发改委24个职能机构变为26个, 具体有哪些变化” [“The 24 Functional Agencies of the National Development and Reform Commission Have Changed to 26, What Are the Specific Changes”], *Paper* (website), April 10, 2019, https://m.thepaper.cn/newsDetail_forward_3276790.

30. “中央军委国防动员部政治工作局副局长、国家国防教育办公室副主任陈军一行来我馆参观” [Chen Jun, Deputy Director of the Political Work Bureau of the National Defense Mobilization Department of the Central Military Commission and Deputy Director of the National Defense Education Office, Visited our Museum], October 22, 2017, <http://www.jgsgmbwg.com/newshow.php?cid%3D19%26id%3D6122>.

Similar to the national-level National Defense Mobilization Commission, every level of government from provincial- to county-level has established defense mobilization commissions to coordinate military-civilian national defense mobilization activities.³¹ Various party, government, and military officials serve as NDMC members under the leadership of the local party committee. Unlike the national-level defense mobilization commissions, lower-level mobilization work is primarily managed by local governments with military representation in select key leadership and coordination positions.

National Defense Mobilization Department

The CMC National Defense Mobilization Department (中央军委国防动员部), one of 15 organizations directly subordinate to the Central Military Commission, is responsible for national defense mobilization planning, coordination, reserve and militia force management, civil air defense and border defense operations, and command of provincial Military Districts (MDs) (省军区).³² Established in 2015, the National Defense Mobilization Department succeeded the former General Staff Department Mobilization Department. The National Defense Mobilization Department leads the majority of national defense mobilization work, in coordination with the NDRC National Defense Office (NDO). The National Defense Mobilization Department includes the following organizations:

- General Office (中央军委国防动员部办公厅) – Assists the National Defense Mobilization Commission in handling matters related to national defense mobilization and manages the comprehensive planning, organization, coordination, theoretical research, and secretarial services for the National Defense Mobilization Department.³³

31. National Defense Mobilization Law of the People's Republic of China (Effective), <http://www.lawinfochina.com> and <http://www.lawinfochina.com/display.aspx?lib=law&cid=8041&CGid=>, accessed January 6, 2022.

32. “揭秘新成立的中央军委国防动员部” [Demystifying the Newly Established CMC National Defense Mobilization Department], 中国青年报 [*China Youth Daily*], January 29, 2016, http://zqb.cyol.com/html/2016-01/29/nw.D110000zgqnb_20160129_1-06.htm; and website of the PRC Ministry of Foreign Affairs, <http://eng.chinamil.com.cn/>, accessed in February 2022.

33. Hua Hao [华昊], “改革开放以来我国国防动员法规建设的实践与启示” [Practice and Enlightenment of China's National Defense Mobilization Law Construction Since Reform and Opening Up], 国防 [*National Defense*], May 2019.

- Political Work Bureau (政治工作局) – Responsible for NDMD political work, including ensuring political reliability of NDMD personnel, human resource assignments, and political education.³⁴ The director of the Political Work Department is concurrently the director of the NDMC National Defense Education Office.³⁵
- Mobilization Recruitment Bureau (动员征集局) – Responsible for military conscription and recruitment in collaboration with various People’s Liberation Army and State Council organs through the Joint Conference System of National Recruitment Work.³⁶ The director of the Mobilization Recruitment Department also holds the position of Director of the Ministry of National Defense-subordinated Recruitment Office (征兵办公室).³⁷
- Militia Reserve Bureau (民兵预备役局) – Manages militia and reserve force policy formulation, organization, and training.³⁸ People’s Liberation Army militia and reserves were formerly controlled by the provincial Military Districts ((省军区, MDs) but transitioned to the control of the National Defense Mobilization Department in 2016.³⁹

34. “2021年中央军委国防动员部面向社会公开招考专业技能岗位文职人员公告” [In 2021, the National Defense Mobilization Department of the Central Military Commission Announced That It Will Openly Recruit Civilian Personnel for Professional Kills Positions to the Public], September 18, 2021, https://81rc.81.cn/news/2021-09/18/content_10090513.htm.

35. “国家国防教育办公室一行参观校史展览” [The National Defense Education Office and His Party Visited the School History Exhibition], <https://xsg.tsinghua.edu.cn/info/1002/1917.htm>, accessed on January 25, 2022.

36. “国务院办公厅，中央军委办公厅关于同意建立” [Letter of the Joint Conference System of the National Recruitment Work], November 16, 2020, http://www.gov.cn/zhengce/content/2020-11/16/content_5561866.htm; and “加快构建面向备战打仗的新型征兵体系” [Accelerate the Construction of a New Conscription System for Preparing for War], 国防 [National Defense], June 14, 2019, http://www.mod.gov.cn/jmsd/2019-03/14/content_4837664.htm.

37. Kenneth Allen, “The Evolution of the PLA’s Enlisted Force: Conscription and Recruitment (Part One),” *China Brief* 22, no. 1 (January 2022), <https://jamestown.org/program/the-evolution-of-the-plas-enlisted-force-conscription-and-recruitment-part-one/>.

38. “军委国防动员部下设民兵预备役局边防局等单位” [The National Defense Mobilization Department of the Central Military Commission Consists of the Frontier Defense Bureau of the Militia Reserve Bureau and Other Units], *Xinhua* (website), April 13, 2016, http://www.xinhuanet.com//mil/2016-04/13/c_128890214_3.htm.

39. Gabriel Dominguez, “China to Centralise Command over Military Reserve Forces,” *Janes* (website), June 29, 2020, <https://www.janes.com/defence-news/news-detail/china-to-centralise-command-over-military-reserve-forces>.

- Border Defense Bureau (边防局) – Responsible for national border and coastal defense work.⁴⁰ The Border Defense Bureau leads the National Border and Coastal Defense Committee (国家边海防委员会) in developing and promulgating policies relevant to border and coastal defense units of the People's Liberation Army and Ministry of Public Security.⁴¹ The NDMD Border Defense Bureau also likely collaborates with the National Development and Reform Commission to develop and deploy smart border and coastal defense systems.⁴²
- Civil Air Defense Bureau (人防局) – Responsible for coordination of civil defense tasks.⁴³ The director of the Civil Air Defense Bureau serves concurrently as the director of the National Civil Air Defense Office (国家人民防空办公室), the administrative department responsible for organizing the masses to take protective measures for preventing or minimizing damage caused by air raids. These organizations are responsible for formulating civil defense policies, organizing and managing national civil air defense construction, and organizing and carrying out civil defense and related rescue operations.⁴⁴

40. “军委国防动员部下设民兵预备役局边防局等单位” [The National Defense Mobilization Department of the Central Military Commission Consists of the Frontier Defense Bureau of the Militia Reserve Bureau and Other Units], *Xinhua* (website), April 13, 2016, accessed on January 24, 2022, http://www.xinhuanet.com/mil/2016-04/13/c_128890214_3.htm.

41. “军地合力，万里边疆海疆筑起坚不可摧的钢铁防线” [The Combined Forces of the Military and the Land Build an Indestructible Steel Line of Defense in the Frontiers and Seas of Thousands of Miles], *PLA Daily* (website), October 14, 2021, accessed on January 25, 2022, https://www.81.cn/dy/2021-10/14/content_10098441.htm; and “从有海无防到强大海防” [From Defenseless to Strong Coastal Defense], *Xinhua* (website), November 19, 2018, accessed on January 25, 2022, http://www.xinhuanet.com/politics/2018-11/19/c_1123735233.htm.

42. “努力建设强大稳固的现代边海防” [Efforts to Build a Strong and Stable Modern Border and Coastal Defense], *People's Daily* (website), October 11, 2021, accessed on January 25, 2022, <http://cpc.people.com.cn/n1/2021/10/11/c64387-32249284.html>.

43. “结成九曲连环 共铸护民之盾——沿黄九省（区）人民防空协调合作暨高质量发展会议在济南召开” [Forming a Series of Nine Twists and Turns to Jointly Build a Shield to Protect the People—the Civil Air Defense Coordination and Cooperation and High-quality Development Conference along the Nine Provinces (Regions) along the Yellow River Was Held in Jinan], *People's Daily Online* (website), September 29, 2021, <http://sd.people.com.cn/n2/2021/09/29/c386785-34938429.html>.

44. “中央军委国防动员部人防局局长殷勇同时担任国家人防办主任” [Yin Yong, Director of the Civil Defense Bureau of the National Defense Mobilization Department of the Central Military Commission, Also Serves as the Director of the National Civil Defense Office], August 9, 2016, https://www.sohu.com/a/109782567_260616; and “Civil Air Defense Law of the People's Republic of China,” January 1, 1997.

Theater, Provincial, and Local Defense Mobilization

Each of the People's Liberation Army's five Theater Command (TC) Joint Staff Departments (联合参谋部) has a Theater Mobilization Bureau (战区动员局) in charge of reviewing mobilization needs within the Theater, drafting mobilization plans and orders, and supervising mobilization activities. Mobilization Bureaus are not subordinate to the National Defense Mobilization Department but work to identify, collate, and evaluate TC mobilization requirements based on operational plans and assigned unit needs. According to officers associated with the Mobilization Bureau of Northern Theater Command, Mobilization Bureaus coordinate with provincial military districts to align mobilization requirements with mobilization potential and coordinate dynamic mobilization requirements during operations through personnel assigned to the TC Joint Operations Command Center (战区联合作战指挥中心, JOCC). Mobilization tasks that span theaters or national industrial sectors are reported to the mobilization department for the mobilization commission to assign mobilization tasks centrally.⁴⁵ Given that Military Districts are subordinate to the CMC National Defense Mobilization Department, not Theater Commands, and the national-level National Defense Mobilization Commission may direct the distribution of resources across theaters, it is unclear how the distribution of high-demand, low-density resources may be arbitrated during wartime operations involving multiple Theater Commands, but this is likely a point of friction between Theater Commands and the Central Military Commission.

While the national-level National Defense Mobilization Commission controls mobilization policies, and the CMC National Defense Mobilization Department and TC Mobilization Bureaus manage mobilization planning and coordination, mobilization implementation is predominantly led by provincial-level governments and associated National Defense Mobilization Commissions as well as through the provincial MD system.⁴⁶ According to the commander of the Ningxia Military District, the provincial National Defense Mobilization Commission is the highest executive-level

45. “战区联合作战国防动员需求问题研究” [Research on National Defense Mobilization Requirements for Joint Operations in Theaters], 国防 [National Defense], August 1, 2019; an article written in a PLA journal by a staff officer in the Northern Theater's Defense Mobilization Bureau; and Yue Shengjun [岳胜军] and Yu Chao [于超], “战区国防动员运行机理探析” [Theater National Defense Mobilization Operating Mechanism: Exploration and Analysis], 国防 [National Defense], March 1, 2017.

46. Chen Wengang and Hou Biao, [陈文刚, 侯彪], “省域国防动员指挥机构建设初探” [Preliminary Study of How to Build Provincial-level Defense Mobilization Command Organs], 国防 [National Defense], July 1, 2019.

organization responsible for the implementation of national and theater mobilization orders.⁴⁷

Provincial and below governments work collaboratively with provincial-military districts, through national defense mobilization commissions, to match mobilization resource potential with military requirements, direct military-civilian dual-use production and infrastructure construction activities, mobilize and deploy resources to support the military, and actively support joint operations. While provincial-level and below NDMC organizational structures resemble the national-level National Defense Mobilization Commission, they vary across jurisdictions based on operational demands and a jurisdiction's distinct geographic, industrial, infrastructure, and social characteristics.⁴⁸ Provincial-level national defense mobilization commissions are led by the provincial party committee, with the General Secretary serving as director and the provincial governor and MD commander serving as NDMC deputy directors.⁴⁹ According to the commander of the Ningxia Military District, provincial MD deputy commanders, the provincial government secretary general, and leaders of People's Armed Police (PAP) command in each province also participate in NDMC decision making. These officials are responsible for determining national defense mobilization tasks, reviewing action plans, and organizing and directing national defense mobilization operations.⁵⁰ Leaders from provincial party committees and government functional departments are included in NDMC deliberations as necessary to provide advice related to specific mobilization tasks.⁵¹

47. Zheng Weibo [郑威波], “探索构建融入联合作战指挥体系的省级国防动员指挥机构” [Explore the Construction of Provincial Defense Mobilization Command Structures That Are Integrated into the Joint Operational Command System], 国防 [National Defense], July 1, 2018.

48. Chen Wengang and Hou Biao [陈文刚, 侯彪], “省域国防动员指挥机构建设初探” [Preliminary Study of How to Build Provincial-level Defense Mobilization Command Organs].

49. Zheng Weibo, “Provincial Defense Mobilization Command Structures”; and “推动广东省党管武装和国防动员工作高质量发展” [Promote the High-quality Development of the Party's Management of the Armed Forces and National Defense Mobilization in Guangdong Province], 南方日报 [Nanfang Daily], December 16, 2021, <http://gd.people.com.cn/n2/2021/1216/c123932-35053605.html>.

50. Zheng Weibo, “Provincial Defense Mobilization Command Structures.”

51. Zheng Weibo, “Provincial Defense Mobilization Command Structures.”

Provincial-level NDMC working offices include People's Armed Forces, economic, transportation war readiness, civil air defense, information, science and technology, and national defense education mobilization offices.⁵² Provincial-level government offices are usually tasked to lead NDMC working offices, often with a deputy director assigned by the military district, to ensure effective military-civilian coordination.⁵³ For example, in Hubei Province the director of the provincial MD War Readiness Construction Bureau also serves as deputy director of the provincial Civil Air Defense Office to ensure mobilization activities support military requirements, and the military is appropriately leveraged to support local emergency response activities.⁵⁴

Military Districts

Each MD headquarters is responsible for a single province or autonomous region and bears its province or region name. Military districts are responsible for military-civilian coordination within their jurisdiction, including mobilization planning and conscription, and management of militia units.⁵⁵ Military districts coordinate mobilization with provincial and below governments as directed by Theater Commands (TCs).⁵⁶ Military districts are assessed by and receive policy guidance from the National Defense Mobilization Department.⁵⁷ Military district subordinate organizations include:

52. Zheng Weibo, "Provincial Defense Mobilization Command Structures"; "推动广东省党管武装和国防动员工作高质量发展" [Promote the High-quality Development of the Party's Management of the Armed Forces and National Defense Mobilization in Guangdong Province]; and Yang Yong [杨勇], Chen Gong [陈功], and Lu Bobo [路波波], "'一场收获颇多的红蓝对抗'——宁夏银川市开展国防动员综合演练见闻" ("Red-vs.-Blue Confrontations' Provide Lots of Takeaways—Account of Comprehensive National Defense Mobilization Drill in Yinchuan City, Ningxia"), 中国国防报 [*China Defense News*], November 5, 2021, <http://www.81.cn/gfbmap/content/21/2021-11/05/01/2021110501.pdf>.

53. Article 18, Law of the People's Republic of China on National Defense, December 26, 2020, <http://www.npc.gov.cn/englishnpc/c23934/202109/567129ffe3144ccb9ff358fed798b9e3.shtml>.

54. Hao Weijie [郝维杰], Biography, Hubei Provincial Civil Air Defense Office (website), http://rfb.hubei.gov.cn/fbjd/xxgkml/jgzl/ldxx/hwj/202006/t20200602_2375801.shtml, accessed on February 21, 2022.

55. "四總部省軍區改'一辦四局'" [The 4 General Departments of Military Districts Transformed into '1 Office 4 Bureaus'], July 26, 2017, <http://www.takungpao.com>; and Lin Ying-yu [林穎佑], "PLA Navy Transfers Not About Infighting" *Taipei Times* (website), May 23, 2019, <http://www.taipeitimes.com>.

56. Zheng Weibo, "Provincial Defense Mobilization Command Structures."

57. "甘肃省军地聚焦提升动员备战效能推动后备力量转型发展纪事" [Gansu Military District Focuses on Improving Mobilization, Combat Preparation], 中国国防报 [*China Defense News*], January 5, 2022, <http://www.81.cn>.

- General Office (办公室) – Supports the provincial NDMC General Office, receives and aggregates mobilization requirements, quantifies and verifies mobilization capacity, formulates mobilization resource allocation and use plans, and organizes and implements mobilization actions. May serve as the provincial NDMC General Office.⁵⁸
- Political Work Bureau (政治工作局) – Supports provincial political mobilization work, public opinion and legal struggle, cadre appointments, discipline inspection, propaganda, and national defense education work. The provincial MD political commissar acts as deputy to the provincial party chief in managing political mobilization.
- War Readiness Construction Bureau (战备建设局) – Organizes training and manages forces for mobilization operations, including security tasks by militia, public security, armed police, and counterterrorism organizations.
- National Defense Mobilization Bureau (国防动员局) – Manages mobilization requirements and collaborates with provincial offices to identify and assess local mobilization potential to develop plans for mobilization of necessary resources.
- Support Bureau (保障局) – Organizes operational support, logistics support, and general support for national defense activities, including communications, cryptologic, hydrologic, meteorological, transportation, fuel, barracks, health services, and maintenance.⁵⁹

Military districts command military subdistricts (MSD) aligned to prefectures, cities, and counties within the MD area of responsibility. Military subdistricts perform the same roles as military districts within their jurisdiction and supervise the activities of local People's Armed Forces Departments (PAFDs).⁶⁰ People's Armed Forces departments are responsible for meeting local conscription quotas and formation of militias

58. “‘四總部省軍區改’一辦四局” [“The 4 General Departments of Military Districts Transformed into ‘1 Office 4 Bureaus’”], July 26, 2017, <http://www.takungpao.com>.

59. Zheng Weibo, “Provincial Defense Mobilization Command Structures.”

60. “‘四總部省軍區改’一辦四局” [“The 4 General Departments of Military Districts Transformed into ‘1 Office 4 Bureaus’”].

as directed by military districts and subdistricts. People's Armed Forces departments also assist in training and logistics support for units in their areas. They are found at the county, city, district, township or sub-district levels and in some large factories and enterprises. Local People's Armed Forces departments provide peacetime command for militia units in their areas of responsibility. County, city, and municipal PAFD headquarters are manned by active-duty PLA officers, while PAFD headquarters at township or subdistrict levels are led by local civilian cadres and financed by local governments.⁶¹

NDMC Information Technology Systems Development

Provincial and local national defense mobilization commissions aspire to use information systems to rapidly identify and locate mobilization resources and direct their deployment to support national defense requirements through interconnected and secure military-civilian mobilization command systems.⁶² PLA authors have broadly discussed their perceived need to link the relevant data systems of the many organizations involved in logistics activities supporting PLA operations. However, while pilot sites have been established, efforts continue to be constrained by poor mobilization data collection and a lack of interconnection between and among military and civilian information systems at each echelon and across administrative divisions. Supporting information systems and communications networks vary by geographic area and functional sector, hindering data-integration initiatives.⁶³ Mobilization officials have sought information technology solutions, but these systems are being developed sporadically, sponsored by individual provincial and below governments with the hopes of broader proliferation.

Geovis Technology Co., Ltd. (中科星图股份有限公司) has developed a National Defense Mobilization Platform that is reportedly in use by some provincial military districts. This system reportedly displays information related to military personnel mobilization, economic mobilization,

61. Nan Dinghong [南丁红], Guo Fu [郭富], Guo Gangan [郭干干], "甘肃省军地聚焦提升动员备战效能推动后备力量转型发展纪事" [Gansu Province's Military Land Focuses on Improving the Efficiency of Mobilization to Promote the Transformation and Development of Reserve Forces], *中国国防报 (China National Defense)*, January 5, 2022, https://www.mod.gov.cn/mobilization/2022-01/05/content_4902329.htm; and Dennis J. Blasko, *The Chinese Army Today: Tradition and Transformation for the 21st Century* (New York: Routledge, 2012), 40–41.

62. Wang Fang, Guo Jing, and Wang Jizhen, "Construction of Smart National Defense Mobilization Information System of Systems," *National Defense Science and Technology* 41, no. 2 (2020).

63. Wang Fang, Guo Jing, and Wang Jizhen, "Construction of Smart National Defense."

civil air defense mobilization, transportation mobilization, and medical and health mobilization.⁶⁴ Shanxi Cloud Era Technology Co., Ltd. (山西云时代技术有限公司) reportedly has developed a similar platform, with similar functions that are used in Shanxi.⁶⁵

National defense mobilization officials also seek to harness smart-city technology to identify, mobilize, and dispatch mobilization resources. For example, the PLA has lauded the application of 5G and smart-city systems in Shenzhen for defense mobilization purposes. Shenzhen's smart-city operations centers collect and share national defense mobilization potential data, down to tracking locations of 18-year-olds for recruitment purposes. Similarly, data on party members and retired soldiers are collected and shared for militia formation purposes.⁶⁶

Mobilization Support to Military Logistics

The national defense mobilization system is a critical enabler of PRC military logistics operations. Through this system, the military can access necessary resources to support combat, emergency response, internal security, border and coastal defense, and other national defense activities. Military-civilian integrated development of support infrastructure and equipment, as well as civilian enterprise and professional technical support, provide the military with logistics capacity without the expense of dedicated military investment. Dual-use programs and subsidized logistics-related enterprises support national strategic goals of economic development while ensuring national defense needs are met.

Economic Mobilization System

National economic mobilization is a series of activities implemented to meet the demand of war, sudden incident, or emergency, in which the state, in a planned and organized manner, converts national economic activity and

64. “‘GEOVIS+’国防智慧动员平台提升国防动员信息化水平” [“GEOVIS+” National Defense Smart Mobilization Platform Improves the Informatization Level of National Defense Mobilization], March 25, 2019, <http://www.81it.com/2019/0325/9374.html>.

65. “云时代公司运用大数据技术, 推进军民融合工作发展” [Cloud Times Uses Big Data Technology to Promote the Development of Military-civilian Integration], December 1, 2018, <https://www.sxctc.net/content/8971.html>.

66. “大数据时代, 国防动员插上‘智慧’翅膀” [In the Era of Big Data, National Defense Mobilization Is Equipped with ‘Wisdom’ Wings], <http://www.mod.gov.cn/>, August 3, 2021, http://www.mod.gov.cn/services/2021-08/03/content_4891006.htm.

corresponding systems from a peacetime to a wartime state.⁶⁷ Within China, economic mobilization is critical to supporting and sustaining PLA operations.

Economic Mobilization is led by the National Development and Reform Commission's (NDRC's) Department of Economic and National Defense Coordinated Development (NDCD) (国家发展和改革委员会经济与国防协调发展司), often referred to as the National Defense Office (NDO) (国防司). The National Defense Office is responsible for organizing the formulation of strategies and plans for promoting the coordinated development of the economy and of national defense construction (military-civilian fusion).⁶⁸ The National Defense Office also assumed the duties of the former NDRC National Economic Mobilization Office (EMO) in 2014, and the responsibility for leading economic mobilization work in the government system.⁶⁹ The National Development and Reform Commission is the only NDMC leading body outside the People's Liberation Army.⁷⁰

The National Defense Office is designed to serve as the central coordination mechanism for government ministries and institutions under the State Council. Development and Reform Commission (DRC) offices serve this function at provincial levels and below. These offices promulgate policies and standards for identifying the resources available for national defense mobilization and development of dual-use industries and infrastructure; prepare and implement economic mobilization plans; and coordinate economic mobilization drills, combat, and emergency response activities.⁷¹ The National Defense Office probably collaborates closely with the Ministry of Industry and Information Technology (MIIT), Ministry of Finance, National Bureau of Statistics, Ministry of Transportation, and State-owned Assets Supervision

67. Ren Min, *Science of National Defense Mobilization*.

68. "Functional Configuration and Internal Organizations," National Development and Reform Commission (website), June 13, 2019, <https://www.ndrc.gov.cn/fzggw/bnpz/?code=&state=123>.

69. "国家发改委24个职能机构变为26个, 具体有哪些变化" [The 24 Functional Agencies of the National Development and Reform Commission Have Changed to 26, What Are the Specific Changes?], *Paper* (website), April 10, 2019, https://m.thepaper.cn/newsDetail_forward_3276790.

70. "国民经济动员机制的深化路径研究" [Research on the Deepening Path of the National Economic Mobilization Mechanism], Ministry of Industry and Information Technology, April 2, 2015, <https://www.21ks.net/lunwen/guominjingjijunwen/29726.html>.

71. "国民经济动员机制的深化路径研究" [Research on the Deepening Path of the National Economic Mobilization Mechanism].

and Administration Commission (SASAC) on economic mobilization issues.⁷² Provincial and below development and reform commissions manage national economic mobilization offices for their jurisdiction and similarly coordinate with the provincial-level equivalents of these national-level institutions and a number of other departments responsible for complementary functions.⁷³

Economic Mobilization Requirements Management Process

Economic mobilization requirements are submitted by the military both horizontally and vertically. Military units submit mobilization requirements to the military district or subdistrict in which the unit is operating or is transiting through. The military district is responsible for transmitting these requirements to the theater command and for identifying requirements it is unable to support. Theater Commands will consolidate these requirements, attempt to balance resources across military districts to satisfy requirements, then transmit to the National Defense Mobilization Department those requirements that cannot be satisfied. The Defense Mobilization Department, in collaboration with the CMC Logistics Support Department and Equipment Development Department, will identify unfulfilled mobilization requirements to the National Development and Reform Commission National Defense Office, which will in turn coordinate across the government to mobilize the necessary resources.⁷⁴

72. East China Sea Research Station [东海研究站], “国家发改委经济与国防协调发展司副司长周平莅临东海站调研” [Zhou Ping, Deputy Director of the Department of Coordinated Development of Economy and National Defense of the National Development and Reform Commission, Visited Donghai Station to Investigate], Institute of Acoustics, Chinese Academy of Sciences (website), June 6, 2016, http://www.ioa.cas.cn/xwzx/zhxw/201606/t20160606_4617321.html; Jia Yong [贾勇], “夯实国防动员建设的基础工程” [Work on Solidifying of National Defense Mobilization Building—Conversation with Military People’s Congress Representative Wu Yongliang on G Potential Statistical Survey], March 8, 2019, *PLA Daily* (website), <http://www.chinamil.com.cn/>; “国防财务管理工作” [National Defense Financial Management Work], *China Finance Magazine* (website), August 6, 2020, https://www.zgcznet.com/cjqk/zgkjin/gjcwkwjglgz/202009/20200915/j_2020091523562000015966845646698088.html; and Pan Di (潘娣), “筑起坚不可摧的钢铁防线——军地共话合力推进边海防基础设施建” [Building an Indestructible Steel Defensive Line – Joint Military-Civilian Promotion of Border, Coastal Defense Infrastructure Building], *PLA Daily* (website), October 13, 2021, https://www.81.cn/dy/2021-10/14/content_10098441.htm.

73. “北流市人民政府关于市政府领导工作分工的通知” [Notice of the Beiliu Municipal People’s Government on the Division of Labor of the Municipal Government Leaders], Beiliu Municipal People’s Government Office (website), August 17, 2021, <http://www.beiliu.gov.cn/xxgk/zfxxgk/xxgkml/wjzl/zfwj/t9830193.shtml>; Anhui Provincial Development and Reform Commission (website), <http://fzggw.ah.gov.cn/jgsz/jgcs/ghc/index.html>; and Zhu Erjian [祝尔坚], “基于云平台和军民融合的军队联勤保障模式创新” [Innovations in Military Joint Logistics Support Model Based on Cloud Platform and Civil-Military Integration], August 11, 2020.

74. Hou Zhonghou and Hu Yue, “A Study of the Reporting Mechanisms for Submitting National Economic Mobilization Demands.”

Information and Industrial Mobilization

Information mobilization is a subset of economic mobilization and includes measures the state takes to mobilize civil information resources, including production of dual-use information technologies and equipment, mobilization of manpower resources to manage and protect the transmission of war-related information, and the mobilization of information technology products for wartime use.⁷⁵ Similarly, industrial mobilization is the conversion of science and technology, chemical, energy, textile, food, medical equipment, and pharmaceutical manufacturing industries to a wartime state.⁷⁶ In coordination with the National Development and Reform Commission, State-owned Assets Supervision and Administration Commission and Ministry of Industry and Information Technology are responsible for coordinating many of these mobilization activities.⁷⁷

State-owned Enterprises Mobilization

The State-owned Assets Supervision and Administration Commission is responsible for supervising the state-owned assets of enterprises under the central government of the People's Republic of China (excluding financial enterprises) and for enhancing the management of state-owned assets.⁷⁸ The NDRC National Defense Office coordinates with State-owned Assets Supervision and Administration Commission for the national defense mobilization work of 96 central state-owned enterprises (SOEs), each of which operates dozens to hundreds of globally dispersed subsidiaries.⁷⁹ According to an author affiliated with the Beijing Institute of Technology National Economic Mobilization Research Center, the State-owned Assets Supervision and Administration Commission has established a mobilization agency to lead and manage comprehensively the economic mobilization work of the SASAC system. Which SASAC organization has assumed these

75. Shi Chunmin and Dong Jianmin [石纯民, 董建敏], “为战争提供高效信息保障” [Providing Highly Effective Information Support for War], *China National Defense*, September 29, 2021.

76. Ren Min, *Science of National Defense Mobilization*.

77. “央企国民经济动员体系建设研究” [Research on the Construction of National Economic Mobilization System of Central Enterprises], *Journal of Beijing Institute of Technology*, September 1, 2021.

78. State-owned Assets Supervision and Administration Commission of the State Council (website), http://en.sasac.gov.cn/2018/07/17/c_7.htm.

79. “央企国民经济动员体系建设研究” [Research on the Construction of National Economic Mobilization System of Central Enterprises], *Journal of Beijing Institute of Technology*; and State-owned Assets Supervision and Administration Commission of the State Council (website).

responsibilities remains unclear.⁸⁰ Local state-owned enterprises also provide significant mobilization potential but are generally leveraged by provincial and below-national defense mobilization commissions.

State-owned enterprises form the core of the national economic mobilization system due to the Chinese Communist Party's ability to directly control their activities. State-owned enterprises control a large market share of resources essential for national defense, including weapons production, petroleum, agricultural products, and construction equipment. Many of these enterprises are involved in work that is directly related to national security, are subject to direct government oversight, and have established military-civilian coordination mechanisms and committees and/or People's Armed Forces departments to organize and direct mobilization work.⁸¹ Most also have emergency management regulations that outline emergency response procedures, organization, and responsibilities which can be used to coordinate wartime mobilization.⁸² Therefore, state-owned enterprises are considered capable of informing mobilization planning and mobilizing resources for contingencies.

In 2021, a researcher working for the NDRC's Economics and National Defense Coordination Development Research Center (经济与国防协调发展研究中心) laid out a rubric for how the National Development and Reform Commission classifies central state-owned enterprises based on economic mobilization potential according to the size and market-share. Beijing will prioritize economic mobilization, drawing resources from these enterprises first, as they have the greatest mobilization potential.⁸³

80. “央企国民经济动员体系建设研究” [Research on the Construction of National Economic Mobilization System of Central Enterprises]; and Beijing Institute of Technology, School of Management and Economics (website), June 25, 2018, <https://sme.bit.edu.cn/>.

81. “央企国民经济动员体系建设研究” [Research on the Construction of National Economic Mobilization System of Central Enterprises].

82. “央企国民经济动员体系建设研究” [Research on the Construction of National Economic Mobilization System of Central Enterprises].

83. “央企国民经济动员体系建设研究” [Research on the Construction of National Economic Mobilization System of Central Enterprises]; and “关于完善中央企业功能分类考核的实施方案” [“Implementation Plan for Improving the Functional Classification Assessment of Central Enterprises”], State-owned Assets Supervision and Administration Commission (website), August 16, 2021, <http://www.sasac.gov.cn/n2588035/n2588320/n2588335/c20234428/content.html> (originally published as SASAC Comprehensive 国资发综合 [2016] 252号).

Table 3-3: Classification of central State-owned enterprises based on mobilization demand

(Source: “关于完善中央企业功能分类考核的实施方案” [Implementation Plan for Improving the Functional Classification Assessment of Central Enterprises], August 16, 2021, State-owned Assets Supervision and Administration Commission [website], <http://www.sasac.gov.cn/n2588035/n2588320/n2588335/c20234428/content.html>. Originally published as SASAC Comprehensive [国资发综合 [2016] 252号].)

Type	Coverage Process	Example	Field
Diamond Level	Almost monopoly, completely covering mobilization needs	1. Various large military industry groups 2. PetroChina, Sinopec, CNOOC 3. China Telecom, China Mobile, China Unicom 4. Aviation, Railway, China Communications Construction Corporation	1. Equipment Mobilization 2. Refined Oil Mobilization 3. Communications Mobilization 4. Transportation Mobilization
Platinum Level	Coverage of more than 50 percent of mobilization needs	1. COFCO 2. Baowu and Anshan Iron and Steel 3. FAW, Dongfeng	1. Food-Oil Mobilization 2. Steel Mobilization 3. Heavy Vehicle Mobilization
Gold Level	Coverage of more than 30 percent of mobilization needs	1. Chinese Traditional Medicine 2. China Resources Holdings Company	1. Medical Mobilization 2. Foodstuffs, Drinking Water Mobilization

Ministry of Industry and Information Technology

The Ministry of Industry and Information Technology plays a significant role in regulating and managing China’s telecommunications and software sectors, electronics and information technology manufacturing industries, and defense industries through its management of State Administration of Science, Technology and Industry for National Defense (国家国防科技工业局).⁸⁴ The NDRC National Defense Office coordinates with Ministry of Industry and Information Technology for economic mobilization of China’s industries in a manner similar to state-owned assets supervision and administration

84. Ministry of Industry and Information Technology Organizational Chart, 2014, US-China Business Council (website), https://www.uschina.org/sites/default/files/2020.09.30_miit_organization_chart.pdf.

commission's management of state-owned enterprises.⁸⁵ The Ministry of Industry and Information Technology subordinate Operation Monitoring and Coordination Bureau (运行监测协调局) is responsible for monitoring and analysis of the industry and communications sectors, coordinating solutions for problems within these industries, managing emergencies, industrial security, and national defense mobilization work.⁸⁶ The Ministry of Industry and Information Technology's Information Communications Authority (信息通信管理局) is responsible for national defense communications information mobilization and readiness communications-related work.⁸⁷ Which of these two offices is designated the national-level information mobilization office after the 2018 State Council reform is unclear.

Information mobilization offices are established by national defense mobilization commissions at the provincial level and below to draft information mobilization plans and regulations, coordinate mobilization resource potential surveys, manage information resource requisition, and coordinate wartime information support activities.⁸⁸ Information mobilization offices are also responsible for the development, management, and security of national defense mobilization information systems and the telecommunications necessary for national defense mobilization and related military-civilian coordination.⁸⁹ The provincial department assigned to collaterally serve as the information mobilization office is usually the Department of Industry and Information Technology (工业和信息化部).⁹⁰ Communications support

85. “央企国民经济动员体系建设研究” [Research on the Construction of National Economic Mobilization System of Central Enterprises].

86. “Operational Monitoring and Coordination Bureau,” Ministry of Industry and Information Technology (website), March 23, 2021, https://www.miit.gov.cn/jgsj/yxj/jgz/art/2020/art_28be63712322426788b6e1b519a6dc60.html.

87. “中华人民共和国工业和信息化部” [Ministry of Industry and Information Technology of the People's Republic], February 22, 2020, <http://www.k4china.com/article-32-95730-0.html>.

88. “江西省国防信息动员办法” [Jiangxi Provincial Measures for National Defense Information Mobilization], General Office of the People's Government of Jiangxi Province (website), http://www.jiangxi.gov.cn/art/2021/12/6/art_64505_3776618.html.

89. “江西省国防信息动员办法” [Jiangxi Provincial Measures for National Defense Information Mobilization].

90. “省国防动员委员会信息产业办公室” [Information Industry Office of the Provincial National Defense Mobilization Committee], Hubei Provincial Department of Economy and Information Technology (website), October 19, 2019, http://jxt.hubei.gov.cn/fbjd/xxgkml/jgzn/nsjg/sgfdywyhxxcybgs/gzzz/201912/t20191231_1822548.shtml; “江西省国防信息动员办法” [Jiangxi Provincial Measures for National Defense Information Mobilization]; and “信息化和软件服务业处（省国防动员委员会信息动员办公室）” [Information and Software Services Division, Information Mobilization Office of the Provincial National Defense Mobilization Commission], Department of Industry and Information Technology of Hunan Province (website), May 14, 2019, https://gxt.hunan.gov.cn/gxt/xxgk_71033/jgzn/nsjg/201905/t20190514_2762333.html.

to mobilization activities is managed by the provincial Communications Administration (省通信管理局).⁹¹

Economic Mobilization Centers

To mobilize critical material resources rapidly from the commercial sector to support wartime or domestic emergency response operations, Beijing has designated select state-owned enterprise and commercial business units as Economic Mobilization Centers (EMCs). Most economic mobilization centers are designated large and medium-sized state-owned enterprises owned by local governments under SASAC oversight. This allows the state to leverage fully the products, personnel, technologies, processes, equipment, and facilities of these enterprises by requiring them to integrate national defense requirements into their business framework. Economic mobilization centers provide economic mobilization potential data to national defense mobilization commissions and the People's Liberation Army, which form the backbone of mobilization potential databases.

Economic mobilization centers are generally large SOE groups that manage numerous subsidiaries at one or more locations. Economic mobilization centers and their subsidiaries manufacture products that meet national defense material requirements to support either military operations or domestic emergency response activities. They also maintain latent production capacity and the excess components, semi-finished products, and standard parts needed to surge rapidly production necessary to support contingency requirements.⁹² This includes military-related technical data such as process diagrams in established databases and the information repositories needed to transition production rapidly from commercial to military-use. By registering and maintaining files on enterprise-affiliated technical and professional personnel, economic mobilization centers also identify personnel that may be mobilized to support wartime production, logistics, or front-line support activities.⁹³

This form of military-civilian fusion allows the government and military to optimize mobilization potential with reduced resource expenditures and

91. “2021年贵州省国防信息动员暨应急通信保障演练圆满闭幕” [The 2021 Guizhou Provincial National Defense Information Mobilization and Emergency Communication Support Drill Was Successfully Concluded], Guizhou Communications Administration (website), May 10, 2021, https://gzca.miit.gov.cn/xwdt/gzdt/art/2021/art_08983c82a1c5453bbdf4e592610656c9.html.

92. Zhang Xiao [张笑], “论国民经济动员中心的基本功能” (The Ten Basic Functions of the National Economic Mobilization Center), *军事经济研究* (*Military Economic Research*), March 20, 2004; and Zhao Xingchang, “Cultivation of National Economic Mobilization Center,” July 20, 2007.

93. Zhang Xiao, “Ten Basic Functions.”

may benefit enterprises through government subsidies, preferential contracts, and endorsement. Economic mobilization centers enable efficient transfer of civilian high-technology resources, data, and expertise to the military and proliferation of military industrial technology to civilian enterprises. Economic mobilization centers also facilitate collaboration and development of military-civilian dual-use technologies.⁹⁴

An economic mobilization center may be designated as a “mobilization center” or “base” under the supervision of provincial, municipal, or city national defense mobilization commissions, which collaborate with local SASAC-affiliated officials through national economic mobilization offices. For example, in 2009, SOE Taizhou Huaxin Pharmaceutical Investment Co., Ltd. (THPI), a subsidiary of Taizhou State-owned Assets Supervision and Administration Commission, and in partnership with the Taizhou municipal government and Jiangsu Province, built the Taizhou Medical High-tech Industrial Development Zone (HTDZ) to serve as a national-pharmaceutical industry hub.⁹⁵ The zone was designated as a national medical mobilization center (NMMC) (国家医药动员中心) by the national National Economic Mobilization Office.⁹⁶ Several dozen pharmaceutical companies, private enterprises, and local state-owned enterprises, established production facilities within the zone and were organized into a mobilization cluster consisting of “1 center, 4 departments, 5 bases, 24 enterprises.”⁹⁷ In September 2021, the Taizhou National Defense Mobilization Commission organized “Taidong-2021” to stand up the Taizhou Military and Civilian Joint Command and transition the Taizhou National Medical Mobilization

94. Zhang Xiao, “Ten Basic Functions.”

95. Lianhe Ratings Global, “Taizhou Huaxin Pharmaceutical Investment Co., Ltd. Ratings Report,” September 30, 2021, https://lhratingsglobal.com/wp-content/uploads/bsk-pdf-manager/2021/09/Rating-Report_THPI-20210930.pdf; and Fitch Ratings, “Taizhou Huaxin Pharmaceutical Investment Co. Ltd. Rating Report,” February 5, 2021, <https://www.fitchratings.com/research/international-public-finance/taizhou-huaxin-pharmaceutical-investment-co-ltd-05-02-2021>.

96. Shan Youkang [单友康], “江苏省泰州市开展医药动员中心转扩产演练” [Taizhou City, Jiangsu Province, Carried Out a Drill to Transfer and Expand the Production of the Medical Mobilization Center], *中国国防报* [*China National Defense News*], October 15, 2021, http://www.mod.gov.cn/mobilization/2021-10/15/content_4896913.htm.

97. Shan Youkang [单友康], “江苏省泰州市开展医药动员中心转扩产演练” [Taizhou City, Jiangsu Province, Carried Out a Drill to Transfer and Expand the Production of the Medical Mobilization Center]; and “江苏华为医药物流有限公司” [Jiangsu Huawei Pharmaceutical Logistics Co., Ltd.], Taizhou Talent Network (website), https://www.tzjob.com/html/company_25637.html.

Center to a wartime state.⁹⁸ During the exercise, the Taizhou National Medical Mobilization Center organized affiliated pharmaceutical companies to deploy drugs and medical supplies to frontline units using a business transaction platform developed by Jiangsu Huawei Pharmaceutical Logistics Co., Ltd., a state-owned enterprise subsidiary of THPI.⁹⁹

Mobilization Potential Data

China's national defense mobilization planning relies on accurate, current, and comprehensive data on available resources to support national security requirements. Starting with 2007's National Defense Mobilization Potential Statistical Survey Regulations (国防动员潜力统计调查规定), the National Defense Mobilization Commission, in collaboration with the National Bureau of Statistics, has conducted annual surveys to assess China's mobilization potential. National defense mobilization commissions at all levels of government are responsible for these surveys.¹⁰⁰ However, since 2019, PLA authors have highlighted the need to further reform mobilization potential data-collection processes. Data has historically been collected as a neglected collateral duty by cadres using out-of-date indices and without

98. “泰州市人防办全力保障‘泰动-2021’演练活动” [Taizhou Municipal Civil Air Defense Office Fully Guarantees the ‘Taidong-2021’ Drill Activity], Jiangsu Civil Air Defense Office (website), September 2021, http://mf.jiangsu.gov.cn/art/2021/9/30/art_64_10033573.html; Xu Youyang [徐佑阳], “市委常委会组织开展泰州国家医药动员中心转扩产演练活动” [The Standing Committee of the Municipal Party Committee Organized the Taizhou National Pharmaceutical Mobilization Center's Conversion and Expansion Drill], Fengcheng Taizhou Network (website), September 27, 2021, <http://www.mytaizhou.net/folder114/folder44/folder51/2021-09-27/517426.html>; and “泰州市人防办全力保障‘泰动-2021’演练活动” [Taizhou Municipal Civil Air Defense Office Fully Guarantees the ‘Taidong-2021’ Drill Activity], September 30, 2021, Jiangsu Civil Air Defense Office (website), http://mf.jiangsu.gov.cn/art/2021/9/30/art_64_10033573.html.

99. Xu Youyang [徐佑阳], “市委常委会组织开展泰州国家医药动员中心转扩产演练活动” [The Standing Committee of the Municipal Party Committee Organized the Taizhou National Pharmaceutical Mobilization Center's Conversion and Expansion Drill], Fengcheng Taizhou Network (website), September 27, 2021, <http://www.mytaizhou.net/folder114/folder44/folder51/2021-09-27/517426.html>; and “江苏华为医药物流有限公司” [Jiangsu Huawei Pharmaceutical Logistics Co., Ltd.], Taizhou Talent Network (website), https://www.tzjob.com/html/company_25637.html.

100. “在完善法规体系中提高国防动员能力” [Improving National Defense Mobilization Capabilities in Improving the System of Laws and Regulations], *National Defense Daily* (website), http://www.mod.gov.cn/regulatory/2019-02/28/content_4836861.htm, accessed on January 22, 2022; “加快建设国防动员潜力大数据” [Accelerate the Construction of Big Data of National Defense Mobilization Potential], *National Defense Daily* (website), May 22, 2020, accessed on January 21, 2022, http://www.81.cn/gfbmap/content/21/2020-05/22/03/2020052203_pdf.pdf; and Hua Hao [华昊], “改革开放以来我国国防动员法规建设的实践与启示” [Practice and Enlightenment of China's National Defense Mobilization Law Construction since Reform and Opening Up].

a simple method of data audit.¹⁰¹ These faults have resulted in mobilization potential data collection that is not considered reliable by PLA leadership.¹⁰²

Pursuant to the goal of improving data sharing and tracking of mobilization potential, calls have been made in PLA publications to establish a National Defense Mobilization Potential Big Data System (国防动员潜力大数据系统). This system would aggregate data from government and SOE databases at national and local levels allowing users access with differing authorities and would push data to PLA joint operations databases to facilitate potential-to-requirement matching.¹⁰³ According to a data engineer working for the National Defense Mobilization Department, one of the goals of this system is to simplify the previously error-prone manual data collection process used to aggregate mobilization potential data. According to this engineer, a pilot mobilization potential data system was established in the Anhui in 2018, collecting data from 30 unspecified provincial and national-level data systems. The engineer indicated that incompatible data standards among government agencies could slow the nationwide application of such a system and called for legal reform to enforce compliance with unified mobilization data standards and improved data sharing.¹⁰⁴ These calls have been echoed elsewhere in PLA media, and by academics and PLA officers across the mobilization system.¹⁰⁵

101. “2021年全国国防动员潜力数据资料集中会” [The 2021 National Defense Mobilization Potential Data Collection Meeting], *National Defense Daily* (website), July 9, 2021, accessed on January 21, 2022, https://www.81.cn/dy/2021-07/09/content_10060054.htm.

102. “新时代做好国防动员潜力统计调查工作的几点思考” [Some Thoughts on Doing a Good Job in the Investigation of National Defense Mobilization Potential in the New Era], 国防 [National Defense], August 1, 2019.

103. “开创动员潜力调查新局面” [Create a New Situation in the Investigation of Mobilization Potential], *National Defense Daily* (website), June 24, 2020, https://www.81.cn/gfbmap/content/21/2020-06/24/03/2020062403_pdf.pdf; and “推进国防动员潜力大数据建设” [Promote the Construction of Big Data of National Defense Mobilization Potential], <http://rfb.guizhou.gov.cn/>, http://rfb.guizhou.gov.cn/ywgz/gfjy/202106/t20210617_68625615.html, accessed on January 23, 2022.

104. “加快建设国防动员潜力大数据” [Accelerate the Construction of Big Data of National Defense Mobilization Potential].

105. “2021年全国国防动员潜力数据资料集中会” [The 2021 National Defense Mobilization Potential Data Collection Meeting]; “开创动员潜力调查新局面” [Create a New Situation in the Investigation of Mobilization Potential]; Kong Zhaojun, Shi Wenqiang, and Han Qiulu, “大数据时代国防动员潜力调查之路” [The Method of the National Defense Mobilization Potential Investigation in Big Data Era], *Journal of Beijing Institute of Technology* (Social Sciences Edition), January 1, 2018, <http://journal.bit.edu.cn/sk/article/id/20180114>; and “新时代做好国防动员潜力统计调查工作的几点思考” [Some Thoughts on Doing a Good Job in the Investigation of National Defense Mobilization Potential in the New Era].

Transportation Mobilization System

The 2020 *Science of Strategy* describes the transportation requirements to support joint logistics support as “meeting the needs of joint operations transportation delivery, relying on the joint logistics support force itself or coordinating other military and local transportation forces, using roads, railways, water transportation, air transportation, pipelines, and other means to complete various types in a timely manner.”¹⁰⁶ For the vast majority of these transportation delivery methods, the People’s Liberation Army relies on its ability to leverage civilian resources.

The NDMC’s National Transportation War Readiness Office (TWRO) (国家交通战备办公室) is responsible for drafting guidelines and laws for national defense transportation work, planning defense transportation networks, and formulating defense transportation plans for major military operations and emergencies.¹⁰⁷ As of early 2022, the office’s director Bai Zhongbin (白忠斌) doubles as the director of the CMC logistic support department (LSD) Transportation and Delivery Bureau (中央军委后勤保障部运输投送局).¹⁰⁸ The National Transportation War Readiness Office coordinates with mobilization offices within the Ministry of Transportation and associated government ministries and also transportation-associated state-owned enterprises.¹⁰⁹ For example, in 2018 the mobilization office of China’s Civil Aviation Administration and the National Transportation War Readiness Office jointly supervised an emergency rescue drill at the Yinchuan International Airport to practice “dealing with the complex environment of wartime and non-wartime military operations.”¹¹⁰ Similarly, the China Classification Society participated

106. “战略学” [*Science of Strategy*] (Beijing: National Defense University Press, 2020), 426.

107. “National Transportation Mobilization Office,” GFDY.Gov.Cn via Baidu Baike, July 20, 2012, accessed on January 9, 2022, https://baike.baidu.com/reference/2473511/80c4_tPWiwj72d1FVbMF2uwVGqI_b0z-DJUN3ZAL02eC9ihde30uZQNYbjZPMXmJEpV98Gv2cB5HZA1z3AAWGxvAgLalJqDvoJaqAO_TglnRlrK7mrQA.

108. “关于 国防交通法 这些你应该知道” [What You Should Know about the National Defense Traffic Act], sohu.cn, October 1, 2021, <https://www.sohu.com/a/493110248121106991>.

109. “Organization Responsibilities,” CAAC.cn (website), accessed on January 15, 2022, <http://www.caac.gov.cn/dev/yshs/>; and “Third Annual Newspaper of COSCO Shipping,” <https://sh.coscoshipping.com>, February 18, 2019, <https://sh.coscoshipping.com/attach/0/2f8c45031fe5499983d98a848cc8a1a7.pdf>.

110. “银川机场圆满完成国防交通专业队伍应急救援综合演练” [Yinchuan Airport Successfully Completed the Comprehensive Emergency Rescue Drill of the National Defense Transportation Professional Team], CAAC (website), August 28, 2018, accessed on January 15, 2022, http://www.caac.gov.cn/PHONE/GLJ_PHONE/XBGLJ/XB_XXGK/XB_GZDT/201808/t20180828_191451.html.

in drafting requirements for civil transport ships to be convertible to national defense purposes.¹¹¹

The 2019 *Regulations on Civil Mobility National Defense Mobilization* and the 2016 National Defense Transportation Law set out the legal division of labor for national defense transportation mobilization.¹¹² Based on operational support requirements, the CMC LSD Transportation and Delivery Bureau, in conjunction with the “National People’s Economic Mobilization Authority” (presumably the NDMC economic mobilization office), and the Ministry of Transportation collectively produce transportation mobilization requirements and submit them to the National Defense Mobilization Commission for approval.¹¹³ These organizations also produce technical requirements for the production of civilian vehicles, rules for subsidizing their production, and requirements for vehicle inspection to confirm compliance.¹¹⁴ The CMC LSD Transportation and Delivery Bureau produces the National Defense Mobilization Plan for Civil Transportation Capacity, and corollary plans are produced for each provincial military district and provincial government.¹¹⁵ According to these plans, the National Transportation War Readiness Office and the National People’s Armed Forces Mobilization Office (国家人民武装动员办公室) have the prerequisite civilian transportation capacity to support future mobilization needs.¹¹⁶

Theater and Provincial Transportation Mobilization

Many of the People’s Liberation Army’s transportation and delivery operations happen within Theater Commands. These operations are authorized by the TC Joint Operations Command Center. The Joint Operations Command Center directs military domain-specific TC sub-centers (战区作战分中心) to plan and supervise transportation and delivery operations to support assigned missions. Theater command sub-centers form ad hoc task forces

111. “新造 船国防技术标准颁布: 战时可迅速转为军” [The National Defense Technical Standards for New Civil Ships Are Promulgated: They Can Be Quickly Converted to Military Use in Wartime], CTCNS (website), June 15, 2015, <http://www.ctcns.net/index.php?a=shows&catid=35&id=4523>.

112. “民用运力国防动员条例” [Regulations on Civil Mobility National Defense Mobilization], gov.cn, March 2, 2019, http://www.gov.cn/gongbao/content/2019/content_5468879.htm; and “National Defense Transportation Law,” *Xinhua* (website), September 3, 2016, accessed on January 20, 2022, http://www.xinhuanet.com//politics/2016-09/03/c_1119506255.htm.

113. Liu Xing, Yang Shangqin, and Cao Haiquan, “Administrative Enforcement in National Defense Mobilization of Civil Transportation Resources.”

114. “Regulations on Civil Mobility National Defense Mobilization.”

115. “Regulations on Civil Mobility National Defense Mobilization.”

116. “Regulations on Civil Mobility National Defense Mobilization.”

supported by leveraging military units and mobilized government units to manage these tasks.¹¹⁷ Task forces apply for support from their theater command's joint logistics support center (JLSC) (联勤保障中心) via their supervising theater command sub-centers.¹¹⁸ Each TC joint logistics support center has transportation and delivery dispatch centers (运输投送调度中心) that command military representative offices (MROs) (军代处) assigned to large transportation enterprises (such as China Railways).¹¹⁹ Through these transportation and delivery dispatch centers, the transportation task force can utilize mobilized trains and other types of civil transport that are available to the Joint Logistics Support Force (JLSF).¹²⁰

Theater command sub-centers use both military and civil communications channels to maintain command and control of transportation operations.¹²¹ For example, according to PLA authors, ground transport task forces directed by one of the theaters' ground command sub-centers will include Theater JLSC MRO officers. The JLSC MRO officers will monitor rail traffic using existing China Railways-operated dispatching and operations networks.¹²² Such a task force could leverage mobilized militia and reserve units provided by the provincial military districts to guard railways and highways and manage

117. Sun Hao, Li Lianbang, and Li Peng [孙浩, 李联邦, 李鹏], “战区主战体制下联合投任务式指挥研究” [“Research on Joint Mission Command under the Main Battle System of the Theater”], *Journal of Military Transportation University*, November 1, 2018; Zheng Weibo, “Provincial Defense Mobilization Command Structures”; and Wang Jianjun, Cao Zhan, and Zhu Ning [王建军, 曹站, 朱宁], “后装保障指挥‘变’在哪” [“Where Is the ‘Change’ in the Rear Equipment Support Command?”], *PLA Daily* (website), March 21, 2019, http://www.81.cn/jfjmap/content/2019-03/21/content_229733.htm.

118. “联勤保障部队探索建立新型军事运输投送机制” [Joint Logistics Support Force Explores the Establishment of a New Type of Military Transport and Delivery Mechanism], *people.gov.cn*, December 31, 2019, <http://military.people.com.cn/n1/2019/1231/c1011-31529984.html>.

119. Xiao Bing and Huang Yi [肖兵, 黄翊], “某军事运输投送调度中心借助地方力量提高保障能力” [A Military Transportation and Delivery Dispatch Center Improves Its Support Capability with the Help of Local Forces], *MOD.gov.cn*, January 21, 2019, http://www.mod.gov.cn/mobilization/2019-01/21/content_4834944.htm; and “军媒曝各地军代处已转隶联勤保障中心 详情公开” [“Military Media Revealed That the Military Representative Offices in Various Places Have Been Transferred to the Joint Logistics Support Center, the Details Are Open”], *Sohu.com* (website), October 10, 2016, <https://m.sohu.com/n/470524646/>.

120. Wang Jianjun, Cao Zhan, and Zhu Ning, “Where Is the ‘Change’ in the Rear Equipment Support Command?”

121. Sun Hao, Li Lianbang, and Li Peng [孙浩, 李联邦, 李鹏], “战区主战体制下联合投任务式指挥研究” [Research on Joint Mission Command under the Main Battle System of the Theater].

122. Yun Junde [云俊德], “军地联合保障通道这样开启” [The Military-civilian Joint Support Channel Is Opened], *MOD.gov.cn* (website), February 1, 2019, http://www.mod.gov.cn/mobilization/2019-02/01/content_4835603.htm; and Sun Hao, Li Lianbang, and Li Peng [孙浩, 李联邦, 李鹏], “战区主战体制下联合投任务式指挥研究” [Research on Joint Mission Command under the Main Battle System of the Theater].

traffic control. Civil Air Defense and construction teams may be dispatched to repair damaged transportation arteries as part of the Task Force.¹²³

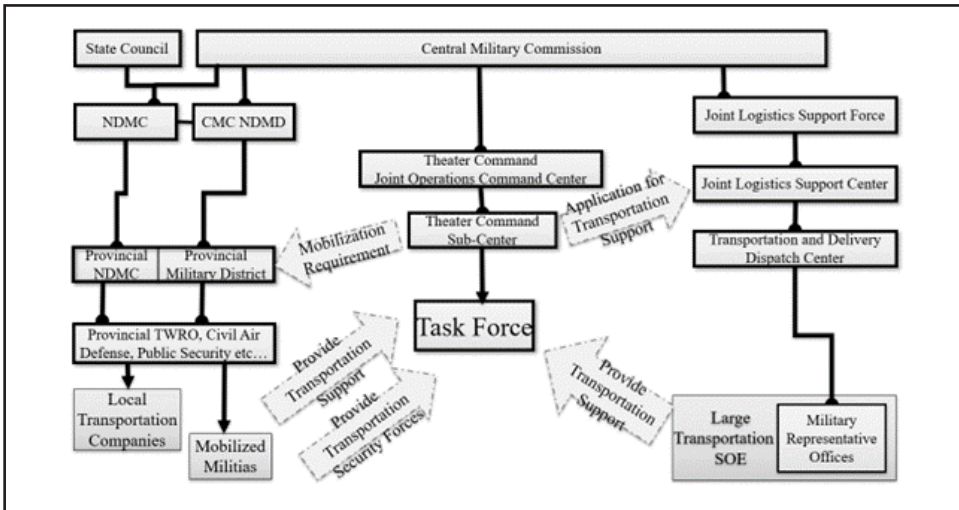


Figure 3-1. Chain of command for theater transportation mobilization¹²⁴

Theater Commands, likely through their sub-centers, also coordinate transportation and delivery operations with the provincial military districts within their jurisdiction and can requisition support from the provincial national defense mobilization commissions in these districts. At the provincial level, responsibility for responding to requests from the Theater Commands for transportation support is routed through the provincial-level transportation war readiness office, which coordinates support from the provincial government development and reform commission, department of transportation,

123. Zhoukou Military Subregion, “周口军分区, “省军区系统保障作战部队跨区机动问题初探” [A Preliminary Probe into the Cross-regional Mobility of the Provincial Military District System Support Combat Troops], 国防 [National Defense], February 1, 2019.

124. Sun Hao, Li Lianbang, and Li Peng [孙浩, 李联邦, 李鹏], “战区主战体制下联合投任务式指挥研究” [Research on Joint Mission Command under the Main Battle System of the Theater]; Wang Jianjun, Cao Zhan, and Zhu Ning, “Where Is the ‘Change’ in the Rear Equipment Support Command?”; Zhoukou Military Subregion, “A Preliminary Probe into the Cross-regional Mobility of the Provincial Military District System Support Combat Troops”; Yun Junde [云俊德], “军地联合保障通道这样开启” [The Military-civilian Joint Support Channel Is Opened]; Zheng Weibo, “Provincial Defense Mobilization Command Structures,” 国防 [National Defense], July 1, 2018; and Li Jiayu, Jiang Chenyang, and Hu Yuxiang [李佳雨, 蒋晨阳, 胡宇翔], “为部队打胜仗提供‘套餐式’保障” [Provide ‘Package Type’ Guarantee for Troops to Win Battles], *Legal Daily* (website), January 21, 2022, accessed on January 30, 2022, http://www.legaldaily.com.cn/army/content/2022-01/21/content_8663022.htm.

civil air defense office, military-civilian integration committee, and various other transportation departments.¹²⁵

In his analysis of provincial-level mobilization command, the commander of the Ningxia Military District described the creation of special-purpose command organizations to support wartime transportation operations under the joint authority of the provincial department of transportation and the military district's support bureau deputy director. Such a group would include the provincial national defense mobilization commission's transportation war readiness office, public security bureau, civil aviation safety supervision management bureau (民航安全监督管理局) and the provincial airport management group company, railway military representative offices and Railway Bureau Group Company leadership, and the Highway Management Bureau. This group would be specifically responsible for the organization and command of transportation security and would coordinate the matching of requirements coming from the TC sub-center transportation task force to available resources. Lastly, it would coordinate with county or municipal national defense mobilization commissions if local transportation or logistics resources are needed to support the transportation operation.¹²⁶

Transportation Mobilization Support for the PLA Air Force and Navy

Just as in the case of ground-based transportation and logistics, the PLA Air Force (PLAAF) and PLA Navy (PLAN) utilize mobilized civil transportation resources. For example the PLA Air Force has a strategic projection support fleet of civil planes that have been mobilized to help organize emergency transportation missions (such as evacuation missions in Libya and Bali).¹²⁷ Similarly, the People's Liberation Army has established relationships with Chinese logistics firms, including SF Express Group (顺丰速运), JD Logistics (京东物流), and Deppon Express (德邦物流).¹²⁸ In 2017, SF Express Group signed an agreement with the PLA Air Force

125. Liu Xing, Yang Shangqin, and Cao Haiquan, "Enforcement in National Defense Mobilization of Civil Transportation Resources," *Journal of Military Transportation University*, August 1, 2018; and Li Jiayu, Jiang Chenyang, and Hu Yuxiang [李佳雨, 蒋晨阳, 胡宇翔], "为部队打胜仗提供 '套餐式' 保障" [Provide 'Package Type' Guarantee for Troops to Win Battles].

126. Zheng Weibo, "Provincial Defense Mobilization Command Structures."

127. "依托战略投送支援机队实施海外航空战略投送" ["Overseas Aviation Strategic Projection Using a Strategic Projection Support Fleet"], *Journal of Military Transportation University*, April 1, 2018.

128. Guo Yajun, Shi Fangdan, and Wei Yaocong [郭亚军, 史方丹, 魏耀聪], "战时地方物流资源动员面临的问题及对策" [Problems and Countermeasures Faced by Local Logistics Resource Mobilization in Wartime], *Journal of Military Transportation University*, November 1, 2018.

to support transport and logistic missions utilizing cargo aircraft affiliated with its subsidiary SF Airlines.¹²⁹

In 2017 JD Logistics signed an agreement with the PLA Air Force to act as a logistics and procurement supply-chain management platform. The firm built a logistics-information platform for the PLA Air Force logistics department to provide real-time data access for its material provision services to the People's Liberation Army.¹³⁰ This platform is used to coordinate logistics for PLA Air Force bases across China.¹³¹ Similarly, Deppon Express began working with China Ordnance Industry Group, China's primary ground-weapons development and production state-owned enterprise, to update its supply chains and logistics systems.¹³² In effect, this agreement gives it a key role in ensuring that munitions and weapons-systems make it from factories to JLSF warehouses.

The People's Liberation Army has similar agreements with Chinese shipping state-owned enterprises. According to discussions in Party-affiliated newspapers, over the past decade the People's Liberation Army has regularly utilized civil shipping in emergency operations and military exercises.¹³³ When using mobilized maritime transport, PLA transportation task forces and their supervising TC sub-centers use military C4 systems placed onboard mobilized civil vessels as well as civil ship tracking systems (such as AIS) to track and command seaborne transit.¹³⁴

129. He Hongyuan [贺泓源], “京东、顺丰与空军后勤部达成战略合作 布局军民融合” [JD.com, SF Express and the Air Force Logistics Department Reach Strategic Cooperation to Deploy Military-Civilian Integration], *Economic Observer* (website), October 25, 2017, <https://www.eeo.com.cn/2017/1025/315365.shtml>; and SF Airlines (website), http://www.sf-airlines.com/sfa/zh/article_44.html.

130. He Hongyuan [贺泓源], “京东、顺丰与空军后勤部达成战略合作 布局军民融合” [JD.com, SF Express and the Air Force Logistics Department Reach Strategic Cooperation to Deploy Military-Civilian Integration].

131. “JD Logistics and the Air Force Logistics Department Reached a Strategic Cooperation, and the Self-built Logistics Model Was Recognized,” Sohu (website), October 26, 2017, accessed on February 8, 2022, https://www.sohu.com/a/200451584_99967243.

132. “加码军事物流! 德邦快递与中国兵器达成合作,全打造‘军民融合’新样板” [Overweight Military Logistics! Debon Express and China Ordnance Reached a Cooperation to Create a New Model of ‘Military-Civilian Integration’], *kknews.cc* (website), March 13, 2019, <https://kknews.cc/zh-cn/military/22ojxjg.html>.

133. “如何讓民用船舶助力軍事運輸?” [How to Make Civilian Ships Assist Military Transportation?], *People's Daily* (website), May 24, 2019, <http://military.people.com.cn/BIG5/n1/2019/0524/c1011-31101519.html>.

134. Sun Hao, Li Lianbang, and Li Peng [孙浩, 李联邦, 李鹏], “战区主战体制下联合投任务式指挥研究” [Research on Joint Mission Command under the Main Battle System of the Theater].

Transportation Dispatching Information Technology Systems

Starting in 2013, the Guizhou Provincial Transportation War Readiness Office began developing a dispatch command platform for mobilizing civilian-owned trucks. Based on a similar Uber-for-truckers-like platform produced by Huochebang Technology Co., Ltd. (货车帮科技有限公司), the Civil Mobility (Freight) Mobilization Resources Information Platform (民用运力(货车)动员资源信息平台) app and its associated data and command center are used by the provincial NDMC transportation war readiness office to select and dispatch trucks and drivers for national defense and emergency response tasks then track their progress along their routes.¹³⁵ The app appears to leverage data on trucks from Huochebang's commercial app to maintain a database of over 5 million drivers. Much like other mobilization potential databases, the platform maintains data on vehicle capabilities and on the drivers' political reliability (possibly from their social credit score) and service histories.¹³⁶ In 2017, the platform was used to mobilize 4,706 drivers to help respond to an earthquake in Sichuan.¹³⁷

Following its platform's perceived success in Guizhou, in 2017, the National Transportation War Readiness Office contracted Huochebang to build out the program nationally, likely in collaboration with CTTIC.¹³⁸ If this expanded Transportation Warfare Readiness Civil Mobility (Truck) Mobilization Potential Real-time C2 Dispatching Platform (交通战备民用运力(货车)动员潜力实时掌控与指挥调度平台) is modeled after Huochebang's existing systems, it is likely hosted on Huochebang's systems using AliCloud

135. Zhang Yunhong et al., “民用运力国防动员资源信息平台建设” [Construction of Civil Transport Capacity National Defense Mobilization Resource Information Platform], *Journal of Military Transportation University*, December 1, 2018; and “贵州省交战办借助大数据提高保障力——大数据如何在交通战备领域‘融’和‘用’” [“Guizhou Provincial Military Affairs Office Uses Big Data to Improve Support—How Big Data Is ‘Integrated’ and ‘Used’ in the Field of Transportation War Readiness”], June 13, 2018, http://rfb.guizhou.gov.cn/ywzg/jtzb/201806/t20180615_16251630.html.

136. Zhang Yunhong et al., “民用运力国防动员资源信息平台建设” [Construction of Civil Transport Capacity National Defense Mobilization Resource Information Platform].

137. “贵州省交战办借助大数据提高保障力——大数据如何在交通战备领域‘融’和‘用’” [“Guizhou Provincial Military Affairs Office Uses Big Data to Improve Support—How Big Data Is ‘Integrated’ and ‘Used’ in the Field of Transportation War Readiness”].

138. “驰援武汉须过几道关?” [How Many Barriers Must We Pass to Help Wuhan?], *Paper* (website), February 1, 2020, https://www.thepaper.cn/newsDetail_forward_5705479; and “货车帮与交信集团签约 共同推动国家物流信息平台建设” [“Huochebang Signed a Contract with Jiaoxin Group to Jointly Promote the Construction of a National Logistics Information Platform”], <https://www.guiyang.gov.cn>, November 3, 2018, https://www.guiyang.gov.cn/jcgy/jcgyzs/jcgyzstzdt/201811/t20181103_11415782.html.

Big Data Group (阿里云大数据团).¹³⁹ This system has reportedly been used over the past two years to deliver emergency supplies to areas quarantined due to the coronavirus.¹⁴⁰ Huochebang-associated researchers have suggested the system may eventually be used by the national Comprehensive Transportation Big Data Center (综合交通大数据中心) announced in 2019.¹⁴¹

Reform and Development of the Defense Mobilization System

Despite recent military and state council reforms, PLA academics have argued that China's national defense mobilization system remains hampered by unclear definitions of powers and responsibilities for wartime mobilization, inefficient operational support linkages, and insufficient connections between the theater command and mobilization offices.¹⁴² On October 24, 2021, the Standing Committee of the National People's Congress announced that it planned to amend and improve provisions of the National Defense Mobilization Law, the Civil Air Defense Law, the National Defense Transportation Law, and the National Defense Education Law.¹⁴³ In the weeks following this announcement, the military district party

139. Zhang Yunhong et al., “民用运力国防动员资源信息平台建设” [Construction of Civil Transport Capacity National Defense Mobilization Resource Information Platform].

140. “满帮集团再次 选中国互联 企业百强榜单” [Manbang Group Was Once Again Selected as One of the Top 100 Chinese Internet Companies], qq.com (website), November 16, 2020, <https://xw.qq.com/amhtml/20201116A0HSYF00>.

141. Zhang Yunhong et al., “Construction of Civil Transport Capacity National Defense Mobilization Resource Information Platform”; and “交通运输部关于印发 推进综合交通运输大数据发展行动纲要 2020–2025年)的通知” [Notice of the Ministry of Transport on Printing and Distributing the Action Outline for Promoting the Development of Comprehensive Transportation Big Data (2020–2025)], Gov.cn (website), December 16, 2019, http://www.gov.cn/xinwen/2019-12/16/content_5461503.htm.

142. Zheng Weibo “Provincial Defense Mobilization Command Structures.”

143. “全国 代表 会常务委员会关于深化国防动员体制改 期间暂时调整适 相关法律法规的决定” [Decision of the Standing Committee of the National People's Congress to Provisionally Adjust the Application of the Provisions of Relevant Laws during the Period of Deepening the Reform of National Defense Mobilization Systems], <https://www.lawinfochina.com> (website), October 23, 2021, <https://www.lawinfochina.com/display.aspx?lib=law&id=36703>.

committees of various provinces announced they had held their own meetings to discuss delegated guidance.¹⁴⁴

Short of public release of the updated regulations, the most authoritative insights into the changes to the laws come from interviews of key leadership. For example, according to a 2021 interview of Bai Zhongbin, the National Defense Transportation Law was updated in 2021 in the following ways: New rules related to national defense transportation planning and strategic delivery, rules related to the conversion from peacetime to wartime, and definitions of the organization and command structure in wartime. For example, enterprises and institutions operating overseas will provide transportation and strategic delivery support.¹⁴⁵ Improvements to the working mechanisms for “market-oriented policy support” and clarification of “responsibilities and rights, incentives and constraints.”

Bai Zhongbin’s comments about the reforms to the National Defense Transportation Law reflect two major trendlines in discussions of weaknesses of the mobilization system in both Chinese state and PLA media sources: concern about uncertainty in the mobilization chain of command and concern about the incentives and punishments underpinning the mobilization system. By investigating the mobilization system’s perceived weaknesses in these arenas, it is likely one can predict the direction of future legislative reforms and administrative changes.

Chain of Command

One of the few specific goals of the 2021 adjustments to all the defense mobilization laws that have been clearly publicized is a review of the

144. “全省国防动员和后备力量‘三项基础’建设总结表彰会暨领导小组会在省军区召开” [Yin Hong Emphasized at the Summary and Commendation Meeting of the ‘Three Basics’ Construction of the Province’s National Defense Mobilization and Reserve Forces], gansu.gov.cn (website), December 21, 2021, accessed on January 16, 2022, <http://www.gansu.gov.cn/gsszf/c100002/c100999/202112/1923712.shtml>; “省军区党委十二届九次全体（扩大）会议强调深入推进全省国防动员建设高质量发展” [The 9th Plenary {Expanded} Meeting of the 12th Provincial Military District Party Committee Emphasized the In-depth Promotion of the High-quality Development of the Province’s National Defense], yn.gov.cn (website), January 16, 2022, http://www.yn.gov.cn/zzms/ywdt/202201/t20220116_234854.html; and “省委召开议军会议推动我省党管武装和国防动员 作 质量发展李希马兴瑞等出席” [The Provincial Party Committee Held a Military Meeting to Promote the High-quality Development of the Party’s Armed Forces and National Defense Mobilization Work in Our Province. Li Xima Xingrui and Others Attended], gd.gov.cn (website), December 16, 2021, http://www.gd.gov.cn/xxts/content/post_3720232.html.

145. “关于《国防交通法》，这些你应该知道” [What You Should Know about the National Defense Transportation Act], sohu.cn (website), October 1, 2021, https://www.sohu.com/a/493110248_121106991.

“military-local coordination link” (军地协调链路).¹⁴⁶ The existing legal framework does not establish a clear chain of command between military leaders and local authorities. The 2010 National Defense Mobilization Law delegates the “organization, direction and coordination” (组织, 指导, 协调) of national defense mobilization activities to the military district and national defense mobilization commissions, but the management (管理) of mobilization work is conducted by the provincial and local governments.¹⁴⁷ According to PLA academics, in practice uncertain chains of command have led to bureaucratic infighting and have inhibited the development of organizational experience.¹⁴⁸

Uncertainty in the administration of mobilization can be seen in the divergent ways the chain of command for the defense mobilization system is described by PLA and party leadership. For example, according to the commander of the Ningxia Military District, the military district and national defense mobilization commissions set requirements for the government to deliver. However, he then goes on to say the specific structure of the relationship should be flexible and responsive to the specific mission.¹⁴⁹ In comparison, according to the secretary of the Gansu Provincial Party Committee, the Provincial Party Committee supervises the mobilization work within the Provincial Military District that the government is in charge of, with the PLA's role being largely one of coordination.¹⁵⁰

Economic mobilization, in particular, continues to lack institutional mechanisms necessary for efficient large-scale mobilization in crisis. No economic mobilization organization has been established under the Central Military Commission or National Defense Mobilization Department

146. “对 关于深化国防动员体制改革期间暂时调整适用相关法律规定的决定 (草案) 的说明” [Explanation to the “Decision on Temporarily Adjusting the Application of Relevant Legal Provisions during the Deepening of the Reform of the National Defense Mobilization System (Draft)”, npc.gov.cn (website), October 19, 2021, <http://www.npc.gov.cn/npc/c30834/202110/beb570fb523a4bdbb1d3420023f732ff.shtml>].

147. “国家国防动员委员会综合办公室负责人就《中华人民共和国国防动员法》答记者问” [The Person in Charge of the General Office of the National Defense Mobilization Committee Answered a Reporter's Question on the ‘National Defense Mobilization Law of the People's Republic of China’], March 3, 2010, http://www.zhuxi.gov.cn/xxgkxi/zc/zcjd/202010/t20201028_3208681.shtml.

148. Chen Zijian, Xiao Xuefu, and Sun Dong, “军民融合应急物流保障指挥体系的构建” [Construction of Civil-military Integrated Emergency Logistics Support Command System], *Journal of Military Transportation University*, March 1, 2018.

149. Zheng Weibo, “Construction of Provincial Defense Mobilization Command Structures.”

150. “全省国防动员和后备力量‘三项基础’建设总结表彰会暨领导小组会在省军区召开” [Yin Hong Emphasized at the Summary and Commendation Meeting of the “Three Basics” Construction of the Province's National Defense Mobilization and Reserve Forces], gansu.gov.cn (website), December 21, 2021, <http://www.gansu.gov.cn/gsszf/c100002/c100999/202112/1923712.shtml>.

to manage requirement submissions in a unified manner. The CMC logistic support department and equipment development department are responsible for organizing logistics mobilization and equipment requirements for the entire military but also lack specialized mobilization organizations, awareness, and control over mobilization requirements levied at various levels. Mobilization offices throughout the system consist primarily of personnel working mobilization duties as a collateral assignment, with only a small number of full-time cadres struggling to carry out mobilization tasks in competition with other government priorities.¹⁵¹ Further, the scope of responsibilities for military commands and government organizations at every level is unclear, as is an understanding of how those responsibilities alter in war or emergencies. This results in both overlaps and gaps in mobilization actions.¹⁵²

Economic mobilization is also hindered by a lack of standards for mobilization requirements submissions and collection of national defense mobilization potential. Office responsibilities for the management of this information are not standard among levels of government and across Theater Commands and provinces. The same is true of information systems used to support these activities.¹⁵³ Additionally, sources claim that existing military and civilian standards are not compatible. This leads to unrequited expectations by the military regarding the civil sectors' ability to support wartime needs.

Awareness, Enforcement, and Incentives

Arguably the most consistent theme in discussions of perceived weaknesses of the national defense mobilization system is lack of public awareness. People's Liberation Army and national security academics have discussed this issue at length, as have publications from Provincial Military Districts

151. Guo Zhonghou [郭中侯], Lu Chun [卢春], and Hu Yue [胡悦], “国民经济动员球体报机制研究” [A Study of the Reporting Mechanisms for Submitting National Economic Mobilization Demands], *中国军事科学 (China Military Science)*, October 20, 2019; “国民经济动员机制的深化路径研究” [Research on the Deepening Path of the National Economic Mobilization Mechanism], Ministry of Industry and Information Technology (website), April 2, 2015, <https://www.21ks.net/lunwen/guominjingjilunwen/29726.html>.

152. Hou Zhonghou and Hu Yue, “Submitting National Economic Mobilization Demands.”

153. Hou Zhonghou and Hu Yue, “Submitting National Economic Mobilization Demands”; and “国民经济动员机制的深化路径研究” [Research on the Deepening Path of the National Economic Mobilization Mechanism].

and municipal military sub-districts.¹⁵⁴ Public reports of inspections claim that officials frequently have a poor understanding of the contents of the National Defense Mobilization Law and the associated responsibilities. Even amongst mobilization workers, there are reported uncertainties regarding the extent of the system's powers compared to its responsibilities.¹⁵⁵ In this vein, PLA academics have expressed concerns that the enforcement mechanisms for defense mobilization work are too vague and occasionally in conflict with existing law enforcement.¹⁵⁶

A report from the Changde Municipal Military District complains that many cadres interpret mobilization rules as applying only to military officials rather than to themselves.¹⁵⁷ It is likely for similar reasons that a public report of the Yunnan Provincial Military District Party Committee spent a full paragraph emphasizing Provincial Party Chairman Wang Ning's (王宁) admonition of the committee, emphasizing that it is "a political requirement and a political responsibility for local party committees and governments at all levels to serve national defense and military construction."¹⁵⁸ It is unlikely that concern over this perceived lack of commitment to defense mobilization would have been publicized were it not considered a serious issue by national defense mobilization leadership.

154. Liu Xing, Yang Shangqin, and Cao Haiquan, "Administrative Enforcement," *Journal of Military Transportation University*, August 1, 2018; "秦安: 调整四法, 贯彻国防动员体制改革的决策部署, 打赢新型战争" [Qin An: Adjust the Four Laws, Implement the Decision-making and Deployment of the Reform of the National Defense Mobilization System, and Win a New Type of War], qq.com (website), October 24, 2022, <https://new.qq.com/omn/20211025/20211025A05HLX00.html>; "全省国防动员和后备力量'三项基础'建设总结表彰会暨领导小组会在省军区召开" [Yin Hong Emphasized at the Summary and Commendation Meeting of the 'Three Basics' Construction of the Province's National Defense Mobilization and Reserve Forces], gansu.gov.cn (website), December 21, 2021, <http://www.gansu.gov.cn/gsszf/c100002/c100999/202112/1923712.shtml>; and "关于检查《中华人民共和国国防动员法》实施情况的报告" [Report on Inspection of the Implementation of the National Defense Mobilization Law of the People's Republic of China], June 27, 2019, http://rd.changde.gov.cn/rdhy/cwhhy/sqjrdcwhdeshchy/content_56920.

155. "军委国防动员部下设民兵预备役局边防局等单位" [The National Defense Mobilization Department of the Military Commission Consists of the Frontier Defense Bureau of the Militia Reserve Bureau and Other Units], gymzxedu.com (website), November 20, 2021, <https://www.gymzxedu.com/redian/331991.html>.

156. Liu Xing, Yang Shangqin, and Cao Haiquan, "Administrative Enforcement."

157. "关于检查《中华人民共和国国防动员法》实施情况的报告" [Report on Inspection of the Implementation of the National Defense Mobilization Law of the People's Republic of China].

158. "省军区党委十二届九次全体(扩大)会议强调深入推进全省国防动员建设高质量发展" [The 9th Plenary (Expanded) Meeting of the 12th Provincial Military District Party Committee Emphasized the In-depth Promotion of the High-quality Development of the Province's National Defense], yn.gov.cn (website), January 16, 2022, http://www.yn.gov.cn/zzms/ywdt/202201/t20220116_234854.html.

Discussions of perceived low public awareness in PLA media sources are frequently followed by requests to expand enforcement capacity.¹⁵⁹ It is likely the discussion of low public awareness is a cover for widespread avoidance or violation of mobilization requirements. There are many reasons why commercial firms, even state-owned ones, would be reluctant for their firms and resources to be available to the People's Liberation Army, even with claims in the law that PLA units will pay market price for those resources. To help deal with this, it appears the mobilization system is stepping up its enforcement activities. In recent years, provincial and local mobilization officials set up "comprehensive law enforcement brigades" (综合执法大队) to help expand public awareness and clarify cadres' legal responsibilities once society is mobilized.¹⁶⁰ These brigades conduct joint military-civilian law enforcement inspections to ensure relevant work units are complying with mobilization laws.¹⁶¹ Moreover, 2019's "Regulations on Civil Transportation National Defense Mobilization" laid out specific fines and vague criminal penalties for individuals found to violate mobilization regulations related to prerequisitioned vehicles and related equipment.¹⁶²

According to Bai Zhongbin, a substantial portion of the 2021 changes to the National Defense Transportation Law relate to clarification of the financial incentives to civilian organizations that are expected to support national defense mobilization activities. According to Bai, "the increased cost of civil delivery vehicles due to the implementation of national defense requirements shall be borne by the state," and "expenses incurred by citizens and organizations in completing national defense transportation tasks shall be paid by the user-unit" at a rate not lower than market price.¹⁶³ This clarification of the monetary carrots that accompany the above-described enforcement sticks likely reflects the People's Liberation Army's attempt to deal with perceived or actual noncompliance.

159. Liu Xing, Yang Shangqin, and Cao Haiquan, "Administrative Enforcement."

160. "组建人防工程平战转换综合执法大队 接受国防动员专业保障点验" [Set Up a Comprehensive Law Enforcement Brigade for Civil Air Defense Engineering Peacetime and Wartime Conversion, and Accept Professional Security Inspections for National Defense Mobilization], cg.nanning.gov.cn (website), June 29, 2021, <https://cg.nanning.gov.cn/gzdt/zhzf/t4789401.html>; and "关于检查 中华人民共和国国防动员法 实施情况的报告" [Report on Inspection of the Implementation of the National Defense Mobilization Law of the People's Republic of China].

161. "构建中国特色的新型国防动员体系" [Building a New National Defense Mobilization System with Chinese Characteristics], people.com.cn (website), October 18, 2018, <http://military.people.com.cn/n1/2018/1018/c1011-30348364.html>.

162. "民用运力国防动员条例" [Regulations on Civil Mobility National Defense Mobilization], gov.cn (website), March 2, 2019, http://www.gov.cn/gongbao/content/2019/content_5468879.htm.

163. "关于 国防交通法, 这些你应该知道" [What You Should Know about the National Defense Transportation Act].

Future adjustments to the defense mobilization-associated laws will likely include expanded emphasis on propaganda and political work and more explicit consequences for noncompliance across the defense mobilization system.

Conclusion

Despite its critical role in China's national defense strategy, the national defense mobilization system remains a work in progress. In recent years, there have been significant reforms intended to ensure the mobilization system is capable of rapidly providing civil manpower and resources. Legal changes have put greater emphasis on the PLA's ability to dictate requirements to government agencies and state-owned enterprises and companies. In parallel, the national defense mobilization system at the provincial and municipal levels has grown more experienced in supporting the People's Liberation Army. Military exercises and emergencies including, but not limited to, COVID-19 have given much-needed experience to the economic and transportation mobilization organs of the system. Throughout the system has grown to exploit the capabilities of China's commercial sector to improve the capabilities of its logistics systems.

People's Liberation Army officers and academics discussing the mobilization system in detail almost uniformly highlight the system's remaining deficiencies even as they laud its improvements. Although China continues to provide increasingly detailed laws and regulations outlining guidance on the mobilization system, it is not clear this growing body of rules will successfully standardize and unify the various branches of the mobilization system. People's Liberation Army authors envision a mobilization switch that can rapidly transition society to a wartime footing without significant hiccups. Massive bureaucracies would nimbly shift to answering to new chains of command. Mobilization C2 systems would provide MD commanders, Theater Commands, and national commanders with full visibility into the People's Liberation Army's requirements and society's capacity to supply those requirements. Realizing this goal will require its prioritization by ministries and enterprises currently occupied with responsibilities other than establishing smooth mobilization processes.

In general, China's national defense mobilization system is designed to support national defense mobilization activities within China and along its periphery, including the deployment and sustainment of forces along interior lines of communication. While national defense mobilization legislative reforms will likely include provisions to improve the People's Republic

of China's ability to mobilize resources internationally to support external PLA operations, integrating those mechanisms with a still-troubled domestically focused national defense mobilization system will likely experience significant challenges. The pilot programs to build dynamic mobilization information systems demonstrate the People's Liberation Army's goal of building omniscience into the mobilization system is no less grand than the People's Bank of China's designs for digital renminbi financial omniscience or the Ministry of Public Security's goal of smart-city omniscient urban control. These goals will likely prove difficult to achieve in full, but even imperfect reform may lead to a stronger mobilization capacity to support the People's Liberation Army.

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PLA Army Logistics

Joshua Arostegui and James R. (J. R.) Sessions

Introduction

According to the US Army, the endurance of ground forces is a function of the Army's sustainment and is essential to retaining and exploiting the initiative. Sustainment provides support to maintain operations until mission accomplishment.¹ Many of the changes stemming from the People's Liberation Army (PLA) 2016 "above the neck" and 2017 "below the neck" reforms were designed to enable the PLA Army (PLAA) to sustain forces at lower echelons. However, most of the changes led to organizational adjustments rather than comprehensive reforms that would allow for independent combat operations beyond China's borders.

Comprehensive support continues to remain a weakness for the PLA Army five years after the reforms. Although China has made great strides in creating a lighter and more sustainable force, using modular units like those recommended in the *2020 Science of Military Strategy*, there remains a distinct lack of support capability. Problems like inadequate staff sizes, low transportation equipment numbers, inefficient logistics processes, a lack of containerization, and challenged civilian-military integration still plague the force. Despite those capability gaps, the PLA Army has demonstrated the use of its new construct to support forces adequately along the Sino-Indian border (and in other remote locations) and has made great strides in the widespread

1. Headquarters, Department of the Army (HQDA), *Sustainment*, Army Doctrine Publication 4-0 (Washington, DC: HQDA, 2019), iii.

fielding of various types of universal chassis to improve sustainment to the lowest echelons.²

This chapter examines PLAA sustainment through the lens of logistics and equipment support. It first details the reorganization of support forces and staff from the battalion up to the Theater Command (TC) Army, focusing primarily on supply, transportation, medical, and repair forces. It then explores the various models of the Army's distribution system from campaign level down to individual units. Finally, it details the PLA Army's view of its sustainment weaknesses to understand better what China will likely attempt to fix in the future.

Pre-reorganization Support

Prior to the 2017 reforms, the PLAA regiment was the lowest echelon with an organic support system. For example, a mechanized infantry regiment had its own support division (保障处) to oversee various staff branches (股), in addition to the unit's transportation and repair companies, and the hospital. The transportation and repair companies were responsible for supporting three maneuver battalions, each with 31 armored vehicles. The regiment could reach back to the division for additional support, but battalion commanders were reliant on higher echelons for resupply, maintaining readiness, and performing combat rescue and repair in the event of war.

The regiment's parent mechanized infantry division had a larger support department (保障部) with several staff offices (科) to oversee various supply depots, a repair battalion, a transportation battalion, and a hospital. This structure made the division command team and a senior staff officer responsible for coordinating logistics and equipment support efforts and directing the task-assignment of forces to subordinate units during conflict.

Around 2012, PLA divisions and brigades combined their logistics department and armaments department into one support department. The PLA Group Army (GA) maintained the original two departments until the 2017 restructure. Additionally, the Group Army's organic support forces included one vehicle battalion and one repair battalion that were almost equivalent in size to those at the division. If a Group Army found itself involved in a conflict,

2. Xiao Tianliang [肖天亮], 战略学 [*In Their Own Words: Science of Military Strategy 2020*] (Beijing: National Defense University Press, 2020), 349–57, <https://www.airuniversity.af.edu/Portals/10/CASI/documents/Translations/2022-01-26%202020%20Science%20of%20Military%20Strategy.pdf>.

it could reach back to army-run military region motor transport units and Joint Logistics Sub-department (JLSD) elements.

In the pre-restructure era, the army dominated the “joint” support system. After 2016 and the formal establishment of the joint Theater Commands and the PLAA Headquarters (equal in status to the PLA Navy, PLA Air Force, PLA Rocket Force, and PLA Strategic Support Force), followed by the stand up of the Joint Logistic Support Force (JLSF), the army implemented a new support system that made its tactical units more self-sufficient. The April 2017 “below the neck” reforms led to the creation of service support units within nearly every echelon—with similar structures to streamline logistics, equipment, and medical support during peacetime and wartime.

Battalion Support

As part of the 2017 restructure, the PLA Army “flattened” its command structure from a GA (division) regiment arrangement to a GA (brigade) battalion arrangement. The establishment of support elements within the new battalion was designed to improve its combat sustainment capability. Those support elements are only found within maneuver and fire support battalions based on their continuous need for resupply and equipment maintenance. The Service Support Company (支援保障连, SSC) established within the PLA Army’s new Combined Arms Battalions (CA BN) takes comprehensive support one step further, enabling the battalion to replace the regiment as the army’s Basic Combat Unit (基本作战单元) for joint and independent operations.³ To assist the battalion commanders, the PLA Army also implemented a new staff system made up of five officers and noncommissioned officers, one of whom is a Combat Service Staff Officer (战勤参谋).

Artillery and air defense battalions under Combined Arms Brigades (CA BDE), artillery brigades, and air defense brigades were given Command and Support Companies (指挥保障连), providing those firepower battalion commanders with organic radar, signal, and engineer platoons and

3. Lu Lei [卢雷], “把握合成营训练实质内涵” [Grasp the Essence of CA BN Training], 解放军报 [PLA Daily (website)], June 5, 2018, http://www.81.cn/jfbmap/content/2018-06/05/content_207876.htm.

transportation platoons for shuttling ammunition and other critical supplies.⁴ These types of capabilities were only found in former artillery and air defense regiments/brigades prior to the 2017 restructure.

Combined Arms Battalion Support – Forces

The SSC commander is primarily responsible for the training and oversight of his platoons in peacetime, while also serving as the battalion's Comprehensive Support Team (综合保障队) leader during operations. In addition to reconnaissance, signal, and engineering platoons, the SSC commander also leads a Repair Platoon (修理排), Transportation Platoon (运输排), and, in medium and heavy CA battalions, an Equipment-rescue Platoon (装备抢救排).⁵ The battalion's Medical Platoon (卫生排) is not part of the service support company but falls under the company commander's oversight during combat operations.⁶ Each of these platoons can be task organized into combat support teams by their respective functions as part of the SSC commander's comprehensive support team.

4. Wu Le, Sun Chao, and Chen Zhi [吴乐, 孙超, 陈陟, “这个‘蓝军’怎么什么都知道?” [“How Does This ‘Blue Force’ Know Everything?”], 解放军报 [PLA Daily (website)], July 2, 2018, http://www.81.cn/jfjbmap/content/2018-07/02/content_209901.htm; Song Zhiqiang, Zhan Lihong, and Hai Yang [宋志强, 詹丽红, 海洋], “向战为战, 第79集团军某旅评先评优注重‘战场贡献率’” [Towards War to Become War, a Brigade of the 79th Group Army Was Evaluated and Prioritized Focusing on “Battlefield Contribution Rate”], 解放军报 [PLA Daily (website)], December 20, 2021, https://www.81.cn/yw/2021-12/20/content_10116330.htm; and Liu Guoliang and Xu Yang [刘国梁, 瑛洋], “‘歼’敌’一千缘何自损八百? 普通一兵也要有体系作战思维” [Why “Kill” 1,000 Enemies and Suffer 800 Casualties? Ordinary Soldiers Must Also Have a System of Systems Combat Mindset], 解放军报 [PLA Daily (website)], February 27, 2020, <http://www.81.cn/jmywyl/2020-02/27/content9753435.htm>.

5. Li Lianjun and Yang Wenhao [李连军, 杨文豪], “综合保障队: 如何让合成营如虎添翼” [Comprehensive Support Teams: How to Make the CA BNs Even More Powerful], 中国军网 [China Military Network Comprehensive], July 11, 2018, http://www.81.cn/jmywyl/2018-07/11/content_8085706.htm; Wang Lijun and Zhang Baoxiang [王立军, 张宝], “支援保障连: 从‘打杂’到‘打仗’要跨越啥” [Service Support Company: What Does It Take to Go from Doing Miscellaneous to Fighting?], 解放军报 [PLA Daily (website)], June 27, 2018, <http://military.people.com.cn/n1/2018/0627/c1011-30089900.html>; Cheng Chen and Huang Zijuan [陈程, 黄子娟], “一场对抗演习‘打痛’指挥机构” [A Force-on-Force Exercise “Breaks Through” the Command Organization], 中国军网 [China Military Network], April 20, 2018, <http://military.people.com.cn/n1/2018/0420/c1011-29939073.html>; Wang Hailong, Jiang Chongze, and Chen Zhi [王海龙, 姜宠泽, 陈陟], “步战车能爬上这么陡的坡?” [Can an Infantry Fighting Vehicle Climb Such a Steep Slope?], 中国军网 [China Military Network], August 8, 2018, http://www.81.cn/jfjbmap/content/2018-08/08/content_212858.htm; Wang Chi, Lei Zhaoqiang, and Wen Suyi [王迟, 雷兆强, 闻苏轶], “非科班出身如何实现华丽转身” [“How a ‘Non-scientific’ Squad Background Achieved a Glorious Turn”], 中国军网 [China Military Network], January 15, 2019, http://www.81.cn/jfjbmap/content/2019-01/15/content_225325.htm; Deng Shuajun and Liu Hui [邓帅军, 刘辉], “抢修抢救再也不用等援军” [Repair and Rescue No Longer Have to Wait For Reinforcements], 解放军报 [PLA Daily (website)], January 25, 2018, http://www.81.cn/jfjbmap/content/2018-01/25/content_197884.htm; and Zhu Xuegang, Pan Liang, and Liu Jialu [朱学耕, 潘亮, 刘家路], “基于灰色层次分析法的重型合成营城市进攻作战效能评估” [Operational Effectiveness Evaluation of Urban Offensive of Heavy Combined Battalion Based on Grey Analytic Hierarchy Process], 兵工自动化 [Ordnance Industry Automation] 39, no. 7 (July 2020): 7–10.

6. Tang Lei and Zhang Chengwei [唐磊, 张城玮], “卫生排, 如何融入战场施救” [Medical Platoon and How to Integrate Battlefield Rescue], 解放军报 [PLA Daily (website)], July 11, 2018, http://www.81.cn/lj/2018-07/11/content_8085764_5.htm.

Although maneuver and fire support companies are normally assigned a single technician (技师), a role noncommissioned officers have taken from officers in recent years, more complex maintenance and repair tasks are carried out at the new SSC repair platoon. The PLA Army's emphasis on reorienting support forces toward combat led to units with armored vehicles also standing up the equipment-rescue platoon with two to three armored recovery vehicles, but it is unclear if the equipment rescue platoon completely replaces the repair platoon in those units or is solely designed for combat-equipment recovery. The repair platoons require technicians to master two to three technical specializations and be capable of operating two types of equipment. According to a 2021 survey by personnel from the PLAA 194th Combined Arms Brigade (Heavy) and the Armored Forces Academy, 32 percent of repairmen within the service-support company have academy- or university-level training. In light combined arms battalions, there is normally one vehicle repair squad with one vehicle technician, limiting the sustainment capability of truck-borne infantry units. As a result, the combined arms battalion is still heavily reliant on higher-echelon repair support.⁷

The SSC transportation platoon provides the command team with its own trucks to supply forces within the battalion's area of operation. The platoon trains to transport ammunition, water, food, fuel, and other necessary resources. This was a responsibility previously assigned to regiment or brigade motor transportation companies, which added extra layers of requests between the company and battalion commanders at the front and the rear command post. The PLA Army combined arms battalions removed those layers by gaining approval authorities to requisition items from depots after working directly with the brigade finance section or establishing smaller-level battalion warehouses, however, a platoon-size transport element with approximately 15 trucks struggles to satisfy the replacement

7. Li Lianjun and Yang Wenhao [李连军, 杨文豪], “从‘抢修’到‘抢救’” [From “Repair” to “Rescue”], 中国军网 [China Military Network], July 11, 2018, http://www.81.cn/lj/2018-07/11/content_8085764_4.htm; Yin Guoming et al. [尹国明], “合成旅实战化装备保障能力问题与对策研究” [Problems and Countermeasures in the Combat Equipment Support Capacity of Synthetic Brigades], 国防科技 [National Defense Technology] 42, no. 4 (August 2021): 138–42; and Zheng Yanliang et al., “新体制下部队车辆装备保障问题研究” [On Military Vehicle Equipment Support under New System], 军事交通学院学报 [Journal of Military Transportation University] 22, no. 3 (March 2020): 42–45.

of consumed ammunition and goods for its parent battalion, especially in larger armored units.⁸

Although the service support company is the primary force provider for battalion support operations, the CA BN headquarters still oversees certain support functions. For example, after 2017, company mess squads merged into a mess platoon subordinate to the battalion headquarters for food preparation and feeding troops.⁹ Medical support is also directly subordinate to the battalion headquarters during peacetime. Previously, PLAA battalions had one medical clinic director who reported to the battalion leadership and was responsible for the health work of the unit, however, the medical director relied on additional medical support from regiment and above echelons. Now, the combined arms battalion has a medical officer serving as a platoon leader and two subordinate medical squads. The primary mission of this platoon during wartime is rescuing and evacuating seriously injured personnel, but it also provides medical training to soldiers within combat squads. While the stand-up of the medical platoon demonstrates an improvement in battalion sustainment, the lack of assigned medics to companies and platoons and limited basic combat medicine training and unrealistic exercises reduces the operational effectiveness of small units during combat.¹⁰

Combined Arms Battalion Support – Staff

The transition of the combined arms battalion into the PLA Army's basic combat unit and its incorporation of dozens of types of combat arms and specializations meant the battalion commander, battalion political instructor, and their two deputies were no longer capable of overseeing the battalion's functions. Although the deputy battalion commander or instructor is still responsible for rear command post oversight, the new combat services staff

8. Wang Hailong, Jiang Chongze, and Chen Zhi, "Infantry Fighting Vehicle"; Li Lianjun and Yang Wenhao [李连军, 杨文豪], "减少指令流转层级, 打通'奇经八脉'" [Reduce the Level of Instruction Flow and Open Up the "Glorious Eight Arteries"], 中国军网 [China Military Network], July 11, 2018, http://www.81.cn/jmywyl/2018-07/11/content_8085706_2.htm; and Chen Yu and Cao Kun [陈羽, 曹昆], "弹药请领实现'就近就便'" [Ammunition Requests Achieve "Closest Convenience"], 解放军报 [PLA Daily (website)], December 26, 2019, <http://military.people.com.cn/n1/2019/12/26/c1011-31523827.html>.

9. Yang Tao, "Story of an Army Cook," China Military Online (website), May 9, 2020, http://english.chinamil.com.cn/view/2020-05/09/content_9810201.htm.

10. Tang Lei and Zhang Chengwei, "Medical Platoon and How to Integrate Battlefield Rescue"; Li Lianjun and Zou Bei 李连军, 邹贝, "仗在一起打, 兵在一起练" ["Fighting Together, Soldiers Train Together"], 中国军网 [China Military Network], July 11, 2018, http://www.81.cn/jfbmap/content/2018-07/11/content_210670.htm; and Zou Liang et al. [周亮, 祁海林, 王春辉, 董成海, 欧阳甘霖, 邓磊, 卢山], "合成营卫生排实兵对抗分队的组建与训练" [Combined Arms Battalion Medical Platoon Realistic Force-on-force Unit Organization and Training], 西南国防医药 [Southwest National Defense Medicine] 30, no. 12 (December 2020).

officer serves as the battalion's primary logistics and equipment support adviser. The staff officer also serves as the nexus between the battalion's repair, storage, supply, and medical forces and those at the brigade level and higher.¹¹

During peacetime, the combat services staff officer is responsible for training battalion support elements, while also ensuring adequate training supplies are requisitioned from brigade staff sections and depots. During wartime, the staff officer will sit in the main battalion command post alongside the chief staff officer, operations and reconnaissance staff officer, firepower and engineering staff officer, and information and communications staff officer to coordinate logistics and equipment support functions for the battalion command team. The staff officer is also granted authority to dispatch the various comprehensive support group teams for medical rescue, combat resupply, equipment repair, and the establishment of the rear-command post.¹²

Most CA BN staff officers are selected from the ranks of the unit's companies and platoons and lack formal staff training. Additionally, according to numerous PLA media accounts, there is a trend of having a noncommissioned officer serve in the combat services staff officer role.¹³ Despite the rank of the soldier serving in that position, only having one staff officer responsible for the coordination of sustainment in a PLAA combined arms battalion is a severe limitation on the ability of that unit to execute modern combat missions, especially for 24-hour coverage. In contrast, a US Army combat battalion has four to six personnel permanently assigned to its S-4 section to oversee a similar level of responsibilities. Although the PLA Army emphasizes developing automated systems to improve support services, the amount of information that will flow through the future PLAA battalion command post will quickly overwhelm one staff officer.

11. Zhong Chongling [仲崇岭], “从士官班长到士官参谋, 两字之差却大不相同” [From NCO Squad Leader to NCO Staff Officer, the Differences between the Two Words Are Very Different], *解放军报* [PLADaily (website)], January 21, 2021, http://www.81.cn/2021zt/2021-01/21/content_9988542.htm; Wang Delin, Fan Xu, and Zhao Junye [王德林, 范旭, 赵俊业], “陆军合成营参谋训练” [A Study on the Training of Army Synthetic Battalion Staff Officers], *国防科技* [National Defense Technology] 40, no. 2 (April 2020): 103–5; and “中国人民解放军内务条令(2010)” [Chinese PLA Internal Regulations (2010)], 中国—东盟国家法律与司法信息中心 [Legal and Judicial Information Center for China-ASEAN Countries], May 4, 2010, <http://temp.pkulaw.cn:8117/chl/133669.html>.

12. Zhong Chongling, “From NCO Squad Leader to NCO Staff Officer”; and Zhang Jun and Guo Fengkuan [张军郭, 丰宽], “决胜中军帐! 这有一位肩戴一道‘粗拐’的‘兵参谋’” [Decisive Victory in the Military! Here Is a “Soldier Staff Officer” that “Wears the Chevrons on His Shoulders”], 中国军网 [China Military Network], August 14, 2018, http://www.81.cn/2018zt/2018-08/14/content_9252627.htm.

13. 中国军网 [China Military Network], “合成营参谋纳入首长机关集训” [The Combined Arms Battalion Staff Officers Assemble for Training as the Commander's Staff], June 3, 2018, http://www.81.cn/jfjbmmap/content/2018-06/03/content_207669.htm; and Zhong Chongling, “From NCO Squad Leader to NCO Staff Officer, the Differences between the Two Words Are Very Different”; and Zhang Jun and Guo Fengkuan, “Decisive Victory.”

Brigade and Division-Regiment Support

For higher echelon support, the PLA Army established the service support battalion (勤务保障营, SSB) in most brigades and remaining regiments. The size and capability of the battalion within different brigade and regiment types vary, but the unit still brings the same types of support elements to the brigade: repair, transport, supply, and medical. Most PLAA brigades, including special operations forces (SOF), artillery and air defense, and Army aviation brigades, have a service support battalion, but this paper focuses on the combined arms brigade since it is now the PLA Army’s basic tactical unit (基本战术单位).¹⁴

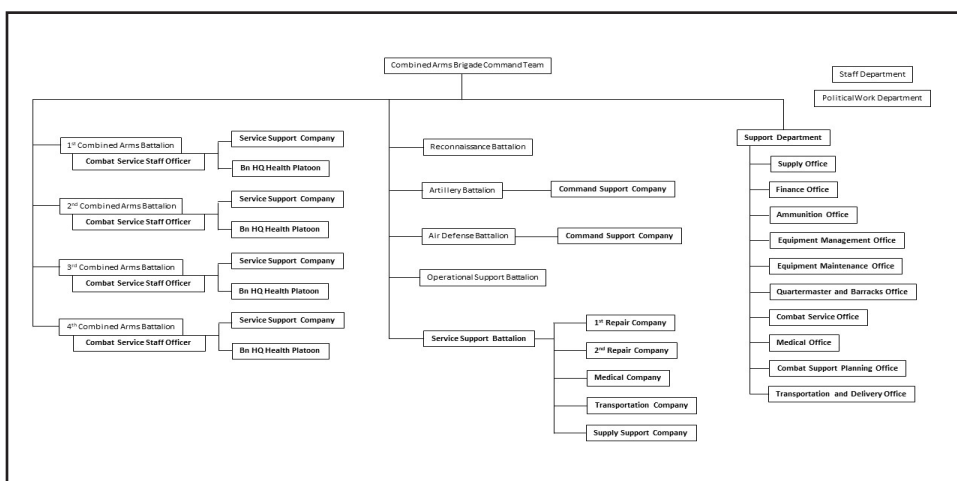


Figure 4-1. PLAA combined arms brigade support structure

Combined Arms Brigade Support – Forces

The establishment of the brigade service support battalion placed the previously dispersed support elements under a single commander who understood the requirements of logistics and equipment support. Although the rear command post remains under the control of the brigade deputy commander or political commissar, the SSB commander assumes the role of rear area support group commander. In this position, the battalion commander can task-assign his companies into the same modular support teams that existed prior to the restructure but with a better understanding of their composition and capabilities. The battalion provides the troops used to staff the brigade’s various depots

14. Lu Lei, “Grasp the Essence of CA BN Training.”

and warehouses rather than relying on soldiers directly subordinate to support department staff sections.¹⁵

The organization of the PLAA service support battalion shares some similarities with the US Army brigade support battalion but expands the number of companies and removes a subordinate forward support company, leaving those elements as part of the combined arms battalion's permanent service support company. The size of the support battalion appears to differ by unit type, but both armored and light infantry brigades have one or two repair companies, a transportation company, a Supply Support Company (供应保障连), and a medical company. Like the lower-echelon battalion support, each of the service support battalion's companies can easily transition into brigade-echelon support groups during wartime.¹⁶

Within medium and heavy combined arms brigades, there are two repair companies. In many armored brigades, the service support battalion's 1st Repair Company has technicians with specializations on armored vehicles, while the 2nd Repair Company has technicians focused on wheeled vehicles. In contrast, many light combined arms brigades appear to have only one repair company.¹⁷ It is unclear if this organization and delineation of responsibility among companies are standard across all brigades or if it varies from unit to unit.

The repair companies also provide support for newly incorporated technologies like optoelectronics, missiles, unmanned aerial systems, and electronic

15. Zhong Chongling [仲崇岭], “细数勤务保障营战场新景观” [A Breakdown of the New Landscape of the SSB Battlefield], 中国军网 [China Military Network], November 8, 2019, <http://military.people.com.cn/n1/2019/1108/c1011-31444789.html>; and Cui Haixu [崔海旭], “从一片绿叶观察一个春天” [Observe Spring from a Green Leaf], 中国军网 [China Military Network], November 8, 2019, http://www.81.cn/jfbmap/content/2019-11/08/content_247067.htm; Zhang Cheng, Yang Jiao, and Sheng Yangdi [张程, 杨礁, 盛洋迪], “紧贴实战、模块编组! 这个旅提升综合保障能力的实招还真不少” [Close to Realistic Combat, Modular Grouping! There Are Quite a Few Practical Moves for This Brigade to Improve Its Comprehensive Support Capability], 新浪军事 [Sina Military], August 1, 2018, <http://mil.news.sina.com.cn/2018-08-01/doc-ihhacrc8884984.shtml>; and Lei Zhaoqiang, Tang Ping, and Yin Wenbang [雷兆强, 唐平, 银汶邦], “战场新景观, 这个勤务保障营如何应对新挑战” [The New Landscape of the Battlefield, How Does This SSB Respond to New Challenge], 解放军报 [PLA Daily (website)], April 28, 2020, http://www.81.cn/jmywyl/2020-04/28/content_9802386_3.htm.

16. Zhong Chongling, “A Breakdown of the New Landscape of the SSB Battlefield.”

17. Qiu Chengliang et al. [仇成梁, 徐彬, 郭达, 刘磊], “老班长有话说: 听听成班长的‘维修经’” [“The Old Squad Leader Has Something to Say: Listen to the ‘Maintenance Experience’ of the Squad Leader”], 中国军网 [China Military Network], November 1, 2017, https://photo.81.cn/pla/2017-11/01/content_7807707.htm; “一位‘双料’技师的‘士兵突击’” [“A ‘Dual-topic’ Technician’s ‘Soldier Assault’”], 新浪军事 [Sina Military], October 16, 2018, <http://mil.news.sina.com.cn/2018-10-16/doc-ihmhafir8834340.shtml>; “战友别灰心, 我们携手同进步” [“Do Not Be Discouraged, Comrades, We Will Make Progress Together”], 中国网 [China Network], April 16, 2020, http://military.china.com.cn/2020-04/16/content_75939803.htm; and “第72集团军某旅组织机关干部蹲连住班” [A Brigade of the 72nd Group Army Organizes Cadre to Continually Focus on Quads], 中国军网 [China Military Network], December 26, 2021, http://www.81.cn/jfbmap/content/2021-12/26/content_306021.htm.

information systems. While many personnel in the companies are reportedly trained on-site, a survey found 93 percent of technicians in the SSB repair teams received higher-level training to be proficient in their fields. Despite the additional training, the amount of new equipment and technology getting fielded in PLAA combined arms brigades places a burden on the repair companies, especially since they are often split into multiple battlefield support groups to supplement frontline repair platoons.¹⁸

The SSB transportation company is a multifunctional organization that oversees a variety of vehicles, including a platoon of 10 to 12 heavy-equipment transporters (HET), and provides troops for the execution of force-delivery methods like air and rail. The company is used during exercises for delivering vehicles, fuel, ammunition, and other supplies and loading and unloading brigade equipment on train platforms.¹⁹ Most PLA Army vehicle companies have approximately 80 to 100 personnel and around 40 trucks.²⁰ While this number might be sufficient in supplementing the transportation platoons for battlefield resupply, it leaves the brigade reliant on higher-echelon transportation units for long-distance road maneuvers.

The brigade's supply facilities were previously run by brigade support department personnel, but the new SSB supply support company appears to have taken over that responsibility. Company members can be found in the brigade ammunition depot, uniform issue and return warehouse, comprehensive materials depot (综合物资库), and fuel station. Within those facilities the company performs vital functions, including loading supplies into vehicles driven by the transportation company and running fueling

18. Lei Zhaoqiang, Tang Ping, and Yin Wenbang, "The New Landscape of the Battlefield, How Does This SSB Respond to New Challenge"; and Yin Guoming et al., "Problems and Countermeasures in the Combat Equipment Support Capacity of Synthetic Brigades"; and Zhong Chongling, "A Breakdown of the New Landscape of the SSB Battlefield."

19. Cheng Xue, Yang Pengfei, and Yang Jian [程雪, 杨鹏飞, 杨健], "凝望战场: 视线超越这片雪原" [Gaze at the Battlefield: Look beyond This Field of Snow], 中国军网 [China Military Network], January 12, 2022, http://www.81.cn/jfjbmmap/content/2022-01/12/content_307168.htm; Shi Liangyu, Xu Shuitao, and Zhao Chunsen [石良玉, 徐水桃, 赵春森], "第83集团军某旅勤务保障营: 让每个兵都闪光" [A SSB of an 83rd Group Army Brigade: Let Every Soldier Shine], 解放军报 [PLA Daily (website)], March 5, 2021, http://www.81.cn/lj/2021-03/05/content_9996936.htm; Zhong Chongling, "A Breakdown of the New Landscape of the SSB Battlefield," and Wang Jianping et al., "新体制下重装备公路运输保障能力建设" [Support Capacity Construction of Heavy Equipment Highway Transportation under New System], 军事交通学院学报 [Journal of Military Transportation University] 19, no. 12 (December 2017): 18–22.

20. Lei Zhaoqiang, Tang Ping, and Yin Wenbang [雷兆强, 唐平, 银汶邦], "勤务保障营的专业训练'三问'" [Three Questions for SSB Professional Training], 解放军报 [PLA Daily (website)], April 28, 2020, http://www.81.cn/jmywy/2020-04/28/content_9802386_2.htm; Chen Si [陈思], "首批川藏线女汽车兵梁娜: 挑战'天路'的科大人!" [The First Batch of Female Vehicle Soldiers on the Sichuan-Tibet Line: The University of Science and Technology Which Challenged the "Road to Heaven!"], 国防科大微信公众号 [National Defense Science and Technology University WeChat Public Account], December 13, 2019, <https://www.nudt.edu.cn/zjkd/kdgs/e96c063172ef4d518665121780edf638.htm>.

operations. Despite the company's new responsibilities, coordinating depot functions is still executed at the relevant support department staff section.²¹

Of all the new companies established under the service support battalion, the medical company experienced the most significant transition. Prior to the restructure, the brigade's medical forces were found in the brigade hospital that was directly subordinate to the support department. The hospital was often commanded by a colonel or senior colonel medical officer. Post-restructure, the hospital became a company under the service support battalion and the respective medical officer was downgraded to a company commander. This change left colonels and senior colonels serving under lieutenant colonels in command of the service support battalions.²²

The medical company, made up of medical officers and senior noncommissioned officers, is responsible for day-to-day brigade medical operations, however, Chinese media consistently emphasizes its push to turn the PLA Army's medical professionals into combatants capable of operating in live-combat environments. In line with the modular task-assignment of support forces found throughout the rest of the service support battalion, the medical company is split into multiple teams of varying functions during training and exercises. These teams, which can include the Medical Company Command Group (指挥组), Serious Injury Rescue Group (重伤救治组), and the Mobile Rescue Group (机动救护组), are using new ambulances and field hospitals to improve the survivability of PLAA combat units while also incorporating contract civilians to improve health care at tactical levels. Despite the new combat emphasis, the medical company of combat units is normally deployed in the form of a brigade rescue station in the rear area, far from the main mission area, and focuses primarily on working

21. Chen Lianxin and Zeng Tao [陈连鑫, 曾涛], "30秒装载1.5吨弹药! 平台改装, 创新举措为战备加速" [Load 1.5 Tons of Ammunition in 30 Second! Platform Reequipping and Innovative Measures Accelerate Combat Readiness], 中国军网 [China Military Network], May 28, 2018, http://www.81.cn/lj/2018-05/28/content_8043195.htm; Zhang Cheng, Yang Jiao, and Sheng Yangdi, "Close to Realistic Combat, Modular Grouping! There Are Quite a Few Practical Moves for This Brigade to Improve Its Comprehensive Support Capability"; Zheng Xingwei and Li Yuanqing [郑兴伟, 李元庆], "小小弹药库蝉联全旅理论考核第一" [The Small Ammunition Depot Ranked First in the Brigade's Theoretical Assessment], 中国军网 [China Military Network], March 30, 2018, http://www.81.cn/jfbmap/content/2018-03/30/content_202797.htm; and Wang Weixu and Lu Chao [王伟旭, 陆超], "还权基层彰显法规意识" [Returning Rights to the Grassroots Shows Awareness and Regulations], 中国军网 [China Military Network], January 30, 2018, http://www.81.cn/jfbmap/content/2018-01/30/content_198333.htm.

22. Li Xiaobo [李晓波], "第80集团军某合成旅周五成:大校连长战沙场" [An 80th Group Army Combined Arms Brigade, on Friday, Complete: A Colonel Company Commander Fights on the Battlefield], 广军事 [China National Radio Military], October 12, 2017, http://military.cnr.cn/ztch/qjwnysh/xfby/20171012/t20171012_523984183.html; and Chen Dianhong, Liu Wenyan, and Peng Youze [陈典宏, 刘文彦, 彭友泽], "从卫生队到卫生连" [From Medical Team to Medical Company], 解放军健康 [PLA Health], February 2019, 4-7.

with battalion medical platoons in evacuating troops to the rear instead of providing more flexible medical support near the front.²³

Combined Arms Brigade Support – Staff

The Brigade Support Department Chief (保障部部长) serves as the brigade leadership team’s primary adviser and logistics and equipment support coordinator. Like the brigade chief of staff and political work department director, the support department chief oversees multiple staff sections in his respective department that are responsible for everything from brigade finance to equipment management. The support department of other PLAA brigades likely mirrors the organization of CA BDE staff offices but are probably smaller in size. Table 4-1 details the brigade support department’s staff offices.

Former PLAA divisions and regiments had a similar staff office organization under their respective support departments, but those offices were responsible for many of the functions now delegated to the brigade service support battalion. At the division level, those offices were typically staffed with three to five personnel, which means the new brigade offices are likely similar in size or slightly smaller, though some division staff offices, like the Quartermaster Section and Barracks Office, were combined into one.

23. Li Xiaobo, “An 80th Group Army Combined Arms Brigade, on Friday, Complete: a Colonel Company Commander Fights on the Battlefield”; Chen Dianhong, Liu Wenyan, and Peng Youze, “From Medical Team to Medical Company;” Han Cheng and Hou Dianyao [韩成, 侯典垚], “‘卫生队’到‘卫生连’一字之差带来哪些变化” [What Are the Changes Brought about by the Difference between “Medical Team” and “Medical Company”], 中国军网 [China Military Network], June 6, 2018, http://www.81.cn/xuexi/2018-06/06/content_8053556.htm; “卫生员“跨界”苦练登离机” [“Medics ‘Crossing the Border’ Train Hard to Board and Leave the Aircraft”], 中国军网 [China Military Network], August 14, 2018, http://www.81.cn/jfbmap/content/2018-08/14/content_213322.htm; Huang Ruifeng, Xu Zhiguo, and Yang Qing [黄瑞锋, 徐治国, 杨庆], “特种作战行动卫勤保障问题刍议” [A Humble Opinion on the Issue of Medical Support in Special Operations], 人民军医 [People’s Military Surgeon] 63, no. 5 (May 2020): 442–45; and “文职人员下基层: 她们有幸当了女子‘特种兵’” [Civilians Go to the Grassroots Level They Are Fortunate Enough to Be Female “Special Operations Soldiers”], 中国军网 [China Military Network], June 19, 2021, http://www.81.cn/wz/2021-06/19/content_10050169.htm.

Table 4-1. Combined Arms Brigade Support Department Offices

(Source: Chen Xiaojing and Sun Xingwei [陈小菁, 孙兴维], “一线保障新亮点·多项惠军利兵政策落地” [New Highlights of Front-line Support: A Number of Policies to Benefit the Army and the Soldiers Have Been Implemented], 中国国防部 [China Ministry of National Defense], March 3, 2021, http://www.mod.gov.cn/services/2021-03/03/content_4880277.htm.)

Office	Chinese
Finance Office	财务科
Supply Office	供应科
Ammunition Office	弹药科
Equipment Management Office	装备管理科
Equipment Maintenance Office	装备维修科
Quartermaster and Barracks Office	军需营房科
Combat Logistics Office	战技勤务科
Medical Office	卫生科
Combat Support Planning Office	战勤计划科
Transportation and Delivery Office	运输投送科

Each brigade support department staff office serves peacetime and wartime functions, and most have seats in the rear-command post or rear-area command group. For example, the finance office is responsible for peacetime travel claim processing and financial guidance services and executing the payment for combat-related requisitions in an operational environment.²⁴ The ammunition office is responsible for maintaining awareness of the brigade’s ammunition consumption rates and working with battalion combat services staff officers to ensure adequate access to supplies, while also coordinating with higher-echelon PLA Army and JLSF depots to requisition various types of munitions.²⁵ The transportation and delivery office has a broad set of peacetime and wartime functions, including petroleum, oil,

24. Li Lianjun and Yang Wenhao, “Reduce the Level of Instruction Flow and Open Up the “Glorious Eight Arteries””; Chen Xiaojing and Sun Xingwei, “New Highlights of Front-line Support: A Number of Policies to Benefit the Army and the Soldiers Have Been Implemented”; and Sun Xingwei and Wang Xianqiang [孙兴维, 王先强], “差旅费管理暂行规定的12个亮点!” [12 Highlights of the Interim Provisions on Travel Expense Management!], 澎湃新闻 [Paper (website)], January 5, 2020, https://m.thepaper.cn/baijiahao_5437369.

25. “80th Group Army Brigade Introduced Scientific Research.”

and lubricant (POL) storage oversight and coordinating long-range maneuvers with Group Army, Joint Logistic Support Force, and civilian entities.²⁶

Most of the brigade support department staff offices have corresponding Staff divisions (处) at the Group Army level to ensure coordination occurs at all levels. Yet, despite the existence of the Group Army staff department and service support brigade, modern PLAA brigades are designed to carry out their own logistics and equipment support. As this chapter discusses later, the service support brigade has a primary mission of supporting Group Army command posts, leaving little higher-echelon tactical support for brigades and forcing the brigade staff to be the primary coordination elements for interaction with the Joint Logistic Support Force. Although many responsibilities held at the staff department prior to the restructuring now belong to the service support battalion, the large amount of equipment and combat requirements for modern warfare place a heavy burden on the brigade support department staff members, particularly those in the combat logistics and combat support planning offices where most coordination, inspections, and planning take place for unit support.²⁷

Division-Regiment Support

As of 2020, the four infantry divisions in the Xinjiang Military District (MD), Western Theater Commands, have transitioned into combined arms divisions made up of five regiments: three combined arms regiments, one firepower regiment, and one service support regiment (支援保障团). Each of the combined arms regiments have their own service support battalion like the combined arms brigade. The regiment also maintains a similar staff structure to the brigade, though its support division (保障处) and subordinate branches (股) are smaller and likely consolidated

26. Wang Lei, Zhao Kun, and Wang Lijun, "Feel the Rhythm of Training and Preparations from the Change of the Fuel Supply Modes"; Deng Qingyang, An Yang, and Xiang Yong [邓庆颖, 安阳, 向勇], "'东方-2018'我参演官兵中的俄军印象" ["Vostok-2018" Impressions of the Russian Army among the Participating Officers and Soldiers], 中国国防部 [China Ministry of National Defense], September 17, 2018, http://www.mod.gov.cn/power/2018-09/17/content_4825116.htm; and "地方物流加盟演训重装投送" [Local Logistics Joins Training for Heavy Equipment Delivery], 中国军网 [China Military Network], July 16, 2018, http://www.81.cn/jfjbmap/content/2018-07/16/content_211006.htm.

27. Li Zihao and Niu Yongjie [李子豪, 牛永界], "陆军合成旅后勤保障" [Study on Logistics Support of Army Synthetic Brigade], 国防科技 [National Defense Technology] 40, no. 2 (February 2019): 115–17.

with other branches.²⁸ The service support regiment, also found in the 1st Guard Division, Beijing Garrison District, appears to provide various comprehensive support functions, including a security and reconnaissance battalion and the division hospital.²⁹ The division support department likely mirrors the combined arms brigade, using the same naming conventions and organization, while probably including more staff officers in each section. Combined with the service support regiment, the staff provides the division's regiments with higher-echelon support that would normally come from the corps-level Group Army support department.

Group Army Support

The PLAA Group Army is China's corps-echelon organization and serves as the Army's basic campaign unit (基本战役军团) under the shared command of two major generals: the commander and political commissar.³⁰ The post-restructure Group Army transitioned from an organization made up of divisions, brigades, and/or regiments to a largely standard formation of 12 to 14 maneuver and functional support brigades. Each of those brigades reorganized its support elements to improve independent support functions. The Group Army now also has a service support brigade and a reorganized staff that mirrors its subordinate units to streamline coordination and provide oversight and guidance to the various brigade staffs. Finally, several PLA hospitals officially became Group Army subordinate medical organizations to ensure each Group Army had its own corps-echelon medical support.

28. Wang Hongyu [王洪禹], “升国旗 奏国歌 敬礼!!!” 海拔5300米上的升旗仪式” [“Raising the National Flag, Playing the National Anthem, Salute!!!” The Flag-raising Ceremony at an Altitude of 5,300 Meters], 央视新闻 [CCTV], October 3, 2020, <http://m.news.cctv.com/2020/10/03/ARTIAngsDMXhpSqmj2FQI2iD201003.shtml>; “新疆军区某合成团着眼实战提升官兵应急处突能力” [A Combined Arms Regiment of the Xinjiang MD Focuses on Realistic Combat to Improve the Emergency Response Capabilities of Officers and Soldiers], 解放军报 [PLADaily (website)], July 10, 2021, <http://military.people.com.cn/n1/2021/0710/c1011-32154072.html>; and Yu Deze and Shi Jianmin [于德泽, 史建民], “码上说事”助力官兵依法维权” [Speaking on the Code to Help Officers and Soldiers Protect Their Rights in Accordance with the Law], 中国军网 [China Military Network], April 2, 2019, http://www.81.cn/jfjmap/content/2019-04/02/content_230760.htm.

29. Tang Shuai [唐帅], “高原战士: 因为心里暖, 训练起来总感觉身上有使不完的劲!” [Plateau Warrior: Because My Heart Is Warm, I Always Feel Like I Have Endless Energy During Training!], 中国军网 [China Military Network], May 16, 2021, http://www.81.cn/bg/2021-03/16/content_10004032.htm; and “关于北京广安中医疗门诊部等定点医药机构有关事项变更的通” [Notice on Changes in Relevant Matters of Beijing Guangan Traditional Chinese Medicine Clinics and Other Designated Medical Institutions], 北京市医疗保障局 [Beijing Municipal Medical Insurance Bureau], August 13, 2013, http://yjbj.beijing.gov.cn/swdt/2020_tzgg/202108/t20210818_2470760.html.

30. Xu Ping [徐平], “集团军的冷知识, 你知道多少?” [How Much Do You Know about the Group Army's Cold Knowledge?], 中国军网 [China Military Network], May 17, 2019, http://www.mod.gov.cn/education/2019-05/17/content_4841808.htm.

Group Army Support – Forces

The service support brigade is a unique organization in the post-restructure PLA Army that takes on responsibilities like those found in a US Army sustainment brigade. The biggest difference between the two is that the US version is designed to support all brigades operating in a defined area of operations, whereas the PLAA service support brigade concentrates its efforts on ensuring the Group Army headquarters is adequately established, has uninterrupted command and control, and provides higher-echelon logistics and equipment support that cannot be executed at the brigade level.

The service support brigade is made up of multiple pre-restructure regiments and battalions that were subordinate to the Group Army, including signal, electronic warfare, and motor transport units. The brigade also appears to provide personnel to manage and operate Group Army depots and warehouses. The new brigade is now primarily made up of signal and protection elements, including a command-and-control battalion (指挥控制营), a trunk network communications battalion (干线网络通信营), a mobile communications battalion (机动通信营), a guard service battalion (警卫勤务营), and an electronic countermeasures battalion (电子对抗营), while the rest of the brigade incorporates repair and transportation battalions. The brigade also maintains the staff department, political work department, and support department structure with the same subordinate sections as found in other PLAA brigade types.³¹

The brigade has two repair battalions, each with approximately 180 to 200 personnel in three companies. The general organization of the six repair companies in the service support brigade is unclear, but they appear

31. Long Xuanlei and Yang Shaoliang [龙轩磊, 杨邵翔], “多损点同步协同抢修” [Synchronized and Coordinated Repairs at Multiple Casualty Points], 解放军报 [PLA Daily (website)], November 14, 2019, http://www.81.cn/lj/2019-11/14/content_9675406.htm; “第83集团军某旅推进实战化训练的探索与思考” [Exploration and Reflection on Promoting Practical Training of an 83rd Group Army Brigade], 解放军报 [PLA Daily (website)], December 21, 2021, <http://m.people.cn/n4/2021/1221/c24-15357995.html>; Xie Guangtian, Dai Zekai, and Fan Fengshuo [谢光天, 代泽凯, 樊峰硕], “抓‘舌尖上’的工作, 这个单位从制度落实入手” [Grasp the Work “on the Tip of the Tongue,” This Unit Starts by Implementing a System], 中国军网 [China Military Network], October 14, 2021, http://www.81.cn/lj/2021-10/14/content_10098871.htm; Zou Liaoyuan and Long Xuanlei [邹燎原, 龙轩磊], “第74集团军某勤务支援旅: 战备食品为战不为看” [A 74th Group Army Service Support Brigade: Combat Preparation Food Is for War, Not for Looking At], 解放军报 [PLA Daily (website)], May 14, 2018, http://www.mod.gov.cn/power/2018-05/14/content_4813492.htm; “无形战场, 过招电磁蓝军” [Invisible Battlefields, Tracking the Electromagnetic Blue Force], 解放军报 [PLA Daily (website)], August 4, 2019, <http://military.people.com.cn/n1/2019/0804/c1011-31274754.html>; Guo Kexin, Lin Hai, and Hai Yang [郭克鑫, 林海, 海洋], “第79集团军某旅探索新编制体制下作战保障新模式” [A 79th Group Army Brigade Explores a New Mode of Combat Support under the New Organization System], 解放军报 [PLA Daily (website)], September 16, 2019, http://www.81.cn/2019zt/2019-09/16/content_9623610.htm; and Dong Yue [董玥], “聚焦军改: 5人的小散远单位咋先进?” [Focus on Military Reform: How Advanced Is the Small, Scattered Unit of 5 People?], 中国军网 [China Military Network], July 13, 2017, http://www.81.cn/jwsj/2017-07/13/content_7674451.htm.

to have a wide range of capabilities in repairing armor, vehicles, electronics, communications systems, and other systems that might not be capable of repair within their parent brigades. Additionally, like lower-echelon support elements, soldiers in the repair battalions are expected to be capable of repairing multiple systems. It appears that they concentrate their skill sets on weapons and equipment of similar types. For example, an artillery technician in a service support brigade must be able to work on firepower systems on armored vehicles, ground suppression, and air defense weapons.³²

The service support brigade repair battalions are equipped to perform second-line, or medium-level, repairs (中修) where equipment requires relocation to the manufacturer or a highly trained and qualified repair unit. In contrast, the repair companies in maneuver and fire support brigades are designed for first-line, or light-level, repairs (小修). This is comparable to the US Army's two-level maintenance program, where most brigades can handle field-level maintenance while sustainment-level maintenance is handled at field support brigades, depots, and logistics readiness centers.³³

These repair battalions can also serve as rescue and repair groups in combat operations, supplementing maneuver and fire support brigades' repair companies and platoons. For example, a November 2019 *PLA Daily* article noted repairmen from the 74th Service Support Brigade, during an exercise, were dispatched in separate electrical teams and chassis teams to repair transmission systems, while fire control teams and communications teams moved forward to carry out various inspections and repairs.³⁴

The service support brigade transportation service battalion (运输勤务营) is made up of three companies: a general transportation company (通用运输连), a service transportation company (勤务运输连), and a HET company (重装备运输连). The general transportation company is made up of around 40 trucks, though there is no standard chassis in each brigade. The Shaanxi SX2110, a long-time workhorse for the PLA Army capable

32. Sun Qingshuai et al., “第71集团军“钢铁劲旅”：科学用兵48小时处置3处险情” [The 71st Group Army's “Steel Powerhouse”: Scientifically Use Soldiers to Resolve 3 Dangerous Situations in 48 Hours], 中国军网 [China Military Network], July 25, 2020, http://www.81.cn/2020zt/2020-07/25/content_9860712.htm; and Guo Hao, Chen Qiang, and Cui Yanjun [郭昊, 陈强, 崔彦军], “陆军勤务支援旅专业技术干部军事职业教育” [Military Vocational Education of Professional Technical Cadres in Army Service Support Brigade], 国防科技 [Defense Technology Review] 39, no. 5 (October 2018): 108–11.

33. Long Xuanlei and Yang Shaoxiang, “Synchronized and Coordinated Repairs at Multiple Casualty Points”; and “主战装备“中修”不出营” [The Main Battle Equipment ‘Mid-level Repair’ Does Not Leave the Battalion], 解放军报 [PLA Daily (website)], April 17, 2020, <http://military.people.com.cn/n1/2020/0417/c1011-31677646.html>.

34. Long Xuanlei and Yang Shaoxiang, “Synchronized and Coordinated Repairs.”

of transporting up to five tons on road and three-and-a-half tons off-road, appears to be widely fielded in the general transportation company, however, the new armored medium-high mobility First Auto Works (FAW) MV3 chassis variants capable of transporting between three-and-a-half and five tons are becoming more prevalent in those units. Other vehicles from Dongfeng and FAW are also frequently observed in the general transportation company since its primary mission is to transport equipment and personnel. Little is known about the service transportation company, but it likely has similar numbers of vehicles and types used to provide logistics support.³⁵

The HET company consists of 30 to 40 heavy equipment transporters designed to carry the PLA Army's heaviest tracked equipment via roads and highways. While older heavy equipment transporters like the Shaanxi SX4323A 40-ton vehicle are fielded to many companies, the Taian TA4360 with a four-axle semitrailer capable of carrying up to 50 tons makes up most of the existing force in service support brigades. The Taian TA4410 with a five-axle semitrailer capable of transporting up to 65 tons is quickly appearing in many units as well.

The main difference between the two Taian trucks is that the newer TA4410 is the only heavy equipment transporter that can transport the Type-99 and Type-99A main battle tanks, the PLA Army's heaviest armored vehicles. This company's heavy equipment transporters serve a vital role in moving GA assets to combat zones and transporting damaged heavy combat vehicles to the service support brigade repair battalions in the rear.³⁶ Despite the slow upgrade in vehicles,

35. Wei Haipeng [魏海鹏], “取消考核排名, 把掌声留给成长” [Cancel the Assessment Ranking and Leave the Applause for Growth], 中国军网 [China Military Network], February 20, 2020, http://www.81.cn/jfjmap/content/2020-02/20/content_254526.htm; “军武零距离 20211218 驾驶能手” [Military Zero Distance 20211218 Driving Expert], 央视网 [CCTV-7], December 18, 2021, <https://tv.cctv.com/2021/12/18/VIDEKJHPyoftDV7bN4byMj6k211218.shtml>; “Shaanxi SX2110 and SX2151 4x5 Trucks,” Jane's Land Warfare Platforms: Logistics, Support, & Unmanned (website), February 2, 2022, <https://customer.janes.com/Janes/Display/JLSU0028-JLSU>; and “宋楠:解读一汽解放MV3型第三代通用军车” [Song Nan: Decoding the FAW Jiefang MV3 3rd Generation General Purpose Military Vehicle], 搜狐 [Sohu], October 19, 2016, https://www.sohu.com/a/116513867_117833.

36. Wang Jianping et al., “Support Capacity Construction of Heavy Equipment Highway Transportation under New System”; Yao Guorong “老班长与新铁骑” [The Old Squad Leader and the New Cavalry], 中国军网 [China Military Network], July 23, 2020, http://www.81.cn/jfjmap/content/2020-07/23/content_266734.htm; Guo Shunan [郭淑楠], “高手过招 汽车兵驾驶重装运输挑战精准倒车定位” [Expert Trick: Motor Soldiers Drive Heavy Equipment Transporters during Challenging Precision Reverse Positioning], 央视网 [CCTV-7], August 25, 2020, http://www.js7tv.cn/video/202008_227534.html; and “中国重卡性能如何: 载58吨99A坦克翻山越岭日行千里” [How Is the Performance of Chinese Heavy Trucks: Carrying 58 Ton 99A Tanks over Mountains for Thousands of Kilometers for Days], 新浪军事 [Sina Military], June 19, 2019, <https://mil.news.sina.com.cn/jssd/2019-06-19/doc-ihyctik6206448.shtml>.

the relatively small number of heavy equipment transporters at the service support brigade is not nearly enough to supplement those in other brigades fully, especially since heavy combined arms brigades remain so numerous in the PLA Army, leaving the army heavily reliant on civilian or militia heavy equipment transporters.

Medical support was also a focus of the PLA Army below-the-neck reforms. Each Group Army received its own tertiary first-class hospital (三级甲等医院) allocated from previously existing PLA hospitals in 2018. Classified as having 501 or more beds, a tertiary first-class hospital provides high-level specialized medical and health services and performs higher-education and scientific research missions. The new GA hospitals serve the public and the military, demonstrating civilian-military integration at the tactical level. Table 4-2 details the new GA hospitals and their previous PLA hospital designation.

Table 4-2. Group Army hospitals current and previous designations

Theater Command	Group Army Hospital	Previous Hospital Designation
Eastern Theater	71st Group Army Hospital	PLA 97 Hospital ³⁷
	72nd Group Army Hospital	PLA 98 Hospital ³⁸
	73rd Group Army Hospital	PLA 174 Hospital ³⁹
Southern Theater	74th Group Army Hospital	PLA 421 Hospital ⁴⁰
	75th Group Army Hospital	PLA 60 Hospital ⁴¹

37. “再见97医院，你是永不消失的番号！” [Goodbye Hospital 97, You Are the Number That Will Never Disappear!], 搜狐 [Sohu], October 30, 2018, https://www.sohu.com/a/272302595_678827.

38. “军改新动向：陆军新组建的集团军也有了自己的医院” [The New Trend of Military Reform: The Newly Formed Group Army Has Its Own Hospital], 搜狐 [Sohu], November 7, 2018, https://www.sohu.com/a/273864689_260616.

39. Lu Xiangyong and Du Hengfeng [卢祥勇, 杜恒峰], “这1万多枚冷冻胚胎是谁的？医院着急找人：速来认领，否则销毁！” [Who Do These More Than 10,000 Frozen Embryos Belong to? The Hospital Is in a Hurry to Find Someone: Come and Claim Them, or They Will Be Destroyed!], 搜狐 [Sohu], December 17, 2020, https://www.sohu.com/a/438847033_115362.

40. “多个集团军医院亮相，第74集团军医院前身始建于一百多年前” [Several Group Army Hospitals Were Unveiled. The Predecessor of the 74th GA Hospital Was Built More Than a Century Ago], 新浪 [Sina], November 29, 2018, <https://news.sina.com.cn/o/2018-11-29/doc-ihmutuec4750529.shtml>.

41. Wu Huiling [吴慧玲], “十月 一批军队医院集中改名、更编” [In October, a Batch of Military Hospitals Was Renamed and Reorganized], 中国网医疗频道 [China Net Medical Channel], October 2, 2018, <http://med.china.com.cn/content/pid/47750/tid/3/>.

Table 4-2 (continued). Group Army hospitals current and previous designations

Theater Command	Group Army Hospital	Previous Hospital Designation
Western Theater	76th Group Army Hospital	PLA 536 Hospital ⁴²
	77th Group Army Hospital	PLA 42 Hospital ⁴³
Northern Theater	78th Group Army Hospital	PLA 209 Hospital ⁴⁴
	79th Group Army Hospital	PLA 201 Hospital ⁴⁵
	80th Group Army Hospital	PLA 89 Hospital ⁴⁶
Central Theater	81st Group Army Hospital	PLA 251 Hospital ⁴⁷
	82nd Group Army Hospital	PLA 252 Hospital ⁴⁸
	83rd Group Army Hospital	PLA 371 Hospital ⁴⁹

Before reassignment to the Group Army, most of the hospitals were regiment-grade Joint Logistic Support Force “Level 3” central hospitals that varied in size and organization. The equipment, staffing, and size of those facilities remained intact following the reassignment, leading to GA hospitals with no standard construct. The mission for each hospital transitioned from one of monetary gain based on their relationships with the surrounding civilian populations to one more closely aligned

42. Yin Junfeng [尹俊丰] is listed as a member of the 76th GA in December 2021 and as a member of the former PLA 526 Hospital in a journal article from September 2016. This indicates the former PLA 526 Hospital became the new 76th GA Hospital. Ou Zhucairen [欧殊才仁], “加湿器使用有方法” [How to Use a Humidifier], 中国军网 [China Military Network], December 19, 2021, http://www.81.cn/jfbmap/content/2021-12/19/content_305559.htm; and Huang [黄燕武] et al., “部队青藏高原机动驻训期间鼠疫防控的难点与对策” [Difficulties and Countermeasures of Plague Prevention and Control during Military Training on the Qinghai-Tibet Plateau], 人民军医 [People's Military Surgeon], (September 2016).

43. “7月1日起, 夹江公交线路优化调整!” [On July 1 the Jiajiang Bus Routes Will Be Optimized and Adjusted!], 腾讯QQ [Tencent], June 23, 2021, <https://new.qq.com/rain/a/20210623a0362100>.

44. “弘扬雷锋精神开展巡诊义诊活动” [Carry Forward the Spirit of Lei Feng and Carry Out Free Clinic Activities], 牡丹江新闻网 [Mudanjiang News Network], March 4, 2019, http://www.mdj.gov.cn/shizheng/bmdt/201903/t20190304_275791.html.

45. “陆军第七十九集团军医院（原第201医院）招聘公告” [Recruitment Announcement for the 79th GA Hospital (Formerly 201 Hospital)], 美篇 - 陆军第79集团军医院 [79th GA Hospital Meipian Page], September 22, 2021, <https://www.meipian.cn/3sygg9t5>.

46. Wu Huiling, “Batch of Military Hospitals.”

47. Wu Huiling, “Batch of Military Hospitals.”

48. Wu Huiling, “Batch of Military Hospitals.”

49. Wu Huiling, “Batch of Military Hospitals.”

to wartime preparations and combat support. There is now less focus on scientific research in those hospitals but more training on military skills and physical fitness for assigned personnel.⁵⁰

The new Group Army hospital is seen as providing a necessary link between the Brigade Medical Company and the Joint Logistic Support Force and Joint Logistic Support Center [战区联勤保障中心] (JLSC) hospital system, while also functioning as the support interface [保障界面] between the joint medical service and army medical service. Compared to the brigade medical company, the Group Army hospital has more medical experience and better equipment but is still more focused on the daily medical care of lower-echelon officers and soldiers than division-grade JLSF hospitals. Table 4-3 outlines relative equivalencies of PLA medical units and hospitals according to a Chinese national defense medical journal.⁵¹

Table 4-3. PLA hospitals and civilian hospital equivalents

PLA Medical Unit/Hospital	Equivalent Civilian Medical Center/Hospital
Battalion Medical Platoon	Village Clinic [村卫生室]
Brigade Medical Company	Township Health Center [乡镇卫生院]
Group Army Hospital	County-level Hospital [县区级医院]
JLSF Central Hospital	Municipal-level Hospital [市级医院]
TC General Hospital	Provincial-level Hospital [省级医院]
Army Medical University Hospitals	National-level Hospital [国家级医院]
PLA General Hospital	

During peacetime, the GA hospital solves routine medical issues and is a component of the national public hospital system. It complements the resident public hospital to support civilian operations. During wartime, it is focused on the early treatment of combat trauma and casualties. Its complementary relationship with the resident public hospital also means

50. Guo Jianbin [郭建斌] et al., “新体制下集团军医院转型建设的几点思考” [Reflections on the Transformation and Construction of the Group Military Hospital under the New System], *人民军医* [People's Military Surgeon] 63, no. 9 (September 2020): 873–77; and Chen Liusheng et al., [陈刘生, 木森, 王琪鸿, 王冠梁], “改革调整期间集团军医院科研工作的困难及对策探讨” [Discussion on the Difficulties and Countermeasures of Scientific Research Work in the Group Military Hospital during the Reform and Adjustment Period], *西南国防医药* [Southwest National Defense Medicine] 29, no. 10 (October 2019): 1060–61.

51. Chen Liusheng et al., “Scientific Research Work”; and Dong Zixi [董自西] et al., “关于集团军医院定位相关问题的思考” [Reflections on the Problems Related to the Positioning of the Military Hospital of the Group Army], *西南国防医药* [Southwest National Defense Medicine] 30, no. 6 (June 2020): 576–78.

it can quickly incorporate civilian medical professionals to strengthen the Group Army hospital's ranks during emergencies.⁵²

The wartime issues of medical support are what primarily drove the creation of Group Army hospitals. The Group Army hospital is designed to provide medical teams that carry out the following missions:

- Provide Level 3 critical care for the Group Army campaign rear area
- Replace brigade-level medical stations to provide Level 2 critical care
- Establish various modular support teams to reinforce brigade medical stations

This added layer of medical support is a result of the PLA's self-acknowledged weak technical levels at brigade and division echelons and below. According to a PLA medical journal, the Group Army hospital serves to improve the tactical area's ability to treat combat casualties despite the existing gap in capability at the brigade and division level needed to fulfill modern wartime support requirements.⁵³

Despite the added layer of medical support, the PLA also recognizes that many of its Group Army hospitals are not fully prepared for the requirements of wartime operations, and many remain focused on the monetary profits of civilian medical service. To negate these issues, the PLA issued several policies and regulations to ensure combat readiness requirements are met at Group Army hospitals, but training continues to focus more on individual training and less on combat unit training.⁵⁴

Group Army Support – Staff

After the 2017 reforms, the Group Army has its own support department with a structure very similar to its brigades and closely aligned with TC army staff elements. Most of the brigades' support department subordinate sections are represented at the Group Army level as a division [处] filled with staff that coordinates the same types of functions for the entire Group

52. Dong Zixi, "Problems Related to Positioning."

53. Zhang Wenliang [张文亮] et al., "基于模块加强方式的集团军医院战时运用模式" [On the Wartime Application Model of Group Army Hospital Based on Module Enhancement Model], *解放军医院管理杂志* [*PLA Hospital Admin Journal*] 28, no. 1 (January 2021): 53–55.

54. Dong Zixi, "Problems Related to Positioning."

Army. Although PLA media frequently publicizes the efforts of its GA support departments in establishing regular competitions and training events to improve personnel and unit capabilities, as well as providing oversight of the Group Army's various depots and warehouses, the staff officers of this department exist to plan and coordinate wartime support functions at the campaign level.⁵⁵

Due to the standard structure of support, these elements work directly with their lower-echelon counterparts in the brigades and battalions to ensure provision of supplies, repairs, and medical services. They also write policies and regulations to standardize the requirements of the GA's brigades and hospital. Located in the Group Army command posts during wartime, the staff interacts with joint support elements in the campaign command posts to ensure PLA Army requirements are met and that their own subordinate support units contribute to the joint mission.⁵⁶

Unlike brigades and divisions, which merged their logistics and armaments departments around 2013, the Group Army merged those departments after the 2017 restructure. Therefore, the position of GA support department chief is relatively new. Additionally, it appears the department chief is commonly filled by a deputy division-grade senior colonel, while his chief of staff and political work department counterparts are division-grade officers.⁵⁷ Lower in grade and primarily filled by an officer with only expertise in commanding logistics or equipment support, there will likely be difficulty pushing support requirements to the commander over operational and political requirements until a new generation of better trained officers takes on corps-level support responsibilities.

Finally, since most Chinese media and PLA literature sources focus on division- or brigade-level and smaller exercises, little is known of the operational capability of the new Group Army support department leadership

55. “锤炼实战环境应急保障能力” [Practicing the Emergency Support Capability in a Realistic Combat Environment], 中国军网 [China Military Network], May 30, 2018, http://www.81.cn/jfjbmap/content/2018-05/30/content_207382.htm; Pang Hao [庞浩], “奔着问题去 紧盯难题改” [Go the Problem and Keep an Eye on It], 中国军网 [China Military Network], September 2, 2019, http://www.81.cn/jfjbmap/content/2019-09/02/content_242337.htm; Lai Wenyong, Zhang Rong, and Yu Xiaoming [赖文湧, 张榕, 余小明], “改变‘配角’思维, 这次集训真的不一样” [Change the Thought on “Supporting Role,” This Training Is Really Dif], 中国军网 [China Military Network], July 18, 2018, http://www.81.cn/jmywy/2018-07/18/content_8092211.htm; and “Focus on Military Reform: How Advanced Is the Small, Scattered Unit of 5 People?”

56. Lai Wenyong, Zhang Rong, and Yu Xiaoming, “Change the Thought on ‘Supporting Role’”; and “第71集团军在实兵对抗演练中检验后装保障能力” [The 71st Group Army Tests the Logistics and Equipment Support Capability in a Realistic Force-on-Force Exercise], 新华社 [Xinhua (website)], October 3, 2021, <http://www.workercn.cn/34066/202110/03/211003090912964.shtml>.

57. OSD, *2021 Directory of PRC Military Personalities*.

and staff. People's Liberation Army media did publicize the efforts of support department officials from the 78th Group Army, Northern Theater Command, in successfully coordinating the movement of personnel and equipment to Eastern Russia for Vostok-2018, however, that mission was near the borders of China. Chinese media reporting on the PLA's participation in Tsentr-2019 the following year covered the deployment of heavy CA BDE troops, equipment, and aviation brigade helicopters from the 76th Group Army, Western Theater Command, to Orenburg, Russia. The units deployed over 2,500 miles from garrison for the exercise. Although both events occurred during peacetime, the complex requirements of road and rail transport and supply across international borders likely provided the PLA with experience executing Group Army support department missions.⁵⁸

Theater Command Army and Military District Support

The Theater Command Army, with its four missions of being a campaign headquarters for combat operations, a component of the theater joint command post, a construction headquarters, and an emergency response headquarters for nontraditional security tasks, provides operational and logistics support to its subordinate tactical units through unique organizations, rear area depots, and a robust staff.⁵⁹

The PLAA-managed Xinjiang and Tibet Military Districts (MD) also have their own support systems that share commonalities with the lower-echelon Group Army and the higher-echelon Theater Command Army. Like the Group Army, these higher echelons only recently merged their logistics and equipment support departments into one support department following the 2017 restructure. The Tibet Military District assumed command of the previously existing Qinghai-Tibet Depot (青藏兵站部) and the

58. Xiang Yong, Deng Qingying, and An Yang [向勇, 邓庆颖, 安阳], “为了打赢明天的战争” [To Win Tomorrow's War], 中国军网 [China Military Network], September 26, 2018, http://www.81.cn/gfbmap/content/2018-09/26/content_216629.htm; Xin Wen [辛闻], “国防部: 中国军队将参加俄军“中部-2019”演习” [Ministry of National Defense: The Chinese Military Will Participate in the Russian Military's “Tsentr-2019” Exercise], 中国网 [China Network], August 29, 2019, http://military.china.com.cn/2019-08/29/content_75151322.htm; and “西部战区这支精锐部队将代表中国参加俄罗斯军演” [This Elite Unit of the Western Theater Will Represent China in the Russian Military Exercise], 搜狐 [Sohu], September 7, 2019, https://www.sohu.com/a/339406747_100283099.

59. “战区陆军既要主战也要主建” [The Theater Army Is Not Only the Primary in Combat but Also in Construction], 解放军报 [PLA Daily (website)], May 10, 2016, <http://military.people.com.cn/n1/2016/0510/c1011-28339468.html>.

Sichuan-Tibet Depot (川藏兵站部) that have their own transportation units designed to resupply PLAA forces at the highest elevations.⁶⁰

Theater Command Army and Military District Support – Forces

In addition to Group Armies, TC Army leaders command various units that protect China's borders and coastlines, support the joint force with signal and ISR assets, and in some theaters, improve maneuver with bridging assets and increase force project capability with transportation units. Although Xinjiang and Tibet Military District commanders also have these forces, their primary combat forces are more in line with those found in a Group Army. The army support departments within Theater Commands and Military Districts are large organizations that have more than 30 different units, most at regiment or battalion and company grade, which include transportation, repair, medical, storage depots, training, and other elements.⁶¹

Motor transportation brigades (汽车运输旅) and regiments make up the main support forces within Theater Commands and Military Districts for the transportation of goods and heavy equipment. According to a September 2019 *PLA Daily* article, the motor transportation units were newly established in 2018, though they were probably reconfigured from previous motor transport units assigned to the former Joint Logistics Department and its JLSF successor. It remains unclear if all theater armies have motor transportation brigades. There is ample PLA media covering the Southern Theater Command Army motor transportation brigade, also called the 1st Motor Transportation Brigade, and even more coverage following the exploits of several Xinjiang and Tibet Military District brigades and regiments,

60. Xu Na [许娜], “陆军青藏兵站部某汽车运输旅官兵祭奠革命先烈传承红色基因 担当强军重任” [The Officers and Soldiers of the Qinghai-Tibet Military Station of the PLAA Pay Tribute to Revolutionary Martyrs, Inherit the Red Gene and Take on Important Tasks of Strengthening the Military], 青海省人民政府网 [The People's Government of Qinghai Province News], April 6, 2019, <http://www.qinghai.gov.cn/zwgk/system/2019/04/06/010327919.shtml>; and Lin Tao [林涛], “西藏军区川藏兵站部提升宿营点保障水平 过往官兵实现拎包入住” [The Sichuan-Tibet Military Station of the Tibet MD Has Improved Garrison Security Levels], 解放军报 [*PLA Daily* (website)], October 31, 2021, <https://news.cctv.com/2021/10/31/ARTIwrKfhTgUfWKSZoNVDq7F211031.shtml>.

61. “解放军五大战区陆军、海军、空军新组建的保障部全部亮相” [The Newly Formed Support Departments of the Five Theater Army, Navy, and Air Force Commands Are Unveiled], 澎湃新闻 [*Paper* (website)], December 17, 2017, http://m.thepaper.cn/kuaiobao_detail.jsp?contid=1909803&from=kuaiobao.

but there is almost no evidence of these types of brigades in the other Theater Command Armies.⁶²

Based on the limited amount of information available on PLA motor transport brigades and regiments, very little is known about the organization and numbers or types of trucks they maintain. The Southern Theater Command Army motor transportation brigade, for example, uses the Steyr 91 to transport fuel within its area of operations, while also using various types of cargo trucks to move other types of supplies.⁶³ It is also unclear if the PLAA units have heavy equipment transporters like their JLSF motor transportation brigade counterparts.

Even if they lack heavy equipment transporters, the known PLAA motor transportation brigades and regiments appear to play a vital role in sustaining border defense and maneuver forces located in the complex terrain along China's western and southern borders. Border defense brigades and regiments do not have a superior Group Army organization to plan and execute coordinated sustainment missions. They are directly subordinate to the Theater Command Army or Military District, thus requiring those echelons to provide transportation support for food, fuel, and ammunition. For example, according to *PLA Daily* and China Central Television (CCTV),

62. Huang Xiang, Ma Zhaoshan, and Zhu Gang [黄翔, 马兆山, 祝刚], “陆军首次汽车运输旅(团)比武竞赛在天津落幕” [The Army's First Motor Transportation Brigade (Regiment) Competition Ended in Tianjin], 解放军报 [*PLA Daily* (website)], May 13, 2019, http://www.81.cn/jwgz/2019-05/13/content_9502208.htm; Li Jing [李晶], “‘任务本’新启, 看强能汽车兵如何高原升级?” [“The Mission Book” Is New, See How the Powerful Vehicle Soldiers Can Be Upgraded on the Plateau?], 中国军网 [China Military Network], November 1, 2019, http://www.81.cn/zq/2019-11/01/content_9684248.htm; Zhu Ying, Yang Shengchao, and Wang Chuanlong [朱颖, 杨胜超, 王传龙], “南部战区陆军某汽车旅这样完成年度首趟油料运输任务” [A Southern Theater Army Motor Transportation Brigade Completed the First Fuel Transport Mission of the Year], 中国军网 [China Military Network], April 22, 2020, http://www.81.cn/jmywyl/2020-04/22/content_9798344.htm; Xu Ye [徐立业] et al., “军车‘飞跃断桥’汽车兵炫技全程高能!” [Military Vehicles “Fly over Broken Bridges” – Vehicle Soldiers Show off Their Skills with High Energy throughout the Process], 中国军网八一电视 [81.cn TV], July 9, 2020, http://tv.81.cn/jq360/2020-07/09/content_9849964.htm; Chang Xin [常鑫], “有了这个‘神器’高原汽车兵遇到积雪路更安全了” [With This ‘Artifact’ Plateau Vehicle Soldiers Are Safer When Encountering Snow-covered Roads], 中国军视网 [China Military Television Network], January 7, 2022, http://www.js7tv.cn/video/202201_267431.html; Zhang Feng [张丰] et al., “雪域高原 | 一名高原汽车兵与昆仑山的告别” [Snow-covered Plateau – A Plateau Vehicle Soldier Bids Farewell to the Kunlun Mountains], 中国军网八一电视 [81.cn TV], October 26, 2020, http://tv.81.cn/jq360/2020-10/26/content_9923222.htm; Han Cheng [韩成], “跨越千里的108封家书, 温暖了天路汽车兵” [108 Letters from Home Crossed Thousands of Miles to Warm the Tianlu Vehicle Soldiers], 新华网 [*Xinhua* (website)], January 31, 2021, http://www.xinhuanet.com/mil/2021-01/31/c_1211005161.htm; “[军事报道] 直击演训场 滇藏线上 汽车兵走一路练一路” [Military Report: Directly Hit the Training Ground, the Yunnan-Tibet Line Vehicle Soldiers Go All the Way], 央视网 [CCTV], November 3, 2020, <https://tv.cctv.com/2020/11/03/VIDEPLrGs76Nr3iNIjhAug201103.shtml>; and “西藏军区某汽车运输旅千里机动保战鹰燃油不断线” [A Tibet MD Motor Transportation Brigade Keeps the Fuel Line for the War Eagle for Thousands of Miles], 央广军事 [Central Radio Military], February 7, 2022, http://military.cnr.cn/zgj/20220207/t20220207_525735362.html.

63. “Tibet MD Motor Transportation Brigade”; and Zhu Ying, Yang Shengchao, and Wang Chuanlong, “Southern Theater Army Motor Transportation Brigade.”

the Southern Theater Command Army motor transportation brigade performed the following actions to support units near China's southern border:

- April 2019: Delivered 100+ tons of goods and fuel while conducting individual driver training for 14 personnel.⁶⁴
- April 2020: Dispatched 60 personnel in 20+ fuel trucks (each capable of carrying 20,000 liters of fuel) over 1,400 kilometers from Kunming to Tibet.⁶⁵
- November 2020: Dispatched 150 vehicles to deliver 900+ tons of goods from Kunming to Tibet.⁶⁶

The Theater Command Army and MD support departments also have several types of support units that make up for the lack of repair elements needed for border and coastal defense and other elements not subordinated to the Group Armies. All TC Armies and Military Districts have general purpose units, referred to as support *daduis* (保障大队), that focus on all aspects of maintenance and repair. While it is unclear if they are found in all TC Armies and Military Districts, there are also more specific support elements focused on repairing different types of equipment such as armored equipment repair *daduis* (装甲装备修理大队) and equipment support *daduis* (装备保障大队).⁶⁷ Unlike Group Army support battalions, there is no PLA media reporting on the ability of these units to serve as combat support modules, but they can likely provide additional support capacity during times of crisis.

64. Zhu Ying, Sun Minzhe, and Liu Sijia [朱颖, 孙民哲, 刘思佳], “南部战区陆军汽车某旅以任务为牵引加强驾驶员培训” [A Southern Theater Command Army Motor Transportation Brigade Strengthens Driver Training with Mission-driven Traction], 中国军网 [China Military Network], August 17, 2018, http://www.81.cn/zq/2019-08/17/content_9592976.htm.

65. Zhu Ying, Yang Shengchao, and Wang Chuanlong, “Southern Theater Army Motor Transportation Brigade.”

66. “Military Report: Directly Hit the Training Ground, the Yunnan-Tibet Line Vehicle Soldiers Go All the Way.”

67. Zhang Hongbo and Lei Ziyuan [张洪波, 雷梓园], “普通一兵如何跃升为指控通信维修专家, 这里有答案” [How Did an Ordinary Soldier Jump to a Command Communications Repair Specialist — Here Is the Answer], 中国军网 [China Military Network], June 27, 2019, http://www.81.cn/lj/2019-06/27/content_9541191.htm; Lei Ziyuan [雷梓园], “东部战区陆军某装备保障大队务实举措助力‘一肩双挑’” [The Pragmatic Measures of an Equipment Support *Dadui* of the Eastern Theater Army Helps “an Individual Shoulder Two Challenges”], 中国军网 [China Military Network], October 23, 2019, http://www.81.cn/lj/2019-10/23/content_9659182.htm; and Lu Zhiqiang and Wang Shexing [吕志强, 王社兴], “数百公里外坦克故障 解放军高手电话中指导修好” [Tank Failure Hundreds of Kilometers Away], 解放军报 [PLA Daily (website)], March 31, 2016, <https://www.chinanews.com.cn/m/mil/2016/03-31/7818505.shtml>.

Theater Armies do not have subordinate hospitals as medical care since that echelon is the responsibility of Theater Command JLSF and JLSC hospitals. The Xinjiang and Tibet Military Districts both have their own long-established tertiary third-class PLAA hospitals, in Urumqi and Lhasa respectively, that provide vital medical care to troops stationed in the plateau and high-elevation border areas. Although both MD hospitals have been around for decades, they have recently been upgraded, including the construction of military helicopter landing pads, to improve rapid response care for remotely stationed troops.⁶⁸

Theater Command Army and Military District Support – Staff

Like the Group Armies, TC Armies and the Xinjiang and Tibet Military Districts combined their logistics and equipment departments after the restructure; the primary difference was that the new TC Army and MD support department have some divisions that reflect their high echelon. People's Liberation Army provincial Military Districts also merged their support elements into one subordinate support bureau (局), but this paper does not cover that echelon of support. Table 4-4 details the staff divisions that make up TC Army and MD support departments observed in Chinese media and official government websites.

These high-echelon offices coordinate the support actions of all TC Army and MD units and staffs while also serving at the theater level to integrate army capabilities into and ensure support from the TC joint staff department combat support bureau. They also work closely with TC JLSC elements to supply subordinate units with common-use supplies like fuel and ammunition, while the TC Army staff department coordinates the delivery of more specialized army-specific munitions and equipment. The following section details how the PLA Army executes this distribution from campaign to tactical levels.

68. Zhang Hongbo and Lei Ziyuan, "How Did an Ordinary Soldier Jump"; Lei Ziyuan, "Pragmatic Measures of an Equipment Support Dadui"; and Lu Zhiqiang and Wang Shexing, "Tank Failure Hundreds of Kilometers Away."

Table 4-4. Theater Command and Military District support departments⁶⁹

Division	Chinese
Combat Service Planning Division	战勤计划处
Military Facilities Construction Division	军事设施建设处
Materials Supply Division	物资供应处
Medical Division	卫生处
Ammunition Materials Division	弹药器材处
Transportation and Delivery Division	运输投送处
Finance Division	财务处
Equipment Repair Division	装备维修处
Technical Support Division	技术保障处
Subordinate Political Work Division	直属工作处

69. Zhang Yuan [张媛], “北部战区部队千里机动检验后装保障能力” [Northern Theater Troops Conduct a 1,000-mile Maneuver to Test the Logistics and Equipment Support Capability], 央视网 [CCTV], June 23, 2019, <http://m.news.cctv.com/2019/06/23/ARTIqV5KuLooXdEzYLUhJty190623.shtml>; Chen Yu and Xiong Xu [陈羽, 熊旭], “北部战区陆军与驻地建立常态协调机制” [Establish a Normal Coordination Mechanism between the Northern Theater Army and the Locals], 中国国防报 [China National Defense Report], March 18, 2018, <http://military.people.com.cn/n1/2021/0318/c1011-32054619.html>; Cheng Yu and Huang Zijuan [陈羽, 黄子娟], “军地携手, 打赢‘舌尖上的战斗’” [The Military and the Land Join Hands to Win the “Battle on the Tip of the Tongue”], 中国国防报 [China National Defense Report], January 3, 2020, <http://military.people.com.cn/n1/2020/0103/c1011-31533769.html>; Xue Weigao and Li Tianmengdan [薛维高, 李田梦丹], “东部战区陆军52名校尉军官、士官和文职人员齐聚3天, 干了一件事!” [52 Officers, NCOs, and Civilians in the Eastern Theater Army Gathered for Three Days and Did One Thing!], 中国军网 [China Military Network], November 1, 2011, http://www.81.cn/zq/2020-11/01/content_9928545.htm; Meng Baochun and Han Suting [孟宝春, 韩素婷], “鏖战‘玛依他乌’: 新疆军区销毁废旧地雷爆破器材” [Fighting “Mayitawu”: Xinjiang Military Region Destroys Abandoned Mine Blasting Equipment], 解放军报 [PLA Daily (website)], October 15, 2018, http://www.81.cn/jmbl/2018-10/15/content_9321946.htm; Sun Xingwei and Zhao Jinshi [孙兴维, 赵金石], “天路之问: ‘从边防老三样如何到按需点’菜” [Questions on the Road: “How to Order ‘Dishes’ on Demand”], 中国军网 [China Military Network], April 2, 2018, http://www.81.cn/jmywyl/2018-04/02/content_7990433_2.htm; Xu Mingming and Yu Jinhui [许明智, 余金虎], “‘红管家’升级版诞生记: 军民融合管好‘钱袋子’” [The Birth of the Upgraded Version of the “Red Butler”: Military-civilian Integration to Manage the Bag of Money], 中国军网 [China Military Network], June 23, 2018, http://www.81.cn/jmbl/2018-06/23/content_8068978_2.htm; Wang Ensheng and Ma Sancheng [王恩生, 马三成], “西藏军区各级领导机关干部常态化参加边防一线巡逻” [Cadres of Leading Organs at All Levels in the Tibet Military Region Regularly Participate in Front-line Border Defense Patrols], 解放军报 [PLA Daily (website)], February 12, 2022, http://www.mod.gov.cn/power/2022-02/12/content_4904716.htm; Wang Ensheng and Ma Sancheng [王恩生, 马三成], “大力弘扬‘老西藏精神’当好强军固边‘领头雁’” [Vigorously Promote the “Old Tibetan Spirit” and Become the “Lead Wild Goose”], 解放军报 [PLA Daily (website)], February 12, 2022, http://www.81.cn/jfjbmapp/content/1/2022-02/12/01/2022021201_pdf.pdf; Hu Yuncheng [胡运成], “适应陆军转型 聚焦强军目标推动新疆军区部队装备维修保障工作创新发展” [Adapting to the Transformation of the Army: Focusing on the Goal of Strengthening the Army, Promoting Innovation, and Developing Xinjiang Military Region Equipment Maintenance and Support Work], 车运用 [Vehicle Application] 9 (2017): 7-8.

PLAA Supply Requests and Distribution by Echelon

Despite the People's Liberation Army's post-restructure organizational changes, long-standing logistics relationships and processes remained in place. According to various Chinese journal articles, PLAA logistics entities at all echelons are struggling to work through the challenges of having new organizations and old systems.

Sustainment under the “new system” of Theater Commands and the Joint Logistic Support Force changed how units request and receive supplies. Described in Chinese texts as “a combination of centralized and decentralized; two lines of supply: common and specialized” (“统分结合, 通专两线”), the new supply system places the Joint Logistic Support Force in charge of providing supplies common to all PLA services while a TC-based service-specific logistics entity handles supplies unique to each service.⁷⁰ PLA Army logisticians describe three levels of logistics: “strategic-level” logistics consisting of strategic-level suppliers and warehouses (not discussed in this paper), “campaign-level” logistics denoted as roughly above Group Army level, and “tactical level” logistics for units below Group Army level.⁷¹

At the campaign level, the primary department responsible for Theater Command Army supplies and distribution is the Theater Command Joint Staff Department (JSD) Combat Support Bureau (战区联合参谋部战勤局) with its subordinate Combat Support Plans Division (战勤计划处) and Forces Delivery Division (力量投送处). The latter divisions transmit supply allocation tasks to the TC JLSC and TC Army Support Department. The two departments' rear warehouses ultimately deliver the requested goods to PLAA operational units of all sizes, depending on mission requirements. During peacetime, Group Armies submit supply requests to the Theater Command JLSC and Theater Command Army Support Department. During wartime, group armies submit supply requests to the Theater Command JSD Combat Support Bureau itself for centralized planning.⁷² PLA Army texts discuss this centralization of requests and raise concerns

70. Yang Xueming, Xun Ye, and Li Xidong [杨学铭, 荀 焯, 李锡栋], “新体制下战区陆军物资配送保障模式研究” [Study on Theater Ground Force Supplies Distribution and Support Mode under New System], *物流技术* [*Logistics Technology*] 37, no. 2 (February 2018): 126–30.

71. Xun Ye, Li Wenyuan, Dang Weitao, and Yang Xueming [荀焯, 李文源, 党伟滔, 杨学铭], “新体制下战区陆军物资配送保障网络规划设计” [Planning and Design of Ground Force Theater Material Distribution Support Network under the New System], *物流技术* [*Logistics Technology*] 38, no. 8 (August 2019): 123–27.

72. Yang Xueming, Xun Ye, and Li Xidong, “Theater Ground Force Supplies Distribution,” 48–52.

about how best to handle a bottleneck of approvals with logistics decisionmakers at higher echelons and how to prioritize requests within the backlog.⁷³

At the tactical level, units submit requests by echelon and, when able, provide supplies to subordinate units within a Group Army or brigade. Smaller units send requirements to brigades that task their subordinate stockpiles and/or service support units to provide the needed supplies or services. During peacetime, units at the tactical level supply lower-level logistics need as much as possible. During wartime, units send requirements to higher levels to leverage the robust logistics force of the campaign-level to complete support missions more effectively.

The PLA Army's new transportation and distribution command information chain is comprised of three levels: the Central Military Commission (CMC), Theater Commands, and Critical Areas (关键地域). The basic tasks are "report through relevant centralized authorities, higher level examine and approve, and multi-level management" (归口提包, 逐级审批, 多级管理). Brigade-level units are the primary "report through relevant centralized authorities" unit. The "higher level examine and approve" means, using the PLA Army as an example, that group armies gather and examine subordinate brigade-level and direct reporting units' transportation and distribution plans. Theater Command Armies then gather and examine the group armies' plans, and finally the PLAA (service-level) Logistics Department Transportation and Delivery Bureau (陆军后勤部运输投送局) gathers and examines the Theater Command Army and other direct reporting units' plans. Any time a service crosses Theater Commands or an international border or other large special project, the transportation/distribution plan typically requires CMC Logistics Support Department Transportation and Delivery Bureau (军委后勤保障部运输投送局) inspection and approval. People's Liberation Army texts suggest logistical decision making in the new system remains untested and recommend taking every opportunity (for example, conscript mobilization/demobilization, natural disasters, "counter-terrorism stability operations," and border conflicts) to practice and optimize logistics processes.⁷⁴

PLAA Supply Distribution

Following the request and approval process, PLA texts detail four methods of supply distribution. Tactical units provide resources down to subordinate

73. Wang Jianguo, Liu Zhong, and Zhang Heng [王建国, 刘中, 张衡], "新体制下运输投送机构调度指挥信息链效能评估模型" [Efficiency Evaluation Model of Dispatching Command Information Chain of Transport Delivery Institutions under New System], 军事交通学院学报 [*Journal of Military Transportation University*] 21, no. 10 (October 2019): 19–23, 56.

74. Wang Jianguo, Liu Zhong, and Zhang Heng, "Efficiency Evaluation Model," 19–23, 56.

units within group armies or brigades using the standard model known as the “Independent Distribution and Support Model” (自主配送保障模式). This model is based on pre-restructure processes, though it has changed slightly due to new organizations.⁷⁵

A slight adjustment to the standard model is the “Direct Distribution and Support Model” (直达配送保障模式), where campaign-level entities (such as JLSC warehouses or TC Army Support Department units) provide goods directly to operational units, bypassing group armies and brigades. The PLA Army believes this model increases efficiency and precision while saving material storage room and transfer costs.⁷⁶ Figure 4-2 depicts the PLAA’s two standard distribution models.

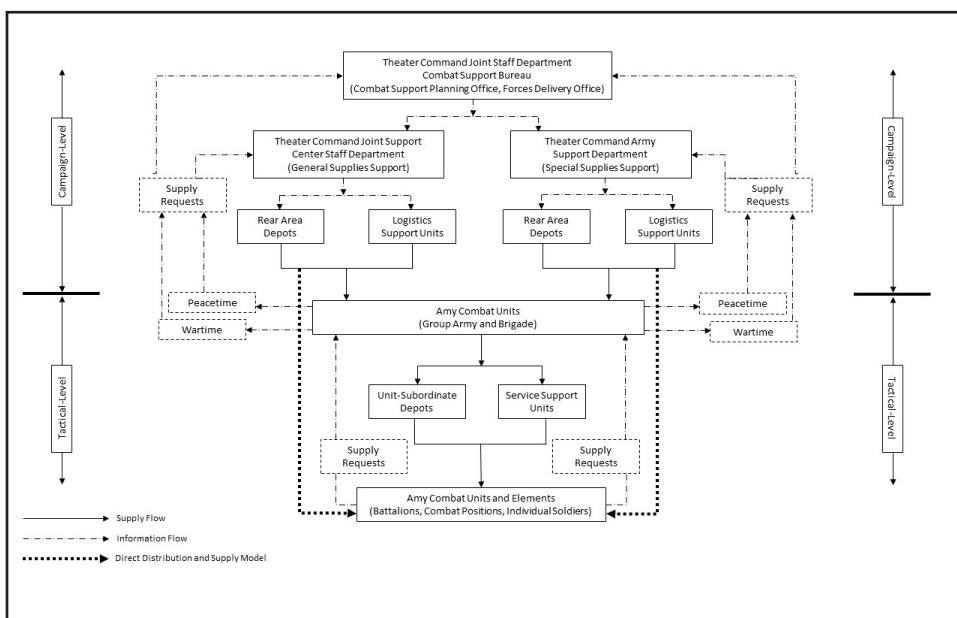


Figure 4-2. Examples of the independent distribution and support model and the direct distribution and support model

(Source: Yang Xueming, Xun Ye, and Li Xidong, “Study on Theater Ground Force Supplies Distribution and Support Mode under New System.”)

People’s Liberation Army texts describe two additional distribution methods that utilize local civilian entities in military distribution. Descriptions indicate these methods could be used in peacetime and wartime. The “Military-Civilian Joint Distribution and Support Model” [军地联合配送保障模式] integrates local logistics firms (such as Dongjing, SF Express,

75. Yang Xueming, Xun Ye, and Li Xidong, “Theater Ground Force Supplies Distribution,” 48–52.

76. Yang Xueming, Xun Ye, and Li Xidong, “Theater Ground Force Supplies Distribution,” 48–52.

and EMS) to distribute goods from campaign-level sites to Group Armies, brigades, or smaller units. Despite the PLA Army's belief that this system could work in wartime, it would be unlikely that civilian delivery services could provide the necessary support beyond China's borders.⁷⁷

The fourth distribution model takes military-civilian integration a step further—the “Collaborative Distribution and Support Model” (共同配送保障模式) brings civilian suppliers directly into the supply distribution plan under the TC JLSC to collaborate in providing supplies for distribution down to the tactical units for maximum efficiency and effectiveness. PLA texts note that the Collaborative Model is the most advantageous in the era of informationization. However, like the Military-Civilian Joint Distribution and Support Method, this model would likely be untenable during wartime outside of China's borders.⁷⁸ Figure 4-3 depicts the two PLAA military-civilian integrated distribution concepts.

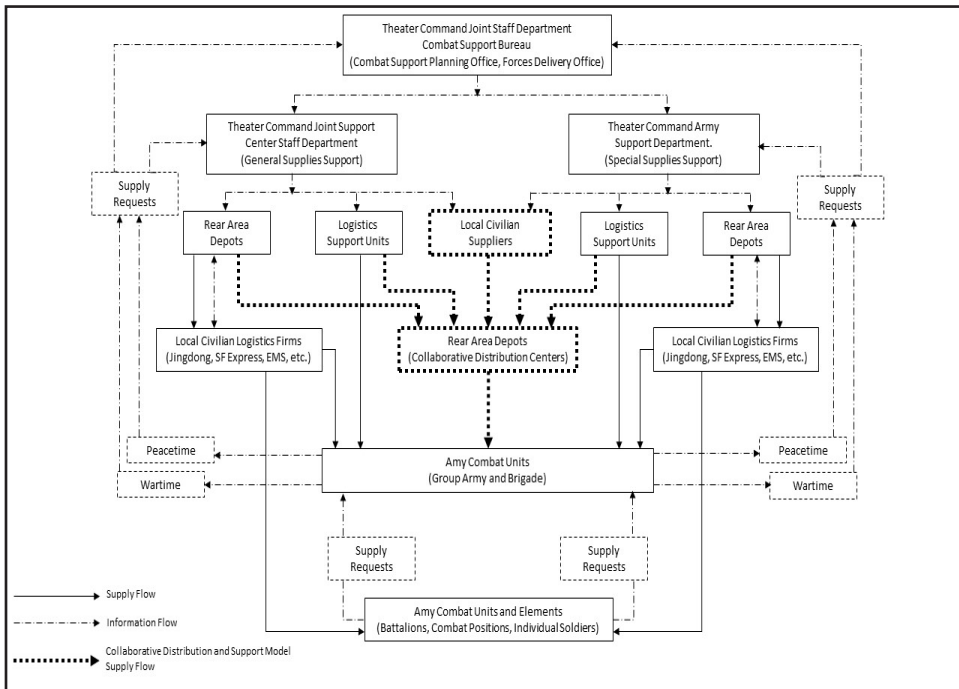


Figure 4-3. Examples of the military-civilian joint distribution and support model and the collaborative distribution and support model

(Source: Yang Xueming, Xun Ye, and Li Xidong, “Study on Theater Ground Force Supplies Distribution and Support Mode under New System.”)

77. Yang Xueming, Xun Ye, and Li Xidong, “Theater Ground Force Supplies Distribution,” 48–52.

78. Yang Xueming, Xun Ye, and Li Xidong, “Theater Ground Force Supplies Distribution,” 48–52.

A demonstration of the collaborative distribution model occurred in early February 2022 when, according to a CCTV news report, a motor transportation regiment in the Xinjiang Military District transported a Lunar New Year feast to a unit located near the Line of Actual Control in the Aksai Chin.⁷⁹ According to the Xinjiang Military District Support Department Material Supply Division Director Zhao Huaizong, an “emergency purchase method” was used to purchase the food, the Central Military Commission coordinated civilian transportation, the goods were transported from Xiamen to Ali by air, and then the motor transport regiment transported the goods by road from Ali to the extremely remote unit. While not a combat scenario, this operation displays a real-world application of the collaborative distribution model between the People’s Liberation Army and PRC civilian businesses.

The PLA TC Army and local government pronouncements provide insight into how PLA TC Armies, government, and businesses interact. In 2018, the Eastern and Central TC Armies published announcements asking companies to submit applications to join a “New-type Military-Business Supermarket Coordination Warehouse” (新型军营超市合作商库).⁸⁰ The requests vary in detail and include commissary-like arrangements but require applicants to have large amounts of storage space, several business outlets, and the ability to supply the theater army in peace, war, and emergencies (平战应急). Even more telling is a 2018 request from the Western Theater Command for “material suppliers” (物资供应商) for 26 kinds of equipment and materials, including office, telecom, meteorological, intelligence, technical reconnaissance, military training, electronic warfare, military transportation, POL, bivouac, engineer, protection, rapid repair, barracks, building material, and mechanical/electrical products.⁸¹ As discussed in PLA literature, Theater Command Armies are working with local businesses to enhance their logistical abilities in peacetime, emergencies, and likely in times of conflict.

79. “军事报道]新春走军营 新春年货送抵喀喇昆仑边防一线” [Military Affairs Report, Spring Festival Comes to the Military Camp: Spring Festival Goods Delivered to the Border Defense Front Lines at the Karakorum], 央视网 [CCTV-7], February 3, 2021, <https://tv.cctv.com/2021/02/03/VIDE1jK5o4c7ofUcGB2LwCzX210203.shtml>.

80. “中部战区陆军部队军营超市合作商库征集公告” [Central Theater Army Forces’ Military Camp Supermarket Cooperation Merchants and Warehouses Recruitment Announcement], 中国财经报 [China Financial and Economic News], February 1, 2018, http://www.cfen.com.cn/zxpd/zfcgxxgg/201802/t20180201_2804693.html; “关于建立东部战区陆军新型军营超市合作商库的公告” [Announcement Regarding the Construction of the Central Theater Army New-type Military Camp Supermarket Cooperative Businesses], 徐州政府采购网 [Xuzhou Government Procurement (website)], February 24, 2018, <http://czj.xz.gov.cn/Home/HomeDetails?type=5&articleid=d3565c37-7c66-4096-a6a9-26cddb7df185>.

81. “西部战区陆军部队物资供应商库入库公报” [Western Theater Army Forces’ Logistics Supplier Recruitment Announcement], 酒泉日报 [Jiuquan Daily (website)], May 28, 2018, <https://www.jiuquan.cc/33446.html>.

PLAA Transport and Distribution Shortfalls

Numerous post-restructure PLA Army writings discuss the shortcomings of ground-force distribution support in the People's Liberation Army. Chinese military journal articles describe numerous areas of improvement in transportation and distribution, including a continuing lack of clarity on command process and authorities, an army logistics system almost solely dependent on land transport, a lack of logistics equipment and capability, and other difficulties.

Authors from the Army Military Transportation University wrote in summer 2019 that if the PLA Army were to execute maneuver operations and full-spectrum operations, then the PLA Army must greatly increase units' ability to project forces. The article more specifically noted that the PLA Army must rectify the transportation and distribution shortcomings of insufficient equipment numbers, slow projection speed, and weak projection ability.⁸²

In 2018, other commentaries noted the TC army supply distribution systems and organizations were insufficient, the distribution of work was flawed, and system efficiency was not high, significantly impacting the completion of supply distribution support missions and negatively influencing unit combat power.⁸³ Despite the inclusion of air and sea movement in some cross-theater exercises, army commanders and transportation planners still overwhelmingly saw ground transport (such as highways and railroads) as the primary form of projection for land units.⁸⁴ This "railroad transport + motor movement" ground transport method is a type of "peace-time transport" organization that does not satisfy the requirements of real combat, in the authors' view.⁸⁵

Multiple post-restructure Chinese journal articles stated the primary limiting factor in TC army forces conducting long-distance maneuvers was the weakness of PLAA force projection. Rapid transport of ground forces was limited due to a dependency on railroad and highway transport and little sea or air force projection ability and the PLA Army possessing

82. Wang Lei, Li Peng, and Li Lianbang [王磊, 李鹏, 李联邦], "陆军运输投送转型建设研究" [Research on Transformation and Development of Army Transportation and Projection], *军事交通学院学报* [*Journal of Military Transportation University*] 21, no. 6 (June 2019): 5–7, 12.

83. Yang Xueming, Xun Ye, and Li Xidong, "Theater Ground Force Supplies Distribution."

84. Yan Ji, Li Xin, and Lu Yujie [燕吉, 李欣, 鲁宇杰], "陆军装备维修器材军民融合二级配送网络规划设计" [Planning and Design of Civil-military Integrated Secondary Distribution Network for Army Equipment Maintenance Equipment], *军事交通学院学报* [*Journal of Military Transportation University*] 22, no. 7, (July 2020): 89–95; and Wang Lei, Li Peng, and Li Lianbang, "Research on Transformation," 5–7, 12.

85. Wang Lei, Li Peng, and Li Lianbang, "Research on Transformation," 5–7, 12.

too few heavy equipment transporters. One article from 2017 claimed the People's Liberation Army had an 18-to-1 ratio of heavy equipment transporter to heavy tracked-vehicle, far below the US military proportion of one heavy equipment transporter per seven tracked vehicles.⁸⁶ Evaluations of PLA Army sustainment during the PRC-Indian standoff at Doklam in 2017 also noted that logistics primarily relied on land-motorized transportation due to rail transport ending at Lhasa and no airfields near the front able to accommodate large transport aircraft.⁸⁷

Other PLA commentators noted that PLAA logistics organizations and processes remained incomplete. Observers stated in 2018 that the TC army distribution system's informationization utilization level was not high and the transmission, execution, and feedback of information was slow and inefficient.⁸⁸ Discussing command information in distribution and support in October 2019, PLAA academics noted "new system" logistics policies were not complete, some command authorities and responsibilities remained unclear, and the command flow was not smooth.⁸⁹ Other authors discussing the TC army equipment support system in May 2021 noted the creation of the TC army reduced command layers and improved command flow generally, but the short time since establishment of the new system meant myriad aspects of the reforms remained unclear or incomplete, including some new organizations and aspects of command and information flow.⁹⁰ Regarding transportation plans, authors noted that at least three levels (Group Army or Brigade, theater service, and a service organ) inspect each plan and that requests frequently "pile up" in the system during times of high demand.⁹¹ In the context of PLAA storage and transport,

86. Hu Haijun and Yao Yuan [胡海军, 姚远], "战区陆军运输投送保障能力转型建设" [Transformation and Construction of Army Transportation Delivery Support Capability in Theater], *军事交通学院学报* [*Journal of Military Transportation University*] 22, no. 4 (April 2020): 1-4; and Wang Jianping, Li Qinzhen, Qian Lifeng, and Liu Haifeng, "Support Capacity Construction of Heavy Equipment Highway Transportation under New System."

87. Xie Jiaxin and Xun Ye [谢佳欣, 荀焯], "浅谈中印边境作战的后勤保障" [Discussion on Logistics Support in Sino-Indian Border Operations], *物流技术* [*Logistics Technology*] 37, no. 9 (September 2018): 138-41.

88. Yang Xueming, Xun Ye, and Li Xidong, "Study on Theater Ground Force Supplies," 48-52.

89. Wang Jianguo, Liu Zhong, and Zhang Heng, "Efficiency Evaluation Model," 19-23, 56.

90. Liu Wenkai, Ma Yali, Wang Bin, and Xie Daiqing [刘文开, 马雅丽, 王宾, 谢代清], "战区陆军装备保障体系复杂适应性研究" [Complex Adaptability of Theater Army Equipment Support System], *军事交通学院学报* [*Journal of Military Transportation University*] 23, no. 5 (May 2021): 28-32.

91. Wang Jianguo, Liu Zhong, and Zhang Heng, "Efficiency Evaluation Model," 19-23, 56.

commentators' first recommendation was a reduction in the number of management layers to increase logistics efficiency.⁹²

Academics noted several operational areas where PLAA logistics lagged behind either PLA expectations or common international military logistics practices. Containerization, despite its widespread use by PRC companies, is rarely used in PLAA logistics at the brigade level or below. The lack of containerization and logistics standardization slows down support before deployment to training or operations and results in unit warehouses using manpower to transfer or move materiel, instead of fully utilizing forklifts and other capabilities.⁹³ An article recommending prepositioning supplies for future domestic (and potentially foreign) contingencies suggested the PLA Army does not regularly preposition supplies in case of future operations.⁹⁴ Transport facilities around China and in neighboring countries are low quality and frequently are unable to accommodate the passage, loading, or unloading of military equipment—whether poor roads, antiquated railway stations, or civilian ports without roll-on/roll-off terminals for rapid-troop loading.⁹⁵

According to various Chinese journal articles, TC army civilian-military joint supply missions are a small proportion of overall missions, and the degree of civil-military integration is low because of issues with relevant policies and civil-military supply chain coordination mechanisms.⁹⁶ The TC army completes relatively few collaborative distribution method missions and is not able to take advantage of this method's advantages. Domestic collaborative distribution policies and standards are incomplete, limitations are fairly large, and local suppliers, third-party supply enterprises, and PLA Army support departments lack personnel with advanced collaborative distribution knowledge and experience.⁹⁷ Friction between local civilian transportation and the PLA Army is evident in the mobilization process where linkages between civilian

92. Yang Huijin, Xia Yu, and Liu Xiaojiang [杨会军, 夏禹, 刘小江], “陆军部队战备物资集装化储运保障探析” [Analysis of the Containerized Storage and Transport Support of War Reserves for the Army], *物流技术* [*Logistics Technology*] 41, no. 1 (January 2022): 131–33, 141.

93. Yang Huijin, Xia Yu, and Liu Xiaojiang, “Analysis of the Containerized Storage and Transport Support of War Reserves for the Army,” 131–33, 141.

94. Wang Yao, Li Bin, Zhou Jixiao, and Lyu Qipeng [王耀, 李斌, 周济晓, 吕麒麟], “陆军全域作战后勤战备物资预置储备研究” [Preset Storage of Logistical War Readiness Materials for Army Full-domain Operations], *军事交通学院学报* [*Journal of Military Transportation University*] 21, no. 11 (November 2019): 50–53.

95. Hu Haijun and Yao Yuan [胡海军, 姚远], “战区陆军运输投送保障能力转型建设” [Transformation and Construction of Army Transportation Delivery Support Capability in Theater], *军事交通学院学报* [*Journal of Military Transportation University*] 22, no. 4 (April 2020): 1–4.

96. Yang Xueming, Xun Ye, and Li Xidong, “Study on Theater Ground Force Supplies Distribution,” 48–52.

97. Yang Xueming, Xun Ye, and Li Xidong, “Study on Theater Ground Force Supplies Distribution,” 48–52.

companies and the military are reduced due to the market-oriented operations of local transportation and the lack of effective mechanisms between the PLA Army and transport entities.⁹⁸

More granular problems include a lack of standardization among PLAA units—for example, units of the same size requiring a different amount of containers, railcars, or ships to transport and the inefficiency of always sending drivers along with their equipment during transport instead of moving them separately.⁹⁹ A lack of standardization between containers, transport vehicles, and transport equipment (for example, forks and lifts) is also a problem.¹⁰⁰ Due to supplies typically going from larger to smaller units, containers and other logistics articles quickly accumulate at battalions, companies, and platoons that lack the ability to transfer materials easily back to higher echelons—units should best utilize this empty storage space whenever possible.¹⁰¹

Conclusion

Tremendous change occurred in PLA Army logistics after the “below-the-neck” reforms in April 2017, with service support units pushed down from higher levels to the battalion level. The diffusion of logistical support provides lower-level commanders with additional resources, but the PLA Army continues to work through the significant changes caused by the reforms. Numerous problems remain, including undersized logistics staffs, limited sustainment equipment, unclear logistics command and control, and unreliable civilian-military coordination.

In addition to the critiques offered by PLAA articles, the new logistics system may face significant hurdles if called upon in a time of conflict. Minimally resourced and low-prioritized logistics staffs may struggle to coordinate sustainment on the modern battlefield. People’s Liberation Army’s overreliance on nonmilitary logistics support may restrict its ability to project power. Significantly, different peacetime and wartime distribution systems may impact the PLA Army’s ability to perfect its systems before

98. Hu Haijun and Yao Yuan, “Transformation and Construction of Army Transportation Delivery Support Capability in Theater,” 1–4.

99. Wang Lei, Li Peng, and Li Lianbang, “Research on Transformation and Development,” 5–7, 12.

100. Yang Huijin, Xia Yu, and Liu Xiaojiang, “Analysis of the Containerized Storage and Transport Support of War Reserves for the Army,” 131–33, 141.

101. Yang Huijin, Xia Yu, and Liu Xiaojiang, “Analysis of the Containerized Storage and Transport Support of War Reserves for the Army,” 131–33, 141.

conflict. The PLA's tendency to centralize decision making and resources may decrease flexibility and increase logistics reaction time. Ascertaining granular details on the capability of the PLA Army is limited due to the PRC's restrictive "state secrets" legislation, but PLA Army writings strongly suggest a nascent joint logistics system unproven in crisis and in need of continued investment and refinement.

Based on People's Liberation Army writings, the PLA Army likely lacks the ability to conduct and sustain expeditionary ground operations. Articles hint at the desire to operate internationally, but a strong impression remains that the PLA Army is only capable of operating inside or near China in the near- and mid-term.¹⁰² It is unclear whether the PLA Army is currently capable of leveraging the PRC's significant economic clout to aid in projecting and sustaining expeditionary ground forces.

As seen in the initial weeks of Russia's invasion of Ukraine, logistics matters in conflict, even when operating near one's borders. Continued analysis and investigation of PLA logistics are critical to assessing properly the People's Liberation Army's ability to execute in modern warfare. Recent reforms increased the ability of the People's Liberation Army to operate jointly on paper. By the PLA's own admission, however, much work remains to ensure PLA forces are able to project and sustain combat power within, near, or far from the PRC.

102. Yang Huijun, Wang Yanxu, Wu Juan, and Liu Haiying [杨会军, 王焱旭, 吴娟, 刘海英], "投送型陆军探要" [Study on Projection-Type Army], 军事交通学院学报 [*Journal of Military Transportation University*] 20, no. 7 (July 2018): 1–5.

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PLA Navy At-sea Sustainment Capabilities

Justin Boggess and Travis Dolney

Over the past several decades, as operations have expanded into the far seas, the People's Liberation Army Navy (PLAN) at-sea replenishment fleet has evolved into a highly proficient force capable of supporting the People's Republic of China's (PRC) peacetime blue-water ambitions. Yet, there is still criticism that the PLAN lacks the numbers to sustain a global presence, especially when compared with the replenishment order of battle of the US Navy, and that at-sea logistics is a limiting factor. History shows, however, that the PLAN was able to overcome and adapt to perceived shortfalls in at-sea logistics even as the PLAN continued to expand its presence beyond the first island chain. From the 1980s and into the 1990s, the navy overcame its inexperience supporting deployments to the far seas and operating replenishment oilers while also demonstrating the ability to be flexible in incorporating the civilian sector for support. The counterpiracy deployments in particular, which started in late 2008 and continue today, show a navy able to overcome logistical hurdles in supporting its first long-term overseas deployment.

Deployments to the Gulf of Aden also served as a catalyst for the expansion of its replenishment fleet order of battle. Overall, PLAN at-sea sustainment capability is best characterized by flexibility, leveraging overseas commercial port access and military base development, use of civilian vessels for underway replenishment (UNREP), and its modern replenishment fleet. While this construct would likely pose certain challenges during wartime, the PLAN has clearly demonstrated the ability to adapt successfully and overcome during peacetime. As a result, we should seek to challenge old assumptions and

think creatively when it comes to assessing the PLAN's at-sea sustainment capabilities; the PRC is likely doing the same.

Laying the Foundation – Maoist Era

From the foundation of the PLAN in 1949 until the latter half of the 1970s, the PLAN was firmly focused on coastal defense and had neither the capability nor operational need to develop at-sea replenishment options. Early PRC military doctrine was born out of the Maoist-era concept of “People’s War,” which relied on utilizing China’s huge size in terms of population and land mass to prevail in protracted conflict.¹ The early PLAN order of battle was small, consisting mainly of captured Kuomintang (KMT) ships largely manned by KMT defectors and a few tugboats and trawlers.² During this period, the PLA was primarily concerned with repelling potential amphibious operations from the KMT forces on Taiwan.³ With little clout in the defense policy process, the navy was relegated to a coastal defense mission in a PLA that was characterized by a continental defense strategy that emphasized ground forces.⁴

The early PLAN focus on counteramphibious operations, coupled with their limited resources, resulted in little need to train to competencies (such as UNREP), which are required for far-seas operations.⁵ The few tankers that were in service were limited to coastal use, with some, especially in the early days, being old US World War II designs.⁶ Instead of developing their UNREP capability, the navy focused primarily on shore-based infrastructure support.

1. Alexander Chieh-cheng Huang, “The Chinese Navy’s Offshore Active Defense Strategy: Conceptualization and Implications,” *Naval War College Review* 47, no. 3 (Summer 1994): 11; Rosita Dellios, *Modern Chinese Defense Strategy: Present Development, Future Directions* (New York: St. Martin’s Press, 1990), 11–12; US Defense Intelligence Agency, *The Chinese Armed Forces Today: The U.S. Defense Intelligence Agency Handbook on China’s Army, Navy and Air Force* (Englewood Cliffs, NJ: Prentice-Hall, 1979), 14; Ngok Lee, *China’s Defense Modernization and Military Leadership* (Sydney: Australian National University Press, 1989), 139–44; and Lin Biao [林彪], “人民战争胜利万岁” [“Long Live the Victory of the People’s War”], *北京周报* [Peking Review], September 3, 1965, 19–29.

2. Christopher D. Yung and Ross Rustici with Isaac Kardon and Joshua Wiseman, “China’s Out of Area Naval Operations: Case Studies, Trajectories, Obstacles, and Potential Solutions,” *Institute for National Strategic Studies China Strategic Perspectives* 3 (December 2010): 8; and Zhou Keyu [周柯宇], ed., *当代中国海军* [*China Today: Navy*] (Beijing: China Social Sciences Publishing House, 1987).

3. Yung and Rustici, “China’s Out of Area Naval Operations,” 8; and Zhou Keyu, *China Today: Navy*.

4. Huang, “Chinese Navy’s Offshore Active Defense Strategy,” 9.

5. Yung and Rustici, “China’s Out of Area Naval Operations,” 8; and Zhou Keyu, *China Today: Navy*.

6. Raymond V. B. Blackman, ed., *Jane’s Fighting Ships 1964–65* (Great Missenden, UK: Sampson Low, Marston & Co. Ltd., 1965), 55.

Initial Moves to the Far Seas in the Deng Era

By the 1970s, PRC leadership, concerned by the PLAN's lack of capabilities, sought to improve Chinese shipbuilding.⁷ During this period, the PRC began production of the Luda-class destroyer, the Jianghu-class frigate, as well as the Fuqing-class replenishment ship.⁸ The new emphasis on sea power saw the PLAN experiment beyond China's coastal waters. Early examples of operational expansion by the PLAN include deployments of survey ships to the Southern Pacific in mid-1976 and a 30-day, 3,000 nautical mile deployment by a PLAN submarine in early 1977.⁹ These early efforts preceded the commissioning of the PLAN's first true replenishment ship.

To address the shortfall in underway replenishment capabilities, the PRC designed and built the first of two Fuqing-class (Type 905) auxiliary replenishment oilers (AOR) in 1979. The Fuqing represented a milestone in the development of the navy as they were the first true UNREP-capable support ships. These ships followed typical replenishment ship designs of the time, with three kingposts sighted amidships capable of transferring petroleum, oil, and lubricants (POL) and dry goods. The ships also featured a large helicopter landing deck at the stern, presumably to support vertical replenishment, though the design failed to incorporate a helicopter hangar.¹⁰

The commissioning of the Fuqing-class AOR enabled the PLAN to finally start to gain experience using replenishment ships for UNREP. In 1980, a PLAN task group was deployed to observe and retrieve long-range rockets launched from the mainland. The task force totaled 18 ships, large even by contemporary standards, and included two replenishment ships. During the deployment, the supply ships provided 14,000 tons of fuel, 70 tons of food, and over 300 tons of fresh water to the task group's warships.¹¹ In 1981, a replenishment ship accompanied three destroyers and a tug to the Philippine and South China Seas, and into the Gulf of Tonkin, before returning to its homeport in the north. Two years later, a replenishment ship and

7. Yung and Rustici, "China's Out of Area Naval Operations," 8; and Zhou Keyu, *China Today: Navy*.

8. Kenneth G. Weiss, "The Naval Dimension of the Sino-Soviet Rivalry," *Naval War College Review* 38, no. 1 (January–February 1985): 44; and David G. Muller Jr., *China as a Maritime Power* (Boulder, CO: Westview Press, 1983), 151–77.

9. Yung and Rustici, "China's Out of Area Naval Operations," 9; Zhou Keyu, *China Today: Navy*; and Huang, "Chinese Navy's Offshore Active Defense Strategy," 9.

10. "People's Liberation Army Navy (PLAN) Auxiliaries Fuqing (Type 905) Class," Jane's World Navies (website), n.d., accessed on July 12, 2020, www.janes.com.

11. Yung and Rustici, "China's Out of Area Naval Operations," 9; and Zhou Keyu, *China Today: Navy*.

one other PLAN vessel traveled a similar path in reverse from the south.¹² These deployments demonstrated the PLAN's nascent ability to sustain naval task groups away from its traditional coastal operating areas.

Early Fuqing deployments were not without challenges for the PLAN. For instance, in late 1985 a Fuqing replenishment oiler accompanied a Luda-class destroyer on an Indian Ocean deployment, where they made port calls in Pakistan, Bangladesh, and Sri Lanka. Despite sailing nearly 9,000 nautical miles and providing 14,000 tons of fuel and supplies over the course of 64 events, the chief designer of the Fuqing-class reported that the replenishment ship struggled to resupply the destroyer. Specifically, the Fuqing had only a limited ability to supply ordnance and was unable to carry out alongside replenishment, forcing the ships to conduct astern refueling. Both ships struggled to operate in rough seas but nonetheless returned to China in relatively good condition.¹³ Some have characterized these challenges as evidence of the Fuqing's inadequacy for supporting combat operations. While this characterization may be true, it also demonstrates the PLAN's resiliency and ability to adapt to difficult circumstances while still accomplishing its objectives.¹⁴

Similarly, the failure of the PLAN to participate in the 1991 evacuation of Chinese nationals from Somalia has been cited as another example of the navy's inability to perform complex logistical operations in the far seas.¹⁵ China had to rely on a COSCO cargo ship with locally-procured tugs and a fishing vessel to evacuate personnel from Somalia.¹⁶ While it is reasonable to suggest the 1991 incident demonstrated how far the PLAN still had to go to become a viable far-seas navy, it also demonstrated the PRC's ability to adapt to dynamic circumstances quickly and successfully. In this case, it is telling that the PRC leveraged state-owned commercial maritime enterprises to augment the capabilities of the PLAN.

As the absence of the PLAN from the Somalia operation displayed, some saw the PLAN of the 1990s as ill-suited for regular operation on the

12. Kenneth G. Weiss, "The Naval Dimension of the Sino-Soviet Rivalry," *Naval War College Review* 38, no. 1 (January–February 1985): 45.

13. Yung and Rustici, "China's Out of Area Naval Operations," 1–14; and Jonathan Weng, "Chief Designer Talks about PLAN Replenishment Ship," Guangzhou-China-Hotels (website), n.d., accessed on February 12, 2009, www.china-defense-mashup.com/?;=2625.

14. Yung and Rustici, "China's Out of Area Naval Operations," 14.

15. Yung and Rustici, "China's Out of Area Naval Operations," 14.

16. Yung and Rustici, "China's Out of Area Naval Operations," 14.

far seas.¹⁷ This view was aided by its small complement of ocean-going replenishment oilers (two), which performed somewhat poorly during the 1985–86 deployment to the Indian Ocean. While one might expect this weakness in at-sea logistics to constrain PLAN activity, the 1990s were instead characterized by a significant uptick in PLAN operations in the far seas.¹⁸ The 1990s saw five times as many PLAN task group visits to foreign countries as in the prior decade.¹⁹ Despite its limitations, the Navy's two Fuqing-class replenishment ships continued to sustain PLAN combatants throughout the 1990s and into the twenty-first century.²⁰

Yet, with the Fuqing AORs already starting to show their age and limitations, the PLAN commissioned only one new replenishment ship in the decade leading up to the twenty-first century. Originally laid down in 1992 as a Project 15966 oiler for the Soviet Navy, the PRC purchased the incomplete hull in 1992 and towed it to China to complete fitting out as the Fusu AOR.²¹ The new Fusu-class AOR represented the largest AOR (not to mention the largest ship) in service with the PLAN until the commissioning of the Fuyu-class fast combat-support ship (AOE) in 2017. At a full-load displacement of 37,000 tons, the Fusu was a marked increase in capability over the older Fuqing; however, only one entered service with the PLAN with the South Sea Fleet (resulting in each fleet having a single AOR).

Enter the Fuchi

Construction of what would become the most numerous AOR in service with the PLAN began in 2002 with the laying down of two hulls of the Fuchi-class (Type 903). The design of these ships was very similar to the AOR built for the Thai Navy in the mid-1990s (the Similan-class). At a full-load displacement of 23,000 tons, these ships were smaller than the Fusu but represented an increase in capability over the aging Fuqing AORs. The Fuchi's have two RAS stations on either side (one for POL with the other

17. Huang, "Chinese Navy's Offshore Active Defense Strategy," 25.

18. Yung and Rustici, "China's Out of Area Naval Operations," 14.

19. Steven L. Horrell, *China's Maritime Strategy: Peaceful Rise?*, US Army War College Strategy Research Project (Carlisle, PA: US Army War College, 2008), 23, <https://apps.dtic.mil/sti/pdfs/ADA478999.pdf>; and US Office of Naval Intelligence (ONI), *China's Navy 2007* (Suitland, MD: ONI, 2007), 111–17, <https://fas.org/irp/agency/oni/chinanavy2007.pdf>.

20. Horrell, *China's Maritime Strategy*, 23–25; and ONI, *China's Navy 2007*, 111–17.

21. "Fusu (Type 908) Class (REPLENISHMENT SHIP) (AORH)," Jane's Fighting Ships (website), n.d., accessed on February 26, 2021, www.janes.com.

for dry goods), and they are equipped with a helicopter deck and hangar.²² Once commissioned in 2004, the Fuchi AORs would become an essential component of the PLAN's shift to the far seas.

A Change in Strategy – New Historic Missions

The new century saw the PLAN again expand its far-seas footprint. From 2000–06, the PLAN deployed more task groups and visited nearly twice as many countries as it had during the entirety of the prior decade. These deployments saw the first far-seas employment of the Fusu- and Fuchi-class replenishment ships in 2003 and 2005, respectively.²³ This time period also saw a significant shift in the direction of maritime strategy for the PRC and the PLAN with President Hu Jintao's "new historic missions." During a speech in December 2004, Hu outlined several missions, one of which sought to defend the PRC's key interests abroad. It was clear from this strategy that China would seek to defend its sea lines of communications, which are crucial to the PRC's economic development.²⁴ The PLAN would obviously have a significant role in this new mission; a mission that would require it to deploy regularly at extended distances outside the first island chain. Yet, the PLAN's at-sea replenishment order of battle remained static in the years immediately following Hu's pronouncement, which would have repercussions once the PLAN embarked on the first overseas task group deployment in late 2008.

Despite Hu's promise of a PLAN more active globally, and a modest increase in the number and capability of their replenishment ships, logistics and sustainment were still seen by some as a significant limitation on PLAN far-seas operations. One scholar noted that, "Without overseas naval bases . . . the number of long-range naval patrols will be constrained by the number of large replenishment ships that China commissions in the future."²⁵ While the PLAN indeed lacked overseas naval bases and had a relatively small number of large replenishment ships, it would soon embark on its most ambitious series of long-range patrols to date.

22. Horrell, *China's Maritime Strategy*, 23; and ONI, *China's Navy 2007*, 111–17.

23. Horrell, *China's Maritime Strategy*, 23; and ONI, *China's Navy 2007*, 111–17.

24. Jia Yong, Cao Zhi, and Li Xuanliang (贾勇, 曹植, and 李宣良), "推进在从新的历史起点-事件纪录的 大大步关于怎样的党委和中共中央军委促进在国防和军队发展的科学发展" ["Advancing in Big Strides from a New Historical Starting Point – A Record of Events on How the Party Committee and the Central Military Commission Promote Scientific Development in National Defense and Army Building"], *Xinhuanet* (website), n.d., accessed on August 7, 2007, <http://news.xinhuanet.com>.

25. M. Taylor Fravel, "China's Search for Military Power," *Washington Quarterly* 31, no. 3 (Summer 2008): 135.

Deployments to the Gulf of Aden Drive Expansion

December 2008 would be a milestone moment for the PLAN as it embarked on its first deployment to the Gulf of Aden in support of a UN-backed effort to combat piracy in the region. The first Naval Escort Task Force (NETF) consisted of three ships: a Luyang II-class guided missile destroyer (DDG), a Luyang I-class DDG, and a Fuchi-class AOR.²⁶ While comprising only three ships, this deployment represented the first-ever operation of its kind for the PLAN outside the first island chain.

Early NETFs faced several logistical challenges. As some noted, the most significant issue the PLAN encountered during the early counterpiracy deployments was a shortage of replenishment ships.²⁷ From the start of the deployments in late 2008 to early 2013, the PLAN utilized three replenishment ships to support 14 counterpiracy task forces. The two Fuchi-class AORs in service saw the majority of use, with the Fusu-class AOR supporting three of the early task force deployments. During this time period, the PLAN adapted to its limited number of replenishment ships by leaving the oiler on station in the Gulf of Aden across two NETF iterations. For example, the *Weishanhu* deployed in December 2008 with the first task group deployment, remained in the Gulf of Aden to support the second deployment, and was then relieved by the *Qiandaohu* for the third and fourth rotations.²⁸ Both Fuchi AORs were responsible for supporting the first nine NETF deployments, placing strain on the replenishment force's ability to support future deployments outside the first island chain.

In addition to the limited number of PLAN ships, other reported problems during early deployments to the Gulf of Aden included difficulty preserving fresh produce, a lack of repair and maintenance facilities, limited employment of helicopters, limited access to medical care, and the vulnerability posed

26. Andrew S. Erickson and Austin M. Strange, *Six Years at Sea . . . and Counting: Gulf of Aden Anti-piracy and China's Maritime Commons Presence* (Washington, DC: Jamestown Foundation, 2015), 68–78.

27. Susanne Kammerling and Frans-Paul van der Putten, "An Overseas Naval Presence without Overseas Bases: China's Counter-piracy Operation in the Gulf of Aden," *Journal of Current Chinese Affairs* 40, no. 4 (2011): 129; Andrew S. Erickson, "Can China Become a Maritime Power?," in *Asia Looks Seaward: Power and Maritime Strategy*, ed. Toshi Yoshihara and James R. Holmes (Westport, CT/London: Praeger Security International, 2008), 70–110; Yung and Rustici, "China's Out of Area Naval Operations," 42; Ronald O'Rourke, *China Naval Modernization: Implications for U.S. Navy Capabilities—Background and Issues for Congress*, Congressional Research Service (CRS) Report RL 33153 (Washington, DC: CRS, December 23, 2009), 12; and Dennis J. Blasko, "Chinese Military Logistics: The GLD System," Asian Research (website), n.d., accessed on November 4, 2004, <http://www.asianresearch.org/articles/2354.html>.

28. Erickson and Strange, *Six Years at Sea*, 68–78.

by such a long supply line.²⁹ With such a myriad of challenges, one might have expected the PLAN's venture to the Horn of Africa to be short-lived. The PLAN, however, has continued these deployments without interruption for more than 13 years now. Although its doubters were often accurate in their observations, the PLAN compensated for its shortcomings in far-seas logistics by expanding its complement of replenishment ships significantly, leveraging the PRC commercial maritime sector, and cultivating varying levels of logistics access abroad.

Expanding the Replenishment Order of Battle

Within two years, the PLAN embarked on a construction program to increase the number of AORs in the fleet as a result of the shortage in available replenishment platforms. Known as the Type 903A, these ships were effectively Fuchi-class AORs potentially equipped with improved aviation-support facilities and increased cargo capacity. Laid down in 2010, the first Type 903A entered service in mid-2013. The PLAN would build a total of seven 903As, bringing the total number of Fuchi-class AORs in service to nine.³⁰ The strain placed on the PLAN's replenishment force was so acute that the first Type 903A departed for NETF duty within two months of commissioning. While the following three NETFs still saw a single AOR stay on station for consecutive tours of duty, by the 19th NETF in early 2014 oiler support was rotated with each successive deployment.³¹

With several decades of experience employing replenishment ships inside and outside the first island chain, the PLAN is highly proficient in conducting UNREP. The PLA Navy is capable of replenishing an entire task group simultaneously, with a ship replenishing on either side of the AOR/AOE with a third trailing behind receiving POL via a stern line.³² Evidence also suggests some proficiency with nighttime UNREP, which can be a dangerous

29. Yung and Rustici, "China's Out of Area Naval Operations," 17–19; Li Jie [李杰], "中国的海军仍然有去" ["China's Navy Still Has Far to Go"], *China Daily* (website), n.d., accessed on August 14, 2009, www.chinadaily.com.cn/opinion/2009-08/14/content_8568918.htm; Yin Zhuo [尹卓], "中国海军应在吉布提建立长期补给基地" ["The PLAN Should Build a Long-term Supply Base in Djibouti"], http://cn.china.cn/article/n494656,fc393fd2477_12053.html, accessed on August 14, 2009; and "海军后勤远洋补给考家团赴法国核新加破考佳" ["PLAN Logistics Experts Visit French and Singapore Experts"], *当代海军* [*Modern Navy*] 11 (2005).

30. "Fuchi (Type 903/903A) class (AORH)," *Jane's Fighting Ships* (website), n.d., accessed on January 27, 2022, www.janes.com.

31. Erickson and Strange, *Six Years at Sea*, 68–78.

32. Zhuo Qiqiang [卓奇强牌], "船品行加注在海在太平洋" ["Vessels Conduct Replenishment-at-Sea in Pacific Ocean"], <https://english.chinamil.com.cn>, accessed on February 11, 2019.

maneuver due to the close proximity of the ships and reduced visibility.³³ The navy is also developing the capability to transfer missile systems while underway, as seen during a training operation in the far seas where a task group conducted a replenishment involving the transfer of an unidentified missile canister from the AOE to a DDG.³⁴ A potential area of improvement for the PLAN is with vertical replenishment, which typically occurs during an UNREP. Limited evidence suggests some use of helicopters during UNREP, but pictures typically show operations without slung loads.³⁵

Leveraging Commercial Shipping for At-sea Sustainment

While some observers described the PLAN's initial logistics strategy for its Gulf of Aden deployments as a "bring-it-with-you" approach, commercial resupply has become more commonplace, reducing the PLAN's reliance on its dedicated replenishment fleet.³⁶ In fact, regional subsidiaries of the state-owned shipping giant COSCO were part of the advance teams facilitating shore-based logistical support for PLAN ships in the Gulf of Aden even from the earliest days of the NETF patrols.³⁷ COSCO, which combines an extensive network of port facilities with a fleet of ocean-going ships, has been a critical connecting node in the far seas for the PLAN.³⁸

33. Fan Pengyu, Xue Chengqing, Wu Huanqing, and Li Shen [范鹏羽, 薛成清, 邬焕庆, 李深], "南部战区海军 多艘舰艇开展高强度多科目海上训练" ["Southern Theater Command Navy Has Multiple Ships Carry Out Highly Intense, Multi-Subject Training at Sea"], <http://www.js7tv.cn/>, accessed on October 2, 2020.

34. "军事报告" ["Military Report"], <http://tv.cctv.com/cctv7/>, accessed on February 26, 2020.

35. Chen Wencai and Wen Zaifei [陈文财 and 文在飞], "中国军舰品行加注在海在亚丁湾" ["Chinese Naval Ships Conduct Replenishment-at-Sea in Gulf of Aden"], <http://english.china.mil.com.cn>, accessed on February 6, 2020.

36. Joel Wuthnow, Phillip C. Saunders, and Ian Burns McCaslin, "PLA Overseas Operations in 2035: Inching toward a Global Combat Capability," *Strategic Forum* 309 (May 2021): 12, <https://ndupress.ndu.edu/Portals/68/Documents/stratforum/SF-309.pdf?ver=vBGjBJXsarEsg7nATeBMBQ%3d%3d>; Isaac B. Kardon, "China's Overseas Base, Places, and Far Seas Logistics," in *The PLA Beyond Borders: Chinese Military Operations in Regional and Global Context*, ed. Joel Wuthnow et al. (Washington, DC: National Defense University Press, 2021); Guo Yuandan [郭援丹], "中国海军看被开阔的视野, 改进的能力通过十年的护航任务" ["Chinese Navy Sees Broadened Horizon, Enhanced Ability through 10-year Escort Missions"], <http://www.globaltimes.cn/content/1134066.shtml>, accessed on December 30, 2018; and Li Faxin [李发新], *中国军队与海上护航行动* [The Chinese Navy's Maritime Escort Operations] (Beijing: China Intercontinental Press, January 2013), 87.

37. Kammerling and van der Putten, "An Overseas Naval Presence," 132; Xia Hongping and Yaming Hou [夏洪平, 亚明侯], "供应船"在亚丁港的薇山湖"停泊处加注的" ["Supply Ship "Weishanhu" Berths in Port of Aden for Replenishment"], http://eng.mod.gov.cn/SpecialReports/2009hjdjhd/2009-04/27/content_4008344.htm, accessed on April 27, 2009.

38. Chad Peltier, Tate Nurkin, and Sean O'Connor, *China's Logistics Capabilities for Expeditionary Operations* (Washington, DC: US-China Economic and Security Review Commission, 2020), 56, <https://www.uscc.gov/sites/default/files/2020-04/China%20Expeditionary%20Logistics%20Capabilities%20Report.pdf>; and Issac B. Kardon, "Research & Debate – Pier Competitor: Testimony on China's Global Ports," *Naval War College Review* 74, no. 11 (2021): 5–8.

This hand-in-glove relationship should not be surprising when one considers it was originally established as a branch of the PLAN.³⁹

In addition to what has been termed “direct” commercial support (for example, PLAN replenishment at a commercial port), commercial vessels have been employed in resupplying PLAN ships at sea.⁴⁰ This form of “direct” commercial support has entailed underway replenishment, of both fuel and dry goods, of PLAN ships from commercial vessels. In 2014, the commercial tanker *Huachuan* completed a refueling exercise with a Jiangwei II-class frigate in the East China Sea.⁴¹ In 2019, solid cargo was transferred via tensioned lines between a Jiangkai II-class frigate and the PRC-flagged container ship *Fuzhou*. The evolution involved the use of a modular horizontal replenishment system installed by the PLAN on board the *Fuzhou*.⁴²

Along with the newly demonstrated capability for dry-goods replenishment, the 2019 exercise with the *Fuzhou* highlighted an additional potential logistical advantage for PRC naval forces. With a plentiful number of PRC commercial container ships, the 2019 event may represent an example of the exploitation of containerized multimodal transport and the military supply benefits it may provide. Chinese defense experts have observed the US military’s use of containerized transport (which allows cargo to transition from ground, rail, or maritime transport seamlessly) and have noted its potential use in streamlining overseas military support under a civil-military fusion construct.⁴³ In this manner, PRC commercial container ships can support PLAN replenishment at overseas commercial ports and at sea.

39. Virginia Marantidou, “Revisiting China’s ‘String of Pearls’ Strategy: Places ‘with Chinese Characteristics’ and their Security Implications,” *Issues & Insights* 14, no. 7 (June 2014): 13; Christina Lin, *China’s New Silk Road to the Mediterranean: The Eurasian Land Bridge and Return of Admiral Zheng He*, Institute for Strategic, Political, Security, and Economic Consultancy (ISPSW) Strategy Series, no. 165 (Berlin: ISPSW, October 2011), 21.

40. Peltier, Nurkin, and O’Connor, *China’s Logistics Capabilities*, 24.

41. Conor M. Kennedy, *Civil Transport in PLA Power Projection*, China Maritime Report No. 4 (Newport, RI: China Maritime Studies Institute/US Naval War College, December 2019), 14, <https://digital-commons.usnwc.edu/cmsi-maritime-reports/4/>; Peltier, Nurkin, and O’Connor, *China’s Logistics Capabilities*, 57; and Zhou Xiaozhou and Hou Rui [周小舟, 候瑞], “东海舰队深化军民融合开辟海上油料补给新通道” [“East China Sea Fleet Deepens Military-Civilian Integration and Opens New Channel for Maritime Fuel Supply”], http://www.81.cn/hj/2014-11/19/content_6230767.htm, accessed on November 19, 2014.

42. Kennedy, *Civil Transport*, 13; Peltier, Nurkin, and O’Connor, *China’s Logistics Capabilities*, 56; and “重大突破! 民船为海军水面舰艇实施干货补给” (“Major Breakthrough! Merchant Ships Conduct Dry Cargo Replenishment of Naval Surface Ships”), https://www.guancha.cn/politics/2019_11_15_525320.shtml, accessed on November 15, 2019.

43. Peltier, Nurkin, and O’Connor, *China’s Logistics Capabilities*, 56; “美军开展集装箱多式联运的做法及启示” [“The US Military’s Practice of Container Multimodal Transport and its Inspiration”], <https://www.shangyexinzi.com/article/details/id-119708/>, accessed on May 9, 2019; and “美军远程投送‘最后一千米’的重要组件” [“US Military Long-Range Delivery of Important Components of the ‘Last Mile’”], <http://m.dazuigu.com/juns/jswz/561886.html>, accessed on September 2, 2019.

How Overseas Bases and Commercial Port Access Help the PLAN

PRC investment in overseas port facilities and the strength of Chinese state-owned enterprises (SOE) in the commercial maritime enterprise has helped the PLAN to bridge logistics gaps created by its lack of overseas bases. For the United States and other world navies, overseas bases allow for the prepositioning of key supplies, equipment, and personnel needed to support and sustain naval operations. In this area, the PLAN has long been hampered by the PRC's aversion to establishing military bases on foreign soil. While the PRC has altered course on overseas basing with the establishment of its installation in Djibouti, the PLAN has also deepened ties with commercial ports as a means of securing logistics support without the potential political complications inherent in establishing an overseas military base. As one scholar noted, this civil-military model responds to logistical needs without violating PRC principles, while appeasing international concerns about its military intentions.⁴⁴

From the earliest days of the PLAN's Gulf of Aden deployments, this civil-military model has been exercised to great effect. NETF ships have called at commercial ports in Aden, Yemen; Salalah, Oman; Abu Dhabi, United Arab Emirates; Jeddah, Saudi Arabia; and Djibouti to replenish stocks of fuel, food, water, and other needed supplies. Additional early visits to places as distant as Durban, South Africa, demonstrate the geographic range of commercial options utilized by the PLAN during the first three years of its operations in the Gulf of Aden.⁴⁵

Other observers have noted the potential for Pakistani ports in Gwadar and Karachi to see an increase in PLAN activity in the future due to a slew of attractive features. These include a sizeable layout suitable to the prepositioned storage of key supplies, port facilities capable of accommodating large naval vessels and historically strong ties between the two countries.⁴⁶ Gwadar's use by the Pakistani Navy (PN) offers another potential benefit for the PLAN. Among PN vessels homeported in Gwadar are several that are export variants of PLAN ships. This setup would conceivably allow the PLAN to take advantage of existing resources for spare parts and

44. Marantidou, "Revisiting China's 'String of Pearls' Strategy," 14.

45. Kammerling and van der Putten, "Overseas Naval Presence," 131.

46. Isaac B. Kardon, Conor M. Kennedy, and Peter A. Dutton, *Gwadar: China's Potential Strategic Strongpoint in Pakistan*, China Maritime Report 7 (Newport, RI: China Maritime Studies Institute/US Naval War College, 2020), 48–50.

technical assistance, particularly via the China State Shipbuilding Corporation (CSSC) technicians already in Pakistan supporting the PN.⁴⁷ While the potential of Gwadar seems to be unrealized thus far, Karachi has become a well-established venue for the PLAN. Its ships have regularly replenished at the better-developed port facilities there. Visits to Karachi as part of multilateral exercises (such as Aman) have also served to deepen diplomatic ties.⁴⁸

Some observers remain skeptical of the potential for prospective commercial facilities, especially at Gwadar, which are seen as underdeveloped and threatened by local instability.⁴⁹ Such concerns are valid, and reasonable observers could question: if such ports hold so much potential for the PLAN, why has their utilization not been greater? This attitude neglects the possibility that limited naval engagement is not a reflection of one area's potential but rather an indication of competing priorities for the PRC. For instance, while the PRC may seek expanded logistics access globally and may see benefit in an area such as Pakistan, it must also carefully manage its bilateral relationship with India. While such forces may alter Beijing's current calculus, this issue does not preclude them from expanding their footprint in a place like Pakistan, should they judge it to be in their national interest.

While the full impact of the PLA support base in Djibouti is yet undetermined, the episode is another example of the PRC's ability to overcome seemingly intractable obstacles in order to sustain military forces far from China. Scholarly prognostications on future Chinese basing prior to Djibouti were varied in their level of, and rationale for, doubt that the PRC would establish overseas bases. Some analysts saw a base as not necessary, given PRC commercial capabilities. Another popular argument was that basing would not be beneficial, as it would undermine the PRC's principled opposition to hegemonic military expansion, predicting they would not depart from this "cornerstone" of Beijing's foreign relations.⁵⁰ Specifically speaking about Djibouti, one US naval analyst posited the PLAN might minimize its presence in the African nation due to the large foreign naval presence there and the "almost neo-imperial presence" it represented.⁵¹

47. Kardon, Kennedy, and Dutton, "Gwadar," 51–53.

48. Kardon, Kennedy, and Dutton, "Gwadar," 54.

49. Daniel J. Kostecka, "Places and Bases: The Chinese Navy's Emerging Support Network in the Indian Ocean," *Naval War College Review* 64, no. 1 (Winter 2011): 70.

50. Marantidou, "Revisiting China's 'String of Pearls' Strategy," 10.

51. Kostecka, "Places and Bases," 70.

Ultimately, this analysis was confounded by the PRC's ability and willingness to square its values with its national interests.

Adjusting to the Logistics Requirements of Carrier Aviation

Concurrent to the development of the PLAN's far-seas presence in the Gulf of Aden, the PRC was realizing its ambitions for a carrier-capable navy. As observers speculated that purchase of the yet-completed Soviet-era aircraft carrier *Varyag* portended big ideas for the PLAN, others doubted its ability to sustain carrier task group operations. For example, one group of scholars predicted "acute issues in developing the logistical procedures necessary to supply, refuel, and maintain an aircraft carrier at sea."⁵² Yet again, the PLAN continues to surmount its logistical challenges by exercising its shipbuilding prowess.

While the PLAN commissioned its first aircraft carrier in 2012, it would take several more years for the PLAN to develop and build a supporting replenishment ship. Laid down in 2013 (after the *Varyag*, now CV-16, entered service) and commissioned in 2017 (well after CV-16 came online), the Fuyu-class AOE (or Type 901) is substantially larger than the Fuchi and was built to support an aircraft carrier and other large task group deployments in the far seas. The ship is similar in appearance and dimensions to the USN Supply-class AOE, and is equipped with a fourth supply point designed specifically for use with aircraft carriers. Two ships are currently in service with the PLAN, and we expect more to be built in the future as additional aircraft carriers are commissioned.⁵³ Operationally, the Fuyu-class has shown itself fully capable of supporting a carrier task group.

While the PLAN designed and built the Fuyu to support large ships like China's aircraft carriers, it is also fully capable of supporting large task groups and other deployments, especially deep in the far seas. Its large flight deck and dual-helicopter hangars make the platform useful for long-distance expeditionary missions. For example, the PLAN recently dispatched a Fuyu along with a Yuzhao-class landing platform dock (LPD) ship to Tonga

52. Yung and Rustici, "China's Out of Area Naval Operations," 47.

53. "Type 901 Class (COMBAT SUPPORT SHIP) (AFSH)," Jane's Fighting Ships (website), n.d., accessed on December 22, 2021, www.janes.com.

to deliver aid following the volcanic eruption in that country, with the Fuyu probably providing replenishment support for the transit.⁵⁴

Wartime Uncertainty

Relying on foreign port access, either commercially or via base agreements, can be particularly problematic during times of crisis or conflict. Countries that would have otherwise approved a peacetime logistical port call can subsequently deny port access to PLAN vessels. Foreign governments may hesitate to be perceived as providing logistical support for a potentially contentious crisis or conflict. There have been numerous instances throughout military history where reliance on foreign access to support a military campaign has backfired. A classic example is the refusal of Turkey to allow the US 4th Infantry Division to participate in Operation Iraqi Freedom via the Turkish border with Iraq. Yet, there are no indications the PLAN is establishing the capability to compensate for the loss of foreign port access during a conflict.

Potential wartime attrition, either due to enemy action or engineering and maintenance casualties, is where having a comparatively low number of replenishment ships in their order of battle would likely pose problems for the PLAN. This problem would be more acute in the far seas than in the near seas where China would be operating on interior lines and units could conceivably return to port for resupply (though this has tactical and operational disadvantages and risks, too). A further complicating factor, especially for a small order of battle, would be availability of ships at the onset of hostilities. Ships require regular maintenance through short-term repairs all the way up to long-term dry-dock periods for overhaul and upgrades. Depending on maintenance cycles, the PLAN could find itself down several replenishment ships before conflict even started.

While use of civilian vessels for at-sea replenishment could serve as a force multiplier and potentially fill gaps caused by attrition, this option poses its own unique risks and challenges. Civilian ships, even those built to dual-use standards, are inherently vulnerable during a conflict as they can lack the construction and damage control capabilities to survive an attack. Crew proficiency can also be a weakness as it is unclear how often civilian crews train with PLAN combatants to conduct underway replenishment. This weakness could result in delays while conducting a replenishment,

54. Chen Zhuo [陈卓], “运载救助供应的中国军舰抵达汤加” [“Chinese Navy Ships Carrying Relief Supplies Arrive in Tonga”], <http://eng.chinamil.com.cn>, accessed on February 16, 2022.

making both ships particularly vulnerable during a conflict. Finally, relying on commercial civilian vessels can expose the assets the PLAN would seek to protect as part of the near-seas defense, far-seas protection strategy.

Conclusion

From its modest post-revolutionary beginnings, the PLAN has grown and evolved in its command of the sea. China's ambition for a modern, capable military force has resulted in an ever-growing navy, which has surpassed the US Navy as the largest in the world. China's rise has been met with some alarm in the West, with the United States going so far as to declare the PRC its greatest strategic challenge. The importance of the PLAN is only likely to grow in coming years, with increased focus in the maritime domain due to possible regional flashpoints over Taiwan and contested claims in the East and South China Seas.

With the PLAN seemingly eager to operate its ever-growing fleet in more areas of the world, many observers continue to identify its logistics and sustainment capacity as a key constraint. For example, military scholars identified factors such as limited sealift and a lack of overseas bases as limiting the PLA's potential for far-seas operations (though they do note the PRC is addressing these deficiencies).⁵⁵ They go on to point to the number of replenishment ships, only 10 by their count, as a continuing challenge for fleet replenishment.⁵⁶

Such arguments are not new or well supported by the past 50 years of PLAN operations. Recent operational history has seen the PLAN exceed projections. As one author noted, "scholars and government analysts persistently have underestimated and downplayed . . . the rise of a global PLAN."⁵⁷ In fact, senior US military commanders have conceded that China has consistently exceeded "our intelligence estimates of their military capability and capacity" with new capabilities becoming operational faster than projected.⁵⁸ Although PLAN ability to operate and project power in the far

55. Wuthnow, Saunders, and McCaslin, "PLA Overseas Operations in 2035," 2.

56. Wuthnow, Saunders, and McCaslin, "PLA Overseas Operations in 2035," 12–13.

57. James E. Fannell, "China's Global Navy—Today's Challenge for the United States and the U.S. Navy," *Naval War College Review* 73, no. 4, (Autumn 2020): 26.

58. Fannell, "China's Global Navy," 26; William C. Triplett II, "Intelligence Failures?," *Washington Times* (website), November 2, 2009, <https://www.washingtontimes.com/news/2009/nov/2/intelligence-failures/>; and Karen Parrish, "China's Military Advance: Navy Intel Chief Discusses China's Military Advances," *Maritime Security Review* (website), January 14, 2011, <http://www.marsecreview.com/2011/01/navy-intel-chief-discusses-chinas-military-advances/>.

seas is certainly not unlimited, it has demonstrated a pattern of confounding outside expectations through a whole-of-country approach. To great effect, the PLAN has leveraged PRC maritime strength to modernize and expand its order of battle rapidly and create novel solutions for sustaining naval operations abroad. Most importantly, the PLAN has demonstrated the construction of new platforms, including logistics ships, need not precede an expansion in naval operational scope or tempo. Instead, the PRC's commercial dominance, in areas like shipping and shipbuilding, and the reach of Chinese SOEs at overseas ports allow Beijing to ramp up naval activity without first waiting for its navy's sustainment capacity to catch up to the party's ambitions.

Going forward, additional research should focus on how the PLAN intends to apply its at-seas logistics construct during a conflict, both within and outside the first island chain. As outlined above, wartime is when potential vulnerabilities come to the fore, especially regarding numbers of dedicated replenishment ships and reliance on foreign port access. As history demonstrates, the PLAN has shown the ability to adapt to changing logistics requirements to sustain its at-sea operations.

Analysts should be mindful of any tendency to underestimate the PLAN because its methods for sustaining ships may be at variance with the model the US Navy has employed to great effect. China watchers would be well served to embrace the view offered by former US Chief of Naval Operations Admiral John Richardson, who described the PLAN as “both ‘ready and capable’ of operating wherever Beijing wants.”⁵⁹ Indeed, the PLAN can operate “wherever Beijing wants” during peacetime, and given its track record of overcoming logistical challenges, the PLAN can remain there for as long as Beijing wants.

59. Fannell, “China’s Global Navy,” 6; and Carla Babb, “US Navy’s Top Admiral Cites Increased Threat in Ocean Nearest Washington,” VOA (website), August 6, 2016, <https://www.voanews.com/a/us-navys-top-admiral-cites-increased-threat-in-ocean-nearest-washington/4515353.html>.

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PLA Capability to Sustain Air Combat Operations

Eli Tirk

Introduction

The People's Liberation Army (PLA) has built out a redundant logistics support and maintenance structure that has become capable of supporting a force that conducts frequent training and is capable of maintaining a high level of readiness. This chapter is organized into three sections. The first section provides an overview of the types of training sorties conducted by the PLA Air Force (PLAAF) and PLA Navy aviation and the levels of readiness that units are able to maintain under current budgeted flight hours and training schedules. It also provides contextual information regarding US Air Force (USAF) readiness statistics. The second section provides an overview of the organizational structures that support combat aviation units in peacetime and wartime, beginning at the Airfield Station (场站) level and moving up to the Theater Command Airforce (TCAF) Support Department (战区空军保障部) level. The third section provides an overview of the support infrastructure of PLA fixed-wing combat aviation airfields, with a focus on fuel and munitions storage. This section draws upon a data set of 91 airfields, seeking to demonstrate the general support characteristics of airfields intended to support modern combat aircraft (fourth-generation to fifth-generation aircraft), legacy third-generation aircraft, and bomber aircraft. This chapter does not discuss PLA Army aviation.

This chapter employs PLA books, newspapers, websites, official WeChat accounts, and videos to provide background on PLA concepts of logistics and a description of the logistics and equipment support structures

within the PLAAF and naval aviation. It further applies publicly disclosed PLAAF and naval aviation readiness rates and sortie generation rates for training and exercises to the disposition of PLAAF and naval aviation brigades. Finally, it provides a characterization of airfields across the Theater Command's (TC) ability to support air combat.

Readiness Rates and Sortie Generation

While it is clear that wartime mission planning will likely lead to more maintenance-intensive sortie rates than peacetime training plans, these sortie generation numbers can provide insight into what minimum level of aircraft availability may be expected of aviation units. For modern combat aircraft, the PLAAF and naval aviation train to conduct at least two sorties over a 12-hour period. Depending on the length of the exercise and platform involved, this can possibly be stretched to three sorties. Under these conditions, the PLAAF claims it is able to maintain a high level (roughly 80 percent) of readiness. It is important to note that pilot flight-hour quotas and how units choose to distribute them affect the number of training sorties flown by different aircraft and pilots. By focusing on longer training with multiple sorties, bias toward shorter training sorties intended to boost certain pilots' ability to compete in training competitions can be avoided. It is important to note the quota scheme does affect wear and tear on aircraft. The way hours are distributed amongst a unit's airframes could lead to inflated readiness rates.

Multi-role and fighter aircraft have been observed to generate a variety of sorties consisting of various numbers of aircraft. Shorter training sorties, those less than six hours, take a variety of forms. For example, J-11B jet fighters, which are unable to conduct midair refueling, have trained to fly two sortie types within an eight-hour period. One type is "trans regional sorties (跨区机动)," indicating cross-provincial or cross-air region flight paths. The other type is TCAF flights during which the aircraft flew to another airfield, rearmed and refueled, then returned to the home airfield, all the while conducting "all domain combat (全疆域作战)."¹ Coverage of this training indicates this was a flight of at least six aircraft and prioritized pilots' ability to transition from daytime to nighttime lighting conditions. Similarly, J-10B multi-role combat aircraft brigades have been observed

1. Li Xiaofan [李小凡], "砺兵2018: 空军航空兵某旅: 大机群跨区机动 练全时全域作战" ["Fighting Soldiers 2018: An Airforce Aviation Brigade: A Large Air Group Conducts Trans Regional Maneuvers Conducting All Domain All Condition Operations"], 央视军事报道 [CCTV Military Report], January 6, 2018, <https://mp.weixin.qq.com/s/bFesUrDCnDNKzRNZrjbW9g>.

conducting night training during which pilots flew one two-hour sortie.² In terms of short sorties with a larger number of aircraft, in a 2018 exercise, an Eastern Theater Command (ETC) naval aviation brigade sortied 20 aircraft to conduct air-to-air combat training for six hours.³

In terms of longer sorties, those greater than six hours, training ranges from sorties focusing on long-range ground attack to longer periods of air patrol operations. For example, a Northern TCAF JH-7 fighter-bomber aircraft brigade conducted a training sortie of at least six aircraft for a seven-hour night strike training sortie, focusing on the transition from nighttime to daytime conditions.⁴ Additionally, aircraft within the PLAAF and naval aviation's inventories that are capable of midair refueling routinely train to conduct extended sorties. In an October 2018 response to foreign reconnaissance aircraft, a coastal PLAAF aviation brigade flew continuous sorties for 18 hours in an unspecified number of aircraft to follow the foreign aircraft until it changed course and left the operational area.⁵ While some of these larger exercises may be scripted or preplanned, the training is allegedly designed to simulate less time for preparation. In a January 2018 exercise, a Northern TCAF brigade was able to generate a sortie of 10 aircraft to conduct a seven-hour-long range training flight—allegedly with an hour's notice.⁶ These training exercises indicate PLAAF and naval aviation brigades train to be capable of sortieing around half of an airfield station's aircraft at one time, and are likely capable of sortieing these aircraft for longer periods of time given a majority of the forces' ability to be refueled in the air.

2. Zhang He and Liu Shaoqiang [张鹤和刘少强], ["Eagles Strike in The Night Sky and Rush to War—A CTCAF Aviation Brigade Focuses on Improving the Quality and Efficiency of Training, Tempering Officers and Soldiers to Cope with Changing Situations"], 空军在线 [Airforce Online], March 25, 2018, <https://mp.weixin.qq.com/s/0fZ-iUtW2u4YgGx5PQv2OA>.

3. Zha Ningning, Tian Jianmin, and Xu Xiaosai [赵宁宁, 田健敏, and 许小赛], “海军数十架战机新年开训对抗激烈飞出极限数据” [“Tens of Navy Fighter Jets Start Training in the New Year, Fighting Fiercely and Flying”], 中国军网 [China Military Online], January 10, 2018, http://www.81.cn/hj/2018-01/10/content_7901499.htm.

4. Wang Fengqiang, Chen Ran, Wang Zhitao, and Sun Zhendong [王峰强, 陈冉, 王志涛, and 孙振东], “北部战区空军航空兵跨昼夜实弹射击训练” [“NTCAF Aviation Conducts a Live Fire Training across Day and Night”], [CCTV Military Report] 央视军事报道, March 25, 2020, <https://mp.weixin.qq.com/s/AHFONEXPu3NvOUWHAfES-g>.

5. Zhang Yuqing, Chi Yuguang, and Ding Yibo [张玉清, 迟玉光, 丁义波], “头雁高飞群雁随——空军航空兵某旅旅长郝井文聚焦练兵备战抓党建记事” [“The Lead Goose Flies High and the Geese Follow—Commander of a PLAAF Aviation Brigade Hao Jingwen Focuses on Training and Preparing for War Has Received a Party Building Award”], 中国军网 [China Military Online], October 16, 2018, http://www.81.cn/jwgz/2018-10/16/content_9314250.htm.

6. Tian Xuhui, Meng Qingbao, Wang Meng, and Yang Pan [田旭辉, 孟庆宝, 王猛, and 杨盼], “开训即实战空军航空兵某旅战机呼啸出征” [“Training for Actual Combat, An Airforce Fighter Aviation Brigade Roars into the Air”], 中国军网 [China Military Online], January 4, 2018, https://photo.81.cn/pla/2018-01/04/content_7894135_2.htm.

Bomber brigades train similarly to conduct at least two sorties during a 12-hour period; however, the length of these missions varies. As of 2021, Central Theater Command (CTC) bomber division flying H-6Ks has trained to conduct maritime strikes, after which the formation landed at another airfield, refueled and rearmed, then departed for further training. After the conclusion of this sortie, the flight landed and was inspected by maintainers, who determined the aircraft was only capable of conducting a third shorter sortie before requiring significant maintenance.⁷ Older versions of the H-6 (such as the H-6M2) are also known to train to conduct two sorties of around 10 aircraft within a nine-hour time period, landing at a separate airfield and refueling and rearming in between the two.⁸ In terms of size, H-6K divisions have been observed to sortie 12 aircraft at a time to conduct strikes with unguided munitions.⁹ Naval aviation also trains to conduct similar missions during the day and the night.¹⁰

Under this training environment, the PLAAF and naval aviation claim to maintain a relatively high rate of readiness. The PLA defines aircraft readiness rates (飞机完好率) as the number of aircraft within a unit that can perform a mission within a certain period as a percentage of the total aircraft of the unit. This rate is similar to the USAF mission-capable rate. In 2017, a then-fourth-generation fighter division of the Southern Theater Command (STC) Air Force claimed to maintain a 94 percent readiness rate among its aircraft.¹¹ Older claims of readiness rates claims made by PLA newspapers are similarly high. While dated, claims of Military Region Air Forces (MRAF) overall aircraft readiness range from 70 percent to as high as 92 percent. Claims of readiness of at least 80 percent for a MRAF date back to 1997,

7. Yug Hongchun, Liu Chuan, and Huang Zhichao [余红春, 刘川, 黄志超], “昼夜奔袭显神威 中部战区空军航空兵某师实战化远程机动训练” [“Day and Night Raids Demonstrate Their Power: CTCAF Aviation Division Conducts Actual Combat Maneuver Training”], 中国军网 [China Military Online], April 27, 2021, http://www.81.cn/pk/2021-04/27/content_10029653.htm.

8. Fan Bin and Li Bingxuan [樊斌, 李秉宣], “东部战区空军某部常态化开展飞行训练” [“An ETCAF Unit Conducts Flight Training on a Regular Basis”], 中国军网 [China Military Online], April 18, 2021, https://www.81.cn/kj/2021-04/18/content_10024197.htm.

9. Li Xiaofan [李小凡], “空军‘神威大队’某师出动12架轰-6K战机 展开跨昼夜实兵实弹演练” [“A PLAAF Division of ‘God of War’ Bombers Dispatched 12 H-6K War Planes to Conduct Live Fire Drills across Day and Night”], 央视军事报道 [CCTV Military Report], March 28, 2018, <https://mp.weixin.qq.com/s/Skzn1X1aS5Pdr-MuFYajKA>.

10. Yu Xu and Yang Ling [虞旭, 杨岭], “燃! 一场新飞行员海上跨昼夜飞行训练这样拉开帷幕” [“Ignition! A New Pilot’s Overwater Day into Night Flight Training Begins Like This”], 中国军网 [China Military Online], August 19, 2020, http://www.81.cn/hj/2020-08/19/content_9885072.htm.

11. Fan Xiangcheng and Li Guowen [樊向城, 李国文], “空军航空兵某师制定训练计划借助由2小时缩短为30分” [“The Training Plan of an Airforce Aviation Division Was Shortened from Two Hours to Thirty Minutes”], 中国军网 [China Military Online], July 10, 2017, http://www.81.cn/2017jj90/2017-07/10/content_7671197.htm.

during which the relatively fuel strapped and aged PLAAF fleet could barely afford fuel to conduct regular training flights.¹² The lowest readiness rate, 70 percent, dates to October 2009 for the Lanzhou MRAF, but the readiness rate for new aircraft (新机完好率) within the Lanzhou MRAF at that time was claimed to be 80 percent.¹³ Flying hour quotas have existed during the entirety of this period, and it is important to not discount their effect on readiness rates. While it does mean this number is likely to change under combat conditions, it still means that the PLAAF and naval aviation will begin a combat campaign with, at a minimum, a highly mission-capable force.

For context, continental US-based USAF F-15 units can maintain a mission-capable rate between the mid-50 percent range to the high-70 percent range. The current standard for F-15 mission-capable rates is 68 percent. This may seem like a shocking comparison, but actual PLAAF and naval aviation readiness rates are potentially slightly inflated by preferential flight-hour distribution, inflation of readiness statistics for propaganda and external messaging purposes, and the difference in flight hours allotted to USAF and PLA aviation units. It is also important to note that the size difference between a PLAAF aviation brigade and a USAF fighter wing makes these comparisons slightly less direct. A PLAAF aviation brigade is composed of 24 aircraft while a USAF fighter wing is composed of 72. Furthermore, given the age of the F-15 fleet, it is probable that it is easier to maintain higher rates of readiness among fewer, relatively younger aircraft.

Overview of PLAAF and Naval Aviation Support Organizations

Airfield stations (场站), regiment leader-grade organizations and their component organizations are core elements responsible for maintaining and supporting combat aviation and equipment support capabilities for the PLAAF and naval aviation. It is important to understand the different organizations under an airfield station that provide logistical and equipment support capabilities. Both the PLAAF and naval aviation maintain airfield stations with similar subordinate organizations under the Staff Department's subordinate Flight Support Command Office (飞行保障指挥室).

12. Yu Kaibao and Zeng Tiemin [于开宝, 曾铁民], “列车展英姿” [“The Heroic Appearance of the Vehicles”], 空军报 [*Air Force News*], September 30, 1997.

13. Peng Mingquan, Li Shujin, and Li Xubing [彭明全, 李树金, 李绪兵], “历练九天飞虎 将威震西北豪气生” [Experience the Nine Heavens Flying Tiger, Which Will Shake the Northwest's Heroic Spirit], 空军报 [*Air Force News*], October 13, 2009.

This office manages overall aviation support, including equipment, logistics, and operational support.¹⁴ This includes activities such as directing refueling trucks to aircraft on the apron and receiving reports on the status of the airfield and equipment.¹⁵ This additional information is fed into a network to “guide support (主导保障)” and allows the office to directly monitor support operations.¹⁶

Airfield stations also maintain several subordinate organizations for maintaining their munitions in storage. An Air-to-Air Missile Maintenance Squadron (空空导弹维护中队) is a company-level organization specializing in maintaining air-to-air missiles to ensure their safe storage and to prepare them for deployment.¹⁷ These squadrons maintain a subordinate Ordnance Detachment (军械分队), which appears to be responsible for conducting tests on weapons, and a Third Group (三队), which has a yet-to-be-identified function.¹⁸ Airfield stations also have a subordinate Ordnance Branch (军械股), which is responsible for maintaining and supplying ammunition and ordnance ranging from small arms to rockets, aircraft cannon rounds, bombs, and potentially precision-guided munitions (PGMs) for aircraft.¹⁹ However, it is also possible there are specific sections tasked with supporting the maintenance and supply of precision ground attack munitions or anti-ship missiles given their short supply and the existence of dedicated

14. “我空军飞行保障实现信息化 指挥时间减少30倍” [“My Airforce’s Flight Support Realizes Informatization of Command and Reduces Command Time by 30-Fold”], 环球网 [Global Times], January 4, 2008, <https://mil.huanqiu.com/article/9CaKrnJkb6j>; and “飞行保障踏上‘网络快车’” [“Aviation Support Boards the ‘Network Express’”], 解放军报 [PLA Daily (website)], May 29, 2013, <http://mil.news.sina.com.cn/2013-05-29/0359726206.html>.

15. Lu Shiqiang and Pang Bo [吕世强, 庞博], “南部战区空军某场站全力做好转隶期间飞行保障工作” [“A Certain Airfield Station in the Southern Theater Command Airforce Fully Completed Transitional Period Flight Support Work”], 中国网 [China Online], April 11, 2017, http://military.china.com.cn/2017-04/11/content_40600020.htm.

16. Li Liang, Xi Bobo, and Chen Qingshun [李亮, 席博博, 陈庆顺], “飞行保障踏上‘网络快车’” [“Aviation Support Boards the ‘Network Express’”], 解放军报 [PLA Daily (website)], May 29, 2013, <http://mil.news.sina.com.cn/2013-05-29/0359726206.html>; and “通天道上‘助航兵’” [“Direct Access to the Top to ‘Aid Aviation’”], 空军报 [PLA Airforce Daily].

17. “统一‘断伙’? 这群兵哥哥的三餐都吃了些啥” [“Breaking Unity? What Did These Soldiers Eat for Their Three Meals?”], 每日头条 [Daily Headlines], March 27, 2019, <https://kknews.cc/zh-cn/military/2ka23xz.html>; and “张家口市2019年随军家属事业单位专项招聘军人贡献计分” [“Zhangjiakou City’s 2019 Special Recruitment for Military Dependents and Institutions Person Contribution Score”], <http://u3.huatu.com/uploads/soft/200116/655544-200116105541.xlsx>, accessed March 20 2020.

18. “Breaking Unity?”

19. 欧阳逸, “【奋进航大人】韩巨龙: 身有绝活的军械行家” [(Endeavors to be Admiral) Han Julong: A Unique Weapon Expert], 海军航空大学 [Naval Aviation University], November 27, 2019, https://mp.weixin.qq.com/s/_XiHujMrgdIZzES-q1-iOA; and 唐俊 李毅康, “乘风破浪的军中小发明, 你PICK哪一款?” [“Military Inventions That Ride the Wind and Waves,” Which One Do You Pick], 南部空军 [Southern Theater Command Air Force], June 19, 2020, <https://mp.weixin.qq.com/s/-8Frc4IE7aRvQEVYFraHKQ>.

units for maintaining air-to-air missiles. Ordnance Branches also maintain subordinate Storage Squads (保管班).²⁰ These organizations are possibly subordinate to airfield stations' battalion-level Air Launched Munitions Groups (机载弹药大队).²¹

Airfield stations also have subordinate Airfield Services Companies (场务连), which are responsible for maintaining the physical infrastructure of the airfield. The subordinate organizations of an airfield services company include a Bird Clearance Detachment (驱鸟分队), a Lighting Detachment (灯光分队), an Airfield Maintenance Detachment (养场分队), an Emergency Runway Repair Detachment (场道应急抢修分队), and a Firefighting Squad (消防班).²² Airfield stations also maintain a Security Company (警卫连) whose function is similar to USAF security forces.²³ In order to augment the survivability of airfield maintenance, militia units also train with airfield stations to conduct tasks that Airfield Services Companies regularly conduct, such as firefighting, runway repair, and emergency fuel bladder operations.²⁴ To support the personnel manning an airfield station, airfield stations maintain a Quartermaster Branch (军需股) responsible for feeding and clothing troops and an Airfield Barracks Branch (机场营房股) responsible for managing housing for soldiers stationed there. To provide general medical support

20. Mi Jianhua and Tan Longlong [米建华, 檀龙龙], “【关注】“海空雄鹰”，这是我们的名片” [“Follow ‘Sea and Sky Eagle,’ This Is Our Business Card”], 东海舰队发布 [East China Sea Fleet Releases], March 20, 2017, https://mp.weixin.qq.com/s/xvL1dICOe_GaNj34ITkaA.

21. 刘琦 林骁龙, “南空夜读 | 陕西小伙的军营版‘自我实现’” [“Night Reading in the Southern Sky | Shaanxi Lad's Barracks Version of Self Actualization”], 南部空军 [Southern Theater Command Air Force], October 23, 2021, <https://mp.weixin.qq.com/s/895314fnGOT83csuL5U4-w>.

22. “不忘初心，场务连老兵的正青春” [“Do Not Forget the Original Mission, the Positive Youth of the Field Service Company Veterans”], 雪花新闻 [Xuehua News], August 21, 2018, <https://www.xuehua.us/a/5eb5511286ec4d1abb55046f>; 刘晓锋 于洋 章越 温少晖 等, “西部战区空军某场站：数九寒冬战低温 保障天路助鹰飞” [“An Airfield Station in the WTCFAF: Beginning of the Coldest Period of the Year Supporting the Heavenly Road and Helping Eagles Fly”], 中国军视网 [China Military Television Online], January 8, 2022, http://www.js7tv.cn/video/202201_267511.html; and 廖诗宽 庞博, “军事训练标兵”成长史：当兵21年，笔记10万多字” [“History of Military Training ‘Trendsetters’ 21 Years in the Service, More Than 100,000 Words of Notes”], 中国军网 [China Military Online], October 9, 2016, http://www.81.cn/kj/2016-10/09/content_7291031.htm.

23. 田刚 and 周建强, “一个连队的育人‘宝典’” [“A Company's Educator's Treasured Book”], 中部号角 [Central Theater Command], February 23, 2022, <https://mp.weixin.qq.com/s/OUiZHM3zLNNj0wV4hcMr4w>.

24. Zhang Jun and Wang Fan [张军, 王帆], “空军+民兵强强联合，这样的组合你看怎样？” [“What Do You Think of the Combination of the Air Force and the Militia?”], 中国民兵 [China Militia], October 15, 2018, <https://mp.weixin.qq.com/s/LHh5gICbJ3-2wVRNQSdz3g>.

for routine health care and combat-related injuries, airfield stations maintain a medical team (卫生队).²⁵

The organization directly responsible for servicing and maintaining aircraft is the Four Station Company (四站连), which is responsible for providing vehicle-based environmental control support, auxiliary power support, oxygen support, hydraulics and lubricants support, battery-charging support, and chemical support to aircraft, as well as maintaining an organic maintenance component for maintaining support vehicles.²⁶ Assisting in aircraft-related equipment support are an Aviation Materials Branch (航材股) and a Fuel Transportation Branch (油料运输股). Aviation Materials Branches appear to be responsible for the storage and maintenance of aircraft components and spare parts, ranging from parachutes (for pilots, crew, and aircraft) to emergency lifesaving equipment, and potentially larger functional aircraft components.²⁷ Fuel Transportation Branches are responsible for fuel supply to airfield stations as well as supplying aircraft with fuel.²⁸ When the main supply of fuel is compromised, these units will work to reinstitute fuel supply at the airfield.²⁹ Airfield stations have Subordinate Vehicle Companies (汽车连), which appear to be responsible for maintaining an array of vehicles, including firetrucks, fuel trucks, general-purpose vehicles, as well as buses

25. Tang Tinglei and Liu Guoliang [唐廷磊, 刘国梁], “学习先进, 感受军需股的硬‘食’力” [“Learn Modern, Feel the Hard ‘Food’ Power of Military Ordnance”], 哈飞院 [Harbin Air Force Flight Academy of PLA], May 7, 2021, <https://mp.weixin.qq.com/s/FWggPaiRX53Uba5m1hajiQ>; and 刘鹏越, “冬日里: 送你一份小温暖” [“On Winter Days: Send a Little Warmth”], 空军在线 [Air Force Online], February 9, 2021, <https://mp.weixin.qq.com/s/915hKIIdqMxi-BWroQ2Aw8g>; and 戚铭智, “某场站开展综合保障演练暨群众性岗位练兵比武活动” [“An Airfield Station Carries Out Comprehensive Supply Drills and Mass Training Competitions”], 北海舰队 [North Sea Fleet], January 24, 2019, <https://mp.weixin.qq.com/s/tl1faWVEjhDpkBV3rV7YZg>.

26. “12年, 从‘一窍不通’到‘无所不能’! 这位老班长到底经历了啥” [“12 Years, From ‘Know Nothing’ to ‘Jack of All Trades’! This Old Squad Leader Finally Has a Lot of Experience”], 中国空军网 [China Airforce Online], 信仰军事 [Sina Military], October 23, 2018, <http://mil.news.sina.com.cn/2018-10-23/doc-ihmuuiyw3442742.shtml>; and He Xiang, Xu Song, and Zhang Yuanhu [何翔, 徐松, 张元虎], “了解一下 这就是场站四站兵” [“Understanding the Airfield Station Four Station Soldier”], China Military Video Online [中国国军视网], August 22, 2020, http://www.js7tv.cn/news/202008_227269.html and <https://mp.weixin.qq.com/s/2nvRjiNxEUtO7HHv250ofA>.

27. 王泉, “入伍25年, 他为战鹰叠出‘保护伞!’” [“After 25 Years in the Military, He Folds a Parachute for the War Eagle”], 哈飞院 [Harbin Flight Academy], November 22, 2021, https://mp.weixin.qq.com/s/5_X_b8ZRUKUX_7Zlq2Y8dQ; and Xi Liang [刁良], “高飞远‘航’, 博学多‘材’, 仓库是他们的战场!” [“Flying High and Flying Far, Knowledgeable in Many Materials the Warehouse Is Their Battlefield!”], 哈飞院 [Harbin Flight Academy], November 2, 2021, <https://mp.weixin.qq.com/s/j2kNokVj1dwFd0N0mEt04A>.

28. Gong Liming and Li Jianwen [宫俪铭, 李建文], “战鹰守护者 | 为梦想奋斗的‘天路尖兵’” [“Guardians of the War Eagles | Trailblazers of the Heavens, Striving for Their Dreams”], 海军航空大学 [Naval Aviation University], April 2, 2020, <https://mp.weixin.qq.com/s/j7XfEmCtduHlv6bNKAGueA>.

29. Qian Liquan, Fan Bo, and Zhang Xin [钱立全, 范波, 张鑫], “东部战区海军航空兵某场站开展军地联合野外油料保障演练” [“Eastern Theater Naval Aviation Airfield Station Holds a Joint Military Civilian Field Fuel Support Exercise”], 新浪军事 [Sina Military Online], March 7, 2019, <https://mil.news.sina.com.cn/2019-03-09/doc-ihxncvhl1133654.shtml>.

and regular passenger vehicles.³⁰ At PLAAF and naval aviation airfields, four station companies work in conjunction with personnel from Maintenance Squadrons (机务中队) attached to flight groups to form ground crews (地勤人员) to prepare aircraft for sorties and service aircraft between sorties. Maintenance Squadrons are organized into four different types with each possessing individual subordinate detachments specializing in different technical tasks, including a machinery, radar, munitions, special equipment, and radio or communications detachment.³¹

Moving back from the flight line to repair and heavy maintenance, the PLAAF and naval aviation both maintain maintenance group-level repair shops (修理厂) to conduct repair and maintenance at airfield stations.³² Repair shops are tasked with conducting repairs to aircraft and more intensive routine inspections to ensure aircraft remain mission capable.³³ Repair shops maintain subordinate detachments responsible for structural repairs of an aircraft, machining parts and components, conducting tests and maintaining pressure systems, and communications and radar. These shops can perform routine inspections on all aircraft systems and are capable of conducting inspections and repairs of electrical systems, replacement of engines, and composite materials repair.³⁴ It appears repairs requiring

30. Yang Ming [杨明], “汽车兵, 在平凡的岗位上创造着不平凡” [“Vehicle Soldiers, Creating the Extraordinary in Ordinary Positions”], 哈飞院 [Harbin Flight Academy], November 16, 2021, <https://mp.weixin.qq.com/s/8JVL3Tc3kAg4pgrnhgwtA>.

31. 徐佳亮徐何博江山, “聚焦演兵场 | 和煦风中硝烟浓” [“Focus on the Battlefield | Gunpowder Smoke in the Warm Wind”], 南部空军 [Southern Theater Command Air Force], January 16, 2020, <https://mp.weixin.qq.com/s/BxVKAV9Su--6p5fFghQWQw>; and Guo Guanyu, Sun Qin, and Zhang Boqi [郭关羽, 孙钦, 张渤奇], “金色战鹰, 熠熠生辉 | 海军航空大学某团隆重举行2019年度‘以海为梦·向战而飞’出彩人颁奖晚会” [“The Golden War Eagle Is Shining | A Regiment of Naval Aviation University Grandly Held the 2019 ‘Dream of the Sea, Flying to the Battle’ Award Ceremony”], 海军航空大学 [Naval Aviation University], January 8, 2020, <https://mp.weixin.qq.com/s/th8UsYDB-9pZP2nMqfBsNw>.

32. Liu Ming and Long Wenbiao [刘明, 龙文彪], “如何打开了从准军官向带兵人转变的方便之门” [“How to Open the Door to an Easy Transition from Officer to Leader”], 北部空军 [Northern Theater Command Air Force], August 21, 2017, <https://mp.weixin.qq.com/s/kYLbCR07-QcDQE0XQiKmWQ>; and Shen Gaojian et al., “Original Head Training Eagle Blows a New Horn,” 海军航空大学 [Naval Aviation University], October 22, 2021, <https://mp.weixin.qq.com/s/vFhrax1MLchN1akXvmYBjg>.

33. Hou Haojie [侯豪杰], “走近‘战机探伤技师’窦树军, 请听他的故事” [“Approach Dou Shujun, ‘Fighter Inspection Technician,’ Please Listen to His Story”], 北部空军 [Northern Theater Command Air Force], April 2, 2019, <https://mp.weixin.qq.com/s/gmEJO-xbAr0Z7ZAcZJjZxw>.

34. 飞龙 仕鹏 吴限, “是时候展示真正的技术了, 排故达人有绝活儿!” [“It’s Time to Show the Real Technology, the Troubleshooter Has Unique Skill”], 西部空天 [Western Theater Command Air Force], April 14, 2020, https://mp.weixin.qq.com/s/33mhYD3PN1gdO3SM_oKA7A; Tao Yang, Xu Junqi, and Wu Han [陶扬, 徐峻麒, 吴涵], “关注 | 帅! ‘海空雄鹰’专属‘医生’亮相” [“Attention! | Handsome! The Exclusive ‘Doctor’ of ‘Sea and Air Eagle’ Debuts”], 东部战区 [Eastern Theater Command], August 17, 2020, <https://mp.weixin.qq.com/s/O3KUVXSovPRpguXC-IQ2UA>; and “[视频]中国空军具备三代战机战伤快修能力” [(Video) The Chinese Air Force Has the Ability to Quickly Repair Third-generation Fighters], CCTV-4中文国际频道 [CCTV-4 Chinese International Channel], January 17, 2013, <https://tv.cctv.com/2013/01/17/VIDE1358383154053776.shtml>.

high-precision engineering (such as turbine blade and gasket replacement) take place at the factory level.³⁵

Factory-level repair is conducted in state-owned defense conglomerate factories and PLA numbered factories. The PLAAF currently runs a variety of repair factories across the PRC, ranging from specific numbered factories (such as 5713 Factory and the 5719 Factory, which both specialize in engine repair) to ordnance and ordnance repair factories (such as those in Shenyang and Xi'an).³⁶ Factories can also be dedicated to repairing or upgrading specific aircraft types, such as the Y-9 repair factory in the Western Theater Command (WTC) area.³⁷ These factories appear to be subordinate to the PLAAF Equipment Department.³⁸

At the base level, a corps deputy leader grade organization responsible for geographic command of PLAAF units under a TCAF appears to maintain support departments (基地保障部) responsible for providing general support, including medical support and transportation services.³⁹ These organizations are likely responsible for more general procurement and supply of consumables, but it remains unclear as to these organizations' role in aircraft-related support.

35. “航空叶片修复，解放军5719厂让叶片重新长出来！” [Aviation Blade Repair, PLA 5719 Factory Let the Blade Grow Back!], 搜狐 [Sohu], January 30, 2018, https://www.sohu.com/a/219806248_274912; and Luo Juan and Long Zhenhua [罗娟, 龙振华], “中国人民解放军5719厂保障空军某部演习侧记” [PLA 5719 Factory Supplies a Component of the Airforce Exercise Side Note], 中华人民共和国国防部 [PRC Ministry of Defense], March 2, 2018, http://mod.gov.cn/power/2018-03/02/content_4805740.htm.

36. Wang Liu [王柳], “大国工匠！他们给战机做‘心脏手术’” [“Great Country Craftsman! They Performed ‘Heart Surgery’ on the Warplane”], 中国军视网 [China Military Television Online], October 7, 2020, https://mp.weixin.qq.com/s/V_PXMNqlvRW7SX3brRioRg; 中国人民解放军5719厂保障空军某部演习侧记” [“PLA 5719 Factory Supplies a Component of the Airforce Exercise Side Note”], 中华人民共和国国防部 [PRC Ministry of Defense]; and “空军西安军械修理厂” [“Air Force Xi'an Ordnance Repair Factory”], 陕西省招聘市场 [Shaanxi Recruitment Market], March 19, 2021, <https://mp.weixin.qq.com/s/xCH7szRN9tCRkH2nxokrhQ>; and “空军沈阳军械修理厂岗位招聘” [“Air Force Shenyang Ordnance Repair Factory Recruitment”], 政通就业与人才服务平台 [Zhengtong Employment and Talent Service Platform], November 21, 2021, <https://mp.weixin.qq.com/s/8FvxkvTV82v41lZzcjIcGg>.

37. 张新 马艺轩, “西部战区空军航空兵某团廖荣民：托举战机升空的幕后英雄” [“WTCAF Regiment's Liao Rongmin: The Hero behind the Scenes”], 解放军报 [PLA Daily (website)], December 6, 2021, <https://mp.weixin.qq.com/s/CZFUq4-JHZdgWE8LfFoh8w>.

38. Lei Zishu [雷子舒], “中国人民解放军第5720工厂来校招聘” [“The 5720th Factory of the Chinese People's Liberation Army Came to the School for Recruitment”], 西航飞行学院 [Xi'an Aircraft Academy], July 14, 2021, <https://mp.weixin.qq.com/s/vyD64Ln72uFBDGWjesYHjw>.

39. Zhnag Tao, Dong Qiang, and Li Guowen [张涛, 董强, 李国文], “空军后勤部与地方物流战略合作说明了啥？这个举动叫响了一句话——现代后勤就是军民融合后勤绝不图看点亮点 紧扭住打仗基点军方的决断：战斗力唯一标准” [“What Does the Strategic Cooperation between the Air Force Logistics Department and the Local Logistics Show? This Move Rang Out a Sentence – Modern Logistics Is Military-Civilian Integration. Logistics Will Never Try to Highlight the Highlights. The Military's Decision to Fight the Base Point: The Only Criterion for Combat Effectiveness”], 解放军报 [PLA Daily (website)], October 23, 2017; and Yin Jianyu and Liu Kaiheng [殷建宇 and 刘凯恒], “巡诊服务下基层，送医送药暖兵心” [“Patrol Services at the Grassroots Level, Sending Doctors and Medicines to Warm the Hearts of Soldiers”], 中国军视网 [China Military Television Online], October 22, 2019, http://www.js7tv.cn/news/201910_196314.html.

To further support fuel supply to airfields, Military Fuel Emergency Fuel Support Elements (军需油料应急保障分队), which are likely subordinate to an unidentified element of Air Defense Base Support Departments, train to set up field fuel supply via transportable bladders at airfields or in other locations.⁴⁰ The TCAF Support Departments also maintain a variety of other emergency or mobile support organizations that can provide ad hoc support to aviation units. These organizations include Aviation Materials Emergency Support Detachments (航材应急支援保障分队) and emergency engineering detachments specializing in more complex runway repair.⁴¹ These teams often train jointly with naval aviation units. The PLAAF appears to manage these units via a TCAF Support Command Center.⁴²

At the TC level, TCAF Support Departments (战区空军保障部) were created around 2017 by merging the logistics and equipment departments into one organization as part of the 2016 military reforms.⁴³ This organization is responsible for overseeing all elements of TCAF equipment and logistics support. For the PLAAF, the flow of materiel to different airfields within a theater command is the responsibility of Transportation Regiments (运输团) subordinate to TCAF Support Departments. While the PLAAF prioritizes pipeline and rail transport of fuel over truck-based shipment, Transportation Regiments are tasked with the emergency transportation of POL over long distances.⁴⁴ These units are also likely responsible for the road transport of other materiel. The PLAAF transport aviation divisions and their subordinate regiments also contribute to materiel transportation tasks and are likely more timely than large convoys.

40. Zhong Tai, Wang Yong, and Zhang Tao [忠太, 王勇, 张涛], “一切为打仗, 一切为打赢, 军需油料综合演练展雄风!” [Everything Is for Fighting, Everything Is for Winning, and the Comprehensive Drill for Military Supplies and Fuels Is on Display!], 西部空天 [Western Theater Command Air Force], June 16, 2020, <https://mp.weixin.qq.com/s/pgvciKrE4c7tYQjRc1jwBA>; and 彭娅, “人员‘战损’后 野战油料保障分队手里还有哪些‘牌?’” [“After ‘Personnel’ Battle Damage, Field Fuel Supply Fendui’s Hands Hold What ‘Cards’?”], 中国军视网 [China Military Television Online], July 20, 2021, http://www.js7tv.cn/video/202107_252944.html.

41. Hu Tianhua, Xiong Huaming, and Dong Qiang [胡天华, 熊华明, 董强], “军地‘保障联合体’亮相练兵场” [“The Debut of the Military’s ‘Guarantee of Joint Support’”], 解放军报 [PLA Daily], December 8, 2018; and Hu Tianhua, Li Jiabao, and Xiong Huaming [胡天华, 李佳宝, 熊华明], “作战保障, 地方专业力量撑起半壁江山” [“Combat Support, Local Professional Power Holds Up Half of Wanjiang Shan”], 解放军报 [PLA Daily], November 19, 2018.

42. Hu Tianhua, Li Jiabao, and Xiong Huaming, “Combat Support, Local Professional Power Holds Up Half of Wanjiang Shan.”

43. Yue Huairang and Tong Wanyan [岳怀让, 童万燕], “北部战区空军保障部亮相, 刘晓锋少将任部长” [NTCAF Support Department Was Unveiled, Major General Liu Xiaofeng Is the Director], 澎湃新闻 [Paper], November 12, 2017, https://www.thepaper.cn/newsDetail_forward_1861720.

44. Huang Yunjia and Deng Shining [黄云豪, 邓世宁], “云端驾驶! 走, 汽车兵带你去感受海拔4500米+的「死亡天路」” [Driving in the Clouds! The Vehicle Soldiers Will Take You to Experience the “Road of Death” at an Altitude above 4,500 Meters], 西部空天 [Western Theater Command Air Force], October 27, 2021, <https://mp.weixin.qq.com/s/dqKT-m4bVE7jOY7Hr5M70w>.

The TCAF Support Departments also maintain a variety of depots (仓库). These depots include Equipment Depots (器材仓库), dedicated Aviation Materials Depots (航材仓库), Ordnance Depots (军械仓库), and Comprehensive Depots (综合仓库).⁴⁵ Equipment Depots appear to manage supply of aviation materials, munitions, and other mechanical or engineering related components and parts, while Comprehensive Depots appear to focus more on general goods and consumables. Comprehensive and Equipment Depots train to move large amounts of supplies across great distances and to other TC areas to set up field depots in an attempt to create a robust supply network.⁴⁶ These exercises often entail moving large numbers of vehicles by both rail and road networks over long distances and likely involve significant time and coordination to both reach their destinations and provide timely support to aviation units in the field.

The PLAN Logistics Department (海军后勤部) maintains a system of depots largely geared toward maintaining supply to naval operations. However, it does appear to maintain dedicated Aviation Materials Depots (航材仓库) for supporting naval aviation, likely including vertical-lift aviation.⁴⁷ Prior to the PLA reorganization, PLA Navy theater aviation also appears to have maintained its own ordnance depots.⁴⁸ Theater naval aviation still maintains its own depots, but they are likely far fewer in number than the depots run by larger elements of the PLAN. To ensure fuel supply to its airfield stations, naval aviation airfield stations also train to work with other

45. Wang Yi and Huang Zijuan [王壹, 黄子娟], “西部战区空军某航材仓库着眼实战提升保障力” [“A WTCAF Aviation Materials Depot Focuses on Actual Combat to Improve Support”], 人民网 [People’s Daily Online], August 1, 2016, <http://military.people.com.cn/n1/2016/0801/c1011-28599675.html>; Xie Yang [谢阳], “军营 [快递公司]: 稳重、迅速、专业派送战斗力” [Military Barracks | Delivery Company]: Stable, Rapid, and Professional Delivery of Combat Power], 西部空天 [Western Theater Command Air Force], October 13, 2021, https://mp.weixin.qq.com/s/K1_cU-IH0mgl8FLABoTI-Q; Ji Xiang and Liang Xiaodong [姬祥 and 梁晓东], “荒漠里有这样一群仓库兵” [In the Desert There Are Such a Group of Warehouse Soldiers], 西部空天 [Western Theater Command Air Force], June 10, 2021, https://mp.weixin.qq.com/s/y3koGo1TAO_HJgzFCTvF0A; and Liu Ruonan and Guo Shuai [刘若男, 郭帅], “‘我们就是您的后代’, 北部战区空军某军械仓库官兵接力为无名烈士守墓” [“‘We Are Your Descendants,’ Officers and Soldiers of an Ordnance Warehouse of the Air Force in the Northern Theater Relayed to Guard the Tomb of the Unknown Soldier”], 北部空军 [Northern Theater Command Air Force], July 13, 2016, <https://mp.weixin.qq.com/s/TasEVqLMpPvEbdEULv1Rug>.

46. Ma Jialong and Li Yang [马嘉龙, 李杨], “物资跨千里畅达战场! 空军某综合仓库开展直供一线保障演练” [Materials Reach the Battlefield across Thousands of Miles! An Airforce Comprehensive Depot Conducts a Direct First Line Support Exercise], 中华人民共和国国防部 [PRC Ministry of Defense], January 21, 2022, http://www.mod.gov.cn/services/2022-01/21/content_4903368.htm.

47. Guan Hongmao and Geng Haipeng [管宏茂, 耿海鹏], “着力提高效率减少工作强度 某材仓库一库翻能机器人为保勒麟” [With a Focus on Improving Efficiency and Reducing Work Intensity, an Aviation Materials Depot Work Saving Robot Is Baoleilin], 人民海军 [People’s Navy], February 5, 2016, 2.

48. Wang Lihua [王立华], “军队没有‘平时时期’ 东航某军械仓库大力培育官兵战斗精神” [“The Military Does Not Have ‘Peacetime,’ the Sailors of a East Sea Fleet Aviation Ordnance Warehouse Trains the Fighting Spirit of Officers and Enlisted”], 人民海军 [People’s Navy], December 21, 2007, 2.

anches to regain access to fuel and set up field depots to ensure the flow of other supplies.⁴⁹

In addition to their purely military support capabilities, the PLAAF and naval aviation continue to integrate a variety of civilian logistics and equipment support into their efforts to create a robust support system. From a materiel supply standpoint, state-owned enterprises have been observed to provide a variety of services, such as Aviation Industry Corporation of China (AVIC) subsidiaries delivering emergency-fuel supplies to damaged airfields as part of logistics exercises.⁵⁰ From an equipment support standpoint, civilian support can also take the form of civilian personnel from either AVIC subordinate factories or PLA repair factories being deployed to airfields to conduct emergency aircraft repair.⁵¹ It is important to note the PLAAF and PLAN do not maintain a permanent civilian maintenance presence like the US Air Force does.

Unsurprisingly, large PRC shipping companies such as SF Express (顺丰云速) and Jingdong Group (京东集团) also regularly train to provide shipping services to the PLAAF.⁵² SF Express also provides delivery services that include delivering components directly to radar sites for rush repair purposes.⁵³ The PLAAF radar network would be integral in maintaining air domain awareness during a blockade of Taiwan, and would enable surface-to-air missile (SAM) battalions to maintain strict emissions discipline to avoid being targeted and supplement airborne early warning and control aircraft and provide sufficient situational awareness for combat air patrols enforcing a blockade. For context, three types of PLAAF radar stations consist of radars intended for air-traffic control and ground control, domain awareness

49. Lu Xiongfei Zhang et al., “热点 | 海军航空兵某场站这场演练, 怎么民兵参加了?” [Hotspot | Why Did the Militia Also Participate in This Exercise at a Certain Naval Aviation Station?], 东线瞭望 [Eastern Front Lookout], March 11, 2019, <https://mp.weixin.qq.com/s/xfHvYjfqxngaLW6HNsYv6A>; and “夏日点兵, 陆海空三支部队在这个空军预备役场站干了件“大事”!” [In the Summer, the Three Troops of Land, Sea and Air Have Done a “Big Thing” at This Air Force Reserve Station!], 桂林军民融合 [Guilin MCF Committee], August 18, 2018, <https://mp.weixin.qq.com/s/du3hweBq54HHRSKwqJ0C-w>.

50. Liu Hanbao and Xiong Huaming [刘汉宝, 熊华明], “若机场阵地被炸, 该如何保障战机起飞?” [If the Airfield Is Bombed, How to Ensure Fighters Take Off?], 中国军网 [China Military Online], October 17, 2018, <https://mp.weixin.qq.com/s/3yIShO1qTgHdvynuni64YQ>.

51. Xiong Huaming and Li Jiabao [熊华名, 李佳宝], “军民融合在“战时”的威力有多大” [How Great Is the Power of Military Civilian Fusion during “Wartime”?], 中国青年报 [China Youth Daily], November 15, 2018, <https://cj.sina.com.cn/articles/view/1726918143/66eeadff02000idb3>.

52. Yi Han [奕含], “京东、顺丰与空军后勤部达成战略合作, 布局军民融合” [Jingdong, Shunfeng and the PLA Air Force Logistics Department Have Reached a Strategic Cooperation Agreement to Distribute Military Civilian Fusion], 观察者网 [Guancha], October 26, 2017, https://www.guancha.cn/economy/2017_10_26_432322.shtml.

53. Zhang Mimi and Feng Guobao [张汨汨, 冯国宝], “我军首次运用无人机实施联合补给演练” [My Military’s First Use of a UAV for a Joint Resupply Exercise], 中国军网 [China Military Online], January 27, 2018, http://www.81.cn/jwgz/2018-01/27/content_7923080.htm.

along PRC borders, and over-the-horizon radars with receivers near the PRC coastline intended for early warning. PLAAF SAM, antiaircraft artillery, and aviation units have indigenous radar elements.

Airfield Sustainment Capabilities

This section will provide an overall assessment of the capabilities of airfields to provide fuel, munitions, and host additional aircraft. Airfields were coded as having certain numbers of large, medium, and small fuel tanks and munitions storage facilities. To generate an assessment of the average size of munitions buildings, 10 airfields were selected at random and the measurements of their munition's storage, maintenance, and checkout buildings were used to generate average ranges for the area of small, medium, and large buildings. Munitions storage, handling, and checkout buildings were found to range from 50 square meters roughly at the smallest to 1,500 square meters roughly at the largest.

While these weapons storage and maintenance facilities are not all laid out in the same manner and do not consist of buildings exactly the same size, creating small, medium, and large categories will help generate a simplified qualitative representation of an airfield station's ability to supply munitions for combat operations. "Small" munitions buildings have an area of roughly 50–300 square meters. "Medium" munitions buildings have an area of roughly 300–600 square meters. "Large" munitions buildings have an area of roughly 600–1500 square meters. Munitions storage and handling facilities are fenced or walled-in areas with two main sections, one devoted to storage, handling, and checkout facilities, and a smaller section devoted to offices and a motor pool. The buildings in the storage and handling section are readily identifiable due to large berms, walls, or partially buried buildings intended to limit the spread of fire or potential impact of secondary explosions due to fire.

Vertical fuel storage tanks, both buried and above ground, were similarly classified into "small," "medium," and "large" categories. "Small" fuel tanks have a diameter of between roughly 10–15 meters. "Medium" fuel tanks have a diameter of between roughly 10–20 meters. "Large" fuel tanks have a diameter of roughly 30 meters or more. Environmental impact studies commissioned for civilian airports such as Beijing Daxing International Airport (北京大兴国际机场) and military-civilian, dual-use airfields such as Huizhou Pingtan Airport (惠州平潭机场) provide general volume information on fuel storage for these two facilities that further aid in developing a general assessment of storage capacity. The "large" fuel tanks at the Beijing Daxing International

Airport have an exterior diameter of roughly 35 meters and a volume of 20,000 cubic meters.⁵⁴ The “medium” tanks at Huizhou Airport’s off-site depot have a storage volume of about 10,000 cubic meters and have a diameter of roughly 15 meters.⁵⁵ The smaller tanks on-site at Huizhou Airport are noted to have a storage capacity of around 500 cubic meters each and have a measured diameter of around 10 meters.⁵⁶

As this chapter focuses primarily on fixed-wing combat aircraft, namely, fighters, multi-role aircraft, and bombers, airfields for turboprop trainers and helicopters were excluded due to their runways typically being too short to support modern combat aircraft. Additionally, airfields for transport aircraft and special-mission aircraft were excluded since during wartime these airfields would primarily be tasked with supporting and maintaining these capabilities. Airfields home to special-mission aircraft were excluded due to their smaller munitions storage facilities and the fact that these facilities would likely be committed to munitions not suited for use by combat aircraft. However, if combat aircraft were observed operating out of these airfields, they were included as reserve airfields. Airfields were deemed active or reserve based on apron activity, ongoing construction, or ability to support combat aircraft despite primarily supporting other aviation. Training airfields and the test and training bases were deemed reserve airfields as their construction was not primarily intended to host combat operations, but they remain capable of doing so.

A total of 91 airfields across the five TCs were able to have, with a degree of certainty, most, if not all, of their munitions and fuel storage facilities identified. Of the airfields identified, 47 were observed to have buried fuel storage and 38 were observed to have railhead access for further redundancy in supply of fuel and materiel. Airfields with buried fuel and railheads are found across all the TCs, with CTC, NTC, and ETC airfields having the highest proportion of direct railhead access. Interestingly, WTC has a higher proportion of its airfields having buried fuel storage, with STC airfields having the lowest proportion of buried fuel. The likely determining factor for railhead access is the airfield’s proximity to existing rail networks. Further observations

54. “北京新机场项目环境影响报告书” [Beijing New Airport Project Environmental Impact Report], 北京国寰天地环境技术发展中心有限公司 [Beijing Guohuan Tiandi Environmental Technology Development Center Co., Ltd.], April 2014, <http://cdn.feeyo.com/vedio/2014/2014.cxt.pdf>.

55. “广东惠州军民合用机场项目 环境影响报告书” [Environmental Impact Report of Guangdong Huizhou Military and Civilian Airport Project], 中华人民共和国生态环境部 [PRC Ministry of Ecology and Environment], April 2013, <http://www.mee.gov.cn/ywgz/hjxypj/jsxmhjxypj/xmslqk/201605/W020160522142644574746.pdf>.

56. “广东惠州军民合用机场项目 环境影响报告书” [Environmental Impact Report of Guangdong Huizhou Military and Civilian Airport Project], 中华人民共和国生态环境部 [PRC Ministry of Ecology and Environment].

indicate that many airfields will have limited fuel-storage capacity adjacent to runways or on-site. The larger bulk of storage and transshipment, whether from railways or pipelines, is often further off-site. Table 6-1 provides the average number of support facilities per airfield, as defined above. The fuel values are in units of thousands of liters, while the munitions storage values are the average number of buildings per airfield within a TC area.

Table 6-1. Average support infrastructure per airfield

Theater Command	Large Fuel Storage	Medium Fuel Storage	Small Fuel Storage	Large Munitions Storage	Medium Munitions Storage	Small Munitions Storage
NTC	39,000	40,500	2,625	3.05	3.75	4.45
ETC	29,400	48,000	850	4.07	3.67	5.53
STC	35,200	44,700	295	3.71	3.47	3.18
WTC	40,000	27,800	695	2.06	2.67	5.72
CTC	64,400	26,700	1,335	3.22	2.67	6.0

From a facilities modernization perspective, newer airfield renovations focus on expanding taxiways and newer shelters for aircraft as well as expanding and updating fuel and munitions storage. Airfields within the ETC, in particular, appear to be expanding their munitions storage, with current construction consisting primarily of a new type of hardened storage facility that more closely resembles USAF storage igloos. Rugao Air Base, in particular, currently has the largest munitions storage and handling facilities expansion effort, with at least 14 of these structures in varying stages of completion. While most operational PLA fixed-wing aviation airfields only have one runway, a handful of bases are beginning to add a second runway for fixed-wing aviation, several of which are intended to be components of military-civilian dual-use airfields. The number of these dual-runway airfields is significantly dwarfed by the single-runway airfields.

Out of these airfields, 80 were deemed to have varying amounts of additional apron space capable of supporting deployment of additional aircraft from other airfields. Generally speaking, additional apron space available at the airfields is not large enough to accommodate most of the 20-odd operational aircraft of a PLAAF aviation brigade. Thus, while the utility of this extra space to support a larger volume of air operations is limited, it does exist. Strictly from a support standpoint, the ability of aircraft to operate out of other airfields on the PRC mainland during wartime will be restricted by the availability of spare parts. For example,

if a J-10C sought to operate out of an airfield home to J-16s, it is likely it would need to have a field supply depot or some other sort of materiel support capability deployed to support its continued operations.

A similar observation can be made for munitions, though it is more likely that airfields which host strike-capable fighter aircraft (such as the J-16, J-10C, Su-35, and Su-30MKK) are likely to require greater storage for dumb bombs and rockets, air-to-air missiles, and ground-attack or surface-attack munitions. Despite the ability to host aircraft from other airfields, it is unlikely a J-10A, J-7, or J-8 airfield station would be able to provide ad hoc munitions support to newer aircraft (such as the J-10B, J-11B, J-16, or J-20), or vice versa, due to the different air-to-air missiles used by each aircraft. Given the older aircraft's inability to use modern munitions, these airfields could still serve as intermediate stops to refuel aircraft before conducting operations or as midway points for return-to-home airfields. This use could be a means of augmenting the operational range of aircraft given the current relatively small size of the PLAAF tanker fleet, which is currently thought to consist of between 12 and 20 H-6Us and a small number of Y-20Us.

While it is impossible to predict wartime consumption and minimum wartime supply requirements by counting munitions storage buildings and fuel tanks, this information can be used to demonstrate the limitations of support facilities to sustain air-combat operations. In a hypothetical employment of large-scale PLA air-combat operations in blockade of Taiwan, ETC and STC airfields within around 600 miles of the island would allow aircraft to remain on station over Taiwan and the surrounding ocean for longer periods of time, while also enabling aircraft on longer-range counterintervention sorties to refuel and rearm. Within this range, there are roughly 29 military airfields and 50 civilian airports. Of the military airfields, 27 have sufficient apron space potentially to host additional aircraft; 11 were observed to have buried fuel storage and only nine were observed to have direct railhead access. This limitation constrains these airfields' ability to receive emergency support and supply other secondary airfields. These weaknesses, combined with the current relatively large size and limited rapid mobility of TCAF's wartime transportation and field depots, could potentially be exploited to limit the generation of combat sorties around Taiwan.

Conclusion

The PLAAF and naval aviation are currently able to maintain, at a minimum, high levels of readiness and a logistics support system that is capable of sustaining operations within an established network of airfields. Despite the improvements of this system's ability to maintain a highly mission-capable force of modern combat aircraft, this system's ability to sustain operations within a broader network of airfields in a contested environment remains limited by the ability of large supply formations to maneuver quickly to sustain distributed operations. This limitation remains an acknowledged weakness of the system. Since the early 2000s, the PLAAF has recognized its airfield infrastructure will be gradually degraded, and it must be able to operate out of other airfields and establish the capability to support these operations. As early as January 2021, PLAAF airfield stations have been experimenting with so-called emergency mobile support test units (应急机动保障试点单位) that are subordinate to airfield stations and are responsible for supporting units out of garrison.⁵⁷ The PLAAF has also begun experimenting with concepts of disbursed logistics in exercise form.⁵⁸ Efforts such as these are crucial to the development of estimates for the minimum support requirements of distributed air-combat operations and the development of organizations and the tactics, techniques, and procedures to be adopted by units across the PLAAF as a whole.

Organizational restructuring and reorganizing of resources have already drastically improved the PLAAF and naval aviation readiness. Future assessments must focus on additional organizational developments intended to support improved distributed logistics. Likewise, estimates should gauge the minimum levels of supply needed to conduct distributed operations. Finally, examining modernization of PLAAF and naval aviation airfields and other support facilities will be crucial in determining how the PLA plans to adapt and operate under contested conditions.

57. Huang Jiaxin and Song Yufei [黄家心, 宋宇飞], “空军某场站开展应急机动保障演练 锤炼无依托野战保障硬功” [An Airforce Airfield Station Begins an Emergency Mobile Support Exercise, Hammering Does Not Rely on the Field Guarantee Hard Work], 解放军报 [*PLA Daily*], January 18, 2021.

58. Derek Solen, “The PLA Air Force’s Efforts toward Agile Combat Employment,” *Jamestown China Brief* 21, no. 17 (September 2021), <https://jamestown.org/program/the-pla-air-forces-efforts-toward-agile-combat-employment/>.



The PLA's Growing Airpower Projection Capabilities in the Western Theater Command

Brian Hart, Bonny Lin, and Matthew Funaiolo

Introduction

In recent years, the People's Republic of China (PRC) has embarked on sweeping expansions and upgrades of infrastructure within areas under the People's Liberation Army (PLA) Western Theater Command (WTC). In particular, China has invested heavily in constructing and upgrading military and dual-use airfields within the autonomous regions of Tibet and Xinjiang. These developments have been reported in a piecemeal fashion—most notably by the Indian news media, which keeps a close eye on military developments on the disputed China-India border and in nearby areas that support Chinese forces near the border.¹ However, there has been a notable lack of systematic information on the full scope of the PRC's western infrastructure expansion and the implications for the PLA.

This study fills a portion of that gap. By analyzing commercial satellite imagery and other open-source material, the authors have compiled a dataset of more than 50 airports and heliports within Tibet and Xinjiang.²

1. Manjeet Negi, "Exclusive: China Developing New Airbase in Shakche near Ladakh, India Watching Closely," *India Today* (website), July 19, 2021, <https://www.indiatoday.in/india/story/india-china-eastern-ladakh-lac-standoff-pla-air-base-1830080-2021-07-19>.

2. China Power Team, "How Is China Expanding Its Infrastructure to Project Power along Its Western Borders?," *ChinaPower* (website), March 16, 2022, <https://chinapower.csis.org/china-tibet-xinjiang-border-india-military-airport-heliport/>.

The data set identifies which facilities are military or dual-use, whether they are newly built or upgraded, the timeline of construction and upgrades, and other details. Taken together, the data paint a fuller picture of significant changes underway in Tibet and Xinjiang. Since 2017, China has initiated upgrades or new construction of more than 36 airfields, nearly two-thirds of which are military or dual-use facilities.

Yet, the data only tell part of the story. What is behind the PRC's buildup of airfields within Tibet and Xinjiang? Where are these developments concentrated? What are the implications for the PLA and the PRC's ability to project military power into neighboring countries? What are the implications for China's pursuit of its "military-civil fusion" (MCF) development strategy?

This chapter is structured along this line of questioning. The first section breaks down the PRC's perceived challenges and threats within the WTC, with particular focus on tensions along the China-India border. The second section provides an overview of the scope of developments in Tibet and Xinjiang and drills down into some of the specific ways the PRC is upgrading airfields. The next two sections assess potential operational implications, first focusing on how these developments may benefit PLA Air Force (PLAAF) and PLA Army (PLAA) aviation operations and logistics and then considering the continued challenges facing the PLA in the region. This assessment is followed by a discussion of the implications of China's investments in dual-use airports for promoting MCF. The concluding section highlights questions that remain unanswered and offers suggestions on areas of future research.

The PRC's Security Concerns within the Western Theater Command

Owing to its size and geography, the WTC presents the PLA and the Chinese government with significant challenges. At roughly 6.7 million square kilometers, the WTC covers almost half of China's total land area. Xinjiang and Tibet together constitute approximately 60 percent of the size

of the WTC and 30 percent of China's national territory.³ On top of this, Tibet and Xinjiang share international borders with a total of 11 countries, putting them on the frontlines of China's relations with countries in South and Central Asia, as well as Russia and Mongolia.

The PRC's infrastructure buildup in Tibet and Xinjiang is driven by economic and security concerns. On the economic front, new and upgraded airports promise to better facilitate the flow of goods and people within Tibet and Xinjiang and into and out of the regions. China's "13th Five-year Plan for Economic and Social Development" (中华人民共和国国民经济和社会发展第十三个五年规划) for the 2016–20 period singles out Tibet and Xinjiang as regions for stepping up construction of international and domestic transportation networks. It specifically lists the goals of "ensur[ing] that Xinjiang becomes an important window for opening up westward, [and] that Tibet becomes a major channel for opening up into South Asia."⁴

Developing new airports and heliports is particularly important for Tibet, given the difficulties presented by the mountainous terrain and harsh climate of the Tibetan Plateau. Tibet's "Civil Aviation Plan for the 13th Five-Year Plan Period" ("西藏自治区'十三五'时期民用航空发展规划") repeatedly laments the challenges posed by the plateau's geography and climate and highlights the role civil aviation can play in developing Tibet. The plan specifically calls for building up the region's airport and helicopter landing infrastructure and linking it up with new roadways, railways, and other transportation platforms to create a better "layout" (布局) for facilitating economic development and tourism.⁵ On the security front, new airfield infrastructure aims to better prepare forces within the WTC to deter and respond to perceived external and internal security threats and to project power beyond China's

3. *Encyclopaedia Britannica Online*, s.v. "Chongqing," March 22, 2022, <https://www.britannica.com/place/Chongqing>; *Encyclopaedia Britannica Online*, s.v. "Gansu," March 22, 2022, <https://www.britannica.com/place/Gansu>; *Encyclopaedia Britannica Online*, s.v. "Ningxia," March 22, 2022, <https://www.britannica.com/place/Ningxia>; *Encyclopaedia Britannica Online*, s.v. "Qinghai," March 22, 2022, <https://www.britannica.com/place/Qinghai>; *Encyclopaedia Britannica Online*, s.v. "Sichuan," March 22, 2022, <https://www.britannica.com/place/Sichuan>; *Encyclopaedia Britannica Online*, s.v. "Tibet," <https://www.britannica.com/place/Tibet>, March 22, 2022; *Encyclopaedia Britannica Online*, s.v. "Xinjiang," March 22, 2022, <https://www.britannica.com/place/Xinjiang>; and 国家统计局 [National Bureau of Statistics], "国土面积与人口密度" ["Surface Area and Population Density by Country"], http://www.stats.gov.cn/zjtj/ztsj/gjsj/2012/201307/t20130703_74186.html.

4. *The 13th Five-year Plan for Economic and Social Development of the People's Republic of China, 2016–2020* (Beijing: Compilation and Translation Bureau, Central Committee of the Communist Party of China, 2016), 79, 114.

5. Autonomous Region Development and Reform Commission [自治区发改委], "西藏自治区'十三五'时期民用航空发展规划" ["Civil Aviation Development Plan of Tibet Autonomous Region during the 13th Five-year Plan Period"], *Xizang* (website), November 22, 2018, http://www.xizang.gov.cn/zwgk/xxfb/gjhj_431/201902/t20190223_61963.html.

borders. One of the central strategic areas of focus for the WTC is India, which Chinese strategists view with varying levels of concern. Official PRC outlets have published commentary noting that India's military reform efforts and growing defense expenditure are oriented toward expanding India's regional and global influence as a great power.⁶ They have also expressed concerns about the prospect that strengthened ties between India and the United States could help nurture India's indigenous defense capabilities and enable the two countries to work together to challenge Chinese interests.⁷

At the same time, the PLA does not hold the Indian military in the highest regard. PRC security and military experts have stated that the Indian military lags the PLA in numerous ways, including the failure to modernize its organizational structure to fit more modern trends and the lack of progress toward "informatization" (信息化) and "intelligentization" (智能化).⁸ PRC experts have similarly argued that India's growing defense spending continues to be skewed heavily toward covering bloated personnel costs rather than funding needed equipment modernization, and they have pointed out that India's attention is split along two fronts, namely, China and Pakistan.⁹

Nevertheless, China perceives significant security threats along its expansive disputed border with India, commonly known as the Line of Actual Control (LAC). The LAC is roughly divided into three sections. The eastern stretch of the border runs along Arunachal Pradesh, which is claimed by China as part of southern Tibet but administered by India as a state. Near the central part of Tibet's border is a narrow stretch of land between Nepal and Bhutan that is partly disputed by not just China and India but also Bhutan. In 2017, tensions flared there on the Doklam Plateau after Chinese army engineers attempted to build a road through the area, and India sent troops to stop the construction. The Chinese government announced that India had "invaded Chinese territory and violated China's territorial sovereignty," and the PRC dispatched the PLA to the area,

6. Song Pengchao [宋鹏超], "印度公布1300亿军购预算 专家:可能引发印巴地区军备竞赛" ["India Military Arms Purchase Budget of 130 Billion, Expert: May Trigger India-Pakistan Arms Race"], http://www.81.cn/wjjsm/2019-10/07/content_9644435.htm, October 7, 2019, accessed on May 25, 2022.

7. Song Pengchao, "India Military Arms Purchase Budget."

8. Wang Se [王瑟], "印度军事改革——新动向与新风向" ["Indian Military Reform: New Directions and New Trends"], <http://www.cicir.ac.cn/NEW/opinion.html?id=a2c7921b-0981-4b3e-913f-916ec6d1cee8>, February 19, 2020, accessed on May 25, 2022.

9. Wang Se, "Indian Military Reform"; and Xu Zicheng and Li Jiasheng [徐梓程、李家胜], "印度新一轮军改面临多重阻力, 现在谈成果为时尚早" ["India's New Round of Military Reforms Face Various Obstacles, Too Early to Determine Its Success"], http://www.81.cn/yw/2021-11/15/content_10107941.htm, November 15, 2021, accessed on May 25, 2022.

resulting in a tense 73-day standoff.¹⁰ China and India faced off again in 2020 in the Galwan Valley and surrounding areas along the hotly contested western sector of the border. The skirmish became violent and resulted in deaths on both sides, marking the first time in decades that border tensions between China and India resulted in fatalities. The flashpoint remains a major source of tension between the two countries, and both countries have continued to maintain a significant military presence in the area.

While the tensions along the LAC are a concern for Beijing—and despite the fact the Indian media often cast PRC activity in the WTC as a direct response to border tensions—India is not China's only source of anxiety in the region.¹¹ Through its Belt and Road Initiative (BRI), China is pushing to expand its influence abroad by promoting the flow of goods, investment, and people, with special attention paid to Eurasian countries.¹² China has already emerged as the leading economic player in Central Asia, surpassing even Russia, which for decades was the dominant power in the region.¹³ As China's economic interests in neighboring countries have grown, so too have its security interests.¹⁴ China has beefed up security cooperation with bordering countries—including Tajikistan, Afghanistan, and most recently Kazakhstan—with the aim of enhancing their domestic security and fending off instability that could spill over into China.¹⁵

Leaders in Beijing also harbor concerns about internal instability and the potential for separatist activity within Tibet and Xinjiang, both of which are “autonomous regions” (自治区) with large ethnic minority populations. The Chinese government has put in place draconian policies in Xinjiang

10. “印度边防部队在中印边界锡金段越界进入中国领土的事实和中国的立场(全文)” [“The Facts Regarding the Indian Border Guard Crossing into Chinese Territory in the Sikkim Section of the Sino-Indian Border and China's Position (Full Text)”], http://www.gov.cn/xinwen/2017-08/02/content_5215586.htm, August 2, 2018, accessed on May 25, 2022.

11. “PLA Modernises Xinjiang's Military Units in ‘Reaction’ to India-China LAC Row,” *Hindustan Times* (website), May 17, 2021, <https://www.hindustantimes.com/world-news/pla-modernises-xinjiang-s-military-units-in-reaction-to-india-china-lac-row-101621231048385.html>.

12. China Power Team, “How Will the Belt and Road Initiative Advance China's Interests?,” *ChinaPower* (website), May 8, 2017, updated August 26, 2020, <https://chinapower.csis.org/china-belt-and-road-initiative/>.

13. Bradley Jardine and Edward Lemon, *In Russia's Shadow: China's Rising Security Presence in Central Asia*, Kennan Cable No. 52 (Washington, DC: Wilson Center/Kennan Institute, May 2020), <https://www.wilsoncenter.org/publication/kennan-cable-no-52-russias-shadow-chinas-rising-security-presence-central-asia>.

14. Dirk van der Kley, “China's Security Activities in Tajikistan and Afghanistan's Wakhan Corridor,” in *Securing the Belt and Road Initiative: China's Evolving Military Engagement along the Silk Roads*, ed. Nadège Rolland (Washington, DC: National Bureau of Asian Research, 2019), 71–90.

15. “习近平会见哈萨克斯坦总统托卡耶夫” [“Xi Jinping Meets with Kazakh President Tokayev”], https://www.fmprc.gov.cn/web/zyxw/202202/t20220205_10639196.shtml, February 5, 2022, accessed on May 25, 2022.

to surveil and stifle ethnic minority populations, especially Uyghurs. Beijing is likewise worried about the potential for unrest and separatist activity from Tibetan and other ethnic minorities in Tibet.

China's Airpower Expansion in the Western Theater Command

Overview and Definition of Terms

In response to these concerns, the PRC is expending significant resources to develop strategically important infrastructure in the WTC, with a particular focus on constructing military and dual-use airfields in Tibet and Xinjiang. The scale of these developments is sweeping. Based on analysis of satellite imagery and other open-source material, the authors have identified 37 airports and heliports within Tibet and Xinjiang that have been newly constructed or upgraded since 2017—the year China and India squared off on the Doklam Plateau (see figure 7-1).¹⁶ At least 22 of these airfields are identifiable as military or dual-use facilities.

The layout of these facilities across the two regions is reflective of geographic and historical realities and changing security dynamics. Compared to Tibet, infrastructure development in Xinjiang—including airports, roads, and railways—has historically been far more advanced. Xinjiang was already home to several airports mostly concentrated in the population centers ringing the region's large Taklamakan Desert. As such, Xinjiang has largely seen a wave of upgrades to its existing airfields rather than a wave of all-new airfields. Meanwhile, much of the activity in Tibet has come in the form of all-new facilities in places that were previously disconnected from air transportation (see table 7-1). The new airports skew close to Tibet's southern border, where more of the population is clustered.¹⁷ Conversely, the new heliports are more spread out through central Tibet and along Tibet's western border with India.

16. China Power Team, "How Is China Expanding?"

17. Lanhui Li et al., "Mapping Changing Population Distribution on the Qinghai-Tibet Plateau since 2000 with Multi-temporal Remote Sensing and Point-of-Interest Data," *Remote Sensing* 12, no. 24 (December 2020): 1–28.

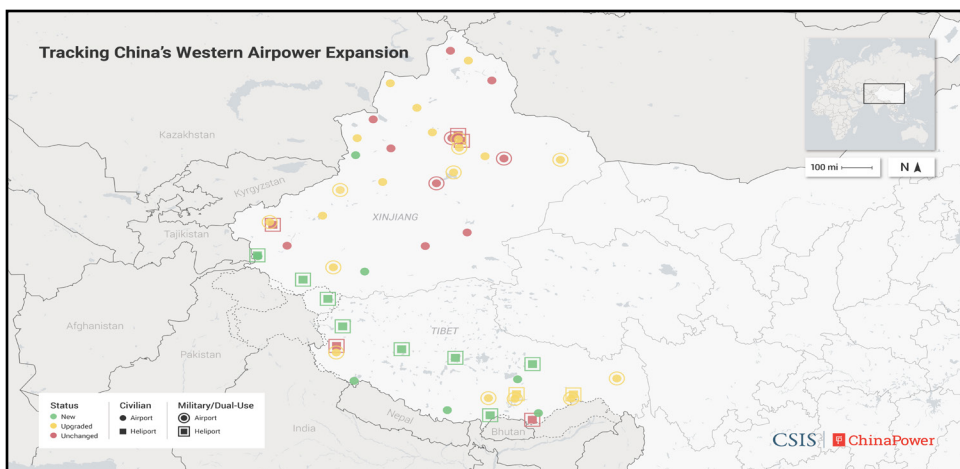


Figure 7-1. Tracking China's western airpower expansion

On the security front, two main observations can be drawn from the PRC's placements of airfields in the two regions. First, most new facilities skew closer to China's border with India. This placement suggests the PRC is approaching its airfield investments in the region with India in mind. Second, the placement of new heliports within Tibet suggests the PRC may be pursuing a strategy of locating heliports in the most remote areas where there is a lack of supporting ground infrastructure and little to no local demand for airports. In doing so, the PLA gains new footholds for projecting airpower while not needing to invest fully in airports. This observation is backed up in part by reporting that notes building airports for fixed-wing aircraft on plateaus is more difficult than constructing smaller heliports.¹⁸

In producing the data that drive this analysis, several important terms and variables were used to scope and inform this study. First, this study defines *military airfields* as those such as Urumqi Airbase that are operated solely by the PLA and do not facilitate civilian transportation under normal circumstances. *Dual-use airfields* are those that facilitate civilian flights (typically airports) but also play a role in supporting the PLA, including regular basing of PLAAF or PLAA Aviation aircraft and other military equipment. They can also include some airports that are not used for permanent basing of PLA aircraft or equipment, but that are regularly used by the PLA for moving personnel and supplies. In counting military and dual-use airfields, this study includes all heliports under construction, which are expected to come under the command of PLAA aviation units.

18. “直升机上青藏高原要过几道关?专家解读,” [“How Many Passes Does the Helicopter Have to Pass on the Qinghai-Tibet Plateau? Expert Interpretation”], <https://mil.huanqiu.com/article/416gJcZXRVu>, December 15, 2020, accessed on May 25, 2022.

However, new airports currently under construction are excluded from the count of military and dual-use facilities since there is not yet sufficient information to conclude whether they will be intended for dual-use roles. This means there are seven airports (four in Tibet and three in Xinjiang) currently under construction that could eventually become dual-use airports.

Table 7-1. Status of airfields in Tibet and Xinjiang

Type	Status	Region	
		Tibet	Xinjiang
Airport	New	4	3
	Upgraded	5	15
	Unchanged	2	3
Heliport	New	5	3
	Upgraded	2	0
	Unchanged	0	10

Second, the status of each facility (for example, whether it is new, upgraded, or unchanged) was determined through analysis of commercial satellite imagery and reporting in PRC news sources. Satellite imagery was accessed through Google Earth and directly from satellite imagery providers like Maxar Technologies and Planet Labs when adequate imagery was unavailable on Google Earth. Airfields classified as “new” are those for which construction began in 2017 or later—including facilities that were still under construction at the time of this study. Airfields categorized as “upgraded” are those where significant, visible changes were made to the facilities or immediate surrounding infrastructure. Upgrades typically took the form of new or expanded terminals, hangars, aprons, and runways. In some instances, improvements also included new or upgraded roads or rail built directly at the site of the airfield. Work that was visibly identifiable in satellite imagery was often also reported in various PRC media outlets.¹⁹ “Unchanged” airfields encompass the remaining facilities that existed prior to 2017 and that have not seen new upgrades initiated after that year.

Finally, the scope of this study is limited to developments since 2017. The data suggest the pace of PRC infrastructure activity in Tibet and Xinjiang

19. “新疆实施乌鲁木齐机场改扩建工程纾解交通压力” [“Xinjiang Implements Expansion Project at Urumqi Airport to Relieve Pressure from Traffic Build-up”], http://www.gov.cn/xinwen/2019-04/08/content_5380543.htm, April 8, 2019, accessed on May 25, 2022.

sped up significantly in 2020. That year alone, the PRC began constructing seven new airfields and initiated upgrades at seven others within the two regions (see figure 7-2). Of these 14 airfields, 11 are known to be military or dual-use, and it is possible that some, or all, of the other three could be dual-use. It is unclear what drove the spike of activity in 2020. China's deadly border confrontation with India in the summer of 2020 may have contributed to the expediting of work on certain airfields. Some projects may have also been initiated in 2020 as part of broader efforts to facilitate an economic recovery from the COVID-19 pandemic through investments in infrastructure.

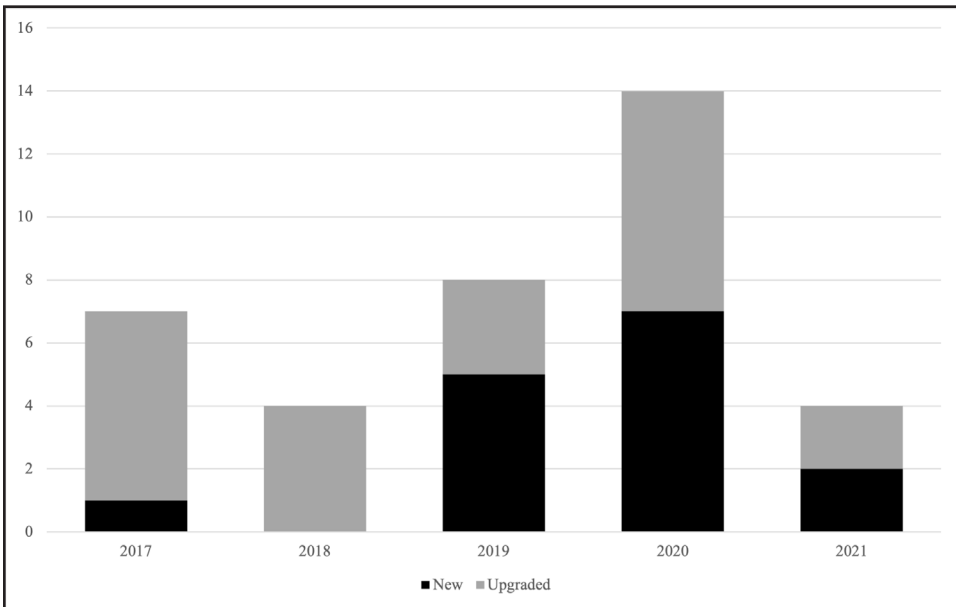


Figure 7-2. Construction and upgrades of airports or heliports in Tibet and Xinjiang newly built or upgraded (based on the year work began)

Airports

Both Xinjiang and Tibet have seen many existing airports upgraded in recent years. At least 15 airports have been upgraded in Xinjiang since 2017, with seven of these being military or dual-use facilities. One airfield that has received significant attention is Hotan Airport (和田机场), a dual-use airport located in Xinjiang's southwestern Hotan Prefecture, approximately 240 kilometers from the western sector of the LAC. The air base hosts several different PLAAF aircraft. The PLAAF's most advanced stealth fighter, the Chengdu J-20, was spotted there in satellite imagery from February 2021, along with other combat aircraft,

including J-11 multi-role fighters.²⁰ Shaanxi Y-8 and Y-9 transport aircraft have also been frequently seen at Hotan, along with airborne early warning and control aircraft and various unmanned aerial vehicles (UAVs).²¹

A significant expansion project began at Hotan in 2020. Construction work includes a new runway and additional tarmacs and hangars. Less than 5 kilometers southeast of the air base's main terminal, work is apparently underway to renovate the existing surface-to-air missile (SAM) complex. A new hangar and helicopter landing pads are also under construction in this area.²²

Similar developments are taking place at multiple airfields in Tibet. Since 2017, China has initiated upgrades at all five of Tibet's existing airports, each of which is dual-use. Some of the most striking activity has occurred at Shigatse Peace Airport (日喀则和平机场), which hosts a strategically located PLAAF base located approximately 155 kilometers north of the China-India border. In imagery captured on January 6, 2022, various aircraft are visible at the base. At the main military terminal and tarmac, 10 probable J-11s are present, along with accompanying generator vehicles.²³ At the runway's eastern end, an apparent WZ-7 Xianglong (Soaring Dragon) high-altitude, long-endurance reconnaissance UAV is visible. The WZ-7 has been in service in the PLAAF since at least 2018, and in recent years they have been spotted at Shigatse Peace and other air bases within the WTC, including Malan/Uxxaktal Airbase (马兰基地) in Xinjiang.²⁴ Finally, four helicopters—likely Z-15 medium utility helicopters—are visible on the helipads dotting the base's western runway.²⁵ While the Z-15s are not dedicated military aircraft, they are likely used by government and military personnel in the area.

In recent years, both the airport itself and the surrounding infrastructure have undergone major upgrades and expansions. In 2017, a new

20. Aakriti Sharma, "Satellite Image Captures China's J-20 Stealth Jets, J-11 Fighters, UAVs, AEW&C at Hotan Airbase near Ladakh Border," *Eurasian Times* (website), February 2, 2021, <https://eurasianimes.com/satellite-image-chinas-hotan-airbase-close-to-ladakh-border/>.

21. Google Earth, 37.039152° N, 79.869969° E, Google Earth (website), December 2021, <https://earth.google.com/web/>.

22. Google Earth, 36.997953° N, 79.925806° E, Google Earth (website), December 2021, <https://earth.google.com/web/>.

23. China Power Team, "How Is China Expanding?"

24. Andreas Rupprecht and Gabriel Dominguez, "Chinese Air Force Equips 16th Air Division with WZ-7 HALE UAVs," *Janes* (website), November 11, 2021, <https://www.janes.com/defence-news/news-detail/chinese-air-force-equips-16th-air-division-with-wz-7-hale-uavs>.

25. China Power Team, "How Is China Expanding?"

3,000-meter-long auxiliary runway featuring seven helipads was added to the airport's existing runway. The configuration of the auxiliary runway is notably different from that of many other airports seen in China. Rather than running parallel to the existing runway, the new one intersects the western end of the main runway and runs at an oblique angle. This setup increases the distance between the runways, making it harder for an attacking military to render both runways inoperable without targeting the airfield with multiple precision strikes. To the east, at the existing portion of the airport, there is a large military presence, and several new upgrades have been made. Three UAV hangars have been built, one near the center of the main runway and two at the far eastern portion of the runway. The main military garrison has also been upgraded with several new support buildings.

There is also significant construction work ongoing at an area approximately two kilometers south of the main base and runway. While not immediately a part of the airport, the work there nevertheless has significant military implications for the air base. In this area, a new rail line has been built, along with three railway terminals of varying sizes. These terminals appear to be capable of loading and unloading large military and other equipment on and off the railway. Directly adjacent to one of the smaller rail terminals is a new fuel depot, likely used for supplying fuel to the surrounding construction sites—and potentially the airport as well.

Immediately west of the new rail line, a large underground facility (UGF) is being constructed within a small mountain formation. Satellite imagery shows at least three UGF entrances being built on the north, west, and south sides of the mountain. The intended purpose of this UGF is unclear, but the PLA has long utilized UGFs to secure and conceal assets (such as command and control and logistics facilities and nuclear and conventional missile systems).²⁶ The PLA Navy also uses UGFs, including at Yulin Navy Base, to house China's fleet of nuclear-powered submarines.²⁷

Capping off work in the area, a new SAM base is under construction approximately one kilometer north of the new rail terminals. This SAM base is the second one to be built in the area; an existing SAM base is also being significantly renovated and expanded at the far western end of the air base's auxiliary runway. The two SAM bases are roughly similar, though the

26. Office of the Secretary of Defense (OSD), *Military and Security Developments Involving the People's Republic of China 2020* (Washington, DC: OSD, 2020), 91.

27. Matthew P. Funaiolo, Joseph S. Bermudez Jr., and Brian Hart, "A Glimpse of Chinese Ballistic Missile Submarines," CSIS (website), August 4, 2021, <https://www.csis.org/analysis/glimpse-chinese-ballistic-missile-submarines>.

SAM complex to the south of the air base appears to be configured for one main launch battery, while the SAM base attached to the auxiliary runway features two launch batteries, one of which is still undergoing renovations. Notably, the construction of two air defense bases in the same area suggests the presence of high-value PLA assets.

In Tibet, at least four new airports are under construction. Three of the airports—Shannan Longzi Airport (山南隆子机场), Ngari Burang Airport (阿里普兰机场), and Shigatse Tingri Airport (日喀则定日机场)—are positioned less than 60 kilometers from the China-India border. The new facilities fill large gaps along the Indian border where there were previously no airports. It is not yet clear whether these will be dual-use airports. Given that all existing airports in Tibet have been dual-use, it is plausible all or several of the new airports will also be dual-use, and unofficial reports claim they will be dual-use. If these airports are dual-use, and they are used for basing PLAAF detachments, China would stand to gain significant new options for projecting airpower into India and other neighboring countries. The operational implications of these airports are discussed in more detail in the following section.

Construction of three new airports has also been initiated in Xinjiang—all since 2019. In the far western reaches of Xinjiang near China's borders with Pakistan, Afghanistan, and Tajikistan, China is constructing a new airport at Tashkorgan (塔什库尔干). The airport, which is Xinjiang's first high-plateau airport, is a key part of the China-Pakistan Economic Corridor, a flagship component of the BRI.²⁸ Based on its current configuration, the airport appears likely to serve primarily civilian purposes; however, less than eight kilometers north of the airport, a new heliport has been constructed, signaling the addition of new PLA assets in the immediate area.²⁹ Elsewhere within Xinjiang, China is constructing midsized airports at Yutian County (于田县), in southern Xinjiang, and Zhaosu County (昭苏县), which straddles Xinjiang's northwestern border with Kazakhstan.

28. “聚焦‘一带一路’：焕发生机的丝路大动脉” [“Focus on the ‘Belt and Road’: The Revitalized Silk Road Arteries”], <http://www.scio.gov.cn/ztk/wh/slx/y/31200/Document/1433982/1433982.htm>, May 14, 2015, accessed on May 25, 2022.

29. Google Earth, 37.724801° N, 75.254765° E, Google Earth (website), January 2019, <https://earth.google.com/web/>.

Heliports

Rounding out China's air infrastructure expansion in the region is a growing slate of new and upgraded heliports. In Tibet, the PRC is constructing five new heliports and upgrading two existing heliports. The largest and most significant heliport in Tibet is located at Lhasa (拉萨), the regional capital. Home to the 85th Army Aviation Brigade, the heliport was completed around 2018. After beginning initial operations, significant upgrades and expansion began at the heliport in 2020. Among other additions, eight large hangars were constructed—five on the north side of the main terminal and three on the south side.³⁰ This expansion of facilities appears to have coincided with the addition of new aircraft into the brigade. Most notably, reports suggest the brigade operationalized Harbin Z-20 medium-lift utility helicopter, a new Chinese-made helicopter capable of operating in the high-altitude environment of the Tibetan Plateau.³¹

The five new heliports being constructed in Tibet are dotted throughout the region. In far western Tibet, China is constructing a new heliport in Rutog County (日土县), approximately 150 kilometers from the LAC at Pangong Lake—one of the sites where Chinese and Indian tensions turned violent in 2020. The heliport in Rutog County is roughly the same distance from the LAC at Pangong Lake as another (existing) heliport in Ngari Prefecture (阿里地区). Notably, reporting from February 2021 shows that a PLAA aviation unit from the Ngari Prefecture heliport flew at least three helicopters over Pangong Lake in a move that was met with anger in India.³²

The PRC also has three new heliports in Xinjiang, all concentrated in the western reaches of the region near China's borders with India and Central Asian countries. Around 2018, the PRC completed construction of a small heliport at Xaidulla (赛图拉), roughly 100 kilometers from the LAC. The aforementioned small heliport at Tashkorgan was completed around 2020. The third new heliport is still under construction in the disputed region of Aksai Chin (阿克赛钦), which is administered as part of Xinjiang.³³

30. Google Earth, 29.589944° N, 91.022618° E, Google Earth (website), February 2020, <https://earth.google.com/web/>.

31. "Xizang LH Brigade Expanding," Scramble Dutch Aviation Society (website), <https://www.scramble.nl/military-news/xizang-lh-brigade-expanding>, December 14, 2020, updated December 15, 2020.

32. "绝美! 陆航直升机带你看班公湖美景" ["Absolutely Beautiful! Army Air Helicopters Will Take You to See the Beauty of Pangong Lake"], *Xinhuanet* (website), http://www.xinhuanet.com/mil/2021-02/07/c_1211016511.htm, February 7, 2021.

33. China Power Team, "How Is China Expanding?"

Other Developments in the Western Theater Command

Owing to the size of Tibet and Xinjiang, and their importance to China's western border defense, the scope of this study is limited to developments in these two regions. However, it is worth pointing out that new infrastructure developments elsewhere in the WTC are also significant. Most notably, the PLA is significantly expanding infrastructure at Golmud (格尔木市), in Qinghai Province. Golmud has long been a central logistics hub for linking up PLA facilities on the Tibetan Plateau with WTC forces in more inland provinces.

In recent years, the PRC has embarked on major upgrades of PLA facilities at Golmud. Since 2020, the PLAAF base at Golmud has seen multiple new facilities added, including several hangars.³⁴ More significantly, construction of a large new heliport is underway immediately south of the PLAAF base. The new heliport includes a large array of hangars and a sizable garrison area.³⁵

Implications for PLA Air Operations in the Western Theater Command

Much of the PRC's investments in new and upgraded airfields in Tibet and Xinjiang are still relatively recent and, in many instances, still ongoing. Still, they promise to generate notable benefits to the PLA's ability to conduct air operations and project power into neighboring countries. This section discusses some of the most notable operational benefits of PRC air infrastructure developments, focusing on the implications for fixed-wing aircraft and rotary-wing aircraft.

Implications for Fixed-wing Aircraft Operations

At the most basic level, new and upgraded airports mean the PLAAF has more runways from which it can launch and land fixed-wing aircraft. This is particularly meaningful in Tibet, an area roughly twice the size of Texas that was previously serviced by only five airports. At present, there is an immense gap of roughly 950 kilometers with no airports between Ngari Gunsa Airport (阿里昆莎机场) in western Tibet and

34. Google Earth, 36.405098° N, 94.788005° E, Google Earth (website), November 2021, <https://earth.google.com/web/>.

35. Google Earth, 36.379535° N, 94.797987° E, Google Earth (website), November 2021, <https://earth.google.com/web/>.

Shigatse Peace Airport in central Tibet. This gap amounts to a large area of space along the China-India border that is generally inaccessible to fixed-wing aircraft. With the ongoing construction of Ngari Burang Airport and Shigatse Tingri Airport, this gap is being significantly shortened. The largest remaining gap will be 580 kilometers, with virtually the entire distance spanning the PRC's border with Nepal rather than its border with India. It remains to be seen whether, and to what extent, these new airports in Tibet will play a military role, but they will nevertheless fill a crucial void of runways along the China-India border.

This progress presents several operational benefits for the PLAAF. If the PLAAF bases detachments of fighters and other aircraft at some of the three new airports along the Tibet-India border, China will have crucial new platforms for launching aerial strikes and counterstrikes in the event of a conflict with India. In 2017, prior to the start of construction of the new airports in Tibet, the former director general of the Indian Defense Planning Staff, Air Marshal Ranjit Singh Bedi, noted that existing PLAAF bases in Tibet were some 500 kilometers from most major strategic targets—like air bases—in India.³⁶ New airports in Tibet could change this reality thanks to their closer proximity to Indian territory. For example, within India's Central Air Command, Bareilly Air Force Station is one of the closest major installations to the border with China. Bareilly would likely be a key target for the PLAAF in the event of a major conflict. At present, the closest PLAAF base to Bareilly is Ngari Gunsu Airport, in western Tibet, at a distance of approximately 410 kilometers. By comparison, Tibet's new Ngari Burang Airport, which is still under construction, would be only about 270 kilometers from Bareilly. This proximity would mean PLAAF fighters and ground-attack planes could more quickly reach Bareilly and other Indian targets and use less fuel to do so.

Upgrades at many airports throughout Tibet and Xinjiang also enhance their survivability. In particular, the layout of new runways at many airports—such as Shigatse Peace and Hotan—makes it much harder for attacking forces to render entire airports inoperable and leaves the PLAAF with better chances of getting planes in the sky. The addition of new and upgraded SAM bases at these and other PLAAF bases in the WTC likewise increases the survivability of military assets in the region.

36. Ranjit Singh Bedi, "China a Threat or a Challenge: Its Air Power Potential," *Indian Defence Review* (website), March 8, 2017, <http://www.indiandefencereview.com/spotlights/china-a-threat-or-a-challenge-its-air-power-potential/>.

The benefits for fixed-wing air capabilities in the region are not limited to combat operations. New and improved airports are playing important roles in advancing China's aerial reconnaissance operations within the WTC, especially in remote border regions characterized by harsh climate and terrain. The aforementioned new UAV hangars at Shigatse Peace Airport, coupled with new UAV support infrastructure at other airports, are significantly enhancing the ability of the PLAAF to conduct aerial reconnaissance missions along both sides of the Indian border. Developments in Xinjiang are likewise enhancing the PLAAF's ability to conduct reconnaissance missions throughout the region and into neighboring countries to China's west. As one example of this, since 2017, the PRC has added new hangars and extended aprons at its Malan/Uxxaktal Airbase in central Xinjiang, which is home to the PLAAF's 178th UAV Brigade. A wide variety of UAVs has been seen at Malan/Uxxaktal in recent years, including the WZ-7, the Wing-Loong (or Yilong) medium-altitude, long-endurance UAV, and many others—including some experimental aircraft.³⁷

Implications for Rotary-wing Aircraft Operations

China's investments in Tibet and Xinjiang also have sizable benefits for the PLA's ability to operate rotary-wing aircraft in the region. In particular, the new heliports emerging throughout Tibet and western Xinjiang are significantly upgrading the ability of PLAA aviation units to conduct air operations in high-altitude areas.

Chinese sources have outlined three main tasks for helicopter forces in high-plateau areas. First, they play a role in providing fire support against enemy ground targets.³⁸ According to reports, PLAA aviation units in Tibet have been focusing on their ability to engage enemy targets through live-fire drills on the Tibetan Plateau.³⁹ Chinese helicopter forces in the region are also improving their ability to perform helicopter-based border patrol missions. In September 2021, servicemembers assigned to a border defense regiment of the Kashgar Military Sub-command, under the PLA Xinjiang Military Command, joined with an unspecified

37. Tyler Rogoway, "Flanker Fighter Appears among Unmanned Aircraft at China's Secretive Test Base," Drive Warzone (website), July 2, 2021, <https://www.thedrive.com/the-war-zone/41386/flanker-fighter-appears-among-unmanned-aircraft-at-chifnas-secretive-drone-test-base>.

38. "How Many Passes Does the Helicopter Have to Pass on the Qinghai-Tibet Plateau?"

39. "轰! 西藏军区某陆航旅开展新机型高原实弹射击首训" ["Yin! An Army Aviation Brigade of the Tibet Military Region Conducts the First Plateau Live Fire Training of the New Model of Aircraft"], <http://m.news.cctv.com/2021/03/28/ARTIG4Jk5getajxtcinzpTWC210328.shtml>, March 28, 2021, accessed on May 25, 2022.

army aviation brigade to perform patrol missions in helicopters at an elevation of more than 5,600 meters. One report notes that harsh weather conditions in the region have historically prohibited border patrols, but efforts to train in high-altitude areas are enabling PLA forces in the region to “realize airspace control.”⁴⁰

Second, transport helicopters play a crucial role in providing “point-to-point” transportation of equipment, supplies, and personnel.⁴¹ While less efficient than moving troops overland, helicopters are crucial to being able to move into areas quickly when road transportation has been rendered impossible—either due to enemy attacks, weather conditions, or simple lack of ground infrastructure. Toward this end, some plateau border defense units have built small helipads to link them to the array of larger heliports appearing throughout the WTC, which Chinese sources indicate are particularly important for supporting and replenishing border troops in cases when overland transportation is impossible due to weather conditions.⁴² The PLA is also experimenting with integrating rotary-wing UAVs of varying sizes into its border defense logistics. Sometime after 2020, the Logistics Support Department of the Central Military Commission (中央军委后勤保障部) established a “UAV logistics team” along with UAV helipads to set up mountain supply routes. UAVs have been used to bring remote troops fuel and fresh food, and they can quickly provide medicine and medical supplies in emergencies.⁴³

Finally, new heliports are poised to enhance the PLA's ability to conduct special operations missions on the Tibetan Plateau. This construction includes operations to seize and occupy quickly important target areas in support of ground troops. It also includes conducting “escort” missions for ground troops engaging in search and rescue operations during crises such as natural disasters.⁴⁴

40. Hu Zheng [胡铮], “直升机立体巡边, 喀什军分区开辟10余条高原巡逻航线” [“Helicopters Add Air Dimension to Patrol, Kashgar Military Division Opens 10 More Patrol Routes”], https://www.81.cn/yw/2021-10/08/content_10096474.htm, October 8, 2021, accessed on May 25, 2022.

41. “How Many Passes Does the Helicopter Have to Pass on the Qinghai-Tibet Plateau?”

42. Liu Jianwei [刘建伟], Sun Xingwei [孙兴维], and Yang Renwei [杨仁伟], “雪域高原边防官兵过冬保障全面加强” [“Border Defense Guards Stationed in the Snowy Plateaus Improve Mechanisms to Combat Winter Weather”], http://www.81.cn/jfbmap/content/2020-12/11/content_277902.htm, December 11, 2020, accessed on May 25, 2022.

43. Chen Zhuo, “Feature: Drones Deliver Supplies to Remote Border Outposts,” http://www.81.cn/jwyw/2022-03/03/content_10136908.htm, March 3, 2022, accessed on May 25, 2022.

44. “How Many Passes Does the Helicopter Have to Pass on the Qinghai-Tibet Plateau?”

Continued Operational Challenges

Despite the benefits that China's investments in the region have brought, the PLA faces several challenges. This section analyzes some of the key persistent challenges the PLA faces in conducting air operations in the region and the steps the PLA is taking to reap the full operational benefits of new and upgraded facilities.

The PLA's challenges in the region are principally a result of geography and climate. Much of China's side of the China-India border is situated on the highest portions of the Tibetan Plateau, which is often described as the "roof of the world" due to its high elevation.⁴⁵ In fact, 20 of China's airports and heliports within Tibet and Xinjiang are located more than 3,000 meters above sea level. By comparison, all but a few of the Indian Air Force's stations across its Western, Central, and Eastern Air Commands—which are responsible for operations vis-à-vis China—are positioned at or below 500 meters above sea level.

The PLA faces major operational challenges associated with operating at such high altitudes. Chinese sources often note the average elevation in Tibet is 4,000 meters, the oxygen level is roughly 60 percent of that of sea level, and the weather in the mountains can shift quickly.⁴⁶ The result of the thinner atmosphere is that it is significantly more difficult for aircraft to take off. To enable fixed-wing aircraft to take off, high-elevation airports typically must have extremely long runways. Tibet's Qamdo Bamda Airport (昌都邦达机场) boasts the world's longest paved runway, which stretches a staggering 5,500 meters. Shigatse Peace Airport features a runway stretching 5,000 meters, tying it for the third longest in the world.⁴⁷ Yet, even with longer runways, airplanes taking off from such high altitudes face significant limitations. Fighter aircraft carrying munitions are typically unable to take off with a full load of fuel, which significantly limits their range.

Rotary-wing aircraft are prone to similar problems. Due to the higher demands imposed on engines by thinner air, many helicopters are inoperable above elevations of more than 4,000 meters. However, those helicopters

45. Ma Zhe [马哲], "潮头观澜 | 世界屋脊 保护优先" ["Watching the Tide | Protecting the Roof of the World Is a Priority"], <http://m.news.cctv.com/2021/07/23/ARTI4BhEL0RAfoZc6YOJpiuv210723.shtml>, July 24, 2021, accessed on May 25, 2022.

46. "Yin!"

47. John Misachi, "Longest Runways in the World," World Atlas (website), July 10, 2018, <https://www.worldatlas.com/articles/longest-runways-in-the-world.html>.

capable of flying at higher altitudes play crucial roles on the Tibetan Plateau since they require less infrastructure to take off (for example, they do not require lengthy runways). This issue explains why the majority of the PRC's highest-elevation airfields in the region are heliports (see table 7-2).

Table 7-2. Elevation of highest airfields in Tibet and Xinjiang

Airfield Name	Status	Elevation (meters)
Aksai Chin Heliport	New	4,876
Nyima County Heliport	New	4,576
Rutog County Heliport	New	4,549
Seni County Heliport	New	4,492
Gerze County Heliport	New	4,441
Kangmar County Heliport	New	4,437
Cuona Heliport	Unchanged	4,366
Qamdo Bamda Airport	Upgraded	4,345
Shigatse Tingri Airport	New	4,306
Damxung Airport	New	4,302
Ngari Heliport	Unchanged	4,290
Ngari Burang Airport	New	4,288
Ngari Gunsai Airport	Upgraded	4,270
Shannan Longzi Airport	New	3,944
Shigatse Peace Airport	Upgraded	3,807
Xaidulla Heliport	New	3,673
Lhasa Heliport	Upgraded	3,630
Lhasa Gonggar Airport	Upgraded	3,575
Tashkorgan Airport	New	3,225
Tashkorgan Heliport	New	3,150

The PLAAF can address some of the limitations on fixed-wing aircraft by extending their range through midair refueling. According to reports, the PLAAF is indeed conducting midair refueling training within the WTC. Reports from January 2021 show the WTC released video of a refueling variant of the Xian H-6 bomber (known as the HY-6) conducting a midair refueling of two Shenyang J-8 interceptors; however, it was unclear where

in the WTC the aircraft took off.⁴⁸ More recently, official reports indicate at least one J-16 fighter underwent midair refueling during a training mission on February 20, 2022.⁴⁹

Nevertheless, refueling adds significant operational complexity and exposes tanker aircraft during a conflict. On top of this, the PLA is still refining its limited midair refueling capabilities. Operationalizing the refueling variant of the Xi'an Y-20 transport aircraft (known as the Y-20U) could enhance the WTC's ability to conduct midair refueling, thereby extending the operational range of some aircraft within the WTC. However, there are not yet indications that the Y-20U has entered service within the WTC; so far, reports indicate the Y-20U has been operationalized within the Central Theater Command and Eastern Theater Command.⁵⁰

PLAA aviation units are also facing difficulties with adapting to high elevation operations. Reports on PLAA aviation live-fire exercises in the region from March 2021 note that soldiers practiced using new types of aircraft in the region and that adjusting to using new equipment at high elevations is particularly challenging.⁵¹

Finally, the climate and terrain of Tibet and Xinjiang impose serious physiological limitations on PLA personnel, especially in very high-elevation areas. Troops moving into areas over 2,400 meters above sea level typically require several days to acclimate safely to lower oxygen levels. This requirement places limitations on the PLA's ability to move troops quickly from inland regions of the WTC—or elsewhere within the PRC—into high-elevation areas of the Tibetan Plateau. Failing to allow troops to acclimate adequately can have serious health effects (such as “acute mountain sickness,” cerebral edema, and pulmonary edema)—a harsh lesson learned by many Indian troops who fell ill during the 1962 China-India border war.⁵² Even once troops

48. “运油20何时服役? 西部战区轰油6为歼8DF双机编队加油” [“When Will the Yunyou 20 Enter Service? A Western Theater Command HU-6 Fuels the J-8DF Twin-plane Formation”], http://slide.mil.news.sina.com.cn/k/slide_8_193_92453.html#p=3, January 21, 2021, accessed on May 25, 2022.

49. “Pilots Maneuver Fighters in Aerial Refueling,” http://english.chinamil.com.cn/view/2022-03/08/content_10138699.htm, March 8, 2022, accessed on May 25, 2022.

50. Andreas Rupperecht, “Images Confirm Y-20U Aerial Tanker Is in PLAAF Service,” *Janes* (website), November 30, 2021, <https://www.janes.com/defence-news/news-detail/images-confirm-y-20u-aerial-tanker-is-in-plaaf-service>; and Liu Xuanzun and Fan Wei, “Aerial Refueling Variant of Y-20 Debuts near the Taiwan Straits, ‘to Amplify PLA’s Air Superiority,’” *Global Times* (website), November 29, 2021, <https://www.globaltimes.cn/page/202111/1240149.shtml>.

51. “Yin!”

52. Aidan Milliff, “Tension High, Altitude Higher: Logistical and Physiological Constraints on the Indo-Chinese Border,” *War on the Rocks* (website), June 8, 2020, <https://warontherocks.com/2020/06/tension-high-altitude-higher-logistical-and-physiological-constraints-on-the-indo-chinese-border/>.

are acclimated to higher altitudes, lower oxygen levels limit their capacity to carry supplies and equipment. To alleviate these difficulties, the PLA has reportedly equipped all frontline training troops and border outposts with oxygen generators and oxygen cylinders.⁵³ The Army Medical University's Xinqiao Hospital in Shigatse is also reportedly developing "a high-pressure oxygen therapy that could effectively solve altitude stress for troops stationed on the plateau."⁵⁴

Implications for Military-Civil Fusion

In addition to the implications for PLA operations, China's western expansion of airfield infrastructure has significant implications for China's pursuit of its Military-Civil Fusion Strategy (军民融合发展战略). The US Department of Defense defines MCF as a high-level development strategy to "fuse [the PRC's] economic, social, and security development strategies to build an integrated national strategic system and capabilities in support of the PRC's national rejuvenation goals."⁵⁵ Enhancing the PRC's technological and scientific capabilities for defense purposes is a major focus of MCF—and the aspect that often receives the most attention—but Beijing's ultimate intentions for MCF run much deeper. In the short-term, MCF seeks to streamline processes and promote resource sharing to achieve greater interconnectivity, efficiency, and resource allocation across military and civilian sectors. In the long-term, MCF aims to unify various military and civilian strategies in such a way that they are woven into the PRC's overarching security and development goals.⁵⁶

PRC authorities frequently cite the benefits of dual-use airports to promote MCF. In 2015, the PRC held its first working conference on the development of military-civil fusion at dual-use airports. A second conference, held the following year, highlighted progress on the integration of military and civilian functions at airports across the country.⁵⁷ The readout

53. "Oxygen Therapy, Portable Barracks Enhance PLA Fighting Strength in Tibet," http://eng.chinamil.com.cn/view/2018-08/14/content_9251543.htm, August 14, 2018, accessed on May 25, 2022.

54. "Oxygen Therapy."

55. OSD, *Military and Security Developments*, 24.

56. Alex Stone and Peter Wood, *China's Military-Civil Fusion Strategy: A View from Chinese Strategists* (Montgomery, AL: China Aerospace Studies Institute/Air University, 2020), 6.

57. "空军民航军民合用机场军民融合深度发展联席会议在京召开" ["The Joint Conference on Deep Development of Military-Civil Fusion at Air Force and Civil Aviation Dual-use Airports Was Held in Beijing"], http://www.gov.cn/xinwen/2016-06/17/content_5083293.htm, June 17, 2016, accessed on May 25, 2022.

from the conference noted the benefits reaped from sharing military and civilian resources at dual-use airports, including sharing maintenance and management resources and even collaborating on preventing damage to aircraft from bird strikes.⁵⁸ Other sources have highlighted the cost-saving benefits of construction and security and the benefits of integrating standards (such as on signage) across military and civilian areas.⁵⁹

The exact number of dual-use airports in the PRC is unclear, but official sources indicate the figure is around 60 airports.⁶⁰ At least 11 airports are in Tibet and Xinjiang, based on available information. Official reports often highlight that remote regions—such as China’s west and northeast—are prime areas for dual-use airports, and they often single out Lhasa Gonggar Airport (拉萨贡嘎机场) as a success story of dual-use airports.⁶¹

While the PRC’s utilization of dual-use airports may benefit efforts toward MCF and result in cost savings for the military, there are significant drawbacks. The Tibet regional government has highlighted that military operations in the region can significantly impact civilian airspace. In particular, it cites the fact that both military and civilian flights are most active when weather conditions are better, which can lead to bottlenecks and delayed flight times for civilian flights. It notes this problem will likely intensify as flight traffic in the region grows.⁶² The sharing of space can also lead to accidents or unsafe operating environments between civilian and military flights, which has been reported at some dual-use airports throughout the PRC.⁶³

58. “Joint Conference on Deep Development.”

59. “共建共享，民用机场起降空军战机——全国机场保障领域军民融合之路回顾与前瞻” [“Co-construction and Sharing, Take-off and Landing of Air Force Fighters at Civil Airports: Review and Prospect of the Road of Military-Civilian Fusion in the Field of National Airport Support”], *Xinhua* (website), May 6, 2017, http://www.xinhuanet.com/mil/2017-05/06/c_129592152.htm.

60. “Joint Conference on Deep Development”; and “2018年以来近60个机场实行军民合用” [“Since 2018, Nearly 60 Airports Have Implemented Joint Military and Civilian Use”], <http://military.people.com.cn/n1/2019/0802/c1011-31272268.html>, August 2, 2019.

61. He Shipeng (何仕鹏), “军民合力建设拉萨贡嘎国际机场推动西藏经济社会发展纪事” [“A Chronicle of the Joint Military and Civilian Construction of Lhasa Gonggar International Airport to Promote Tibet’s Economic and Social Development”], http://www.mod.gov.cn/mobilization/2021-08/24/content_4892841.htm, August 24, 2021.

62. “Civil Aviation Tibet Autonomous Region.”

63. “Co-construction and Sharing.”

Conclusion

Over the years, much attention has been paid to studying the PRC's efforts to modernize the PLA with new weaponry and equipment. Significant focus has also gone to studying PLA organizational reforms and efforts to improve doctrine, tactics, and training. By comparison, there has been less attention paid to the role of infrastructure development in shoring up the PLA's operational capabilities. Yet, the PRC is undertaking a major expansion of its infrastructure that is enhancing the ability of the WTC to conduct air operations, project power into neighboring countries, and defend its assets from attacks along its borders.

The full extent of China's infrastructure expansion in the WTC remains to be seen. Developments in the coming years should reveal details on the extent to which new airfields will provide the PLAAF with greater capabilities, especially in the case of the new airports emerging along Tibet's border with India. As such, PLA observers should continue to monitor developments in the area to gain a greater understanding of how the PLA's capabilities are evolving along the PRC's western borders—especially its border with India.

One question remains unanswered. What are the PRC's ultimate intentions for its western infrastructure buildup? There are obvious economic and military benefits to the PRC's activities. On the military front, are these efforts more defensively oriented, or are there signs China has intentions in the region that are more aggressive? It may be too soon to answer these questions, and doing so would require a deeper investigation into how PRC leaders and strategists perceive threats on China's western borders—especially their threat perceptions of India. Future studies into the PLA's activities in the WTC would benefit from trying to answer these questions.

Finally, this study shows the PLA is investing heavily in dual-use airports in its western regions, and this investment has significant implications for China's MCF strategy. It remains unclear exactly how the PLA and civilian aviation authorities are cooperating across the board. It is also unclear exactly which airports throughout China are dual-use. Future studies of the PLA—especially the PLAAF—would benefit from investigations into China's utilization of dual-use airports nationally and what this means for China's military modernization and MCF more broadly.

Still Not a “Pearl”: Djibouti as a Dual-use Logistics Facility

Christopher D. Yung

Introduction

As the first overseas military base for the People’s Liberation Army (PLA), Djibouti has the potential to serve several functions for the Chinese Communist Party (CCP). Symbolically, it can represent China’s aspirations to be a great, rejuvenated power. Politically, the base can demonstrate to the Chinese people that its military is protecting China’s interests abroad. Strategically, the location of the base near the Bab el-Mandeb places China in a position to be able to protect vital energy resources flowing through the Persian Gulf and into the Indian Ocean. Lastly, the base provides the Chinese military with an opportunity to support operationally its wider out-of-area operations with a facility dedicated to logistical support. The Chinese did, after all, characterize the facility as a “Dual Use Logistics Facility,” stating the primary purpose of the base is logistics support.

Since the PLA established the facility in 2017, more is known about its functions and its potential to support China’s wider ambitions in Africa and areas outside of China. The facility is a consistent stopping point for the PLA Navy (PLAN) counter-piracy deployments, which refuel and replenish at the facility. The facility is comprised of some 2,000 personnel, a sizable majority of them from the PLAN Marine Corps (PLANMC). It has added pier space to berth some of the larger surface combatants of the PLAN and has dedicated support functions, including medical facilities and housing for troops. The facility unquestionably provides logistical support to PLA

out-of-area operations, but the question arises as to how far that logistical support goes. What is the likely operational trajectory for the base and for China's larger out-of-area operations?

This chapter is a meta-analysis of some of the most current Western analyses of the operational situation in Djibouti. It seeks to answer the question cited above, by first looking at the evidence of operational activity supported by the Djibouti facility. The chapter then assesses the likelihood of potential logistical support activities. Finally, it evaluates Djibouti's role within a larger picture of Chinese military activity out of area.

Far-seas Operations, Basing, and Djibouti: A Review of the Field

Before embarking on a detailed assessment of the likely PLA use of Djibouti, a cursory examination of what the Chinese have been saying on the subject is merited. Some Western analyses of the subject effectively summarize the Chinese views of the issue. A lot has changed over the past decade when Chinese views on this subject began to tentatively emerge in the open press. Isaac Kardon of the US Naval War College points to a number of Chinese writings that recognize the PLA's air and sealift capabilities "remain insufficient to supply and sustain complex military operations beyond the range of mainland logistics networks."¹ He observes in his *Naval War College Review* article that

military analysts from the PLA Navy Service College in Tianjin have attempted to model out how commercial cargo terminals can be used to provide emergency fuel and material support for the PLAN. Accepting that commercial piers and refueling facilities typically are not built to military standards, they address the complex protocol that would be required to conduct refueling safely using local power, fuel supplies, and military refueling vehicles that can provide the correct types and quantities of petroleum, oil, and lubricants for various classes of PLAN ships.²

1. Isaac Kardon, "Research & Debate – Pier Competitor: Testimony on China's Global Ports," *Naval War College Review* 74, no. 1 (Winter 2021): 2, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=8168&context=nwc-review>.

2. Shao Haiyong and Ma Longbang [邵海永, 马龙邦], 展示海军舰艇利用民用港口 货运码头实施应急游客保障装备需求预测模型 ["Prediction Model for Wartime Use of Civil Port Cargo Terminals to Realize Requirements for Emergency Fuel Supply and Material Support"], *军事运筹与系统工程 [Military Operations Research and Systems Engineering]*, no. 1 (2019): 52–57, as cited in Kardon, 8.

Djibouti is, therefore, recognized by the PLA as a vital “way point” in addition to a number of commercial and state-owned enterprise (SOE) controlled facilities to sustain PLA “far-seas” operations.

A number of Chinese analyses, including those Kardon has identified, have highlighted the stepping-stone nature of PLA overseas operations. He notes the geographical pit stops the PLA has contemplated to support far-seas operations. Kardon cites academics from the Army Transportation Academy who propose that “to protect our ever-growing overseas interests, we will progressively establish a logistics network in Pakistan, United Arab Emirates, Sri Lanka, Burma, Singapore, Indonesia, Kenya and other countries based on various means—buying, renting, cooperating—to construct our overseas bases or overseas support strongpoints.”³ Researchers from the PLA Naval Research Institute have advocated the establishment of “at least one strategic strong point in the Bay of Bengal, one in the Persian Gulf region, and one in the Suez-Red Sea-Gulf of Aden region. They suggest Sittwe in Burma, Gwadar in Pakistan, and Djibouti or the Seychelles respectively.”⁴ Joel Wuthnow, in a study on PLA overseas operations in the Red Sea, writes that

[t]he Djibouti base can also be interpreted as the Western Anchor in a larger attempt to protect Chinese seaborne trade through the Indian Ocean. Chinese strategic writings have long described the need to establish a stronger naval presence through Southeast Asia and into the Indian Ocean . . . Djibouti is likely only the first of a series of bases that will provide shelter and logistics support for Chinese forces, with others likely in countries such as Pakistan and Cambodia.⁵

Some Chinese sources have gone so far as to identify potential and likely missions for the Djibouti base. Phillip Saunders has noted that “the new logistics base in Djibouti improves the PLA’s ability to sustain peacetime naval operations in a permissive environment and provides a nascent

3. Wang Tianze, Qi Wenzhe, and Hai Jun [王天泽, 齐文哲, 海军], 海外军事基地运输投送保障探讨 [“An Exploration into Logistical Support of Transportation and Projection for Military Bases Abroad”], 国防交通工程与技术 [Defense Transportation Engineering and Technology], no. 1 (2018): 32, as cited in Kardon, “Pier Competitor,” 10.

4. Li Jian, Chen Wenwen, and Jin Jing [李剑, 陈文文, 金晶], 印度洋海权格局与中国海权的印度洋拓展 [“Indian Ocean Sea-power Structure and the Expansion of China’s Sea Power into the Indian Ocean”], 太平洋学报 [Pacific Journal] 22, no. 5 (2014): 74–75, as cited in Kardon, “Pier Competitor,” 10.

5. Joel Wuthnow, “The PLA Beyond Asia: China’s Growing Military Presence in the Red Sea Region,” in *Strategic Forum*, no. 303 (Washington, DC: Institute for National Strategic Studies, January 2020), 7, <https://inss.ndu.edu/Portals/68/Documents/stratforum/SF-303.pdf>.

capability to support other types of operations that may involve a combat role.”⁶ He observes that Chinese sources, including China’s Defense white papers indicate that nascent overseas basing operations make sense from a domestic politics context: “These operations are justified domestically by the need to protect China’s overseas interests and internationally by the claim that the Chinese military can provide public goods and contribute to international stability.”⁷

Mathieu Duchâtel notes analysts from the Institute of Military Transportation have written that military facilities overseas have five functions: war, diplomatic signal, political change, building relationships and providing facilities for training. These overseas facilities

enable the conduct of several types of missions; logistical support for anti-piracy, peacekeeping troops deployment and humanitarian assistance/disaster relief (these are the three official missions of Djibouti); conducting military operations other than war (MOOTW) such as international cooperation, noncombatant evacuation operations and emergency rescue; [and] guarantee the security of sea lanes of communication and the Chinese supply chain.⁸

One last point needs to be made here. Western analyses of the Chinese motivations underlying the establishment of an overseas operational base repeatedly fixate on the operational utility of the base to China’s military. Chinese writings on the subject acknowledge the operational implications of these “far-seas” facilities but also highlight the international political dimensions of these bases. As Duchâtel’s report noted above, the Chinese recognize that the functions of an overseas base have a political dimension to them, which in turn determines or shapes the military missions. He also observes that overseas bases are part of a larger political-military strategic framework, which is a far better predictor of what these future overseas facilities are designed to do than a strictly operational utility approach to assessing the future trajectory of these bases. He notes that a group

6. Phillip C. Saunders, “Beyond Borders: PLA Command and Control of Overseas Operations,” in *Strategic Forum*, no. 306 (Washington, DC: Institute for National Strategic Studies, July 2020), 7, <https://inss.ndu.edu/Portals/68/Documents/stratforum/SF-306.pdf>.

7. See *Diversified Employment of China’s Armed Forces* (Beijing: Information Office of the State Council, 2013); and Saunders, “Beyond Borders,” 7.

8. Mathieu Duchâtel, *China Trends #2 – Naval Bases: From Djibouti to a Global Network?* (Paris: Institut Montaigne, June 26, 2019), 2, <https://www.institutmontaigne.org/en/analysis/china-trends-2-naval-bases-djibouti-global-network>.

of military analysts at the Beijing Military Equipment Strategy “address the question of bases under the larger analytical framework of overseas operations in the ‘context of the go global military strategy.’”⁹ According to their writings bases are “designated protection places (定点保障) that support overseas operations, and as such they have to ‘radiate’ (辐射) over an area where military operations are conducted.”¹⁰

As a consequence, the key element of managing an overseas base is the effectiveness of that facility in conducting repair and maintenance of Chinese ships and aircraft operating overseas and in maintaining a close political relationship with the host country. He also points to the writings of Xue Guifang and Zheng Hao, both of Shanghai’s Jiaotong University, who argue that another function of an overseas facility is to “build an international environment that will accept China’s [future] construction of overseas bases.”¹¹ Finally, he takes note of analyses from Li Qingsi and Chen Chunyu, academics from Renmin University who argue that Chinese overseas bases have a perpetual political mission, which means “on a strategic level, China must never depart from the political priority attached to bases, which is not military domination but protection of [China’s] trade interests.”¹² During the phase of PLA expansion, they write, “China needs to ‘reduce the sensitivity’ of its actions and ‘stop before going too far’ (适可而止) to avoid the ‘tragedy of great power.’ In other words, the constructions of bases needs to be linked to the exercise of international responsibilities.”¹³

9. Duchâtel, *China Trends #2 – Naval Bases*, 3.

10. Liu Dalei, Hu Yongmin, and Zhang Hao, “我军海外军事行动装备保障问题研究” [*Equipment Support in Overseas Military Actions*] 军事交通学院学报 [*Journal of Military Transportation Academy*] 19, no. 9 (September 2017), as cited in Duchâtel, *China Trends #2 – Naval Bases*, 3.

11. Xue Guifang and Zheng Hao, “中国21世纪海外基地建设的现实需求与风险应对” [Risk Management and Realistic Needs for China’s Construction of Overseas Bases in the 21st Century], 国际展望 [*International Outlook*], no. 4 (2017): 104–21.

12. Li Qingsi and Chen Chunyu, “试析中国的海外港链基地战略” [Analysis of Chinese Overseas Port String Bases Strategy], 区域与全球发展 [*Regional and Global Development*], no. 2 (2019) 123–37.

13. Li Qingsi and Chen Chunyu, “Port String Bases Strategy.”

Djibouti Is Not the Sum of Our Fears

Before China established its first overseas military facility, the US national security community was consumed with the idea that China was intent on getting footholds in key strategic locations. As the thinking went, China would establish a small military presence throughout the Indian Ocean and on the African continent, signing secretive agreements with host-nation governments. Then, after years of military presence, these bases would suddenly open as full-fledged conventional military bases capable of threatening US and allied national security interests. The so-called “String of Pearls” strategy centered around the idea that Chinese overseas military basing was secretly a springboard to the Chinese capability to challenge the United States conventionally abroad.¹⁴

While the term *string of pearls* is still popular within the security and strategy community, the concept of a Chinese conventional military base ready to pop out and permit the PLA full-scale conventional capability to take on the United States and its allies and partners has lost some of its sheen. Instead, most analysts correctly characterize the Djibouti facility, as the Chinese have done, referring to it as a “Strategic Strongpoint.” This chapter will, nevertheless, revisit the possibility of Djibouti being used as a naval logistics base in support of large-scale naval conventional operations.

Djibouti as a “Strategic Strong Point”

As Peter Dutton, Isaac Kardon, and Connor Kennedy have noted in some of their work, Djibouti “does not yet offer a significant wartime capability. Instead, it serves largely as a supply, logistics, and intelligence hub for increasingly complex peacetime military operations across China’s Indian Ocean lifeline.”¹⁵ As these authors note, Chinese officials and analysts are quick to point out that the Djibouti base is intended to fulfill “international obligations by providing humanitarian relief, supporting Chinese peacekeeping in Africa, assisting ongoing anti-piracy missions

14. Christopher D. Yung, “Burying China’s ‘String of Pearls’: The ‘String of Pearls’ Model Has Long Outlived Its Usefulness as a Strategic Concept,” *Diplomat* (website), January 25, 2015, <https://thediplomat.com/2015/01/burying-chinas-string-of-pearls/>.

15. Peter A. Dutton, Isaac B. Kardon, and Conor M. Kennedy, *China Maritime Report No. 6: Djibouti: China’s First Overseas Strategic Strongpoint* (Newport, RI: China Maritime Studies Institute/US Naval War College, April 2020), 3–4, <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1005&context=cmisi-maritime-reports>.

and maintaining peace and stability in Africa and the world.”¹⁶ Dutton et al. conclude that “benign or not, the emerging PLA support system overseas is unlikely to mirror America’s. Instead, it will follow the PRC’s commercial presence to support its expanding portfolio of military missions.”¹⁷

A consensus is beginning to emerge amongst Western China analysts that Djibouti is following the “Shekou” model.¹⁸ Shekou refers to a small fishing village in Guangdong Province. The establishment of a seaport there (combined with export activities there) following China’s Opening Up and Reform period, spurred commercial, financial, and industrial activities that turned Shenzhen into a major commercial center. The idea is the establishment of a port facility with private and state-owned enterprises (SOEs), military protection for business and commercial interests, and government cooperation with a local host nation to develop a robust economic development enterprise. Most analysts are beginning to conclude that Djibouti is part of a major transshipment hub meant to help unlock the economic potential of the Horn of Africa and the African continent.¹⁹ Because of its strategic location near a major Asia-Europe shipping route and a potential gateway into the African continent, Chinese firms and SOEs are investing millions to develop infrastructure, transportation networks, and the business environment. The aim is for Chinese firms to gain an advantage over Western competitors in tapping into the African market.

The Djibouti base as a “strategic stronghold” serves as a means to protect China’s political-strategic interests and its commercial-economic interests.²⁰ First is the existence of commercial port development in the vicinity of the Djibouti base. Doraleh multipurpose port, the Tadjourah bulk terminal, Ghoubet mineral terminal, and the Horizon Djibouti Terminal all represent significant investments made by Chinese SOEs or private firms

16. Dutton, Kardon, and Kennedy, *Djibouti*, 4.

17. Dutton, Kardon, and Kennedy, *Djibouti*, 5.

18. James Park, “How China Uses State Capitalism to Gain Power and Influence in Djibouti,” *National Interest* (blog), February 3, 2021, <https://nationalinterest.org/blog/buzz/how-china-uses-state-capitalism-gain-power-and-influence-djibouti-177575>; Daniel R. Russel and Blake H. Berger, *Weaponizing the Belt and Road Initiative* (New York: Asia Society Policy Institute, September 2020); and Dutton, Kardon, and Kennedy, *Djibouti*, 5–10.

19. For example, see John Fei, “China’s Overseas Military Base in Djibouti: Features, Motivations, and Policy Implications,” *China Brief* 17, no. 7 (December 2017), <https://jamestown.org/program/chinas-overseas-military-base-djibouti-features-motivations-policy-implications/>; Lauren Ploch Blanchard, *China’s Engagement in Djibouti*, Congressional Research Service (CRS) Report IF11304 (Washington, DC: CRS, September 4, 2019), <https://crsreports.congress.gov/product/details?prodcode=IF11304>; and Wuthnow, “PLA Beyond Asia,” 4.

20. Conor Kennedy, “Strategic Strong Points and Chinese Naval Strategy,” *China Brief* 19, no. 6 (March 22, 2019), <https://jamestown.org/program/strategic-strong-points-and-chinese-naval-strategy/>.

in the port infrastructure of Djibouti.²¹ Next, the Chinese have invested heavily in the development of a Djibouti free-trade zone. According to Dutton et al., it is “a trade and logistics park intended to attract firms to the area to use the port and its connecting infrastructure.”²² Dutton continues:

The Free Trade Zone is divided into four “industrial clusters.” One is focused on the logistics industry and will support provision of transport, bonded warehousing, logistics and distribution capabilities. Another will focus on “business industry” functions such as bulk goods transactions, merchandise display, and duty-free retail. A third cluster will focus on the “business support” sector and cater to financial services, information services, hotels, office buildings, and training. Finally, a manufacturing cluster will support packaging, light processing of raw materials, food processing, and auto parts assembly.²³

Overall, Chinese investment in Africa seems to suggest that Chinese ambitions extend out to the development of Africa’s infrastructure. Chinese banks have played a significant part in investing in the Djibouti section of the Addis Ababa Railway in an effort to connect Djibouti with the Ethiopian and, subsequently larger, African economies. The same can be said of Chinese investment in the development of highways connecting Djibouti to Ethiopia. China’s Exim Bank provided some of the financing for the Ethiopian highway running from Addis Ababa to Adama based on the Chinese belief that successful investment in Djibouti rests on the robustness of the Ethiopian economy.²⁴ It is the case, then, that the Djibouti facility as a “strategic stronghold” is meant to protect, in part, this budding business and commercial development at the horn of Africa.

Djibouti’s Potential for Logistics Support of PLA Out-of-area Operations, Some Analytical Considerations

To assess Djibouti’s logistical support role for PLA out-of-area operations, the far-seas out-of-area missions the PLA will likely undertake must be

21. Dutton, Kardon, and Kennedy, *Djibouti*, 11–14.

22. Dutton, Kardon, and Kennedy, *Djibouti*, 15.

23. Dutton, Kardon, and Kennedy, *Djibouti*, 16.

24. Dutton, Kardon, and Kennedy, *Djibouti*, 17–20.

estimated. Past analysis has summarized the possible roles and missions of the PLA abroad.²⁵

Table 8-1. Potential PLA missions

(Source: Saunders, "Beyond Borders," 4; and Yung et al., *Chinese Overseas Basing Requirements*, 9.)

Type of Operation	Operational Forces	Existing Examples
Military Diplomacy	Army/Navy/Air Force	SCO exercises, PLAN exercises with Iranian/Pakistan navies, PLAN port visits in Mediterranean and Baltic states
Far-seas Operations and Contingencies	Navy/other services and Strategic Support Force in supporting roles	Counterintervention, SLOC protection, counter-piracy deployments, Navy retrieval and disposal of Syrian chemical weapons
Peacekeeping Operations	Army	PLA engineer, medical, and infantry units have deployed to UN peacekeeping operations in Africa and the Middle East
Humanitarian Aid/ Disaster Relief (HA/DR)	Navy	PLAN delivered supplies and provided HA/DR to Indonesia after September 2018 Earthquake and tsunami
Noncombatant Evacuation Operations (NEO)	Navy/Air Force	2011 NEO in Libya, 2015 NEO in Yemen
Counterterrorism	Army/Special Forces	None yet
Counterinsurgency	Army/Special Forces	None yet

Most contemporary analyses of the potential role of the Chinese military abroad reached consensus that the PLA's far-seas missions have probably been narrowly set.²⁶ These missions include: UN Peacekeeping, counter-piracy operations in the Gulf of Aden and other possible areas around Africa, naval diplomacy in the region and further afield, noncombatant evacuation operations, supporting China's economic interests along the Maritime Silk Road, and assisting in other military operations other than war.²⁷

25. Saunders, "Beyond Borders," 4; and Christopher D. Yung et al., "*Not An Idea We Have to Shun*": *Chinese Overseas Basing Requirements in the 21st Century*, China Strategic Perspectives # 7 (Washington, DC: Institute for National Strategic Studies, October 2014), 9, <https://ndupress.ndu.edu/Portals/68/Documents/stratperspective/china/ChinaPerspectives-7.pdf>.

26. As reflected in the work of Kardon, Dutton, Kennedy, Saunders, Wuthnow, and Yung.

27. Fei, "Military Base in Djibouti"; and Wuthnow, "PLA Beyond Asia," 3–7.

With the exception of a long-term storage location (SLOC) protection mission, the vast majority of these mission sets imply a narrow, nontraditional threat focus for the PLA when operating out of area. Many Western China analysts have concluded that the potential future far-seas missions are narrow and focused on nontraditional missions for a number of reasons. First, there are the Chinese political restraints, which limit PLA far-seas operations to the missions cited above. Most significantly, there are opportunity costs involved with operating out of area. The more extensive PLA overseas missions are, the less potent the Chinese military's ability to handle its most pressing military mission—Taiwan. Additionally, as Wuthnow points out, PLA defense budget growth is slowing, and the PLA has to weigh the cost of overseas expeditionary operations against a host of military missions close to home.²⁸ Additionally, it is unlikely the PLA will get dragged into a large-scale extra-regional conflict. China has demonstrated that when core national interests are not involved, it is truly averse to missions that will significantly increase casualties and guarantee large sunk costs.²⁹

The PLA far-seas emphasis on nontraditional out-of-area missions and contingencies of lesser intensity means the logistical support for out-of-area PLA operations does not need to be extensive nor does it need to be significantly redundant as would be the case for large-scale, wartime logistical support. The Chinese military would not need to install repair facilities to address losses of vehicles, ships, or aircraft. Similarly, logistical support would not need to address other realities of large-scale conflict—huge numbers of dead and wounded—thus medical and mortuary services would not need to be extensive.

In a previous study of likely overseas PLA basing activity, the US National Defense University (NDU) gathered a group of logisticians from the Center for Joint and Strategic Logistics to evaluate what a future overseas Chinese military facility would look like. The group considered these operational constraints on the PLA: a focus on nontraditional, unconventional conflict; the presence of some political and legal restrictions; the facility having a logistical purpose; and a time horizon of 5–10 years.³⁰ The presumed list of basing characteristics is presented in table 8-2.

With the exception of the personnel footprint, which the logisticians speculated would be limited to about 300 personnel (Djibouti's personnel

28. Wuthnow, "PLA Beyond Asia," 9.

29. Wuthnow, "PLA Beyond Asia," 9.

30. Yung et al., *Chinese Overseas Basing Requirements*, 39–43.

number is about 2,000), the Djibouti base has adhered closely to what the logisticians predicted. The logisticians speculated that a Chinese overseas facility would not involve an extensive stockpiling of parts but would involve some warehousing and more shipments of spare parts to the facility for repair purposes.³¹ Satellite imagery of the Djibouti base supports this conclusion, with the warehouses on the base dwarfed in size by its counterpart at Camp Lemonnier, let alone other warehouses in other military sites across the globe.

The logisticians also predicted, given the complications of air and sea logistics, it would be unlikely for a single overseas Chinese facility to attempt to combine both missions at a single location. Thus far, Djibouti does not appear to involve support to air operations. On a related note, the logisticians predicted the Chinese would establish a network of facilities to support a wide range of out-of-area operations. Finally, the NDU analysis posited that one potential mission for the PLA abroad would be ground operations ashore, including peacekeeping, counterterrorism, counterinsurgency, noncombatant evacuations and humanitarian assistance and disaster relief. The logisticians speculated the PLA may want to provide a logistical support facility to support these kinds of ground operations over the long run. This would entail a facility with training ranges, housing for troops, armory or weapons storage, and rest-and-recreation facilities. However, as was the case with naval and air operations, the logisticians predicted it would be unlikely for the PLA to seek to merge logistical support focused on naval operations with those focused on basic reception, staging, onward movement, and integration (RSOI). Does Djibouti follow the model speculated in the NDU report, or does the Djibouti facility encompass all of these functions?

31. Yung et al., *Chinese Overseas Basing Requirements*, 40.

Table 8-2. US logistician prediction of characteristics of PLA overseas bases³²

Category	Facility or Logistics Operation Characteristic
Footprint	300 personnel
Joint or Multiservice	Single service focus
Warehousing or Distribution Network	Not large warehousing, focus on distribution management
Legal and Political Restrictions	Tight permission windows, restricted or well-defined military activities
Division of Labor among Hubs: Naval Support Activities	Ship repair, replenishment and refueling of vessels, medical support, rest and recreation, food and water storage, weapons storage area and handling
Division of Labor among Hubs: Air Hub	Aircraft maintenance and repair, refueling and rearming, spare parts distribution and installation, airfield maintenance and management, flight training, weapons storage area and handling
Division of Labor among Hubs: Ground Logistics Support	Vehicle and equipment repair, armory and weapons handling, intermediary medical support, mortuary services, extensive training area for troops, large housing areas for troops

There is no evidence to date that Djibouti is being groomed to serve as some kind of air logistics hub for the PLA. At present the Chinese airfield at its Djibouti base is not long enough to support fixed-wing aircraft, including long-range transport aircraft. No fixed-wing aircraft have deployed to the airfield at the facility. Additionally, Djibouti does not possess the necessary attributes for the purpose of aviation logistics support (for example, it lacks the jet fuel and associated fuel farm to refuel jet aircraft). There is also a notable absence of a large number of support and emergency vehicles necessary for extensive jet aircraft operations. Finally, the Djibouti facility lacks the PLAAF personnel to conduct these kinds of operations.³³

The Djibouti facility also lacks PLAAF long-range transport aircraft. At present, the PLAAF has roughly 20 Y-20 aircraft with a range of 3,700 kilometers (payload of 66,000 kilograms) or 2,299 miles and a maximum range of 5,200 kilometers (51,000 kilograms payload)

32. Yung et al., *Chinese Overseas Basing Requirements*, 39–43.

33. Dutton, Kardon, and Kennedy, *Djibouti*, 31.

or 3,321 miles.³⁴ In contrast to the PLAN, with a growing sophisticated fleet of expeditionary ships and support vessels (some of which have conducted port calls into the Djibouti facility), the PLAAF does not appear at present to be in a position to initiate robust out-of-area air operations.

It is possible the PLA will eventually develop far-seas aviation facilities in support of overseas PLAAF operations. But, if the logisticians from the NDU report are correct, the PLA is not likely to attempt to place both aviation and maritime logistics activities at the same location. They are more likely to place aviation logistics functions at a separate overseas facility when China succeeds in obtaining host-nation permission for such an activity.³⁵ In the meantime, given the nontraditional missions the PLA is likely to be expected to perform, the PLAAF could make use of some commercial airfields (as they have done in the past) to execute these narrow, nontraditional missions. Table 8-3 lists recent PLAAF use of commercial airfields in support of sudden nontraditional “far-seas” missions.

Table 8-3. Select examples of PLA use of commercial airports

(Source: Peltier, Nurkin, and O’Connor, *China’s Logistics Capabilities*.)

Candidate	Rationale
Gao Airport Mali	PLA utilized airport in 2013 for UN peacekeeping operations
El Fasher Airport Sudan	2019 PLA peacekeeping medical operation in Sudan
Karachi Airport Pakistan	Four IL-76 aircraft utilized this airport during Libya 2011 noncombatant evacuation operations
Khartoum Airport Sudan	PLAAF also utilized this airfield for the Libya noncombatant evacuation operations
Duqm Port Oman	Western edge of the Y-20 maximum range from Chengu-Qionglai airbase

34. Cristina L. Garafolo and Timothy R. Heath, *The Chinese Air Force’s First Steps toward Becoming an Expeditionary Air Force* (Santa Monica, CA: RAND Corporation, 2017), 8, https://www.rand.org/pubs/research_reports/RR2056.html; and Chad Peltier, Tate Nurkin, and Sean O’Connor, *China’s Logistics Capabilities for Expeditionary Operations* (Coulson, UK: Jane’s/US-China Economic and Security Review Commission, April 2020), <https://www.uscc.gov/sites/default/files/2020-04/China%20Expeditionary%20Logistics%20Capabilities%20Report.pdf>.

35. Yung et al., *Chinese Overseas Basing Requirements*, 41.

Staging Area and Foundation for Future Africa Ground Operations

There is a possibility Djibouti could be used as an initial logistics support area for potential PLA ground operations in Africa. In addition to UN peacekeeping missions, there is also the possibility the PLA is called to conduct counterterrorism, counterinsurgency, noncombatant evacuation operations, and humanitarian assistance and disaster relief missions, as posited by the Saunders and Yung analyses. There is also the distant possibility PLA ground forces will be called to help stabilize friendly governments or to provide security assistance and build partner capacity to nations with Belt and Road Initiative projects.

There is some evidence these kinds of support activities and logistical features are present at Djibouti. Satellite imagery has identified troop housing, training areas (including a rifle range), a recreation area, a medical facility, ammunition storage and armory, and vehicle maintenance and repair facilities.³⁶ Djibouti's connectivity to Africa's expanding rail and road network also supports this as a possibility. At the same time, these features are currently meant to support the PLANMC contingent deployed to Djibouti to provide force protection and basic protection of the commercial enterprises and Shekou-related commercial developments mentioned previously.

Despite the existence of features supporting a modest troop presence at the facility, it is unlikely Djibouti will be reserved for some kind of initial staging area for a PLA buildup on the continent. First, no PLA peacekeeping force has entered Africa through Djibouti.³⁷ Second, to make such sustained operations possible, Djibouti's housing, maintenance, and repair facilities, armory and ammunition storage, and training and medical facilities would all have to expand extensively. This is unlikely to happen since the Djiboutian government will be politically sensitive to a large footprint at any given military facility, especially with the presence of other militaries in Djibouti. Finally, Wuthnow's analysis concludes that the absence of a Joint Theater Command or Joint Center in theater coordinating Chinese far-seas activities also militates against the mixing of separate Chinese military activities across the continent.³⁸

36. Wuthnow, "PLA Beyond Asia," 4.

37. Jean-Pierre Cabestan, "China's Djibouti Naval Base Increasing Its Power," East Asia Forum (website), May 16, 2020, <https://www.eastasiaforum.org/2020/05/16/chinas-djibouti-naval-base-increasing-its-power/>.

38. Wuthnow, "PLA Beyond Asia," 9.

PLA Navy Support Activity

The preponderance of evidence points to Djibouti’s focus as a naval logistics hub. Open-source analysis shows facilities for storing fuel, weapons, and equipment as well as maintenance for ships and rotary-wing aircraft. At present, there is no dry dock, but as Dutton et al. point out in their report on the facility, “There are locations to the south of the main pier available for such a facility.” Additionally, “[I]ts proximity to the expansive yards at the Doraleh Multipurpose Port provides for significant augmentation of base operations.” The report cites the base as having the following features, “[a]n armory, equipment support area, subterranean entrance, barracks, heliport, oil depot, reinforced bunker and pier.”³⁹ A PLAN petroleum, oil and lubricant (POL) detachment has reportedly deployed to the base for the purpose of refueling support.⁴⁰

Dutton and company note that a close examination of satellite imagery finds “at least 10 storage barracks, an ammunition point, [an] office complex and a heliport.” They also take note of “two entrances to the base (one connecting to the main road and another connecting to the container terminal) and four layers of defensive works.”⁴¹ Several hangars make up the heliport, and they describe a 400-meter (approximately 1,312-foot) runway with air traffic control. Their report observes that “no aircraft have been reported deployed to the installation, nor could combat or transport aircraft use this short runway.”⁴² Also of significance is the medical facility constructed in 2017.

Perhaps of greatest significance is the pier space associated with the Djibouti base. The PLAN has now completed the construction of a 330-meter (1,100-foot) pier, bringing the total berthing space at Djibouti to 660 meters (2,165 feet), which permits the PLAN to accommodate the largest of China’s surface combatants.⁴³ Additionally, as mentioned above, the proximity of the Doraleh Port permits the PLAN to berth its largest surface combatants and replenishment ships at Djibouti.

For force protection, there is the PLANMC contingent, which is deployed to the facility. At battalion strength, the contingent is comprised of three

39. Dutton, Kardon, and Kennedy, *Djibouti*, 30.

40. Dutton, Kardon, and Kennedy, *Djibouti*, 31.

41. Dutton, Kardon, and Kennedy, *Djibouti*, 31.

42. Dutton, Kardon, and Kennedy, *Djibouti*, 31.

43. Dutton, Kardon, and Kennedy, *Djibouti*, 32.

mechanized infantry companies supported by an undisclosed number of vehicles.⁴⁴ Units usually organic to PLANMC units (such as artillery and aviation units) have not been spotted. Additionally, open-source reporting has identified PLA Special Forces units located at the facility. Reporting indicates special forces training at the Djibouti base has been focused on “boarding, anti-piracy, and hostage rescue using rigid hull inflatable craft.”⁴⁵ The previously mentioned troop housing, training ranges, vehicle repair facilities, armory, and equipment storage facilities are unquestionably intended to support these PLANMC troops.

Beyond the physical characteristics of the Djibouti base, PLAN operational activity strongly suggests the primary (if not the sole) purpose of the facility is to provide logistical support to PLA Naval operations. Chinese reporting states that the base has been significantly engaged in repair services involving thousands of parts to PLAN escort task forces stopping by the logistics facility.⁴⁶ Since 2009, the PLAN’s Gulf of Aden counter-piracy task force has deployed 40 times to the region. With the exception of the first deployment, the task force has stopped in Djibouti each time for refueling, replenishment, and personnel rest and recreation.⁴⁷ The US reporting indicates ship visit duration is approximately five days, with each of the ships rotating in and out of Djibouti.⁴⁸

The PLA Navy has also utilized Djibouti’s logistical support services for its out-of-area military diplomacy deployments. Data on PLA Navy exercises extending into the Mediterranean Sea all list stops into Djibouti before continuing through the Suez Canal and into the Mediterranean Sea. In fact, with the exception of deployments heading east, Djibouti is utilized for all PLAN long-range deployments. Open-source reporting highlights the gaps in the PLA Navy’s logistics support structure. Despite the use of Djibouti, PLAN task forces accompanied by a Type 093A replenishment ship must still be replenished by another Type 093A dispatched from a commercial civilian facility, otherwise the ship runs out of sufficient fuel, freshwater, and other necessary supplies.⁴⁹

44. Dutton, Kardon, and Kennedy, *Djibouti*, 32.

45. Dutton, Kardon, and Kennedy, *Djibouti*, 33.

46. Peltier, Nurkin, and O’Connor, *China’s Logistics Capabilities*, 35.

47. “Chinese Naval Fleet Set to Deploy in Gulf of Aden for ‘Escort’ Duties,” *Xinhua* (website), January 16, 2022.

48. Dutton, Kardon, and Kennedy, *Djibouti*, 34.

49. Peltier, Nurkin, and O’Connor, *China’s Logistics Capabilities*, 51.

Djibouti as Part of a Network of Logistics Support Facilities

This latter observation highlights the notion that the PLA Navy must inevitably expand its network of operational support facilities. Although mentioned earlier that Chinese writings have emphasized the networking nature of its far-seas operations, this observation is supported by US analyses of PLAN overseas operations as well. Isaac Kardon, in a report published by the *Naval War College Review*, notes that the nonconventional warfare mission set combined with the current absence of PLA Navy basing worldwide pushes the PLAN toward relying on commercial civilian facilities.⁵⁰ Kardon notes these facilities are almost exclusively controlled by PRC SOEs or PRC firms with close ties to the Chinese Communist Party. The PLAN Task Force that secured Syrian chemical weapons made use of COSCO supply points in the Mediterranean. Kardon reinforces this point noting, "PLAN vessels (including the hospital ship *Peace Ark*) have visited at least thirty-one of those ninety-five (Chinese controlled or influenced) sites."⁵¹ Finally, he notes that "PLA logistics officers argue that civilian firms' organic capabilities far exceed the PLA's own." Port calls to their facilities "provide a platform for the military to rely on corporate strengths . . . use market economic means and adopt commercial contract entrustment methods to give full play to the advantages of enterprises and realize resource sharing."⁵²

Djibouti, then, would serve as one hub in a network of hubs that are commercial-civilian or dual-use in nature. Potential candidates for these hubs, Kardon says, would need to connect China's out-of-area lifeline, which stretches from "the Taiwan Strait through the South China Sea, Malacca Strait, Indian Ocean, and the Arabian Sea."⁵³

50. Kardon, "Pier Competitor," 9–10.

51. Kardon, "Pier Competitor," 11.

52. Kardon, "Pier Competitor," 9.

53. Kardon, "Pier Competitor," 10.

How Offensive-oriented a Naval Operational Support Base?

Although the likelihood of Djibouti serving as a forward naval operating base, permitting the PLAN to challenge the United States and its allies conventionally, is considered rather low by most estimates, the question emerges of whether the support facility has the potential to provide wartime logistical support to naval operating forces operating in the far seas. For such an assessment, it is necessary to look again at the physical features of the facility. It is also necessary to revisit the idea of the government of Djibouti allowing the PLAN to utilize the facility for wartime operations and whether Doraleh should also be considered in that calculation.

This author believes the likelihood of the Djibouti government permitting the PLAN facility to support PLAN military operations directly during war is low. This is the case with other military forces stationed in Djibouti. The government does not want to risk its fragile economic development for the sake of a conflict. By extension, Djibouti would not permit the PLAN to utilize Doraleh to support offensive PLAN operations. Still, it is a useful exercise to see if the Djibouti facility and the civilian port of Doraleh can provide such operational support, even if the political likelihood of the PLAN using these facilities in this way is low.

Table 8-4 lists the US Department of Defense and Department of Transportation identification of features of a naval operating base during conventional wartime. The Djibouti facility on its own lacks many of the infrastructure support functions identified in the table. Although the Djibouti facility contains three berthing spaces, the Department of Defense calls for that number of berthing spaces of 1,000 linear feet each. Djibouti lacks this feature. Satellite imagery does not appear to reveal any direct rail connectivity from the ammunition points to the piers. There does not appear to be a port-operated interchange yard to support switching two trains per day. Despite the existence of a heliport, the Department of Defense recommends a suitable area to land and service helicopters (approximately five acres). The Department of Defense calls for 30–40 acres of open storage, the Djibouti facility clearly lacks this feature. There are insufficient interior roadways connecting outside of the base to the port facilities. The facility lacks four-rail offloading spurs of 1,000 feet of straight track each. The viability of PLAN support to offensive operations starts to change when PLAN accessibility to Doraleh is considered. Table 8-4 illustrates that when the extensive features and size of Doraleh are combined with those of the PLAN dual-use facility in Djibouti, PLAN offensive operational support becomes more potent.

Table 8-4. Department of Defense and Department of Transportation required features for naval operating bases(Source: Yung et al., *Chinese Overseas Basing Requirements*, 52.)

Logistics Support Feature	Djibouti Dual-use Facility	Facility + Doraleh
Three berthing spaces (1,000 linear feet each)	No	Yes
Minimum water depth of 35 feet	Yes	Yes
30–40 acres of open storage	No	Yes
Four rail offloading spurs of 1,000 feet of straight track each	No	Yes
Four rail/truck end ramps	No	Yes
Gatehouse/security	Yes	Yes
Access to port-owned interchange yard to support switching two trains per day	No	Yes
Suitable area to land/service helicopters (approximately 5 acres)	No	Yes
Two container handlers	No	Yes
Adequate interior roadways to port facilities	Yes	Yes
Office space with adequate utilities and communications service	Yes	Yes
Processing area for 30 trucks	No	Yes
Close proximity to interstate highway system	Yes	Yes
Access to at least one major commercial rail carrier	Yes	Yes
Water channel access (width of 500 feet and depth of 35 feet)	Yes	Yes
Access to commercial rail interchange yard (if port-owned facilities are inadequate)	Yes	Yes

Another factor requiring further analysis is the extent to which the PLAN facility on Djibouti has sufficient space for expanded naval weapons storage. At present, the hardened structures that are apparent in satellite imagery might be the housing area for the armory, but there is also some open-source reporting that as much as 23,000 square feet of storage has been constructed underground.⁵⁴ A cursory analysis of what would

54. Joshua Berlinger, "Satellite Photos Reveal Underground Construction at Chinese Military Base," *CNN World* (website), August 1, 2017, <https://www.cnn.com/2017/07/26/asia/china-military-base-djibouti-photos>.

be required for an extensive weapons storage area with potential spacing limits (such as bombs/warheads/mines and demolition material needing to be 700 feet apart from other categories of weapons) appears to make Djibouti too small to support this function.⁵⁵ The addition of Doraleh into the calculus, however, obviously helps address the size issue. But, again, the government of Djibouti is highly unlikely to permit the storage of a large number of weapons at a civilian commercial site.

Sustaining and Supplying the Djibouti Facility

Finally, there is the question of how the Djibouti facility is being sustained or logistically supported. The almost complete absence of long-range PLAAF transport aircraft rules out robust air deliveries of cargo to the facility. Given the proximity of the Doraleh facility to the Djibouti base, it is very likely such sustainment comes by the sea through the extensive civilian/SOE shipping network. Those supplies, increasingly containerized, are most likely transported by truck to the Djibouti facility where they are housed for replenishing and resupplying the PLAN ships passing through. This line of reasoning needs to be reinforced through further analysis.

Special spare parts (such as communications equipment) for repairing specialized assets on ships most likely comes from specialized air delivery to the Djibouti International Airport. Transporting these types of parts to the Djibouti base by naval shipping or military aircraft would not be difficult.⁵⁶ A more modern logistical approach would work with husbanding agents and international logistics carriers to order these parts quickly from suppliers in China or elsewhere. The parts would then be shipped via commercial air to Djibouti International Airport. Chinese contractors could then install the parts and repair specialized equipment on the PLAN ships. Recent PLA writings on modern, agile, and “just-in-time logistics” suggest this prediction is probably accurate.⁵⁷ In the words of the aforementioned US logisticians, “With technician access to the ship or aircraft in question plus the availability of most spare parts by expedited delivery services, most parts can be replaced even during wartime, with the exception

55. *NAVSEA Manual for Ammunition and Explosives Ashore: Safety Regulations for Handling Storage, Production, Shipping*, op. 5, vol. 1, chap. 12 (Naval Sea Systems Command, February 16, 2001), 12-1 to 12-23.

56. Yung et al., *Chinese Overseas Basing Requirements*, 40.

57. LeighAnn Luce and Erin Richter, “Handling Logistics in a Reformed PLA: The Long March toward Joint Logistics,” in *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms*, ed. Phillip C. Saunders et al. (Washington, DC: National Defense University Press, 2019): 278–79, <https://ndupress.ndu.edu/Portals/68/Documents/Books/Chairman-Xi/Chairman-Xi.pdf>.

of submarine and aircraft carrier reactors.”⁵⁸ This speculation also needs to be reinforced with additional research and analysis.

Conclusion

The best available evidence suggests the logistical functions of the Djibouti “Strategic Strong Hold” are highly focused on naval support activities designed to assist directly with the Gulf of Aden counter-piracy deployments and the long-range military diplomacy missions that the PLAN periodically undertakes. This function is logical given the amount of analysis that took place in China following the initial counter-piracy deployments and which highlighted the difficulties the PLAN deployers were experiencing while operating overseas.⁵⁹ The Djibouti facility appears to be the direct result of the PLAN’s assessment of its gaps in operational support—hence the presence of recreational facilities, communications facilities, medical support, replenishment and refueling support activities, extensive pierage, and storage facilities.

Even with the Doraleh Port considered, the facility does not appear to be a nascent capability to support a naval conventional conflict. In the first place, such a function near so many other strategic rivals makes no sense operationally. Second, it is unlikely the government of Djibouti would permit the naval facility and Doraleh to be used in this fashion. Nevertheless, the features of the combined facilities, their combined size, the potential to construct and expand magazines spaced sufficiently apart, and the potential to increase existing infrastructure to meet warfighting standards means such a possibility cannot be ruled out.

The presence of battalion-strength PLANMC units suggests an additional force protection mission for the ground forces stationed at the facility. Observed unit training focused on hostage crises, counterterrorism, and visit, board, search, and seizure (VBSS) operations, suggesting the PLANMC units are also intended to protect the large number of Chinese businesses establishing themselves in the region.

An assessment of activities and features of the Djibouti facility does not support the idea that the facility will be turned into an air operations

58. Yung et al., *Chinese Overseas Basing Requirements*, 40.

59. For example, see Li Jie, “China’s Navy Still Has Far to Go,” *China Daily*, August 14, 2009; and see also “尹卓：中国海军应在吉布提建立长期补给基地” [Yin Zhuo: The PLAN Should Build a Long-term Supply Base in Djibouti], 中国供应商 [Chinese Suppliers], December 28, 2009.

logistical hub, nor that it will serve as an initial staging area, training base, and RSOI center for incoming PLA troops destined for UN peacekeeping or other ground operations in Africa. These activities are likely to be supported eventually by the PLA, but at other locations on the continent.

Djibouti is likely to be one of several logistics support hubs extending from the Indian Ocean into Africa through the Middle East and into the Mediterranean Sea. Establishing additional naval and air operational support facilities will be difficult for China, requiring tough negotiations and acceptance of political and legal restrictions. Yet, those facilities will come, albeit in limited numbers. Supplementing these facilities will be a number of civilian commercial private and state-owned facilities and vessels that will be used to supply and refuel PLAN, PLAAF, and PLA ground forces operating forward.

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How Well Do We Understand PLA Logistics?

Lonnie D. Henley

This chapter provides an overview of the presentations at the conference and assesses how much progress has been made toward understanding the logistics and sustainment capabilities of the Chinese People's Liberation Army (PLA). The observations below address the papers in this volume and other recent works presented at the US Naval War College, the US-China Economic and Security Review Commission, and other venues.

While more is known about PLA logistics than 10 or even five years ago, there is not yet enough data to answer the most important questions with any degree of confidence. The most pressing question is whether the PLA logistics system could sustain the force in large-scale, high-intensity combat operations—a war—near China. This question is particularly pressing if the war should last more than the couple of weeks some observers believe the PLA envisions for a Taiwan, Senkakus, or South China Sea conflict. Better understood is how well the PLA could sustain small-scale, low-intensity, noncombat operations, both within the immediate theater and farther afield. But how much they intend to expand that noncombat logistics power projection in the future is not known with any confidence. What is known is that the PLA is not capable now, and will not be capable soon, of even medium-scale, moderate-intensity combat operations far from China (for example, the Indian Ocean or East Africa). But, again, there is little insight into whether they aspire to that capability, much less whether current intentions may change in the future.

What We Have Learned

This conference was the third recent event focused on PLA logistics. The China Maritime Studies Institute at the US Naval War College hosted a conference in 2021 examining large-scale amphibious warfare, including the logistical underpinnings of such an operation.¹ The US-China Economic and Security Review Commission held hearings in 2020 on China's military power projection capabilities, focusing on operations outside China's immediate periphery.² These and other important studies offered new insights in several areas.

Structure of Military Logistics and Goals of Logistics Reform

Logistics modernization, “military-civilian fusion,” and national defense mobilization are discussed extensively in specialist military journals and the general news media in China. It is relatively easy for outside observers to discern how Chinese leaders intend the system to work; how the PLA logistical apparatus is organized; the location, subordination, and role of major logistical units and facilities; what kind of operational training the PLA conducts; and what kind of logistical support that requires.³ There is more information available on these topics than can be digested, but it appears to this observer that we have a good grasp of the basic outlines.

1. US Naval War College/China Maritime Studies Institute, *Quick Look Report: Large-Scale Amphibious Warfare in Chinese Military Strategy* (Newport, RI: US Naval War College, 2021), https://dnnlgwick.blob.core.windows.net/portals/0/NWCDepartments/China%20Maritime%20Studies%20Institute/NWC_CMSI_Conference_Quick%20Look_20210614_Large-Scale%20Amphibious%20Warfare%20in%20Chinese%20Military%20Strategy.pdf?sv=2017-04-17&sr=b&si=DNNFileManagerPolicy&sig=4j5oeE7jvn%2B4MMG%2B3js4JuRG5TRnALldHS5Zupz7OC8%3D.

2. *China's Military Power Projection and U.S. National Interests: Hearings before the US-China Economic and Security Review Commission*, 116th Cong. (2020), <https://www.uscc.gov/sites/default/files/2020-04/February%2020%2C%202020%20Hearing%20Transcript.pdf>.

3. Joel Wuthnow, “Joint Logistics Force Support to Theater Commands,” in *PLA Logistics and Sustainment: PLA Conference 2022*, ed. George R. Shatzer and Roger D. Cliff (Carlisle, PA: US Army War College Press, 2023); and Joshua Arostegui and James R. (J. R.) Sessions, “PLA Army Logistics,” in *PLA Logistics and Sustainment: PLA Conference 2022*, ed. George R. Shatzer and Roger D. Cliff (Carlisle, PA: US Army War College Press, 2023).

Overall Relationship among Military Logistics, Military-Civilian Fusion, and National Defense Mobilization

There is a great deal more to learn here, but several recent works have addressed the broad outlines of civilian support to military operations in China.⁴ These sources have also looked at some aspects of military-civilian fusion, primarily as it affects the defense industrial base and technology for military systems.⁵ Yet, this research has only begun to look at aspects that affect logistical support to operational units, and this problem is addressed at greater length later.⁶

PLA Power Projection Capabilities

This topic has attracted a great deal of attention from PLA specialists and what one might call the foreign policy public, particularly since the opening of the Chinese military base in Djibouti.⁷ Despite the Djibouti base and China putting out feelers to other potential host nations, however, it is clear the PLA has not invested heavily in military power projection. Djibouti and other potential locations are sufficient to sustain small-scale, low-intensity operations:

4. Erin Richter and Benjamin Rosen, “China’s National Defense Mobilization System: Foundation for Military Logistics,” in *PLA Logistics and Sustainment: PLA Conference 2022*, ed. George R. Shatzer and Roger D. Cliff (Carlisle, PA: US Army War College Press, 2023); Devin Thorne, *Inside China’s National Defense Mobilization Reform: Capacity Surveys, Mobilization Resources, and “New-type” Militias* (Washington, DC: Recorded Future Insikt Group, March 10, 2022), <https://go.recordedfuture.com/hubfs/reports/ta-2022-0310.pdf>; Larry M. Wortzel, *Military Mobilization in Communist China*, Land Warfare Paper 136 (Arlington, VA: Association of the United States Army, December 2020), https://www.ausa.org/sites/default/files/publications/LWP-136-Military-Mobilization-in-Communist-China_0.pdf; and Dean Cheng, “Converting the Potential to the Actual: Chinese Mobilization Policies and Planning,” in *The People’s Liberation Army and Contingency Planning in China*, ed. Andrew Scobell et al. (Washington, DC: National Defense University Press, 2015).

5. Alex Stone and Peter Wood, *China’s Military-Civil Fusion Strategy: A View from Chinese Strategists* (Montgomery, AL: China Aerospace Studies Institute/US Air University, 2020), https://www.airuniversity.af.edu/Portals/10/CASI/documents/Research/Other-Topics/2020-06-15%20CASI_China_Military_Civil_Fusion_Strategy.pdf; and Richard A. Bitzinger, “China’s Shift from Civil-Military Integration to Military-Civil Fusion,” *Asia Policy* 16, no. 1 (January 2021): 5–24.

6. Conor M. Kennedy, *Civil Transport in PLA Power Projection*, China Maritime Report No. 4 (Montgomery, AL: China Maritime Studies Institute/US Air University, 2019); J. Michael Dahm, *Chinese Ferry Tales: The PLA’s Use of Civilian Shipping in Support of Over-the-shore Logistics*, China Maritime Report No. 16 (Montgomery, AL: China Maritime Studies Institute/US Air University, 2021); and Chung Chieh and Andrew N. D. Yang, “Crossing the Strait: Recent Trends in PLA ‘Strategic Delivery’ Capabilities,” in *The PLA Beyond Borders: Chinese Military Operations in Regional and Global Context*, ed. Joel Wuthnow et al. (Washington, DC: National Defense University Press, 2021).

7. Isaac B. Kardon, “China’s Overseas Base, Places, and Far Seas Logistics,” in *The PLA Beyond Borders: Chinese Military Operations in Regional and Global Context*, ed. Joel Wuthnow et al. (Washington, DC: National Defense University Press, 2021); Rayan V. Bhagwagar, “China’s Overseas Military Bases,” *Modern Diplomacy* (website), August 31, 2020, <https://moderndiplomacy.eu/2020/08/31/chinas-overseas-military-bases/>; and Hal Brands, “Opinion: America and China Are in a Global Fight over Military Bases,” *Bloomberg* (website), November 30, 2021, <https://www.bloomberg.com/opinion/articles/2021-11-30/america-and-china-are-in-a-global-fight-over-military-bases>.

anti-piracy patrols, peacekeeping operations, intelligence collection, show-the-flag regional presence, humanitarian assistance and disaster relief, military diplomacy, and so forth. This capacity, however, would be nearly irrelevant in a serious conflict. The PLA has made no effort to build a warfighting power projection capability or to create an organizational structure or doctrine for power projection logistics.⁸

The PLA Navy has some capacity for at-sea replenishment on a very small scale. The Air Force has an inherent capability as its fleet of large cargo jets begins to grow, but it has not developed the command-and-control structures or logistical foundation for large operations far from China. The majority of the PLA's power-projection effort has focused on operations inside China or on its immediate borders—moving forces to combat natural disasters, reinforce the Indian border, suppress unrest, or support (potentially) a friendly Central Asian government.⁹

As in several other aspects of PLA studies, the debate among China watchers is more about future intentions than current capabilities. Some believe China's current leaders aspire to project combat power far beyond China's immediate periphery to protect Chinese interests and shape the geopolitical environment.¹⁰ This author is in the opposite camp, judging that China will continue to adhere to a supremely self-interested foreign posture, with no desire to take responsibility for other people's problems. Who rules Syria and how—or Sudan or Venezuela—and how is of moderate interest to China but not worth spending very much Chinese blood or treasure. In any case, the debate among foreign specialists is about what China may do in the

8. Phillip C. Saunders, "Command and Control of Overseas Operations in a Reformed PLA," in *The PLA Beyond Borders: Chinese Military Operations in Regional and Global Context*, ed. Joel Wuthnow et al. (Washington, DC: National Defense University Press, 2021).

9. Bonny Lin, Brian Hart, and Matthew P. Funaiolo, "The PLA's Growing Airpower Projection Capabilities in the Western Theater Command," in *PLA Logistics and Sustainment: PLA Conference 2022*, ed. George R. Shatzer and Roger D. Cliff (Carlisle, PA: US Army War College Press, 2023); Center for Strategic and International Studies (CSIS), "How Is China Expanding Its Infrastructure to Project Power along Its Western Borders?," China Power Project (website), May 2022, <https://chinapower.csis.org/china-tibet-xinjiang-border-india-military-airport-heliport/>.

10. James E. Fanell, "China's Global Navy: Today's Challenge for the United States and the U.S. Navy," *Naval War College Review* 73, no. 4 (2020); *How Xi Jinping's 'New Era' Should Have Ended U.S. Debate on Beijing's Ambitions: Hearing before the US-China Economic and Security Review Commission*, 116th Cong. (statement of Daniel Tobin, China Studies faculty, National Defense University, March 2020), https://www.uscc.gov/sites/default/files/2020-10/March_13_Hearing_and_April_27_Roundtable_Transcript_0.pdf; and Oriana Skylar Mastro, "Ideas, Perceptions, and Power: An Examination of China's Military Strategy," in *Strategic Asia 2017–18: Power, Ideas, and Military Strategy in the Asia-Pacific*, ed. Ashley J. Tellis, Alison Szalwinski, and Michael Wills (Washington, DC: National Bureau of Asian Research, 2017).

future, not about the PLA's current capacity for large-scale power projection—or rather lack thereof.

Things We Do Not Know

How Well the PLA Logistical System Would Work under Stress

The issues outlined above represent important progress in understanding PLA sustainment capacity, but vital knowledge gaps remain. The most important question about the logistics system is whether it could sustain the force in long-duration, high-intensity combat operations—that is, in a major war against the United States and its allies. Among the many unknowns:

- Can the PLA land a large enough force on Taiwan, and sustain it, to invade and conquer the island successfully? Can it do so now, and, if not, when will it reach that level? Is the current reliance on civilian vessels to supplement PLA logistics an interim measure or an enduring part of how the PLA envisions this conflict?¹¹
- How would the PLA sustain its forces on Taiwan if it managed to land them? What would the on-island logistical structure look like? What are the cross-Strait throughput requirements for essential materiel? How would the PLA open and operate Taiwan ports and airfields? Does the PLA even think seriously about logistics beyond the beachhead? There is no indication of that in available military journals.

11. *China's Logistic Support to Expeditionary Operations: Hearing before the US-China Economic and Security Review Commission*, 116th Cong. (statement of Kevin McCauley, February 20, 2020), <https://www.uscc.gov/sites/default/files/2020-04/February%2020%2C%202020%20Hearing%20Transcript.pdf>; Conor M. Kennedy, *Civil Transport in PLA Power Projection*, China Maritime Report No. 4 (Newport, RI: China Maritime Studies Institute/US Naval War College, December 2019), <https://digital-commons.usnwc.edu/cgi/viewcontent.cgi?article=1003&context=cmsi-maritime-reports>; and Lonnie D. Henley, *Civilian Shipping and Maritime Militia: The Logistics Backbone of a Taiwan Invasion*, China Maritime Report No. 21 (Newport, RI: US Naval War College, 2022), <https://digital-commons.usnwc.edu/cmsi-maritime-reports/21/>.

- Can the air force and naval aviation maintenance crews service aircraft quickly enough to sustain high sortie rates and for how long—days, weeks, months? How quickly can they replace an engine? How many at once? How many flight hours are there between engine overhauls, and how many spare engines do they have? Can they maintain stealth aircraft well enough to keep them stealthy?
- How large are the PLA's stockpiles of precision munitions and key components? How quickly can the defense industrial base replenish those stores under wartime conditions?
- What is the intended force structure for major new logistics platforms—Y-20 transport aircraft, Yuchi-class replenishment ships, and others?
- How resilient are PLA logistics? How quickly can they repair damage to their runways, road and rail networks, ports, and depots?
- How much have the intended changes to organizational culture actually taken hold? The reforms since 2016 are intended to shift authority from the national to the theater level and from the service headquarters to the joint force commander.¹² When the United States made the same kind of shift in the late 1980s, it took years for military culture to change to match the new legal authorities and command structure. Some would say it remains a work in progress. It is very difficult to tell how the PLA is doing in that regard given the kind of information sources available.

12. David M. Finkelstein, "Breaking the Paradigm: Drivers behind the PLA's Current Period of Reform," in Phillip C. Saunders et al., eds., *Chairman Xi Remakes the PLA: Assessing Chinese Military Reforms* (Washington, DC: National Defense University Press, 2019), <https://ndupress.ndu.edu/Portals/68/Documents/Books/Chairman-Xi/Chairman-Xi.pdf>; and Joel Wuthnow, "Joint Logistics Force Support to Theater Commands," in *PLA Logistics and Sustainment: PLA Conference 2022*, ed. George R. Shatzer and Roger D. Cliff (Carlisle, PA: US Army War College Press, 2023).

China's Long-term Intentions for Out-of-region Power Projection Logistics

There has been a great deal of speculation about additional overseas bases in the Indian Ocean, the South Pacific, and even in the South Atlantic. There is no good evidence about their intentions. One must infer intentions from actions, but the observed facts fit a wide range of hypotheses.

China's Ability to Withstand a Blockade

As the conflict in Ukraine has reemphasized, Chinese leaders must expect a war would create massive disruption to China's foreign trade. Even if US forces did not impose a formal military blockade as PLA authors assume, massive US sanctions and the intensity of conflict would produce much the same result. It is hard to assess how a near-total cessation of trade would affect a continental-sized economy operating on a war footing. How large are China's stockpiles of key resources? How vulnerable are they to enemy attack? What would China's wartime consumption rates be, with tight rationing offset against huge increases in military consumption? How much of which materials could they expect to get through if Russia remained friendly—and how much if it did not? At what point would economic disruption affect PLA operational capabilities?

How Well the National Defense Mobilization System Would Work

China has built an elaborate bureaucracy to mobilize civilian resources in support of military operations. If this system functions as planned, it will provide thousands of trucks, ships, and aircraft with their crews, tens of thousands of technicians and mechanics, and millions of tons of materiel to supplement PLA logistics. We have only begun to mine the large volume of publicly available information on the defense mobilization and militia logistics network. Preliminary studies document the huge level of effort and the existence of many unresolved challenges within this system. Not enough work has been done to permit any informed judgment about whether national defense mobilization is the "people's war" secret sauce that greatly multiplies PLA sustainment capabilities or an enormous Rube Goldberg apparatus that would collapse in a real conflict. This question is one of the most important unanswered questions in PLA studies.

Recommendations

The growing number of papers and conferences focused on PLA logistics is encouraging, but these efforts have yet to achieve a critical mass. The key questions that make logistics such an important topic remain unanswered, leaving it unclear whether the PLA can sustain a large war close to China today and whether it will be able to fight even a medium-sized war farther from China in the foreseeable future. The unexpected struggles of Russian forces in Ukraine highlight the importance of this issue, as what many considered one of the world's most powerful military forces has severely underperformed due in part to bad logistics. The United States, and the Chinese themselves, need to look closely at how Chinese military logistics would perform under similar stress.

How well the PLA could sustain a large conflict close to China requires looking beyond the PLA's organic logistics and equipment maintenance units to consider it, as the Chinese do, as a whole-of-society people's war undertaking. It requires looking much closer at the National Defense Mobilization Committees, the PLA Provincial Military District (PMD) system, and the parts of the People's Militia directly involved in logistical support to PLA maneuver operations. There is little enthusiasm for studying the militia, aside from Maritime Militia forces involved in "rights protection" missions in the South and East China Seas. The People's Militia is large, decentralized, diverse, and, honestly, boring compared to ballistic missiles, fighter jets, and amphibious mechanized combined arms brigades. If professionals study logistics, as is often said, then professional PLA watchers cannot ignore the huge component of PLA logistics resident in the PMD system and militia forces.

Luckily, China's apparatus for mobilizing civilian support for military operations, by its nature, must exist in the open, visible to the economic entities it interacts with and therefore somewhat visible to the United States and others. The problem is not finding data as it is for many other aspects of China's military. The problem is grappling with large volumes of low-value data to develop a clear picture.

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