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China Maritime Report No. 4: Civil Transport in PLA Power Projection

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Summary

The People's Liberation Army (PLA) has ambitious goals for its power projection capabilities. Aside from preparing for the possibility of using force to resolve Beijing's territorial claims in East Asia, it is also charged with protecting China's expanding "overseas interests." These national objectives require the PLA to be able to project significant combat power beyond China's borders. To meet these needs, the PLA is building organic logistics support capabilities such as large naval auxiliaries and transport aircraft. But it is also turning to civilian enterprises to supply its transportation needs. Since 2012, the PLA has taken major steps to improve its ability to leverage civilian carriers as part of the strategic projection support forces in support of military operations. It has developed strategic projection support ship fleets, comprising civilian-operated roll-on/roll-off, container, tanker, and semi-submersible ships. It has also integrated civilian aviation enterprises into strategic projection support aircraft fleets. To facilitate the staging of military forces for projection beyond China's borders, the PLA has improved its ability to use China's modern rail networks and trucking fleet. The PLA has also developed its first strategic projection base, a specialized center of logistics expertise intended to serve PLA power projection requirements through civil-military fusion. To be sure, China's strategic projection support forces must overcome several challenges before they can fully meet the needs of the PLA. In some cases, training is lax and national defense standards are outdated, or not fully implemented. The PLA itself, which is currently in the midst of a major reform, must also improve its ability to integrate civilian carriers into its combat and support operations. However, the PLA is already taking steps to overcome these challenges, and the PLA logistics community is energetically developing new approaches to better leverage China's enormous civil transportation sector to meet Beijing's current and future power projection requirements.

Introduction

The People's Liberation Army (PLA) has undergone significant transformation over the past several years through reforms enacted by Chairman Xi Jinping. Accompanying major changes in senior leadership, organization, and force structure are growing efforts by the PLA to boost its power projection capabilities. Much analysis of Chinese military development tends to focus on the emblematic platforms of long-range power projection: large warships and military aircraft.¹

But the PLA also relies on civilian carriers—ships, airplanes, trains, and trucks—to support its power projection needs. Since the 18th Party Congress (November 2012), the People's Republic of China (PRC) has taken major steps to improve its ability to leverage civilian carriers to serve the Chinese military. This is an important, but understudied, aspect of China's military development.

This report seeks to help close this gap in the literature. It examines efforts by the PLA to strengthen what it calls "new-type strategic projection forces."² Aside from the PLA's own organic lift capabilities, this includes civilian transport systems and platforms that could be leveraged in a crisis or conflict. Much of this effort has been aimed at improving the PLA's ability to project power over water and across long distances—to the frontiers of Chinese-claimed territory in maritime East Asia, and to countries and oceans around the world where Chinese "overseas interests" are concentrated.

¹ Annual Report to Congress – Military and Security Developments Involving the People's Republic of China 2019, pp. 58-62, https://media.defense.gov/2019/May/02/2002127082/-1/-1/1/2019_CHINA_MILITARY_POWER_REPORT.pdf.

² 我军新型战略投送力量建设取得长足发展 [“Major Progress Made in Construction of Our Military's New-type Strategic Projection Forces”], 中国国防报 [*China Defense News*], 16 August 2017, <https://news.qq.com/a/20170816/010864.htm>.

These developments therefore have huge implications for the U.S. and its allies and partners in this period of growing great power competition.

This report comprises four main parts. Part 1 introduces the PLA concept of strategic projection and the drivers behind the PLA's recent prioritization of strategic power projection force development. Part 2 outlines the legal and organizational foundations for PLA employment of civilian carriers for military purposes. Part 3—the bulk of the report—describes force development in strategic sea lift, strategic airlift, rail and road projection, and strategic projection bases, focusing heavily on support capabilities derived from civilian carriers. The report concludes with a discussion of challenges the PLA must overcome before it can fully leverage civilian carriers to achieve the power projection capabilities it desires.

China's Strategic Power Projection Needs

The PLA defines “strategic power projection” (战略投送) as “actions to comprehensively use a variety of transportation forces to insert forces into an area of operations or crisis in order to achieve specific strategic objectives.”³ These transportation forces include organic PLA transportation supporting forces, such as PLA Air Force (PLAAF) Y-20 transport aircraft or the PLA Navy's (PLAN) Type-071 Landing Platform Dock (LPD) vessels. They also comprise national civilian transportation resources—the focus of this report.

Strategic projection capabilities are vital to the success of any likely military scenario involving China. In East Asia, the PLA must be prepared to project power over water in order to seize and defend disputed islands, including Taiwan. To achieve these aims, the PLA could be asked to fight what it calls an “informatized limited war” (信息化局部战争—sometimes translated as “informatized local war”).⁴ It must also be prepared for a range of other combat operations along its periphery, including an intervention in North Korea.

But China's interests are not confined to maritime East Asia. The need to defend China's expanding “overseas interests” (海外利益) is often cited as a key driver behind efforts to augment the PLA's ability to project power over long distances.⁵ China's overseas interests include the security of Chinese citizens and property in foreign lands and the security of sea lines of communication.⁶ Indeed, experts in the PLA are increasingly advocating for the improvement of “cross-border, transoceanic long-range projection capabilities” (跨境越洋远程投送能力).⁷

³ This report will hereafter shorten the term to “strategic projection.” 中国人民解放军军语 [PLA Dictionary of Military Terms] (Beijing: Academy of Military Science Press, 2011), p. 58.

⁴ M. Taylor Fravel, “China's New Military Strategy: ‘Winning Informatized Local Wars,’” *China Brief*, Vol. 15, Issue 13, July 2, 2015, <https://jamestown.org/program/chinas-new-military-strategy-winning-informationized-local-wars/>

⁵ 寿晓松 [Shou Xiaosong, ed.], 战略学 [The Science of Military Strategy], (Beijing: Military Science Press, 2013), p. 259.

⁶ See section three in “Fulfilling the Missions and Tasks of China's Armed Forces in the New Era” in 新时代的中国国防 [China's National Defense in the New Era], 国务院新闻办公室 [State Council Information Office], July 2019.

⁷ 刘嘉生, 孙大同, 彭富兵 [Liu Jiasheng, Sun Datong, and Peng Fubing], 基于国家安全需求的战略投送载运工具建设 [“Development of Carriers for Strategic Projection in Response to National Security Needs”], 军事交通学院学报 [Journal of Military Transportation University], no. 2, (2019), p. 10; In 2018, two senior captains from the Nanjing Naval Command College included “transoceanic projection” in their effort to define the PLAN's future development strategy. See: 史常勇, 陈炎 [Shi Changyong and Chen Yan] 试论新时代海军战略定位 [“On the Navy's Strategic Positioning in the New Era”] 国防 [National Defense] no. 5 (2018), pp. 34-36.

Power projection capabilities also serve valuable strategic purposes even when they are not used. Demonstrating the ability to project power beyond China's borders helps influence the strategic calculus of foreign decision makers. It is therefore integral to deterrence, crisis control, and war prevention, and maintenance of the initiative in almost any scenario.⁸

China's strategic projection needs are not static. Indeed, they seem to be increasing on the basis of an explicit timeline. This timeline was outlined by the chief of staff of the Central Military Commission's (CMC) Transport and Projection Bureau Liu Jiasheng in a February 2019 article.⁹ Liu describes three phases:

- In the short-term, the military must be ready to fight and win an informatized limited war in the maritime direction. To this end, the PLA will focus on greater development of strategic sea and air lift forces. Efforts will include implementing technological advancements in self-loading trucks, fast passenger roll-on/roll-off (RO-RO) ships, large strategic transport aircraft, unmanned platforms, and precision projection systems.
- In the medium-term, the PLA will focus on developing the ability to project power to "countries and regions along the 'Belt and Road' and areas crucially related to key interests around the globe." The focus of the PLA's preparation for military struggle will be "fighting and winning an overseas informatized limited war or controlling a major crisis." To this end, the PLA will develop unmanned projection systems on land, sea and air, with significant focus on precision air projection capabilities.
- In the long-term, the PLA will primarily focus on "global projection." It will rely on China's overseas bases and air and space multi-dimensional projection systems to meet the rapid reaction requirements of transportation projection capabilities, in the event of a war anywhere around the globe. Future developments will include high-speed cargo rail, high-performance sea and air platforms, hypersonic transport aircraft, coordinated robotics and unmanned systems in automated transportation systems, and intelligent unmanned transport decision-making systems.¹⁰

To improve strategic projection capabilities, the PLA is constructing its own strategic lift forces, including heavy lift aircraft, military helicopters, large transport ships, amphibious ships, and replenishment ships.¹¹ The PLA began developing its organic strategic lift capabilities relatively late compared to other great powers. Chinese military leaders believe the PLA has a long way to go before it can meet its strategic projection requirements.

To support strategic projection, the PLA is also striving to enhance civil-military fusion in the nation's maturing transportation infrastructure. The role of civilian carriers in strategic projection operations has become a major area of development in the military. In large part, this is driven by a desire to compensate for shortcomings in the PLA's own organic lift capabilities. Civilian

⁸ 肖天亮 [Xiao Tianliang], ed., 战略学 [The Science of Military Strategy], (Beijing: National Defense University Press, 2015), pp. 195-200; Liu Jiasheng, "Development of Carriers for Strategic Projection in Response to National Security Needs," p. 10.

⁹ Liu Jiasheng, "Development of Carriers for Strategic Projection in Response to National Security Needs," pp. 9-13.

¹⁰ Ibid, pp. 9-13.

¹¹ 米斌斌, 王圣立 [Mi Binbin, Wang Shengli], 现代战争优势战斗力的来源: 强大的空中战略投送能力 ["The Source of Superior Combat Effectiveness in Modern Warfare: Powerful Air Strategic Projection Capabilities"], 解放军报 [PLA Daily], June 12, 2016, www.81.cn/kj/2016-06/12/content_7095608.htm.

transportation carriers organized for military transportation support are considered part of the PLA's strategic projection support forces (战略投送支援力量).

Organizing Civilian Carriers for Power Projection

The PLA has the authority to assume control over civilian carriers for military purposes. This authority stems from a number of laws and regulations. These include the 1995 Regulation on National Defense Transportation, the 2003 Regulations on National Defense Mobilization of Civil Transport Resources, and the 2010 National Defense Mobilization Law.¹² These laws underpinned the construction of National Defense Transportation Support Forces (国防交通保障队伍), which comprise civilian transportation reserve forces developed by government transportation management departments and industry to carry out a range of tasks for the PLA. Tasks include emergency repairs, construction, local facility support, and transportation support.¹³ Some of these forces have evolved to meet the new power projection requirements established by the PLA.

In September 2016, China issued the *National Defense Transportation Law*, providing further clarity about the requirements of civil transportation resources in supporting the military's missions. Superseding the 1995 Regulation on National Defense Transportation, it was designed to improve the PLA's ability to leverage civilian carriers to support strategic projection. Among other things, the new law placed obligations on Chinese transportation enterprises located abroad or engaged in international shipping. It required them to provide logistical support for PLA forces operating overseas. The new law also introduced the concept of "strategic projection support forces." Strategic projection support forces chiefly comprise large- and medium-sized Chinese companies organized into strategic projection support units. The 2016 Law charges them with responsibility for providing "rapid, long-distance, and large-scale national defense transportation support."¹⁴

Strategic projection support forces are managed directly by civil transportation enterprises under the guidance of national and provincial Transportation War Readiness Offices. The National

¹² See chapter six in 国防交通条例 [Regulation on National Defense Transportation], 1995, <https://baike.baidu.com/item/%E5%9B%BD%E9%98%B2%E4%BA%A4%E9%80%9A%E6%9D%A1%E4%BE%8B>; Article two of 民用运力国防动员条例 [Regulations on National Defense Mobilization of Civil Transport Resources], 2003, <http://en.pkulaw.cn/display.aspx?cgid=f121bea40b0cb4a6bdfb&lib=law>; Chapter ten of 国防动员法 [National Defense Mobilization Law], 2010, www.gov.cn/flfg/2010-02/26/content_1544415.htm.

¹³ The national defense transportation support forces include "specialized support forces" (国防交通专业保障队伍) created in transportation enterprises and "transportation support forces along routes" created by local military districts and civilian governments. The strategic projection support forces originate out of enterprises from the specialized support forces. Chapter 5, Regulation on National Defense Transportation; 陈祥鹏, 海军, 孙振岚, 丁利亮 [Chen Xiangpeng, Hai Jun, Sun Zhenlan, Ding Liliang], 加强我国战略投送支援舰队建设的思考 ["Consideration on Strengthening Construction of Strategic Delivery Support Fleet in New Period"], 军事交通学院学报 [Journal of Military Transportation University], no. 10 (2019), p. 11.

¹⁴ Chapter five discusses the obligation of civilian entities in providing transportation support to the PLA, including its overseas missions. The strategic projection support forces explained in article 36 are likely distinct from general civilian entities that could be called up for support. These more organized forces have enhanced roles in power projection compared to previous civilian carriers that supported the PLA domestically. See articles 36-38, 《中华人民共和国国防交通法》 [Law of the People's Republic of China on National Defense Transportation], 中国人大网 [China National People's Congress Online], September 3, 2016, http://www.npc.gov.cn/npc/xinwen/2016-09/03/content_1996764.htm; The 2016 National Defense Transportation Law also provides that during a war or crisis, the PRC would establish a National Defense Transportation Joint Command Organization (国防交通联合指挥机构) to command civil transportation resources. To date, there has been very little reporting on the circumstances of its activation or how it would function. See Article 13, National Defense Transportation Law of the People's Republic of China.

Transportation War Readiness Office (国家交通战备办公室) drafts guidelines, policies, and plans for mobilization of civil transportation resources in support of national defense.¹⁵ It also promulgates national defense mobilization standards. The National Transportation War Readiness Office is overseen by the Transport and Projection Bureau (运输投送局) of the CMC Logistic Support Department.¹⁶

Provincial-level Transportation War Readiness Offices serve as the interface between the PLA and individual companies. They oversee implementation of national defense mobilization standards, ensure that civilian resources are available for the PLA when required, provide funding to national defense transportation mobilization work, and report on the availability of transportation resources to their relevant PLA counterparts.¹⁷ Military Representative Offices located in railway hubs, ports, and airports also help civil transportation enterprises meet national readiness requirements, which include periodic training exercises with PLA units.¹⁸

Command and control of China's strategic projection support forces remains unclear. PLA reforms established five Theater Commands out of the former seven Military Regions to enhance the PLA's joint warfighting capabilities. Civilian carriers can be subject to the control of operational units within each Theater Command. However, the Joint Logistics Support Force (JLSF), an independent force directly subordinate to the CMC also has command and control authorities over these civilian

¹⁵ Its responsibilities also include implementing national defense standards for construction of transportation infrastructure and resources, organizing and managing national defense transportation materials storage, as well as overseeing the construction of transportation support forces in the civilian economy. 卢锐, 许四海 [Lu Rui, Xu Sihai], 军民融合加快推进战略投送能力建设 - 国家交通战备办公室主任、中央军委后勤保障部运输投送局局长白忠斌答记者问 [“Civil-Military Fusion Accelerates the Construction of Strategic Power Projection Capabilities - National Transportation Readiness Office Direct and Central Military Commission Logistic Support Department Transport and Projection Bureau Head Bai Zhongbin Answers Questions from Reporters”], 中国交通新闻网 [China Transportation News], September 6, 2016, www.zgjt.com/2016-09/06/content_94342.htm; 中国战争动员百科全书 [Chinese War Mobilization Encyclopedia], (Beijing: Military Science Press, 2003), p. 298.

¹⁶ Run by a Corps Leader-grade officer, the CMC Transport and Projection Bureau is in charge of coordinating the PLA's transportation over land, sea, and in the air. It replaced the former General Logistics Department's Military Transportation Department. 原总后勤部副部长白忠斌任军委后勤保障部运输投送局局长 [“Former Deputy Director of the Military General Logistics Department Transportation Department Bai Zhongbin Appointed Director of Central Military Commission Logistics Support Department Transport and Projection Department”], 澎湃新闻 [The Paper], September 5, 2016, www.thepaper.cn/newsDetail_forward_1524277

¹⁷ Transportation War Readiness Offices fall under the National Defense Mobilization Commission system at the national and local levels, which prepare to mobilize national resources for national defense during peacetime and command the transition of those resources in service of the military during wartime. *Chinese War Mobilization Encyclopedia*, p. 298; 田野, 张凯, 乔振友 [Tian Ye, Zhang Kai, Qiao Zhenyou], 国防动员委员会三问明责: 我是谁、干什么、怎么干 [“National Defense Mobilization Committee's Three Questions on Duty: Who I am, What I do, and How to Implement”], 解放军报 [PLA Daily], June 27, 2018, www.mod.gov.cn/mobilization/2018-06/27/content_4817763.htm; An often-expressed phrase describing the guiding principle in how locally-coordinated transportation support forces and infrastructure are made available to the PLA is as follows: “the Military submits requirements, the Transportation War Readiness Office coordinates, and governments implement” (军队提需求、交通战备办公室搞协调、政府抓落实). 对接交通基础设施建设军事需求 推进军民融合发展 [“Meeting Military Requirements in the Construction of Transportation Infrastructure”], 湖南省交通运输厅 [Hunan Province Department of Transportation], May 13, 2019, http://jtys.huaihua.gov.cn/26721/29261/content_702931.html .

¹⁸ 李宏, 高洁 [Li Hong, Gao Jie], 战略投送支援船队开进联合演练场 [“Strategic Projection Support Ship Fleet Joins Joint Training”], 中国军网 [China Military Online], September 11, 2016, www.81.cn/jfbmap/content/2016-09/11/content_156271.htm

forces. The JLSF supports the military services for all general logistics requirements, helping to relieve Theater Commands and the services of many duplicative support functions.¹⁹

PLA Strategic Lift Developments

Modern military operations are rapid and complex, and consume significant quantities of materials. In some scenarios, PLA power projection operations could require highly-coordinated, rapid, and precise mobilization of sea and air lift carriers to achieve large volumes of force.²⁰ In such cases, it would be very difficult for the PLA to provide the entirety of its lift requirements organically.²¹ Therefore, the PLA relies on civilian carriers as part of the strategic projection support forces to support its operations.

Enterprises committing carriers to these forces are organized into three tiers (from largest to smallest): the *zongdui* (总队), *dadui* (大队), and *zhongdui* (中队).²² However, the exact composition and scale of these units at each tier is unclear. The following is an examination of China's strategic projection support forces, with a focus on recent efforts to improve their ability to support PLA power projection operations.

Strategic Sea Lift

The PLAN has taken steps to modernize its strategic projection capabilities through construction of large amphibious platforms, fleet replenishment ships, and other fleet support vessels. Since 2008, the PLAN has received five Type-071 LPD and is building at least three more.²³ The PLAN's first Type-075 landing dock helicopter (LHD) launched in September 2019, inaugurating a new class of ships expected to significantly enhance the PLAN's ability to conduct long-range power projection operations.²⁴ Additionally, new fleet replenishment ships are under construction to sustain oceanic operations. The PLAN's newest and largest Type-901 comprehensive replenishment ships displace

¹⁹ Transport and projection departments have been established in both the JLSF and Theater Commands, but their working relationship is unclear. The JLSF comprise the central Wuhan Base and subordinate centers in each of the Theater Commands. The former military transportation departments in the services have also been renamed similarly. 盈世勇, 刘仁亮, 孙著 [Ying Shiyong, Liu Renliang, Sun Zhu], 改革开放 40 年我军后勤改革的成就与启示 [“Achievements and Implications of PLA Logistics Reform in the Past 40 Years of Reform and Opening Up”], 中国军事科学 [China Military Science], no. 6 (2018), p. 56; 张方, 李剑肆, 何建涛 [Zhang Fang, Li Jiansi, He Jiantao], 加强空中战略投送地面保障体系建设的思考 [“Thoughts on Accelerating Ground Security System Construction for Air Strategic Projection”], 军事交通学院学报 [Journal of Military Transportation University], no. 4 (2017), p. 3.

²⁰ 张健, 赵世宜 [Zhang Jian, Zhao Shiyi], 战略投送力量运用基本问题研究 [“Basic Issues on Employing Strategic Projection Force”], 军事交通学院学报 [Journal of Military Transportation University], no. 10 (2016), pp. 1-4.

²¹ Shou Xiaosong, *The Science of Military Strategy*, p. 260.

²² 何国本, 邹伟, 鲍文华, 陈龙 [He Guoben, Zou Wei, Bao Wenhua, Chen Long], 战略投送支援船队训练现状及对策 [“Current Situation and Countermeasures of Strategic Projection Support Fleet Training”], 军事交通学院学报 [Journal of Military Transportation University], no. 5 (May 2017), p. 2; Chen Xiangpeng, “Consideration on Strengthening Construction of Strategic Delivery Support Fleet in New Period,” p. 11.

²³ China's first Type-071 LPD joined the South Sea Fleet in January 2008. 夏超波 [Xia Chaobo], 昆仑山舰—“两栖先锋”向深蓝 [“‘Amphibious Vanguard’ Kunlunshan to the Deep Blue”], 人民海军 [People's Navy], May 28, 2013, p. 4; Annual Report to Congress—Military and Security Developments Involving the People's Republic of China 2019, Office of the Secretary of Defense, p. 37, https://media.defense.gov/2019/May/02/2002127082/-1/-1/1/2019_CHINA_MILITARY_POWER_REPORT.pdf

²⁴ Xavier Vavasseur, “China Launches 1st Type 075 LHD for PLAN,” *Naval News*, September 25, 2019, www.navalnews.com/naval-news/2019/09/china-launches-1st-type-075-lhd-for-plan/; Minnie Chan, “China Building Navy's Biggest Amphibious Assault Vessel, Sources Say,” *South China Morning Post*, March 29, 2017, www.scmp.com/news/china/diplomacy-defence/article/2083109/china-building-navys-biggest-amphibious-assault-vessel.

twice as much as the Type-903 *Fuchi*-class oilers and are designed to sustain future PLAN aircraft carrier formations and other fleet operations further abroad.²⁵

Despite these advancements, the PLAN's organic lift capacity would likely prove inadequate in a number of scenarios. It is often recognized, for instance, that the PLAN lacks the amphibious lift required for an assault on Taiwan.²⁶ Therefore, the PLAN would likely rely heavily on supporting fleets of civilian vessels to support power projection operations.

To this end, in late 2012 the PLA began to create “strategic projection support ship fleets” (战略投送支援船队), starting with vessels owned by China Shipping Group (中国海运集团).²⁷ Built out of large Chinese marine enterprises, these fleets generally include RO-RO ships, container vessels, bulk carriers, tankers, auxiliary crane ships, barges, and semi-submersible ships.²⁸ These vessels have been organized into numerous “transport *dadui*” (海运大队) for unit, fuel, and material transport.²⁹ According to PLA experts, these fleets “are responsible for force projection and logistics support in diversified military missions such as maritime combat operations, securing national maritime rights and interests, and the security of strategic passages.”³⁰

What follows is a detailed look at each of the different types of ships comprising the strategic projection support ship fleets.

RO-RO Ships

Large capacity RO-RO ships are ideal for rapidly transporting motorized and mechanized PLA units. PLA experts note that there are currently 63 civilian RO-RO ships suitable for use by military units, totaling 140,000 tons in capacity.³¹ Many of the companies operating RO-RO ships have been organized into transport units and are actively cooperating with the PLA. Many of their ships are capable of long-distance oceanic transport.

²⁵ 中国海军最大补给舰二号舰将入役 航母与其编队将获最强战力 [“The Second of Chinese Navy's Largest Replenishment Ship to Enter Service—The Strongest Combat Power for Aircraft Carriers and their Formations”], 央视网 [CCTV], February 21, 2019, <http://military.cctv.com/2019/02/21/ARTIHtUyglSboSRcx8acPPOn190221.shtml>; Viola Zhou, Sara Zheng, “China Commissions New Naval Supply Ship,” *South China Morning Post*, August 1, 2017, www.scmp.com/news/china/diplomacy-defence/article/2105010/china-commissions-new-naval-supply-ship

²⁶ Kristin Huang, “Experts Doubt China's Ability to Launch Assault on Taiwan,” *South China Morning Post*, May 12, 2019, www.scmp.com/news/china/military/article/3009780/experts-doubt-chinas-ability-launch-assault-taiwan; Ben Werner, “Report: China Can't Execute Major Amphibious Operations, Direct Assault on Taiwan,” *US Naval Institute News*, May 3, 2019, <https://news.usni.org/2019/05/03/report-china-cant-execute-major-amphibious-operations-direct-assault-on-taiwan>.

²⁷ 曹吴戈, 叶皓龙 [Cao Wuge, Ye Haolong], 民船参军 – 中国版远征船坞登陆舰浮出水面 [“Merchant Ships Join the Military—Chinese Version of Expeditionary Landing Ship Dock Emerges”], 广东交通 [Transportation of Guangdong], no. 4 (2017), p. 17.

²⁸ 刘刚, 虞鹏程 [Liu Gang, Yu Pengcheng], 关于组建快速动员海运力量的思考 [“Our Reflection on the Quick Organization of Military Sealift Reserve Forces”], 国防交通工程与技术 [Traffic Engineering and Technology for National Defence], no 3 (2014), p. 3.

²⁹ “Strategic Projection Support Ship Fleet Joins Joint Training.”

³⁰ He Guoben, “Current Situation and Countermeasures of Strategic Projection Support Fleet Training,” p. 1.

³¹ 李鹏, 孙浩, 赵喜庆 [Li Peng, Sun Hao, Zhao Xiqing], 国家战略投送能力发展对合成部队建设的影响与对策 [“Impact of National Strategic Delivery Capability Development on Construction of Synthetic Forces and Countermeasures”], 军事交通学院学报 [Journal of Military Transportation University], no. 8 (2019), p. 3.

The Bohai Ferry Group (渤海轮渡股份有限公司) operates 11 RO-RO ferries in the Bohai Gulf, running quick routes from Yantai, Shandong province to Dalian, Liaoning province.³² Its ferries have been organized into the “Eighth Transport *Dadui*” (海运八大队) of the strategic projection support ship fleet.³³ The company’s smaller ferries displace around 20,000 tons and have capacity for 200 large and small vehicles and 1280 passengers with a minimal vertical clearance of 14 feet on the lower decks and 13 feet on the upper deck.³⁴ The company also operates larger 35,000-ton ferries that can carry over 300 large and small vehicles and 2038 passengers. These can accommodate oversized special vehicles up to 120-tons and 26 feet wide with a vertical clearance of nearly 16 feet.³⁵

In spatial terms, these vessels could easily load the PLA’s Type-96 and Type-99 main battle tanks or infantry fighting vehicles such as the ZBL-09.³⁶ However, according to a senior engineer at the former General Logistics Department, ships involved in the transport of forces require the installation of strengthened ramps and local deck structures.³⁷ The strength of deck structures is a primary concern for RO-RO vessels embarking heavy military equipment. In principle, the heaviest equipment should be stowed in the bottom decks of these ships with lighter vehicles secured on upper decks. Loading procedures should secure equipment uniformly along vehicle lanes.³⁸

RO-RO ships inducted into the strategic projection support ship fleets indicate they already satisfy requirements for transporting PLA units. Recently-built ships designed with PLA oversight are more likely to meet requirements. When delivered in 2012, the *Bohai Cuizhu* (渤海翠珠号) was celebrated for implementing national defense requirements. The Jinan Military Region Military Transportation Department participated in its design. The *Bohai Cuizhu* is capable of delivering the heavy equipment and personnel of PLA units. It also features a helicopter pad, medical bay areas, and rapid

³² 渤海轮渡集团公司简介 [“Bohai Ferry Group Company Introduction”], Bohai Ferry Group Website, www.bohailundu.cn/info/?id=1, (Accessed August 20, 2019).

³³ 李远星, 王丙 [Li Yuanxing, Wang Bing], 新时代战略投送支援力量建设运用研究 [“Research on Construction and Use of Strategic Projection Support Forces in the New Era”], 国防 [National Defense], no. 12 (2017), pp. 20-23.

³⁴ 渤海金珠 [“Bohai Jinzhu”], Bohai Ferry Group Website, www.bohailundu.cn/ship/?type=list&classid=7, (Accessed 20 August 2019).

³⁵ “渤海钻珠” [Bohai Zuanzhu], Bohai Ferry Group Website, <http://www.bohailundu.cn/ship/?type=list&classid=20>, (Accessed August 20, 2019).

³⁶ 中国 96 式主战坦克 [“Chinese Type-96 Main Battle Tank”], 环球展望 [Global Outlook], January 8, 2006, <https://web.archive.org/web/20090107115346/http://www.armsky.com/yuanchuangzhuangao/seechina/ChinaArmy/200601/3253.html>; “Type 99A 99A2 ZTZ-99A MBT—Main Battle Tank China,” Army Recognition, December 23, 2018, www.armyrecognition.com/china_chinese_heavy_armoured_vehicle_tank_uk/type_99a_99_a2_ztz-99a_main_battle_tank_china_11408171.html; 中国 ZBL-09 系列装甲车: 火力凶猛 借鉴西方设计 [“China ZBL-09 Series of Armored Vehicles: Fierce Firepower—Design Borrowed from the West”], 新华网-参考消息 [Xinhua – Reference News], December 17, 2014, https://military.china.com/important/11132797/20141217/19117000_all.html.

³⁷ 王和文 [Wang Hewen], 新形势下推动民船贯彻国防要求体系发展的思考 [“Thoughts on Promoting Development of Civilian Ship Carrying Out National Defense Requirements Under New Situation”], 军事交通学院学报 [Journal of Military Transportation], no. 11 (2015), p. 23.

³⁸ According to the PLA’s 2005 National Military Standard “Loading Standards for Armaments Maritime Transport in Main Ship Types” (GJB 5312-2004), lighter car decks generally can support average loads of 0.2–0.3 tons per square meter and heavy vehicle decks can support average loads of 2-3 tons per square meter. Loading plans must be carefully created to ensure ships remain seaworthy while also attempting to streamline debarkation procedures. See: 吴晓东, 苏鹏 [Wu Xiaodong, Su Peng], 部队海上投送滚装船配积载模型与算法 [“Stowage Model and Algorithm of RO-RO Ships for Sea Projection”], 军事交通学院学报 [Journal of Military Transportation University], no. 4 (2016), p. 14; 陈益平 [Chen Yiping], 军用车辆船舶滚装运输有关问题研究 [“Research into the RO-RO Transportation of Military Vehicles”], 国防交通工程与技术 [Traffic Engineering and Technology for National Defense], no. 5 (2018), pp. 4-7.

fastening systems. Prior to the *Bohai Cuizhu*'s maiden voyage, senior military officials observed an embarkation exercise with dozens of armored vehicles, artillery pieces, and transport trucks. The then head of the General Logistics Department Military Transportation Department declared the ship's delivery a major advancement for the PLA's strategic projection capabilities.³⁹

In southern China, vessels owned by the Hainan Strait Shipping Co. Ltd. (海南海峡航运股份有限公司) run routes between ports in Guangdong and Guangxi to Hainan province. Its ferries have joined the "Ninth Transport *Dadui*."⁴⁰ While most of its RO-RO passenger ships are smaller in size, the company's fleet displaces 165,633-tons and can carry 32,571 tons and 15,488 passengers in total.⁴¹ The company also received an "Advance Unit" award during the National Transportation Industry Transportation War Readiness Work Conference held by the PLA in 2011.⁴²

Some Chinese RO-RO car carrier ships typically laden with Toyota, Geely, and other automotives are also integrated into the strategic projection support ship fleets. CSC RORO Logistics Co., LTD. (深圳长航滚装物流有限公司)—a subsidiary of China Merchants Group specializing in RO-RO vehicle shipping and logistics—is based out of Shenzhen and contains the "Fifth Transport *Dadui*."⁴³ It operates a fleet of 25 car carriers and large transshipment depots around the country.⁴⁴ Actively working with the PLA, this unit conducted eight transport missions in 2016. In March 2017, it conducted an "emergency maritime projection" exercise involving one of its ships, the *Changdalong*, a 20,000-ton car carrier built to national defense specifications. During the exercise, military containers with deployable field kitchens, toilets, and showers were emplaced on the top deck to improve habitability at sea. Military transportation departments regard this unit as a model example of implementing national defense standards in RO-RO ships.⁴⁵

³⁹ 李响 [Li Xiang], 军民融合领域的一次成功实践 – ‘渤海翠珠’ 滚装船提升我军海上战略投送能力纪实 [“Record of a Success Practice in Civil-Military Fusion—The RO-RO Ship ‘Bohai Cuizhu’ Enhances Our Military’s Maritime Strategic Projection Capabilities”], 国防科技工业 [Defence Science & Technology Industry], no. 1 (2012), p. 53.

⁴⁰ Li Yuanxing, “Research on Construction and Use of Strategic Projection Support Forces in the New Era,” pp. 20-23.

⁴¹ “公司简介” [Company Introduction], 海南海峡航运股份有限公司 [Hainan Strait Shipping Co. Ltd.], <http://www.hnss.net.cn/About.aspx?id=1> (Accessed 19 August 2019).

⁴² 全国交通运输行业交通战备工作会议在郑州召开 [“National Transportation Industry Transportation War Readiness Work Conference Held in Zhengzhou”], 海南省交通战备办公室 [Hainan Province Transportation War Readiness Office], July 5, 2011, <http://jtt.hinews.cn/system/2011/07/05/012877323.shtml>.

⁴³ 红色研学弘扬长征精神 重温历史增强国防意识 [“Red Research Promotes the Spirit of the Long March – Reviewing History to Strengthen National Defense Awareness”], 深圳长航滚装物流有限公司 [CSC RORO Logistics Co., LTD.], http://roro.sinotrans-csc.com/art/2017/4/10/art_434_246267.html, (Accessed 27 August 2019).

⁴⁴ 公司概况 [“Company Overview”], CSC RORO Logistics Co., LTD., <http://roro.sinotrans-csc.com/col/col414/index.html>, (Accessed 27 August 2019).

⁴⁵ 鲁文帝, 熊伟, 苏鹏飞 [Lu Wendi, Xiong Wei, Su Pengfei], 远程国防运输有了新帮手 [“Long-range National Defense Transportation Has a New Helper”], 中国军网 [China Military Online], March 28, 2017, www.81.cn/gfbmap/content/2017-03/28/content_173420.htm.



Image 1: A graphic depiction of the Changdalong in the February 2019 issue of Naval & Merchant Ships magazine.



Image 2: A model of the Changdalong displayed at a 2017 exhibition in Beijing on the military's achievements. Sources indicate it can transport two mechanized infantry battalions and has spaces and facilities for command and living quarters to support long-distance transport to the far seas. Tanks and various military vehicles are depicted on its decks and containers to supplement living conditions for troops on board are shown on the top deck.⁴⁶

⁴⁶ 砥砺奋进的五年 – 大型成就展 海军多种装备为争夺制海权打下基础 [“Five Years of Endurance – Exhibition of Grand Achievement, Various Types of Naval Equipment Lay a Foundation to Compete for Sea Power”], 中国网

These fleets are not tied down to any single Theater Command. Strategic projection support ship fleets based in different parts of China—i.e., different “strategic directions”—can be mutually supporting. For example, the Bohai Ferry Group’s Eighth Transport *Dadui* could mobilize to support operations in the South China Sea, or the Hainan Strait Shipping Co. Ltd.’s Ninth Transport *Dadui* could dispatch its ferries to support operations in the Bohai area.⁴⁷

With access to a port facility, the RO-RO ships of these strategic projection transport *dadui* could rapidly disgorge large volumes of PLA motorized and mechanized ground forces. However, RO-RO ships are not just useful for ground combat maneuver units. The ships of the strategic projection support fleets are common user platforms available to the PLA joint forces. During the summer of 2015, a 20,000-ton RO-RO vessel was used to transport the personnel and equipment of several PLAAF units in a “civil-military fusion trans-sea projection mission.” The PLAAF’s military transportation department, military representatives for navigational affairs, and company representatives carefully planned and gamed the exercise ahead of time, ensuring the successful execution of many detailed procedures such as securing equipment, data collection, vessel preparation, and transfer from motorized transport to vessel embarkation. This transport mission sought to establish new modes for transporting PLAAF units, which transited over 1,000 nautical miles from the Bohai Gulf to the South China Sea, disembarking at an unknown port in southern China.⁴⁸

The PLAAF conducted a similar exercise in November 2017, using a 15,000-ton RO-RO vessel to transport aviation, ground-to-air missile, radar, and electronic countermeasures forces from the South China Sea to the Bohai Gulf. It repeated the exercise in 2019. Such exercises reportedly ensure power projection through the transport of entire combat systems rather than just personnel and their equipment. Chinese experts also claim these exercises aid in transforming power projection operations from coastal and offshore areas into the far seas.⁴⁹ The movement of whole PLAAF units could be required for future missions far from the mainland, such as operations out of major airfields constructed on artificial islands in the South China Sea or to future overseas airbases. Since 2016, the PLAAF has conducted training on distant islands and reefs by moving its units on such RO-RO ships. PLAAF logistics experts have specifically mentioned the increasing requirement to be capable of moving its units to Chinese-built “battlefield facilities” in the Spratlys via maritime transport.⁵⁰

[China.org], October 19, 2017, http://mil.qianlong.com/2017/1019/2107258_8.shtml; “长达隆”号客滚船想象图 [“Concept Graphic of the ‘Changdalong’ RO-RO Ship”], 舰船知识 [Naval & Merchant Ships], no. 3, (2018).

⁴⁷ Li Yuanxing, “Research on Construction and Use of Strategic Projection Support Forces in the New Era,” pp. 20-23.

⁴⁸ 李开强, 吴俊伟 [Li Kaiqiang, Wu Junwei], 空军探索验证航空兵部队海上远程输送模式—军民融合, 跨海区投送快速高效 [“Air Force Explores and Validates Modes in Long-range Maritime Transport of Aviation Units—Civil-Military Fusion, Rapid and Efficient Trans-Sea Projection”], 解放军报 [PLA Daily], July 8, 2015, http://jz.chinamil.com.cn/n2014/tp/content_6575675.htm.

⁴⁹ 袁源, 熊华明 [Yuan Yuan, Xiong Huaming], 跨海投送运为战 [“Projection Across the Sea, Transporting for War”], 国防 [National Defense], no. 6 (2019), p. 40; 陈龙, 熊华明 [Chen Long, Xiong Huaming], 空军动员民用船舶保障部队跨海归建 [“Air Force Mobilizes Merchant Ships to Support Units Returning Across the Sea”], 中国军网 [China Military Online], November 30, 2017, www.81.cn/gfbmap/content/2017-11/30/content_193160.htm.

⁵⁰ 刘永华, 张家应, 孙启峰 [Liu Yonghua, Zhang Jiaying, Sun Qifeng], 空军部队南海岛礁驻训水路投送问题研究 [“Maritime Projection for PLA Air Force Troops of Training in South China Sea Islands and Reefs”], 军事交通学院学报 [Journal of Military Transportation University], no. 7 (July 2019), pp. 10-13.



Image 3: PLAAF units load onto a RO-RO vessel of the strategic projection support ship fleet.⁵¹

These ships are also used to deliver ammunition to military units. Under direction of the Northern Theater Command, vehicles loaded with troops and various types of ammunition embarked aboard one of COSCO Shipping Group's RO-RO ships in September 2016 for transport to an island firing range. This was reportedly the first time the Northern Theater Command used civilian ships to transport ammunition.⁵²

Container Ships

While RO-RO ships are ideal for transporting unit equipment, container ships can more efficiently move the PLA's cargo.⁵³ Containerized shipping brings advantages in speed and regularity that is often lacking in other forms of shipping.⁵⁴ Shipping juggernaut China COSCO Shipping Corporation Limited alone operates 497 container ships that can move over three million twenty-foot equivalent units, making it the third largest container carrier in the world.⁵⁵ It stands to reason that the PLA would leverage China's vast fleet of large container shipping.

There are numerous considerations in the PLA's use of containers, such as types of containers, suitability of equipment to fit in containers, loading practices, and the ability of units to receive equipment through containerized transport. For example, semi-knockdown loading, where equipment is partially disassembled for loading into containers, can improve efficiency. However, deployed

⁵¹ Yuan Yuan, "Projection Across the Sea, Transporting for War," p. 40.

⁵² 民船首次运送实兵实弹直达演兵场 ["First Time Delivering Troops and Ammunition on Merchant Ship Directly to Exercise Site"], 解放军报 [PLA Daily], September 27, 2016, <http://military.people.com.cn/n1/2016/0927/c1011-28743017.html>.

⁵³ 刘宝新, 王海威, 袁沐 [Liu Baoxin, Wang Haiwei, Yuan Mu], 军事装备水路集装箱运输模式探讨 ["A Study on Transportation Modes of Military Equipment Waterway Container Transport"], 物流技术与应用 [Logistics & Material Handling], no. 8 (2019), p. 141.

⁵⁴ PLA experts observe that 90 percent of materials, including wheeled and tracked equipment, used by the United States Military is moved through containerized transport. 刘宝新, 苏春华 [Liu Baoxin, Su Chunhua], 大力推进军事装备水路集装箱运输 ["Vigorously Promote Maritime Container Transport of Military Equipment"], 集装箱化 [Containerization], no. 1 (2018), pp. 9-10.

⁵⁵ The company also has significant infrastructure operations worldwide to handle container shipping. 集团概况 ["Group Overview"], 中国远洋海运集团有限公司 [China COSCO Shipping Corporation Limited], www.coscoshipping.com/col/col6858/index.html, (Accessed October 6, 2019).

units lacking home-based technical capabilities may burn significant time attempting to restore equipment to operating status if reassembly is difficult.⁵⁶ This is particularly critical for moving large and heavy military equipment via containerized transport. China's container shipping companies have significant experience in semi-knockdown loading and the use of specialized containers.⁵⁷

Additionally, PLA experts also advocate for working with civilian industry to develop container technology for use by the military. Delivery of such specialized containers strengthened and modified for oversized and heavy military equipment will not likely be an issue, as China International Marine Container Group has long been the world's largest manufacturer of shipping containers.⁵⁸ The PLA is also working on information systems that enable tracking of containers and their contents to ensure required materials are delivered where they are needed. As PLA experts have observed, problems with container tracking impacted US operations during the 1991 Gulf War.⁵⁹

The PLA is actively developing its ability to use civilian container ships. Companies like Shanghai Changjiang Shipping Co., Ltd. (上海长江轮船有限公司), owned by logistics giant Sinotrans & CSC, are now providing containerized shipping services as part of the strategic projection support ship fleet. In November 2018, this company participated in exercises under the direction of the Eastern Theater Command's Transport and Projection Bureau's Dispatch Center.⁶⁰

The PLAN's Naval Research Institute has developed container ship modifications enabling alongside dry cargo replenishment, testing a modular electrically-powered tensioner system installed on the foredeck of another Sinotrans & CSC container vessel in November 2019. During at sea tests, the container ship *Fuzhou* transferred containers to the Type 054A frigate *Linyi* and the Type 903 replenishment ship *Dongpinghu*. A first for the PLAN, this test could represent a new path for maritime prepositioning support.⁶¹

⁵⁶ Liu Baoxin, "A Study on Transportation Modes of Military Equipment Waterway Container Transport," pp. 141-143.

⁵⁷ From January to October 2015, China exported 1,125,044 pieces of construction machinery, many of which were broken down for shipment in containers. Liu Baoxin, "Vigorously Promote Maritime Container Transport of Military Equipment," p. 10.

⁵⁸ "Introduction of CIMC Group," China International Marine Containers (Group) Ltd., May 2018, www.cimc-im.com/data-pdf/cimc_intermodal_english.pdf; Liu Baoxin, "Vigorously Promote Maritime Container Transport of Military Equipment," p. 11.

⁵⁹ At one point, replenishment efficiencies dropped due to problems tracking the content of significant numbers of containers. Liu Baoxin, "Vigorously Promote Maritime Container Transport of Military Equipment," p. 12.

⁶⁰ 上海长江轮船有限公司战略海运大队专项军事训练突出实战 ["Shanghai Changjiang Shipping Co., Ltd.'s Strategic Maritime Transport Dadei Specialized Military Training Focuses on Realism"], 环球物流报 [Global Logistics News], November 30, 2018, http://cjhyb.sinotrans-csc.com/art/2018/11/30/art_5096_278839.html.

⁶¹ 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"], 海军新闻 [PLAN Official Wechat Account], November 15, 2019, www.guancha.cn/politics/2019_11_15_525320.shtml.



Image 4: Sinotrans & CSC container vessel Fuzhou conducts dry cargo alongside replenishment tests with the Linyi in November 2019.

Tanker Vessels

The limited number of PLAN fleet support ships capable of efficient underway replenishment would likely be working at maximum capacity during any large-scale PLA projection of power at sea. Petroleum, oil, and lubricant (POL) provisioning by strategic projection support ship fleets will prove essential to meet the PLAN's bunkering requirements when fleet support ships become unavailable.

Civilian tanker vessels are being built and organized for longer-range power projection support and are being integrated into the strategic projection support ship fleets. After signing agreements with the local Transportation War Readiness Office and the Ningbo port's Military Representative Office for Navigational Affairs in 2014, the Ningbo East Sea Shipping Co., Ltd. (宁波东海海运有限公司) began constructing tanker ships that implemented national defense standards. After the delivery of the *East Sea-221*, an 11,000-ton tanker, in August 2015, the company established a "Transport *Dadui*" (海运大队).⁶²

Some reports on one of the new tankers built to national defense standards indicate faster speeds, military communications capabilities, the ability to conduct astern fueling for naval ships and special coatings allowing tankers to transport diesel and aviation fuels.⁶³ These improvements come at a cost. As the chairman of the Zhejiang Ruiyuan Shipping Company (浙江瑞远海运有限公司)—which operates tankers as part of the strategic projection support ship fleet—explained in 2015, these

⁶² 娄先锋, 姚建新, 赵继承 [Lou Xianfeng, Yao Jianxin, Zhao Jicheng], 军运登上民船, 企业有啥想法 ["What Companies Think about Military Transportation Aboard Merchant Ships"], 中国军网 [China Military Online], April 14, 2016, www.81.cn/gfbmap/content/2016-04/14/content_141503.htm

⁶³ 周小舟, 候瑞 [Zhou Xiaozhou, Hou Rui], 东海舰队深化军民融合开辟海上油料补给新通道 ["East Sea Fleet Deepens Civil-Military Fusion and Opens Up a New Channel for Refueling at Sea"], 解放军报 [PLA Daily], November 19, 2014, www.81.cn/hj/2014-11/19/content_6230767.htm.

standards increased the cost of construction by 10-15 percent and extended maintenance periods.⁶⁴ One of the company's tankers, the *Ruiyuan-5*, conducted refueling training for PLAN ships in September 2016.⁶⁵

Some tankers are capable of both astern and alongside underway replenishment. This capability was demonstrated in October 2014 when a China Shipping Group (中国海运集团) tanker *Huachuan* refueled the East Sea Fleet's *Putian* guided missile frigate (523) in the East China Sea.⁶⁶ The exercise was hailed as a major breakthrough in the use of strategic projection support forces for replenishment at sea.



Image 5: China Shipping Group tanker *Huachuan* refuels the *Putian* in the East China Sea on 25 October 2014.

Semi-submersible Ships

The PLA is currently developing sea-based logistics capabilities for use in scenarios when it lacks access to piers, such as during amphibious operations. Additionally, the PLA requires sea-based logistics capabilities to compensate for its lack of overseas bases and inability to conduct loading and transfer operations without pier access.⁶⁷ According to the *PLA Daily*, future amphibious operations

⁶⁴ “中国新油船多方面达到军事要求 吸取南海维权教训” [China's New Oil Tanker Meets Military Requirements in Many Ways and Adopts Lessons from Maritime Rights Protection in the South China Sea], 中国社会科学网 [China Social Sciences Network], 9 July 2015, <https://item.btime.com/057rngooono6739t4mfc2nmpfqd>.

⁶⁵ 揭秘中央军委联勤保障部队: 绷紧战备弦 [“Revealing the Central Military Commission's Joint Logistics Support Force: Tightening Up Combat Readiness”], 中国青年报 [China Youth Daily], January 19, 2017, http://mil.gmw.cn/2017-01/19/content_23510595.htm.

⁶⁶ The tanker *Huachuan* was inducted into the strategic projection support ship fleet after its delivery in 2013. China Shipping Group has since merged with China Ocean Shipping (COSCO). “Five Years of Endurance – Exhibition of Grand Achievement, Various Types of Naval Equipment Lay a Foundation to Compete for Sea Power,” October 19, 2017”; 民船首次对军舰实施海上输油补给 [“First Time Merchant Ships Conduct Refueling of Warships at Sea”], 环球网 [Global Times], October 31, 2014, <http://china.huanqiu.com/photo/2014-10/2751037.html>.

⁶⁷ 刘刚 [Liu Gang], 我国半潜式运输船动员需求及能力展望 [“On the Needs for the Mobilization of Civilian Semi-Submersible Vessels in China and the Prospects of their Potentialities”], 国防交通工程与技术 [Traffic Engineering and Technology for National Defence], no. 3 (2015), p. 2; Liu Gang, Yu Pengcheng, [“Our Reflection on the Quick Organization of Military Sealift Reserve Forces,” p. 1.

will regard the ocean as a basic maneuvering area for landing operations and will establish “floating bases at sea” that integrate command and control, logistics, and fire support.⁶⁸

Acting as mobile seabases, semi-submersible ships enable the transfer of forces and equipment between platforms or to connectors at offshore assembly areas. These highly versatile ships can serve numerous supporting functions across the range of military operations requiring lift and working platforms at sea for the PLA. For example, PLA reports highlight their value protecting overseas interests through enhanced logistics capacity and speed to deliver heavy equipment and combat materials to front-line units.⁶⁹

The PLAN received its first and currently its only semi-submersible ship the *Donghaidao* in July 2015.⁷⁰ It was used to transport equipment and materials to China’s first overseas base in Djibouti in August 2017.⁷¹ The PLA is also developing the capability to use civilian semi-submersible ships in ways akin to US Navy expeditionary transfer docks.⁷²

China’s first large self-propelled semi-submersible was the *Tai’an Kou*, launched by Guangzhou Shipyard International Company Ltd. in 2001 for COSCO Shipping.⁷³ More advanced semi-submersible ships displacing greater tonnages have been built in subsequent years. Most are operated by Chinese companies.

China’s presence in this market is substantial. Of the 34 large, open-deck semi-submersible ships built within the last 25 years, 27 are operated by Chinese companies.⁷⁴ COSCO Shipping Specialized Carriers Co. Ltd. operates eight vessels. Launched in 2016, the largest is capable of carrying 98,000 metric tons.⁷⁵

⁶⁸ 史益星 吴志丹 [Shi Yixing, Wu Zhidan], 两栖作战, 战争舞台的“长青树” [“Amphibious Operations, an ‘Evergreen Tree’ on the Stage of Warfare”], 解放军报 [PLA Daily], October 2, 2018, www.81.cn/jmywyl/2018-10/02/content_9302793.htm.

⁶⁹ 闫宇辉, 秦宝军, 周自涛 [Yan Yuhui, Qin Baojun, Zhou Zitao], 国产半潜船的军用价值: 兵力运输和船坞 [“The Military Value of Domestically-produced Semi-submersible Ships: Force Transport and Docks”], 中国国防报 [China Defense News], June 3, 2015, www.81.cn/bqtd/2015-06/03/content_6520968.htm.

⁷⁰ 柳博, 高毅 [Liu Bo, Gao Yi], 海军首艘半潜船加入战斗序列 [“Navy’s First Semi-submersible Ship Joins the Order of Battle”], 人民海军 [People’s Navy], July 13, 2015, p. 2.

⁷¹ 李强 [Li Qiang], 海军首批停靠吉布提基地的舰艇为啥是这两艘? [“Why Are These Two Ships the First Two Naval Vessels to Dock at the Djibouti Base?”], 环球时报 [Global Times], July 12, 2017, <https://mil.huanqiu.com/article/9CaKrnK42Ek>.

⁷² Yan Yuhui, “The Military Value of Domestically-produced Semi-submersible Ships: Force Transport and Docks”; “Expeditionary Transfer Dock (ESD)/Expeditionary Sea Base (ESB),” United States Navy Fact File, 28 January 2019, www.navy.mil/navydata/fact_display.asp?cid=4600&tid=675&ct=4.

⁷³ 详解世界半潜船“全能冠军”——“泰安口”号 [“Detailing the World’s Semi-submersible Ships ‘All-round Champions’—The ‘Tai’ankou’”], 中国船舶网 [CNshipnet.com], November 15, 2013, www.cnship.org/new_view.asp?id=18853; The *Tai’an Kou* was built using foreign designs. China’s first domestically-designed large semi-submersible ship was the *Xiwang Zhilu* (希望之路), launched in December 2009. Yan Yuhui, “The Military Value of Domestically-produced Semi-submersible Ships: Force Transport and Docks.”

⁷⁴ 陈矗立 [Chen Chuli], 基于‘波特五力’模型的半潜船运输市场战略分析 [“Strategic Analysis of the Semi-submersible Transport Market Based on the ‘Porter’s Five Forces’ Model”], 世界海运 [World Shipping], no. 8 (2019), pp. 12-13.

⁷⁵ 杨洪所, 张群, 胡双 [Yang Hongso, Zhang Qun, Hu Shuang], 全球半潜船运输行业竞争格局与前景 [“Competition and Prospects of the Global Semi-Submersible Vessel Transport Industry”], 设备管理与维修 [Plant Maintenance Engineering], no 12 (2018), p. 116; 我国最大半潜船‘新光华’轮投入运营 [“China’s Largest Semi-submersible Ship

Another company, Shanghai Zhenhua Heavy Industries Company Ltd., has seven vessels with lift capacity ranging from over 30,000 to 50,000 tons.⁷⁶ Its latest semi-submersible ship, the *Zhenhua-33*, is China's first "civil-military dual-use semi-submersible ship." Launched from Nantong City in June 2016 and fully implementing national defense standards, it is meant to serve "intermediate support functions" (海上中继保障功能) for the PLA. Intermediate support functions, according to one expert, will require helicopter support systems on-board, such as munitions storage compartments, and connections and hoses for fueling containers. With these capabilities installed aboard the *Zhenhua-33*, helicopters can have additional re-arming and fueling platforms at sea.⁷⁷ Overseen by the Wuxi Joint Logistics Support Center, this ship can also provide berthing for transfer operations and emergency ship repair and retrieval.⁷⁸ PLA experts state that vessels like the *Zhenhua-33* can "multiply the ability of the PLA Navy Marine Corps to deploy across the seas."⁷⁹

Chinese semi-submersible ships have taken part in numerous logistics support exercises, serving as transfer platforms between the PLA's landing ships and civilian cargo vessels. Additionally, they can deliver mobile loading equipment, floating barges, and landing stages needed to build mobile ports at sea, thereby creating "sea to shore mobile comprehensive debarking systems" (海岸机动综合卸载系统). The Wuxi Joint Logistics Support Center is adding semi-submersible vessels to the strategic projection support ship fleets to support power projection and amphibious operations.⁸⁰

'Xin Guanhua' Begins Operations", 中国海洋报 [*China Ocean News*], December 9, 2016, www.oceanol.com/keji/kjdt/2016-12-09/65182.html.

⁷⁶ Yang Hongsuo, "Competition and Prospects of the Global Semi-Submersible Vessel Transport Industry," p. 116.

⁷⁷ Wang Hewen, "Thoughts on Promoting Development of Civilian Ship Carrying Out National Defense Requirements Under New Situation," p. 24.

⁷⁸ The Wuxi Joint Logistics Support Center is located in the Eastern Theater Command. 中国首艘军民两用半潜船在南通启动建成投入使用 ["China's First Civil-Military Fusion Semi-submersible Ship Completed and Enters Use in Nantong"], 央广网 [CCTV], March 15, 2017, www.ntjoy.com/news/yw/2017/03/2017-03-15554678.html.

⁷⁹ Cao Wuge, "Merchant Ships Join the Military – Chinese Version of Expeditionary Landing Ship Dock Emerges," p. 18.

⁸⁰ 高洁, 赖瑜鸿 [Gao Jie, Lai Yuhong], 又一艘民船“参军”, 中国战损舰船有了专属座驾 ["Another Merchant Ship 'Joins the Military', Chinese Warship Casualties Have an Exclusive Vehicle"], 解放军记者部 [*PLA Press Department*], April 16, 2017, http://news.ifeng.com/a/20170416/50948428_0.shtml.



Image 6: The Zhenhua-33 in Qidong, Nantong City.⁸¹

Strategic Air Lift

Strategic air lift is an increasingly critical component of PLA power projection. In a conflict scenario, strategic air lift can grant the PLA a relative advantage by rapidly concentrating forces in decisive locations to achieve psychological shock, strategic or operational surprise, and destructive effects that can render paralysis in adversaries.⁸² Strategic airlift is also vital for a whole range of non-combat operations.

The PLA currently relies on a limited fleet of Y-20 and IL-76 heavy transport aircraft for its primary strategic air lift carriers, as well as a number of Y-8 and Y-9 medium aircraft for tactical lift.⁸³ The PLA acknowledges the inadequacy of these forces.⁸⁴ The PLA's air rescue effort during the 2008 earthquake disaster in Sichuan, for example, highlighted severe shortcomings in its strategic air lift and ground support.⁸⁵ Due to the urgent demand for such capabilities and the shortage of organic air

⁸¹ Ibid.

⁸² Mi Binbin, "The Source of Superior Combat Effectiveness in Modern Warfare: Powerful Air Strategic Projection Capabilities."

⁸³ The PLAAF is tasked with building strategic air lift to be made available to all PLA services. See: Zhang Fang, "Thoughts on Accelerating Ground Security System Construction for Air Strategic Projection," p. 3; 运-9 到底有多厉害? 这些机型都是由它“变形” ["How Powerful is the Yun-9? These Aircraft Types Have All 'Morphed' from It"], 央视网 [CCTV], November 24, 2018, <http://news.cctv.com/2018/11/24/ARTIPC0zeumXkIhGFoWUTsZS181124.shtml>; Cristina L. Garafola, Timothy R. Heath, "The Chinese Air Force's First Steps Toward Becoming an Expeditionary Air Force," RAND Corporation, 2017, pp. 7-8.

⁸⁴ 张昕, 苑德春, 张超 [Zhang Xin, Yuan Dechun, Zhang Chao], 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 Strategic Projection Support Fleet"], 军事交通学院 [Journal of Military Transportation University], no. 4 (2018), p. 6.

⁸⁵ A number of aircraft were unable to unload and others were sitting on standby at other airports, such as Chengdu Shuangliu International Airport and Taipingshi Airport. See Zhang Fang, "Thoughts on Accelerating Ground Security System Construction for Air Strategic Projection," p. 3; 仁宣 [Ren Xuan], 解放军空运能力严重缺乏无法应对真正的战

lift, civil aviation fleets serve as a necessary and crucial means for filling the gaps and ensuring effective PLA power projection operations.

PLAAF officers involved in this work recognize the importance of the role of civilian carriers in supplementing PLA strategic air lift. As director of the PLAAF Logistics Department Transport and Projection Bureau (局长) Zhang Fang wrote in 2017, “Accelerating the generation of combat power for rapid response, emergency maneuver, all-domain maneuver, and cross-border maneuver of forces and firepower in future wars is increasingly inseparable from aviation strategic projection and the support of its robust ground support system. Military air transport formations and civil aviation reserve forces must be comprehensively used.”⁸⁶ A division director (处长) within the same department further reinforced this point in early 2019, stating “the strategic air projection force system is currently stepping up construction primarily with the military’s air transport forces supplemented by civilian aviation transport forces.”⁸⁷

The potential lift in China’s civilian aviation industry is significant. According to PLA experts, the total registered aircraft in 2017 numbered 3,160 passenger aircraft with over 500,000 seats. Civilian cargo aircraft were far fewer at 143 medium and large aircraft. The vast majority of China’s aviation fleet is comprised of Boeing and Airbus passenger aircraft with domestically-produced aircraft accounting for only 1.6 percent. Civilian cargo aircraft are largely Boeing aircraft. According to Chinese experts, the development and introduction of China’s first domestically-developed passenger aircraft, the C919, will help optimize the industry.⁸⁸

Since the 18th Party Congress, the CMC has ordered expanded roles for civil aviation in preparing aviation transportation and projection for military conflict.⁸⁹ The first “strategic projection air support fleet” (战略投送支援机队) was established in 2013 with China Southern Airlines. Since then, 15 more have been selected and created from large commercial aviation companies, including fleets in Air China and China Eastern Airlines. As civil aviation reserve forces whose employees are unarmed, these fleets primarily conduct missions such as transporting troops, evacuating casualties or

争 [“The People’s Liberation Army Severely Lacks Air Lift Capabilities and Is Incapable of Dealing With Real War”], 航空世界 [Aviation World], July 1, 2008, <http://mil.news.sina.com.cn/p/2008-07-01/1059508099.html>; 于殿祥, 鞠小林 [Yu Dianxiang, Ju Xiaolin], 综合性投送基地建设基本构想 [“Basic Conception of Comprehensive Projection Base Construction”], 军事交通学院学报 [Journal of Military Transportation University], no. 3 (2018), p. 3.

⁸⁶ Zhang Fang, “Thoughts on Accelerating Ground Security System Construction for Air Strategic Projection,” p. 2.

⁸⁷ Chen Yu is identified as a division director within the PLAAF Logistics Department Transportation and Projection Bureau; however, the source does not specify which division. 陈瑜, 李剑肆, 曾宇 [Chen Yu, Li Jiansi, Zeng Yu], 境外空中战略投送能力建设研究 [“Research on Development of Overseas Strategic Airlift Capability”], 军事交通学院学报 [Journal of Military Transportation University], no. 2 (2019), p. 6.

⁸⁸ Authors from the Army Military Transportation University estimate that China will have around 8,000 civilian passenger aircraft and up to 2,617 cargo aircraft by 2035. The introduction of the C919 will presumably reduce reliance on foreign companies for aircraft, such as Boeing and Airbus. 孙振岚, 海军 [Sun Zhenlan, Hai Jun], 我国民航运输业建设现状与未来发展 [“On the Present Situation and the Future Development of the Construction of the Civilian Aviation Transportation in China”], 国防交通工程与技术 [Traffic Engineering and Technology for National Defence], no. 1 (2019), pp. 1-3.

⁸⁹ 孙兴维, 陆斌 [Sun Xingwei, Lu Bin], 全军航空运输投送步入快速发展轨道 [“The Military’s Aviation Transport and Projection Enters a Rapid Development Track”], 中国军网 [China Military Online], August 26, 2017, www.81.cn/jmywyl/2017-08/26/content_7732143.htm.

sick personnel, and rapidly delivering materials and equipment.⁹⁰ Recent efforts have included increasing service to remote areas to satisfy requirements for high-elevation and island transport and projection.⁹¹



Image 7: This released photo shows troops embarking aboard a China Southern Airlines aircraft during a PLAN Marine Corps-wide trans-regional long-range projection training exercise held in March 2018.⁹²

Like their shipping counterparts, the strategic projection support aircraft fleets form “strategic air transport *dadui*” (战略空运大队) and subordinate *zhongdui*. As an example, the Chongqing *Zhongdui* is subordinate to the “Southwest Plateau Emergency Aviation Transport *Dadui*” (西南高原应急航空输送大队). Set up in 2014, the Chongqing *Zhongdui* comprises facilities, aircraft, and ground support resources from several entities, including the company operating Chongqing Jiangbei International Airport, the Chongqing air traffic control branch, and several civilian aviation and aviation support companies.⁹³ The *zhongdui* is divided into eight function-based groups: airport support, air traffic control, aviation fuel support, flight, passenger cabin [support], ground service, aircraft maintenance, and loading/unloading support. This *zhongdui* reportedly has 16 aircraft (Airbus 319 and Boeing 737) that provide service to high-elevation airports.⁹⁴ In the months preceding this *zhongdui*’s establishment, PLA representatives in the Chongqing area were busy

⁹⁰ Sun Zhenlan, “On the Present Situation and the Future Development of the Construction of the Civilian Aviation Transportation in China,” p. 1; Zhang Xin, “Overseas Aviation Strategic Projection Using Strategic Projection Support Fleet,” p. 5.

⁹¹ Sun Xingwei, “The Military’s Aviation Transport and Projection Enters a Rapid Development Track.”

⁹² 梁景锋, 孙宏韬, 陈朝领, 陶佳伟, 曾亮, 韩玉龙, 范旭东 [Liang Jingfeng, Sun Hongtao, Chen Chaoling, Tao Jiawei, Zeng Liang, Han Yulong, Fan Xudong], 全域大练兵 脚下生风云 – 海军陆战队组织多方向大规模跨区域远程兵力投送训练 [“Large-scale Troop Training, the Wind Blows Under the Soldiers’ Feet—The Marine Corps Organizes Multi-directional, Large-scale, Cross-regional and Long-distance Forces Delivery Training”], 当代海军 [Navy Today], no. 3 (2018), pp.12-16.

⁹³ The aviation companies comprising this *dadui* include the Air China Chongqing Branch, the Sichuan Airlines Chongqing Branch, Chongqing Airlines, Western Airlines, and China Aviation Fuel Chongqing Branch. See 谢弋科, 袁杰 [Xie Yike, Yuan Jie], 驻重庆长江航务军代处加强投送力量建设 [“Military Representative Division for Changjiang Navigational Affairs in Chongqing Strengthens Projection Force Construction”], 中国国防报 [China Defense News], December 29, 2014, www.gfdy.gov.cn/transportation/2014-12/29/content_7688331.htm.

⁹⁴ Ibid.

coordinating civilian aviation support for Chinese U.N. Peacekeeping units combating the Ebola outbreak in West Africa. Experience gained from this operation may have provided proof of the benefits of more organized civil aviation support.

China's civilian air cargo carriers support the PLA in other ways. They use mature, established logistics networks, fleets of cargo aircraft, and information systems to monitor and manage cargo flows during the course of their regular operations. The growth of commercial air delivery services stems from significant demand by Chinese consumers and the rise of internet shopping. Cargo delivery companies working with the PLA can offer proven logistic services for the movement and tracking of military materials.

In October 2017, the PLAAF's logistics support department signed strategic cooperation agreements with major logistics companies, including SF Express, China Post Express, Deppon Logistics, and Jingdong Logistics.⁹⁵ Companies like SF Express, a major air courier in China, operates a fleet of 54 cargo freighters largely comprising Boeing aircraft. While signing agreements with SF Express, the head of PLAAF logistics stated that future cooperation will focus on supporting warfighting through new methods of logistics support.⁹⁶ The PLA sees this large network of civilian cargo aircraft and facilities nationwide as a key capability to integrate into the strategic projection support aircraft fleets.⁹⁷

Other cargo couriers such as China Postal Airlines have long conducted missions for the PLA. China Postal Airlines has supported the PLA since it was established in 1996, conducting air transport missions in disaster relief and medical support. With its fleet of 33 Boeing freighter aircraft flown by host of former PLA pilots, this airline established a "strategic support cargo *dadui*" (战略支援货运大队) and the "19th Strategic Air Transport *Dadui*" (战略空运十九大队) in 2015.⁹⁸ The 19th Strategic Air Transport *Dadui* conducted its first combat readiness embarkation exercise at Nanjing Lukou International Airport in September 2017, reviewing support planning and procedures while

⁹⁵ A unit of the major Chinese online retailer JD Logistics began developing its own cargo aircraft services in 2017, with plans to build a fleet of 50-100 aircraft. JD Logistics previously relied on passenger airlines and ground transport for much of its transport services. It has worked with the PLA to provide a "Military Online Procurement Mall" that reportedly accounts for over 60 percent of the PLA's orders and serves more than 1,200 military units. See: 贺泓源 [He Hongyuan], 京东, 顺丰与空军后勤部达成战略合作, 布局军民融合 ["Jingdong, Fengshun, and the PLA Air Force Logistics Department Reach Strategic Cooperation to Arrange Civil-Military Fusion"], 观察者网综合 [Observer Net Comprehensive], October 25, 2017, www.eeo.com.cn/2017/10/25/315365.shtml; "China's Largest All-Freighter Airline Sees Fleet Expand to 50," Xinhua, December 22, 2018, www.xinhuanet.com/english/2018-12/22/c_137691624.htm; Amanda Lee, "Chinese Online Retailer JD.com Explores Move into Aviation to Improve Logistics," *South China Morning Post*, December 11, 2017, www.scmp.com/tech/e-commerce/article/2123871/online-retailer-jdcom-feels-addition-cargo-aircraft-will-give-wing;

⁹⁶ He Hongyuan, "Jingdong, Fengshun, and the PLA Air Force Logistics Department Reach Strategic Cooperation to Arrange Civil-Military Fusion;" Chen Xiangpeng, "Consideration on Strengthening Construction of Strategic Delivery Support Fleet in New Period," p. 11.

⁹⁷ Chen Xiangpeng, "Consideration on Strengthening Construction of Strategic Delivery Support Fleet in New Period," p. 13.

⁹⁸ 中国邮政航空有限责任公司介绍["Introduction to China Postal Airlines Co. Ltd."], 民航资源网 [Civil Aviation Resource Net of China], August 23, 2018, www.fjtd-logistics.com/show.asp?id=8443; 邮政航空首次进行战略投送支援机队战备演练 ["First Strategic Projection Support Aircraft Fleet Combat Readiness Exercise of China Postal Airlines"], 民航资源网 [Civil Aviation Resource Net of China], September 26, 2017, http://news.ifeng.com/a/20170926/52165620_0.shtml;

military representatives, aviation officials, and numerous other civilian airline company personnel observed.⁹⁹

Naturally, the use of civilian air transport resources has limited utility in areas that see active combat. Any armed threats to civilian transport companies would present significant risk. These fleets are therefore primarily used to complete low-threat missions in peacekeeping operations, foreign assistance, military training, and non-combatant evacuation operations (NEO).

Some aspects of the PLA's first overseas NEO from Libya in 2011 illustrated the value of civil air transport prior to the creation of strategic projection support aircraft fleets. Four PLAAF IL-76 aircraft from the Guangzhou Military Region and one Type-054A frigate from the PLAN's 7th Escort Task Force in the Gulf of Aden were sent to assist the NEO. Over 35,000 Chinese citizens in Libya were evacuated to Tunisia via ground transport, merchant ship, and civilian aircraft, including 91 Chinese and 35 foreign chartered flights.¹⁰⁰ In situations where ground support, fuel, and security are limited, the PLA can provide its transports as a link to civilian airliners. In 2011, the four IL-76s deployed to assist in the evacuation of 5,600 Chinese citizens waiting at Sabha airport in southwestern Libya helped provide this link.¹⁰¹ They ferried 1,655 personnel from Sabha to Khartoum International Airport, Sudan, where evacuees could then board Chinese civilian airlines.¹⁰² The heavy reliance on civilian carriers in Libya likely convinced Chinese leaders of the value of being able to leverage civil aircraft for longer-range missions.

Going forward, strategic projection support aircraft fleets will likely see more use in overseas NEOs. They are particularly useful for evacuating Chinese citizens from areas experiencing natural disasters. During the November 2017 Mount Agung volcanic eruption in Bali, Indonesia, aircraft of the strategic projection support aircraft fleet reportedly evacuated 17,000 Chinese nationals out of Ngurah Rai International Airport.¹⁰³

For regions experiencing war and instability, these fleets can transport personnel and cargo from the rear to the margins of the combat zone, where they can then complete onward movement using organic military carriers, such as PLA aircraft.¹⁰⁴

⁹⁹ "First Strategic Projection Support Aircraft Fleet Combat Readiness Exercise of China Postal Airlines."

¹⁰⁰ 第一次动用军事力量撤侨: 2011 年利比亚大撤侨 ["The First Time Using Military Forces for An Evacuation: The Major Evacuation of Libya in 2011"], 新华社 [Xinhua], August 15, 2017, www.xinhuanet.com/politics/2017-08/15/c_1121487719.htm.

¹⁰¹ Diplomatic personnel coordinating evacuation efforts on the ground reported difficulties in securing foreign chartered aircraft. One example includes an Egypt Air flight chartered to receive Chinese citizens, but being taken by Egyptians seeking evacuation after landing in Sabha. While the situation was reportedly calm around Sabha, the airport was overwhelmed with evacuees as armed conflict was soon to break out. "[面对面] 跨国撤离中的外交官 (2011.03.20)" [Face to Face: The Diplomats in Transnational Evacuation (2011.03.20)], CNTV, March 21, 2011, http://news.cntv.cn/china/20110321/100017_print.shtml.

¹⁰² An additional 287 personnel were flown to Beijing from Sabha Airport. 田炜, 李幽幽 [Tian Wei, Li Youyou], 空军赴海外执行撤离我在外人员任务圆满完成 ["The Air Force Completes Its Mission to Evacuate Chinese Personnel Overseas"], 空军报 [Air Force News], March 7, 2011, p. 1; Zhang Xin, "Overseas Aviation Strategic Projection Using Strategic Projection Support Fleet," p. 6

¹⁰³ It is unclear which units of the strategic projection support aircraft fleet were dispatched and how many civilian airliners unaffiliated with these fleets were also mobilized. Zhang Xin, "Overseas Aviation Strategic Projection Using Strategic Projection Support Fleet," pp. 5-6.

¹⁰⁴ *Ibid*, p. 6.

Rail & Road Strategic Projection

Despite not being the focus of this report, surface transport is vital to the success of power projection over water. Rail and road transport brings PLA forces and material from China's vast interior to frontier and distant areas. In recent years, the PLA has made improvements in its ability to leverage civilian surface carriers in support of its power projection capabilities.

Nationally, rail transport occupies a "core" position in the PLA's strategic projection capabilities. Movement by rail grants large capacities, low costs, and resilience against inclement weather, making it a solid resource for getting PLA forces across theater commands.¹⁰⁵ The near-national coverage of China's rail system and innovations in moving lighter units via high-speed rail are enabling rapid strategic projection operations anywhere within China's borders.¹⁰⁶ At regular rail speed, the PLA is able to move personnel and equipment together less than 1,000 km a day. However, using high-speed rail a light division can be moved approximately 3,500 km in a 24 hour period. The Eastern Theater Command reported in late 2018 that the *Fuxing Hao* high-speed rail lines are regularly transporting light units.¹⁰⁷

If military personnel, equipment, and materials could be moved on dedicated high-speed rail cars, it would significantly enhance PLA power projection operations throughout the country and region.¹⁰⁸ However, PLA forces in large part have not been able to effectively utilize the high-speed rail network since it is primarily designed for light passenger transportation. High-speed rail may lack sufficient power to transport some forces on certain lines with high inclines. Furthermore, the design of bridges and stations may not be suitable for PLA forces.¹⁰⁹ This could impact the movement of forces to hubs and points of embarkation, therefore constraining PLA combat force generation when urgently required. Nevertheless, PLA engineers and researchers are working to expand the role of the high-speed rail network in strategic projection operations.¹¹⁰

Another crucial element in unit transport via rail is the ability to conduct emergency mobile loading in the field, when railway infrastructure may be degraded due to enemy strikes. According to PLA experts, the military transportation departments of the theater commands, the PLAN, PLA AF, and PLA Rocket Force have been equipped with mobile railway platforms. These have seen widespread use in railway projection missions and exercises. Light platforms, vehicle mounted platforms, and mechanized railway platforms for heavy equipment have been distributed to various units. Such

¹⁰⁵ 郑旭, 张国全, 司爱威 [Zheng Xu, Zhang Guoquan, Si Aiwei], 建制部队铁路战略投送关键问题研究 ["Research on Key Points of Railway Strategic Projection for Organizational Troops"], no. 2, (2014), p. 2.

¹⁰⁶ *Ibid*, p. 3-5.

¹⁰⁷ 东部战区某军事运输投送调度中心为“进博会”任务部队反营助力 ["A Military Transport and Projection Dispatch Center of the Eastern Theater Command Assists the Task Force at the Expo in its Return to Camp"], 东部战区微博 [Eastern Theater Command Weibo], November 18, 2018, <http://mil.news.sina.com.cn/2018-11-18/doc-ihmutuec1382529.shtml>.

¹⁰⁸ Authors note that operating military high-speed rail services would necessarily impact the already tightly-coordinated civilian route schedules, which would require careful study of the safety of such operations. See 张瑞鹏, 程虹, 季锋, 尉蓝天 [Zhang Ruipeng, Cheng Hong, Ji Feng, Wei Lantian], 利用高速铁路投送军事力量研究思路与方向 ["Research Ideas of Application of High-Speed Railway in Troop Movement"], 军事交通学院学报 [Journal of Military Transportation University], no. 1, (2019), p. 12.

¹⁰⁹ *Ibid*, p. 13.

¹¹⁰ *Ibid*, pp. 13-14.

platforms are also useful when fixed platform space is limited.¹¹¹ The vehicle-mounted railway field platform was on display in the October 2019 PLA Military Parade.¹¹²

These developments in rail transport provide important connections for the movement of equipment and materials in large volumes to major ports of embarkation. But China has also developed the ability to transport the trains themselves over water. Completed in 2003, the Guangdong-Hainan Railway (粤海铁路) was China's first cross-sea railway. It runs from Zhanjiang, Guangdong, home to the Southern Theater Command Navy headquarters, down to Hai'an Township at the tip of the Leizhou Peninsula, where lengths of rail cars are loaded aboard ferries and transported to Haikou, Hainan province.¹¹³ With the completed upgrades to the Hainan Western Ring Railway in 2007, freight trains arriving from Guangdong can continue on from Haikou down to the southern city of Sanya, home to the Yulin Naval Base.¹¹⁴ Using imported German anti-rolling technology, these ferries are capable of operating in extreme sea states: there are reportedly only around 30 days per year where weather conditions in the Qiongzhou Strait do not permit transit.¹¹⁵

This system has important implications for Chinese power projection into the South China Sea.¹¹⁶ In November 2017, the Guangdong-Hainan Railway began offering transport services using flatbed cars for oversized military equipment. Compared to transferring equipment onto ships, this practice shortened transit times by nearly 10 hours and allows equipment to be moved directly from Guangdong to Phoenix International Airport or Sanya Station, near Yulin Naval Base.¹¹⁷

In the north, Yantai, Shandong province and Dalian, Liaoning province have similar rail-ferry-rail connections that can support freight movement across the Bohai Gulf.¹¹⁸ This could support mobility across the Bohai Gulf and alleviate rail congestion in the projection of power into North Korea and

¹¹¹ 曾运清, 张瑞鹏, 辛昕, 贾永涛 [Zeng Yunqing, Zhang Ruipeng, Xin Xin, Jia Yongtao], 部队远程投送铁路野战站台应用研究 [“Study of Field Platform Application in Our Army's Long-Distance Projection”], 军事交通学院学报 [Journal of Military Transportation University], no. 5 (2016), pp. 20-21.

¹¹² 补给供应方队: 联保“铁骑”接受检阅 [“Supply Column: The Joint Support ‘Cavalry’ Receive Inspection”], 新华网 [Xinhua], October 1, 2019, www.xinhuanet.com/politics/2019-10/01/c_1125063238.htm.

¹¹³ The author rode this line in 2017, sharing a rail car with a squad of newly-recruited PLAN marines on their way to Hainan. The transit was executed quickly and smoothly. 我国首条跨海铁路今天通车 庆典行程公布 [“China's First Cross-sea Railway Opens Today, Celebratory Trip Announced”], 中国新闻网 [China News Network], January 7, 2003, <http://news.sina.com.cn/c/2003-01-07/072827873s.shtml>.

¹¹⁴ 西环线铁路 18 日全线通车 三亚火车驶进京 [“Full Line of the West Circuit Railway Opens on the 18th, Sanya Trains Can Enter Beijing”], 南海网-南国都市报 [Hainan News - Nanguo Metropolis Daily], April 13, 2007, www.hinews.cn/news/system/2007/04/13/010096937.shtml.

¹¹⁵ These reports claim that there are only 30 days in the Qiongzhou Strait where conditions are greater than level eight, equivalent to over 46 mph (75 km/h) winds and swells over 24 feet (7.5 m). 中国第一条跨海铁路—粤海铁路通道正式开通 [“China's First Cross-sea Railway—the Guangdong-Hainan Railway Passage Officially Opens”], 中国报道 [China Report], www.cctv.com/lm/522/41/76916.html, (Accessed 22 August 2019); 风速、风力等级与海况等级对照 [“A Comparison of Wind Speed, Wind Force Levels, and Sea State Levels”], 海事处 [Maritime Safety Division], April 20, 2017, www.jialing.gov.cn/a/xxgk/yingjiguanli/yingjichangshi/2017/0420/9453.html.

¹¹⁶ 海军, 葛同民, 常刚 [Hai Jun, Ge Tongmin, Chang Gang], 加强南海方向战略投送能力建设探讨 [“Discuss on Strengthen Construction of Strategic Projection Capacity of South China Sea”], 军事交通学院学报 [Journal of Military Transportation University], no. 6 (June 2013), p. 9.

¹¹⁷ 琼州海峡火车轮渡首次组织跨海军事运输 专家: 提升战略投送能力 [“Qiongzhou Strait Train Ferry Organizes its First Cross-sea Military Transport, Expert: Improves Strategic Projection Capabilities”], 环球网 [Global Times], November 22, 2017, <http://mil.qianlong.com/2017/1122/2194494.shtml>.

¹¹⁸ 烟大铁路轮渡试运营 [“Yantai-Dalian Train Ferry Trial Operation”], 人民日报 [People's Daily], November 7, 2006, <http://news.sohu.com/20061107/n246232820.shtml>.

other parts of Northeast Asia. The Bohai Ferry Group (discussed above) has conducted transport exercises for the PLA. In August 2016, it embarked rail cars loaded with a PLAAF brigade's containerized generators, tractors, and mobile kitchens at West Lüshun Station, and delivered them to Yantai port, Shandong province. Military use of the rail-ferry-rail connection between the Shandong Peninsula and the Liaoning Peninsula was established in accordance with the joint operational requirements of the Northern Theater Command, and has reportedly reduced transit time into the northeast by 30 hours.¹¹⁹

In July 2019, a PLAN Marine Corps (PLANMC) combined arms unit utilized nine ferries, including those from the Eighth Transport *Dadui* and rail-car ferries operated by China Railway Bohai Railway Ferry, to transit armor, artillery, support vehicles and personnel across the Bohai Gulf to Dalian. Among the reported advantages of this approach was improved operational security: keeping military units at sea reduced the attention drawn to unit movements by road closures.¹²⁰



Image 8: PLANMC units transported by railway ferries in July 2019.

¹¹⁹ 驻沈阳铁路军代处探索军民融合海上投送新模式 [“Military Representative Division for Shenyang Railways Explores a New Mode of Civil-Military Fusion Maritime Projection”], 中国军网 [China Military Online], August 24, 2016, www.81.cn/jfjmap/content/2016-08/24/content_154586.htm.

¹²⁰ A PLAN Type-072A landing ship was also used to transport tracked amphibious armor during this exercise. 赵佳庆, 张旭, 张劭轶 [Zhao Jiaqing, Zhang Xu, Zhang Shaokai], “猛龙”过海—沈阳联勤保障中心联合航运船企开展跨海投送演练纪实 [“Raptors’ Cross the Sea—A Record of the Shenyang Joint Logistics Support Center’s Cross-sea Projection Exercise Jointly Held with a Shipping Company”], 解放军画报 [PLA Pictorial], no. 8 (2019), pp. 84-87.



Image 9: RO-RO vessels embark PLANMC vehicles in July 2019.¹²¹



Image 10: A vehicle-mounted railway field platform used during the “Firepower-2015” trans-regional exercise.¹²²

Bridging the Bohai Gulf and Qiongzhou Strait with PLA rail transport connections provides important opportunities for PLA training and projection operations. One senior engineer from the CMC Logistics Department explained in 2016 that demand for unit training in maritime projection will increase in the future. He stated that “the trial operations of cross-sea railway ferry transports for

¹²¹ 胶东半岛 军地联合跨海投送演练 [“Shandong Peninsula, Local Military and Government Authorities’ Joint Trans-sea Projection Exercise”], 中国军视网 [CCTV-7], July 10, 2019, www.js7tv.cn/video/201907_186516.html.

¹²² 驻川某炮兵旅: 站台被毁, 装备照样上火车 [“Artillery Brigade in Sichuan: The Platform was Destroyed and Equipment was Still on the Train”], 新华网 [Xinhua], July 14, 2015, www.xinhuanet.com/mil/2015-07/14/c_128018722.htm.

units has opened up a new strategic transport passage, innovated modes of joint projection, and improved the efficiency of projection support.”¹²³

Strategic projection support forces also include truck fleets (战略投送支援车队). These serve as excellent connectors between other modes of transportation and have the flexibility to access areas unavailable to rail, shipping, or air transport. The first of these trucking fleets was established by the former Xinjiang Military Region in July 2013 out of a transportation enterprise associated with the Xinjiang Production and Construction Corps. According to PLA reports, this fleet includes *zhongdui* for container, bulk cargo, and oil transport respectively, and contains dedicated emergency command, communications, refueling and maintenance trucks. Under contract with the former Xinjiang Military Region (now Western Theater Command), this truck fleet is obligated to rapidly activate emergency plans and carry out transport missions once orders are received.¹²⁴

Trucking fleets are already seeing use in PLA exercises. In an August 2017 exercise, the strategic projection support truck fleet in one of China National Petroleum Corporation’s aviation fuel transport subsidiaries helped supplement the PLAAF’s refueling requirements. A first for the newly created JLSF, the transport and projection office of the Guilin Joint Logistics Support Center mobilized 20 of the company’s trucks to transport aviation fuel 300-km after its own fuel trucks proved insufficient.¹²⁵

While trucking may appear to lie on the lower-end of the projection spectrum, it has proven to be a bottleneck in power projection capabilities for the PLA. The movement of armored units is constrained by a lack of flat-bed trucks for moving tracked vehicles, and low numbers of tractor trailers and tanker trucks.¹²⁶ As one PLA officer notes, the US military currently employs a ratio of one transport vehicle for every seven units of heavy equipment, which can be augmented to one vehicle for every three units of equipment during war time. China however, is far behind in its trucking resources. Nationally, civilian trucking fleets can only generate several hundred trucks suited to transporting tanks and armored vehicles, as heavy trucking has been limited in tonnage capacity due to industry regulation. For example, there are only around one-hundred 40-ton or greater low-flatbed trucks dispersed nationwide, and they are difficult to mobilize. The width of civilian trucks are also an important consideration. PLA experts recommend modifying low flatbed semi-trucks by widening their beds to more than three meters, thereby enabling the transport of tracked vehicles.¹²⁷

¹²³ 刘建伟, 胡月, 赵雷 [Liu Jianwei, Hu Yue, Zhao Lei], 军列搭民船, 远程机动辟新径 [“Military Locomotives on Merchant Ships Create New Paths for Long-range Maneuver”], 中国国防报 [China Defense News], August 22, 2016, www.mod.gov.cn/mobilization/2016-08/22/content_4716392_3.htm.

¹²⁴ Compensation is provided for expenses incurred when fulfilling their contractual obligations. 我军建首支战略投送支援车队 [“PLA Establishes First Strategic Projection Support Truck Fleet”], 解放军报 [PLA Daily], November 17, 2013, <https://xw.qq.com/mil/20131117001735/MIL2013111700173500>.

¹²⁵ Movement of these support forces was further facilitated by local transportation war readiness offices, which cleared the formations through tolls and arranged emergency hospital and mechanical repair support using local resources. 桂林联勤保障中心深化军民融合提升运投效能—战略投送支援车队加盟油料运输 [“Guilin Joint Logistics Support Center Deepens Civil-Military Fusion to Enhance Projection Efficiency—Strategic Projection Support Truck Fleet Joins in POL Transport”], 中国军网 [China Military Online], August 8, 2017, www.81.cn/gfbmap/content/2017-08/08/content_184957.htm.

¹²⁶ Hai Jun, “Discuss on Strengthen Construction of Strategic Projection Capacity of South China Sea,” p. 8.

¹²⁷ Liu Jiasheng, “Development of Carriers for Strategic Projection in Response to National Security Needs,” pp. 12-13; Li Peng, “Impact of National Strategic Delivery Capability Development on Construction of Synthetic Forces and Countermeasures,” p. 3.

Strategic Projection Bases

In order to respond to new strategic projection requirements, the PLA is also transforming the way it develops its bases and uses transportation infrastructure. It has sought to better integrate PLA logistics forces and civilian transportation resources, and it has built specialized facilities and bases to help it do so.

The PLA established its first “civil-military fusion strategic projection base” (军民融合战略投送基地) in 2014.¹²⁸ It is located in Zhengzhou, Henan province, the location of the JLSF Zhengzhou Joint Logistic Support Center assigned to the Central Theater Command. Zhengzhou is a major road, rail, and aviation hub. The Zhengzhou Strategic Projection Base is developing network integration between rail and road services with airports for rapid troop, equipment, and materials loading onto aircraft.¹²⁹ It is a test base for improving joint logistics support for strategic projection capabilities that will “cover the nation and radiate overseas” (覆盖全国、辐射境外). According to base staff, the Zhengzhou base marks a key step in conducting “long-range rapid multi-dimensional projection of large quantities of forces” and is gradually developing capabilities for all-domain support and distant deployment to conduct overseas projection support missions.¹³⁰

The projection base is adjacent to the Zhengzhou Xinzheng International Airport, where a “base command position” was created in conjunction with the airport operational command center.¹³¹ The base is also reportedly frequented by PLA academies for training and research on advanced joint logistics support.¹³² From 26-28 December 2016, the National Transportation War Readiness Office held a training course in Zhengzhou to familiarize officials in various sectors on the recently promulgated National Defense Transportation Law. Reporters at this event were allowed to visit the base where they noted “materials delivery teams working quickly and orderly to transship and load materials, a three-dimensional automated warehouse for aviation containers rapidly operating, and a support mode that fuses mechanization and informatization in integrated materials transport processes, pre-storage, and transshipment.”¹³³ If automation and technical standards that can

¹²⁸ The former General Logistics Department began developing the idea of this base in 2011, and signed a “strategic cooperation agreement” with the Henan Provincial Government that same year. Work on the base was launched in February 2012. 卢伟, 郝庆杰, 李娜 [Lu Wei, Hao Qingjie, Li Na], 聚力打造军民融合战略投送保障劲旅 [“Coming Together to Create Elite Civil-Military Fusion Strategic Projection Support”], 军民融合 [Civil-Military Integration], August 7, 2018, <http://wemedia.ifeng.com/72615855/wemedia.shtml>.

¹²⁹ 花晓, 赵杰 [Hua Xiao, Zhao Jie], 全国首个军民融合式应急投送保障基地高效运行 [“The Nation's First Civil-Military Fusion Emergency Projection Support Base is Operating Efficiently”], 解放军报 [PLA Daily], October 14, 2016, www.mod.gov.cn/mobilization/2016-10/14/content_4746556.htm.

¹³⁰ Lu Wei, “Coming Together to Create Elite Civil-Military Fusion Strategic Projection Support.”

¹³¹ The Zhengzhou Base formed a working small group with the operators of the Zhengzhou airport Henan Airport Group Co., Ltd. To set up plans, operational security measures, and other measures on managing the use of the airport for military strategic projection operations. Ibid.

¹³² Construction of the base also features 16 large military and civilian general materials and equipment transportation and storage support bases. 河南郑州依托民生工程推进军民融合深度发展纪事 [“A Chronicle of Zhengzhou, Henan Civil Projects Promoting Deep Civil-Military Fusion Development”], 中原网 [ZY News], December 17, 2014, http://news.ifeng.com/a/20141217/42737053_0.shtml; 军列装载时间缩短一半 [“Military Train Loading Time Reduced by Half”], 解放军新闻传播中心融媒体 [PLA News Communication Center], July 11, 2018, <https://kknews.cc/military/9nmy4ll.html>

¹³³ 屈百春, 戴丹华 [Qu Baichun, Dai Danhua], 国家交通战备办公室《国防交通法》培训班 [“National Transportation War Preparedness Office National Defense Transportation Law Training Course”], 中国国防报 [China Defense News], January 3, 2017, www.mod.gov.cn/mobilization/2017-01/03/content_4769029.htm.

streamline logistics processes are successfully implemented at the Zhengzhou base, they will likely be adopted on a larger scale at similar facilities elsewhere in the future.

To date, the Zhengzhou Strategic Projection Base has supported Theater Command-level trans-regional exercises and provided a staging base for air lift in support of rotating peacekeeping forces and trans-regional special police missions. It has also supported China's aid missions in Myanmar and Afghanistan with materials transportation.¹³⁴

Integrated with PLA rear depots, bases like the one in Zhengzhou will preposition forces and materials and aid their movement from the heartland to a strategic direction, or help them to rapidly respond to national emergencies.¹³⁵ They enable the unified integration of projection support resources, often covering a wide geographic area. They also work to optimize these resources with new facilities and equipment so they can take on diverse missions and deal with larger volumes of forces and materials. When force projection orders are given, operational units can rely on these bases to provide a host of dual-use carriers and solutions for sustainment, rest, staging, technical preparation, transshipment, materials distribution, casualty retrieval, and training. As long as a unit can reach one of these bases, its mobility will be greatly enhanced.¹³⁶

Challenges in Effective Strategic Projection

The PLA has clearly made major progress developing its strategic projection support forces. However, Chinese military experts are acutely aware of ongoing challenges preventing the military from fully leveraging civilian carriers for power projection purposes. These chiefly include problems with national defense standards, inadequate training, weak operational security, and inadequacies within the PLA itself.

Standards

To effectively support PLA power projection, civilian carriers must fully implement national defense standards. Approved in 2015, the *Technical Standards for New Civilian Ships to Implement National Defense Requirements* provided significant guidance and support for China's growing merchant fleet to ensure its readiness for military service.¹³⁷ However, large numbers of vessels not conforming to these standards have already been built. These older vessels will require significant modification and conversion before they can conduct missions for the military. As the deputy commander of the Northern Theater Command Army explained in March 2017, out of the 200,000 transport vessels in China, fewer than 2000 are suited for "direct mobilization."¹³⁸

¹³⁴ Lu Wei, "Coming Together to Create Elite Civil-Military Fusion Strategic Projection Support."

¹³⁵ 海军, 杨军, 刘顺尧 [Haijun, Yang Jun, Liu Shun Yao], 军民融合式战略投送基地力量体系规划建设战略思考 ["Our Strategic Reflection on Planning and Building-up an Army-Civilian Combined Force System of Strategic Projection Bases"], 国防交通工程与技术 [Traffic Engineering and Technology for National Defence], no. 6 (2015), pp. 5-8.

¹³⁶ Yu Dianxiang, "Basic Conception of Comprehensive Projection Base Construction," pp. 1-5.

¹³⁷ These standards covered five categories of vessels, including container, roll-on/roll-off, multipurpose, bulk carriers, and break bulk. Zhao Lei, "New Rules Mean Ships Can Be Used by Military," *China Daily*, June 18, 2015, www.chinadaily.com.cn/china/2015-06/18/content_21036944.htm; 刘航 [Liu Hang], 我国《新造民船贯彻国防要求技术标准》正式颁布实施 ["China's 'Technical Standards for New Civilian Ships to Implement National Defense Requirements' Formally Promulgated"], 中国军网 [China Military Online], June 5, 2015, www.81.cn/jwgz/2015-06/05/content_6527060.htm.

¹³⁸ According to the deputy commander, this accounted for less than 1 percent of China's transport carrier fleet. 胡修斌: 我国海上战略投送后备力量建设存在“四个不足” [Hu Xiubin: 'Four Insufficients' Present in the Construction of

National defense standards in the aviation industry are also inadequate. Several technical and general standards have been reviewed and approved by the PLA. These include *General Technical Requirements for Air Transportation* and *Facilities Construction Standards for Conversion of Permanent Airfields into Bases*. The PLAAF has also implemented the *Code of Practice for Resident Loading and Unloading Detachments for Air Transport (Trial)* to further improve standards in ground support teams.¹³⁹ However, some standards are clearly outdated, or based on Russian or American standards. Others face difficulties with operationalization. For example, some vehicles cannot be loaded onto aircraft due to unforeseen size constraints or poor packing methods. More efficient methods of moving materials—such as containerized shipping equipment for air transport—are gradually being implemented.¹⁴⁰

Training

Civilian carriers and their crews require training to maintain readiness levels in the fleets and ensure they can meet PLA requirements. The National Transportation War Readiness Office promulgated the first *Outline for Training and Evaluation of National Defense Transportation Specialized Support Forces* in early 2015. Strategic projection support forces were then subject to a new set of training requirements meant to guide and standardize training.¹⁴¹ Monitored by local transportation war readiness offices, training responsibilities are divided differently at the *zongdui*, *dadui*, and *zhongdui* levels. *Zongdui* are expected to formulate annual training plans for the *dadui*-level units, focusing on formation maneuvers, command, communication, and lifesaving training with PLAN ships. *Dadui* organize and implement these plans, combining their regular transportation work with support for major exercises by PLA units. Such training is conducted once or twice a year. *Zhongdui*-level units execute training plans by dispatching personnel and allocating equipment and materials to take part in training activities. They also conduct self-evaluations.¹⁴²

However, a 2017 study by PLA experts found that in many cases enterprise management staff were not enthusiastic about spending money, resources, and time on peacetime training. In fact, many enterprises had not even established departments for handling training matters and dedicated no personnel to overseeing training plan development and requirements. Since training is primarily conducted by the enterprises themselves, their negligent approach to training has meant a lack of combat realism. Compounding this issue is the reported limited ability of transportation war readiness offices to oversee and assist the organization of fleet training.¹⁴³

Operational Security

Article 9 of the National Defense Transportation Law states that any organization or individual has a duty of confidentiality for state and commercial secrets learned during national defense

China's Maritime Strategic Projection Reserve Forces”, 央广网 [China National Radio], March 9, 2017, http://news.cnr.cn/zl2017/2017h/ppzb/lhzkzyt/zkzythxb/zbkx/20170309/t20170309_523647186.shtml.

¹³⁹ Zhang Fang, “Thoughts on Accelerating Ground Security System Construction for Air Strategic Projection,” p. 3.

¹⁴⁰ *Ibid*, p. 3.

¹⁴¹ 周济晓, 张歌 [Zhou Jixiao, Zhang Ge], 国防交通专业保障队伍有了首部训考大纲 [“National Defense Transportation Specialized Support Forces Now Have Their First Training and Evaluation Outline”], 解放军报 [PLA Daily], February 7, 2015, www.81.cn/jwgz/2015-02/07/content_6344869.htm.

¹⁴² He Guoben, “Current Situation and Countermeasures of Strategic Projection Support Fleet Training,” p. 2.

¹⁴³ The authors of this study advocated for the creation of a specific training outline for civilian shipping organized into strategic projection support forces, which can help standardize training subjects and other requirements. Currently, these forces train according to the *National Defense Transportation Specialized Support Force Training and Evaluation Outline*. *Ibid*, pp. 1-4.

transportation work.¹⁴⁴ However, this does not always happen. For example, some personnel in the strategic projection support aircraft fleet purportedly lack awareness in security and secrecy.¹⁴⁵ In a conflict or crisis, poor operational security by China's civilian carriers could enable the adversary to more easily track PLA movements.

The PLA is taking steps to remedy this problem. Civilian trucking fleets are reportedly committed to secrecy as part of confidentiality clauses in the contracts they sign with the PLA. They also receive dedicated computers and classified materials handling and "secrecy" training.¹⁴⁶ In the future, merchant shipping training could include silent running operations and encryption training to ensure the PLA can engage in encrypted communications with ship formations during wartime.¹⁴⁷

Problems with the PLA

Some problems are not the fault of civilian carriers themselves. Rather, they relate to weaknesses within the PLA and its ability to integrate civilian carriers into joint operations. Since 2015, the PLA has undergone major organizational reforms. One objective is to improve jointness. This process is far from complete, and has created organizational uncertainties for China's strategic projection support forces.

Greater use of civilian carriers could enhance logistics support for joint operations. However, poor coordination between the services can inhibit their effective use. For example, PLAAF experts argue that greater use of strategic projection support forces, like civilian sea and air carriers, can rectify the significant shortfalls in PLA organic projection capabilities out to places like the Spratlys. However, they state that support for PLAN and PLAAF aviation units lacks jointness, especially when multiple aircraft types are being supported. Each service still relies on its own organic support instead of making greater employment of common-use carriers. As a result, units undergoing projection out to distant islands and reefs have "long tails" due to slow transport procedures and difficulties in embarkation and debarkation.¹⁴⁸

There also appears to be problems in determining who is responsible for commanding and activating China's strategic projection forces. The division of responsibilities and procedures between newly-created transport and projection departments in Theater Commands and those in the JLSF for supporting joint operations has not been determined.¹⁴⁹ Unclear command and activation authority over civilian forces could negatively impact the effectiveness and speed of strategic projection support forces.

The PLA recognizes this issue and is contemplating ways to resolve it. Coordinating the various transport forces of the JLSF, services, and local civilian resources for strategic projection will require higher-level command authority. Lacking coordination and effective communication between the transport departments of the services and local military commands means that important missions must be led at the CMC-level. This solution is widely discussed by PLA experts. PLAAF officers

¹⁴⁴ Article 9, Law of the People's Republic of China on National Defense Transportation.

¹⁴⁵ Chen Xiangpeng, "Consideration on Strengthening Construction of Strategic Delivery Support Fleet in New Period," p. 11.

¹⁴⁶ "Guilin Joint Logistics Support Center Deepens Civil-Military Fusion to Enhance Projection Efficiency—Strategic Projection Support Truck Fleet Joins in POL Transport."

¹⁴⁷ He Guoben, "Current Situation and Countermeasures of Strategic Projection Support Fleet Training," p. 4.

¹⁴⁸ Liu Yonghua, "Maritime Projection for PLA Air Force Troops of Training in South China Sea Islands and Reefs," pp. 10-13.

¹⁴⁹ Zhang Fang, "Thoughts on Accelerating Ground Security System Construction for Air Strategic Projection," p. 3.

from the Southern Theater Command advocated in 2017 for the concentration of command authority for strategic projection operations in the CMC Transport and Projection Department with inter-service coordination primarily conducted by Theater Command transport and projection departments. Theater Command transport and projection departments would also coordinate with the mobilized forces generated by local transportation war readiness offices in their jurisdictions.¹⁵⁰

Another major challenge for the PLA is in the integration of operational and support command systems that will enable rapid precision support. As one observer from the Southern Theater Command put it, “the front and rear should operate on one network, using a single platform for command, while looking at the same operating picture.”¹⁵¹ In supporting projection operations, civilian carriers will be operating under the PLA’s command and logistics networks. Precise allocation of civilian carriers to meet transportation demand will prove difficult if the PLA is unable to successfully integrate these systems. The resulting gaps in information and awareness would hinder the provision of support in real-time. However, technical capabilities for implementing unified control of the transport and projection forces are currently under development.

The CMC Logistics Support Department has taken the lead on developing these capabilities. One of its research projects—entitled “Key Technologies in a Planning, Command, and Simulation Platform for Transport and Projection in Joint Operations”—is expected to be completed by the end of 2019. The objective of this project is to provide informatized and intelligent methods of support for command planning of transport and projection in joint operations. It seeks seamless integration of joint operational command systems and the military’s transportation monitoring systems. This project will integrate data from a vast network of sources to provide solutions in route planning, plan dissemination, in-transit visibility, simulated exercises, simulation evaluation, operations feedback, and a host of other functions that will directly support PLA-wide transportation capabilities.¹⁵² Greater tracking of inventories and sites could allow planners to run simulations of potential scenarios involving the movement of large volumes of PLA forces and materials for power projection operations, which will prove essential to understanding how much force will be available at a specific point in time.¹⁵³ These capabilities are fundamental to assisting decision makers in assessing the volume of lift required and the quantity of civilian carriers that will need to be activated ahead of time to better meet requirements for power projection missions.

The PLA itself may not be prepared to fully embrace the diverse options presented by the strategic projection support forces. As the PLA transitions towards “all-domain” operations, services like the

¹⁵⁰朱光, 王辉, 刘永华, 赵旺 [Zhu Guang, Wang Hui, Liu Yonghua, Zhao Wang], 海上方向军事行动联合投送保障研究 [“Joint Projection Support of Maritime Military Operations”], 军事交通学院学报 [Journal of Military Transportation University], no. 2 (2017), p. 7-8.

¹⁵¹ 刘显军 [Liu Xianjun], 立足战区联合作战指挥体制加速发展现代军事物流 [“Base on Theater Joint Operations Command System and Accelerate Modern Military Logistics”], 中国军事科学 [China Military Science], no. 5 (2018), p. 113; Ying Shiyong, “Achievements and Implications of PLA Logistics Reform in the Past 40 Years of Reform and Opening Up,” p. 57.

¹⁵² Description of this project includes requirements for system responsiveness, data transmission speeds, target search parameters, user capacity, and transport solution support. The project must be compatible with the PLA’s current joint operations command information system’s technological frameworks and data standards. 中央军委后勤保障部: 2018 年度军队后勤 89 个开放研究科研项目 [“Central Military Commission Logistics Support Department: 89 Open Research Projects in Military Logistics for 2018”], 中央军委后勤保障部 [Central Military Commission Logistics Support Department], July 4, 2018, www.ccqxtech.com/showknowledge.asp?ID=71.

¹⁵³ Zheng Xu, “Research on Key Points of Railway Strategic Projection for Organizational Troops,” p. 3.

PLA Army are working to become a “projection-type” (投送型) force.¹⁵⁴ Greater mobility for power projection operations will require increased use of diverse civilian transportation services. However, PLA experts explain that many units are still heavily reliant on rail transport due to their unfamiliarity with aviation transport methods. They choose rail transport over air when possible due to “traditional thinking.”¹⁵⁵ Advocates in the PLA call for combined arms units to avail themselves of different kinds of transportation modes and adopt new projection methods whereby personnel and equipment are transported using separate means to the same location (人装分运、目的地结合). Unit commanders previously emphasized the transport of personnel and equipment together (人装合运) in order to rapidly regain combat readiness on arrival. Such modes favored the PLA’s domestic defensive missions in the past, but are poorly suited to overseas operations that will rely on moving personnel via air lift and equipment and materials via land and sea transport.¹⁵⁶ PLA commanders will need to leave the comfort of traditional transport modes for a more complex mix of sea and air lift where different force components are in transit at varying rates. They will need to learn how to reassemble and restore combat forces at points of debarkation in far-away locations.

Facing these challenges and lacking experience in conducting long-range power projection operations, the PLA will be strenuously challenged to meet the goals for global projection outlined earlier in this report by CMC Transport and Projection Bureau head Liu Jiasheng. Nonetheless, strategic projection receives top-level leadership attention and is an area of increasing focus in PLA research and development. As the PLA builds toward fulfilling its missions and tasks in protecting PRC interests wherever they extend, the civilian forces supporting this longer reach will be crucial to enabling and sustaining those operations. The creation of numerous strategic projection support forces in the past several years demonstrates this commitment to enhancing power projection capabilities.

¹⁵⁴ Li Peng, “Impact of National Strategic Delivery Capability Development on Construction of Synthetic Forces and Countermeasures,” p. 3.

¹⁵⁵ Chen Xiangpeng, “Consideration on Strengthening Construction of Strategic Delivery Support Fleet in New Period,” p. 11.

¹⁵⁶ Li Peng, “Impact of National Strategic Delivery Capability Development on Construction of Synthetic Forces and Countermeasures,” pp. 2-4.

Appendix¹⁵⁷

Maritime Service Support Requirements for Different Types of Civilian Vessels		
Mission Use	Support Mission	Suitable Vessel Types
Transport and projection	-Unit maneuver and equipment and materials supply and transportation support conducted jointly with PLA organic transport ships; -Support for debarking organic landing units.	Passenger or vehicle Ro-Ro ships, multi-purpose ships, container ships, bulk carriers, cargo ships, tankers
Maritime replenishment	Conduct dry and liquid cargo replenishment of ship formations at sea as a supplement to standard PLA replenishment ships.	Tankers, multipurpose ships, or container ships
Health service support	Conduct rescue and transfer of wounded and sick personnel and support preliminary treatment and evacuation as a supplement to standard PLA health equipment.	Passenger Ro-Ro ships (converted into health transport ship), container ships (converted into hospital ships), fast passenger ferries and ocean-going fishing vessels (converted into rescue boats), and rescue ships
Engineering support	Assist in the repair of port terminals and navigational channel dredging and clearance as a supplement to PLA auxiliary ships.	Tugboats, deck barges, salvage ships
Equipment technical support	Conduct repairs, towing, and other equipment technical support for battle-damaged or malfunctioning ships. Act as intermediate support for helicopters.	Tugboats, semi-submersible ships (barges) or heavy lift ships, and crane ships
Rights protection operations	Take part in maritime rights protection and other support missions.	Marine fishing vessels

¹⁵⁷ This table is based on an article written by a senior engineer at the former PLA General Logistics Department's Institute of Military Transportation. Wang Hewen, "Thoughts on Promoting Development of Civilian Ship Carrying Out National Defense Requirements Under New Situation," pp. 22-26.

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