

# Jane's

## China's Logistics Capabilities for Expeditionary Operations



*The modular transfer system between a Type 054A frigate and a COSCO container ship during China's first military-civil UNREP.*

Source: "重大突破！民船为海军水面舰艇实施干货补给 [Breakthrough! Civil Ships Implement Dry Cargo Supply for Naval Surface Ships]," *Guancha*, November 15, 2019

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## Contents

|   |     |
|---|-----|
| Abbreviations .....   | 3   |
| Executive Summary .....   | 4   |
| Methodology, Scope, and Study Limitations.....                                    | 6   |
| 1. China's Expeditionary Operations Logistics System .....                        | 8   |
| China's Logistics Reform Effort: Dimensions and Drivers.....                      | 8   |
| Military and Geopolitical Drivers of PLA Logistic Reform .....                    | 8   |
| Logistics Support Department and Joint Logistics Support Force.....               | 12  |
| Continuing Development Priorities and Challenges .....                            | 17  |
| Integration and Bureaucratic Resistance.....                                      | 17  |
| Enhancing Military-Civil Fusion.....  | 17  |
| Informatization of Logistics Systems .....  | 18  |
| Combat Readiness: Training, Talent Recruitment and Retention, and Exercises ..... | 19  |
| Discipline and Corruption .....   | 21  |
| 2. Bases and Basing Objectives .....  | 22  |
| PLA Basing Strategy 2020 – 2030 .....   | 36  |
| PLA Basing After 2030 .....   | 37  |
| 3. PLA Expeditionary Operations Capabilities and Sustainment.....                 | 39  |
| PLAN Expeditionary Capabilities .....   | 39  |
| PLAN Future Force Requirements .....  | 44  |
| PLAN Marine Corps (PLANMC) deployment.....  | 46  |
| PLAN Expeditionary Logistics Models .....   | 48  |
| PLAAF Expeditionary Capabilities.....   | 52  |
| 4. Role of Civilian Organizations in Expeditionary Operations .....               | 54  |
| Civilian overseas port facilities.....  | 55  |
| RO-Ros and Container ships .....  | 55  |
| Tankers .....   | 57  |
| Strategic airlift.....  | 57  |
| Recommendations for Congress.....   | 59  |
| Appendix A: Gulf of Aden Task Forces .....  | 62  |
| Appendix B: Djibouti Base and Potential Base Locations .....                      | 63  |
| Appendix C: Satellite Imagery of Potential Overseas Chinese Bases .....           | 84  |
| Endnotes .....  | 103 |

## Abbreviations

|        |  |
|--------|--|
| ASUW   | Anti-Surface Warfare                             |
| ASW    | Anti-Submarine Warfare                           |
| BRI    | Belt and Road Initiative                         |
| CCTV   | China Central Television                         |
| COSCO  | China Ocean Shipping Company                     |
| CMC    | China Central Military Commission                |
| DoD    | Department of Defense (U.S.)                     |
| GLD    | General Logistics Department                     |
| HA/DR  | Humanitarian Assistance / Disaster Relief        |
| ISR    | Intelligence, Surveillance, and Reconnaissance   |
| JLSB   | Joint Logistics Support Base                     |
| JLSC   | Joint Logistics Support Center                   |
| JLSF   | Joint Logistics Support Force                    |
| LHD    | Landing Helicopter Dock                          |
| LPD    | Landing Platform Dock                            |
| LSD    | Logistics Support Department / Landing Ship Dock |
| MEU    | Marine Expeditionary Unit                        |
| MND    | Ministry of National Defense                     |
| NEO    | Noncombatant Evacuation Operation                |
| PLA    | People's Liberation Army                         |
| PLAAF  | People's Liberation Army Air Force               |
| PLAN   | People's Liberation Army Navy                    |
| PLANMC | People's Liberation Army Navy Marine Corps       |
| UNREP  | Underway Replenishment                           |
| XAC    | Xi'an Aircraft Company                           |

## Executive Summary

China is prioritizing three military development goals through 2030:

1. The ability to impose unacceptable costs on the access of, or freedom of maneuver within, China's first and second island chains. This includes the South and East China Seas as well as the waters out to Guam.
2. The ability to contribute to international commons operations, which China perceives as the responsibilities of a great power.<sup>1</sup> This is seen through China's involvement in the Gulf of Aden anti-piracy task force missions and participation in overseas humanitarian assistance and disaster relief (HA/DR) operations.
3. Defending China's overseas economic interests, particularly through the Belt and Road Initiative (BRI), including infrastructure and overseas Chinese nationals. The risk of terrorist activity targeting Chinese facilities and personnel is likely to be a major driver of People's Liberation Army (PLA) expeditionary combat operations through 2030.

In pursuit of these goals, China has pursued both organizational reforms as well as new military capabilities to aid in expeditionary operations. As part of broader organizational restructuring beginning in 2015, the PLA created the Logistic Support Department (LSD) and Joint Logistic Support Force (JLSF) to better support joint operations. The administrative separation of these two organizations divides responsibilities for force management and logistics implementation / operations support, countering corruption, enhancing joint logistics between the services, and better aligning the organizations with Central Military Commission (CMC) strategic planning. The JLSF manages the implementation of the joint logistics support system, coordinating logistics, personnel, and supplies to theater commands. Based at Wuhan Joint Logistics Support Base (JLSB), the JLSF directs five joint logistics support centers (JLSC) aligned with a specific theater command. The LSD provides PLA-wide strategic logistics planning, coordinates military-civil fusion, and determines strategic priorities. Together the two organizations are responsible for diverse logistics activities including inventory and warehousing, medical services, transport, force projection, oil pipelines, engineering and construction management, reserve assets management.

Additionally, both the People's Liberation Army Navy (PLAN) and People's Liberation Army Air Force (PLAAF) are rapidly expanding their offensive and logistical capabilities. These include the introduction of the PLAN's Type 055 destroyers, Type 075 landing helicopter docks (LHD), Type 901 fast replenishment ships, and indigenously designed aircraft carriers (including the Type 002 and future Type 003), as well as the PLAAF's Y-20 strategic transport aircraft, the Y-20 tanker variant, and the J-20 fifth-generation fighter.

Despite these advancements, the PLA is still in the early stages of developing its expeditionary military capabilities. As one defense analyst argued in the *South China Morning Post*, "bigger supply ships were no substitute for more overseas bases when it came to supporting the expanding mission of China's naval fleets."<sup>2</sup> Many of the PLAN's and PLAAF's new capabilities help to address long-standing deficiencies in expeditionary capabilities – including in anti-submarine warfare, maritime air-defense, strategic airlift, and tanker aircraft – but China has not yet had the time to develop the doctrine or experience necessary to maximize their use of these new capabilities.

The PLAN's primary replenishment capabilities lie in the nine Type 903A ships and two newly introduced Type 901 fast support ships, which are designed to support carrier groups. Altogether, this auxiliary fleet is capable of supporting approximately 20-30 surface combat ships for 2-3 weeks without replenishment, with the Type 901s also supporting the PLAN's two carriers. PLAN assets would need solid and liquid supplies from foreign civilian ports and/or domestic civilian container ships or tankers for operations exceeding that time period. The PLAN appears to be pursuing five basic expeditionary logistics models: accompanying

replenishment ships, civilian ports, logistics bases, replenishment relays, and civilian underway replenishment (UNREP).

The PLAN and PLAN Marine Corps (PLANMC) may be developing the capability to conduct organic amphibious combat operations in the model of a U.S. Marine Corps Marine Expeditionary Unit (MEU). The PLANMC has expanded to over 30,000 personnel in the last few years because of transfers from the PLA Army. Without foreign air bases and with limited aircraft carriers, China has a limited capability to project airpower beyond limited amphibious operations using its Type 075 LHD. Type 075s, in conjunction with Type 071 landing platform docks (LPD) and other, smaller landing ships, may be able to conduct limited amphibious operations overseas, but a lack of rotary wing assets (due in part to competition for capabilities with the PLA ground forces) will severely limit PLANMC amphibious assault capabilities at least until 2030.

Chinese analysts note that strategic airlift allows militaries to rapidly respond to emerging conflicts overseas, whereas naval power projection is significantly slower. The Y-20, China's new strategic transport aircraft, will significantly expand PLAAF expeditionary capacity by providing a rapid-reaction transport lift capability, but the lack of overseas airbases means that China will need to rely on civilian airports at least through the short term.

Chinese military analysts increasingly note the importance of military-civil fusion (军民融合) for expeditionary operations as well as China's BRI interests. China released several technical standards and laws beginning in 2015 that are designed to further military-civil fusion, including capabilities such as roll-on/roll-off and container ships. The PLAAF has also conducted exercises with civilian cargo aircraft companies so that these organizations can support expeditionary military operations if required. In fact, Chinese companies already have experience supporting some noncombatant evacuation and HA/DR operations. While these capabilities have important limitations, particularly in their utility during armed conflicts, coordination with the military command and control network, and in meeting military construction standards, they are nevertheless capable of supplementing PLA capabilities for operations short of armed conflict and fulfilling an emergency reserve function.

Through 2030, China's expeditionary capabilities appear primarily aimed at supporting the second and third goals above – the participation in international commons operations and the protection of overseas economic investments. Critically, although the PLA will likely be challenged to sustain overseas combat operations or operations in hostile countries through 2030, China is nevertheless rapidly developing capabilities necessary to disrupt U.S. interests in the Middle East, Africa, and throughout Asia. China's existing overseas operations in the Red Sea provide it with valuable experience and opportunities to develop expeditionary concepts of operations (CONOPS). The United States should monitor signs that China's overseas capabilities and/or goals have shifted, such as:

- The deployment of the PLAN's Type 901 fast replenishment ship, Type 075 LHD, or Type 055 destroyer on overseas operations (particularly Gulf of Aden missions)
- Pre-positioning of ordnance abroad, particularly at the Djibouti logistics support facility.
- An increase in the Type 901 or Type 903A's ability to transport solid cargo (for UNREP of ordnance)
- An increase in the number of helicopters – for anti-submarine warfare, tactical transport, or attack – available to the PLAN and PLANMC
- An expansion in the number of Type 901 fast replenishment ships
- The establishment of a military logistics facility for aerial replenishment or the frequent use of a foreign airfield

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The PLA's actual fixed overseas footprint may continue to remain light until approximately 2030 because it can still rely on civilian infrastructure and platforms to support its expeditionary operations. However, after 2030, the PLA will likely pursue more dedicated military bases beyond its existing Djibouti Logistics Support Base. The PLAN and PLAAF's capabilities in 2035 would theoretically allow the PLA to perform higher-level overseas combat operations, but operations in contested environments will almost assuredly require overseas military facilities or, at the least, preferred access to both ports and airfields in friendly countries. Further, the PLA will still likely have limited capability to conduct operations in hostile countries with integrated air defense systems without support from future PLAN aircraft carriers. This may be difficult for the PLA given slowing economic growth and defense budgets.<sup>3</sup>

## Methodology, Scope, and Study Limitations

This study is intended to assess China's military logistics capabilities, concepts of operation, and organizations to conduct expeditionary operations. It is divided into four sections. First, we assess the People's Liberation Army (PLA) Joint Logistics Support Force (JLSF), including its structure, mission, and personnel, to understand its ability to support overseas missions. Second, we consider where China might seek to develop additional overseas military bases and its objectives in doing so. Third, we analyze the PLA's expeditionary capabilities – with a focus on in-development capabilities (such as strategic airlift, naval replenishment ships, and amphibious warfare capabilities) to project and sustain forces abroad. Finally, Jane's surveys the role of civilian organizations and capabilities to better understand how dual-use assets and military-civil fusion (军民融合) could assist in expeditionary logistics.

Unless otherwise specified, the “short term” future refers to 2020-2025, “medium term” refers to approximately 2025-2030, and “long term” refers to after 2030. In the context of this report, “expeditionary” operations refer to the PLA's overseas operations, generally beyond the South and East China Seas. These operations require replenishment and/or basing overseas. Following this definition, this report does not examine PLA activities in Central Asia.<sup>4</sup>

Jane's gathered a variety of sources during our analysis. Jane's focused on primary Chinese sources, including Chinese news organizations and official PLA websites. Critically, we also searched through Chinese forums, which were a particularly valuable source of data and imagery of in-development military capabilities. Through our partnerships with Maxar Technologies and Airbus Defense and Space, Jane's was able to leverage up-to-date, high resolution satellite imagery to better understand the suitability of specific sites as potential PLA overseas bases. Finally, we created or used a number of quantitative databases to analyze and visualize various aspects of PLA expeditionary capabilities. For example, Jane's created a dataset of the PLA's Gulf of Aden deployments and used the American Enterprise Institute and Heritage Foundation's China Global Investment Tracker. We also made extensive use of Jane's internal defense and military data, including procurement information in *Jane's Defense Procurement*, satellite imagery analysis from *Jane's Satellite Imagery Analysis*, equipment specification data from *Jane's All the World's Aircraft* and *Jane's Fighting Ships*, and order of battle information from *Jane's Military and Security Assessments*.

There are nevertheless some limitations to our analysis. There are countless civilian organizations that may be able to contribute capabilities – roll-on / roll-off vessels, container ships, and civilian aircraft – towards expeditionary operations if required. A completely comprehensive survey of available and future assets would be a valuable addition to U.S. understanding of China's dual-use capabilities, but Jane's attempted to focus on the most representative and potentially impactful capabilities. Second, additional research into Chinese language academic writings – particularly those from PLA military colleges and think

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tanks – would be very valuable. While Jane's incorporated those sources into this report, there are additional resources for future studies to consider.

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## 1. China's Expeditionary Operations Logistics System

This section will assess the organizational reforms that the PLA has undertaken to improve joint logistics support, including the creation of the Logistics Support Department (LSD) and the Joint Logistics Support Force (JLSF).

### China's Logistics Reform Effort: Dimensions and Drivers

China has undertaken expansive reform of its military logistics system as part of broader People's Liberation Army (PLA) organizational restructuring begun in late 2015. At an institutional level, these reforms consolidated command authority in the Central Military Commission (CMC) and improved the PLA's ability to conduct joint operations. According to the 2019 State Council Defense White Paper "China's National Defense in the New Era", the objective of the reforms was to advance the establishment of a "modern and specialized military capable of fighting and winning wars in the information age" and to "improve the operational effectiveness and development of efficiency of the military."<sup>5</sup>

The development of a joint logistics system is critical to improving the operational effectiveness and development of efficiency of the PLA. Indeed, the PLA defines joint logistics largely in terms of efficiency, referring to a system that "unifies the organization of the services to implement basic logistics work; avoids duplicate staffing, organizations, and facilities; and rationally distributes workforce, material, and financial resources to support joint operations and joint activities."<sup>6</sup>

The reforms also cleared the way for the establishment of two new organizations that now anchor the PLA efforts to develop and deploy a joint logistics support system with these characteristics, both in supporting local and expeditionary operations and contingencies: the Logistic Support Department (LSD) and Joint Logistic Support Force (JLSF). The combined efforts of these organizations have created a logistics system more capable of supporting joint operations, especially along internal lines of communication. These organizations also have featured in the refinement of processes, practices, and relationships that will support China's "going out" effort and need to protect its expanding global interests.

However, both the LSD and JLSF are at a relatively early stage in their development and judgments of their success are premature. They continue to adapt and adjust their priorities to address a range of persistent gaps in capabilities, integration inefficiencies, and organizational and technological constraints.

### Military and Geopolitical Drivers of PLA Logistic Reform

The main military driver<sup>7</sup> for these PLA reforms and for on-going refinement of China's logistics support system is the urgent need for the PLA to deepen its understanding of and capacity for jointness in an informatized environment. These reforms seek to integrate the activities of multiple components of the PLA in a coordinated effort, under a single command authority.

Joint operations have become a fundamental part of modern warfare<sup>8</sup> and are critical to meeting the increasingly dynamic, crowded, and uncertain operational environments in which conflict is taking place simultaneously across multiple domain areas. Competition in the traditional military domains of land, air, surface of the sea, and undersea have been augmented over the past decade by activity in the cyber domain, electromagnetic spectrum, and space. The need to coordinate activities across all these domain areas and adapt to frequently fluid conditions places a premium on jointness, especially joint command and control, logistics, and training, especially in a "highly-informatized" environment. Chinese military writings have frequently used the term "informatized" to capture the prominence of information collection, processing, and dissemination as well as the requirement to better exploit information and integrate information technologies in modern military activities.



The PLA since the first Gulf War has recognized a significant vulnerability related to its capacity to organize, train for, and conduct joint operations. As experiments in joint operations have progressed, the PLA has concentrated efforts on breaking service silos, ensuring joint logistics support, and addressing a lack of combat experience, especially among operational commanders.<sup>9</sup> As a result, joint training, including logistics training, has become a critical priority. China's 2019 defense white paper noted that China's increased defense spending since 2012 has emphasized, "supporting training in real combat conditions, enhancing strategic-level training, joint training at the [theater command] level and training of services and arms, and improving the conditions for simulated, networked and force-on-force training." The paper also listed "establishing and improving the joint operations command system" as one component of reforming the PLA's leadership and command system.<sup>10</sup>

An efficient joint logistics system capable of delivering precision logistics—providing the right support at the right place in the required amount<sup>11</sup>—is also essential to building these sought-after joint operations capabilities.<sup>12</sup> While the main focus of the reforms has been on supporting joint operations and "winning modern regional wars"<sup>13</sup>, PLA logistics reform will also provide resources and mechanisms to support China's efforts to protect its growing overseas interests.

Zhou Bo, the director of the Center for Security Cooperation in the Ministry of National Defense's (MND) Office for International Military Cooperation effectively summarized the scale of these interests in an August 2019 article in *Foreign Policy* magazine: "As the world's largest trading nation and exporter, [China's] overseas interests include, among other things, the safety and security of more than 1 million Chinese nationals working overseas, 140 million Chinese travelling abroad every year, some 40,000 Chinese enterprises around the globe, and overseas property and investment of \$7 trillion." According to Zhou, the PLA cannot be the only means of protecting these expansive interests, but "a forward presence is useful."<sup>14</sup>

Indeed, the 2019 defense white paper "explicitly states "overseas interests are a crucial part of China's national interests" and "one of the missions of China's armed forces is to effectively protect the security and legitimate rights and interests of overseas Chinese people, organizations and institutions."<sup>15</sup> Prominent PLA activities and investments in the broad areas listed below have reinforced the emerging importance of this mission.

- **Platforms:** China's massive naval ship-building campaign has an increasing focus on developing capabilities to project power and protect China's overseas interests. The commissioning in December 2019 of the *Shandong*, China's second aircraft carrier and first indigenously designed and built aircraft carrier is a strong indicator of intent, especially when seen in conjunction with the development of new destroyers and support ships.
- **Personnel:** In 2017, the PLA announced the expansion of the PLANMC from approximately 10,000 personnel to about 30,000 troops by 2020. The scope of PLANMC missions has also expanded to expeditionary operations as well. According to Alan Burns at CNA, "over several years, the PLANMC has been developing into a rapid response force that could be tasked with conducting a variety of expeditionary missions to defend China's overseas interests."<sup>16</sup>
- **Basing:** The establishment in 2017 of China's first overseas base in Djibouti was an important development in China's power projection and overseas operations efforts. According to the Chinese MND, the base was "built to better fulfill the international obligations such as such as escort missions in the Gulf of Aden and waters off the Somali coast, as well as to provide humanitarian relief."<sup>17</sup> In addition, the base provides a useful position from which to carry out non-combatant evacuations of Chinese citizens living in the region as well as counter-terrorism and other military missions. The base's location at the junction of the Red Sea and Gulf of Aden also

provides China broader strategic value in protecting and expanding its interests in Africa and the Middle East and reinforcing China's energy security. The base sits along the Bab el-Mandeb strait, a critical sea lane through which approximately 6.2 million barrels a day—about 9% of total seaborne trade in oil—transited in 2018, moving to and from the Suez Canal. About 2.6 million barrels a day were being shipped to Asian markets including China.<sup>18</sup>

- **Operations:** Since December 2008, the PLAN has participated in anti-piracy missions in the Gulf of Aden, and reportedly escorted over 6,600 civilian ships, more than half of which were foreign.<sup>19</sup> According to *Xinhua*, by the end of 2018, China's navy had "sent out 26,000 officers and soldiers" since 2008 as part of this Gulf of Aden mission.<sup>20</sup> While specific numbers of ships escorted at any time varies, there are quantitative indications of the operational tempo of China's counter-piracy mission. According to reporting in *China Military Online*, the 30<sup>th</sup> PLA escort task force escorted 59 vessels in 31 "batches" over its nearly four months deployment from September 1, 2018 to December 24, 2018.<sup>21</sup> The counter-piracy mission has also afforded China the opportunity to increase the deployment of PLA Navy submarines in the Indian Ocean purportedly in support of the transit of task forces to the Gulf of Aden. The "growing footprint" of the PLAN has raised concerns in the United States, India, and other countries like Japan that rely on secure shipping lanes through the Indian Ocean. According to the 2018 U.S. Department of Defense report to Congress on China's military activities, "these submarine patrols demonstrate the PLAN's emerging capability both to interdict sea lines of communication (SLOC) and to increase China's power projection into the Indian Ocean."<sup>22</sup> In addition, Chinese forces have deployed abroad to support the evacuations of Chinese citizens from both Libya and Yemen. The PLAN is also increasing its deployments and independent operations in the Atlantic Ocean along the western coast of Africa to support the growing scale of Chinese investment there as well as Chinese citizens living in West Africa.<sup>23</sup>

Jane's research also suggests that the development of a more centralized, high-profile, empowered, and effective logistics operation brings additional strategic importance, especially in the development or furtherance of valuable geopolitical relationships.

The nature of logistics operations offers an opening for the LSD to provide material support for the expansion of soft power to strategically important states that might otherwise be resistant to directly engaging with the PLA. It is far more palatable for countries to deepen PLA direct military-to-military contact on natural disaster relief or medical exercises than combat-focused exchanges.

One notable example of how China is using its joint logistics organizations to deepen strategically important geopolitical relationships is seen in recent developments in Djibouti. In January 2020, 10 PLA medical personnel stationed at the PLA support base in Djibouti received the Djibouti Independence Day medal. Lt. General Zakaria Sheikh Ibrahim, the Chief of General Staff of the Djibouti Armed Forces, awarded the medal – "the highest medal awarded to Djibouti's citizens and friends" – for "humanitarian relief operations including public welfare in assisting impoverished students, medical assistance, as well as rescue and disaster relief, bringing about genuine help to the Djiboutian people." The JLSF is also currently engaged in a special medical service operation in Djibouti known as "Operation Bright Eyes" to treat over 100 cataracts patients since December 2019.<sup>24</sup>

PLA medical and humanitarian activities in Djibouti are notable because the United States also maintains a strategically important base in Djibouti only six miles from China's, creating a unique and uncomfortable situation for the United States. As Kate Almquist Knopf, the director of the U.S. Department of Defense's Africa Center for Strategic Studies noted, "there is nowhere else in the world where the U.S. military is

essentially co-located in close proximity to a country it considers a strategic competitor. This is not something the Pentagon is used to.”<sup>25</sup>

This discomfort is partly rooted in the potential for disruption and observation of U.S. military operations and personnel in Djibouti. For example, in May 2018, the U.S. Department of Defense released a Notice to Airmen warning of numerous incidents “involving a high-power laser” being used to blind pilots approximately 750 meters from China’s Djibouti base. At least two U.S. airmen were injured as a result. There is also a persistent potential for a “quiet contest” between the United States and China to surreptitiously collect information about the other’s capabilities, operations, and personnel.<sup>26</sup>

Moreover, China’s military presence in Djibouti, and its continued medical operations there, creates a more strategic challenge for soft power influence with the Djibouti government that could harm U.S. interests in the Middle East and North Africa over time. The medal ceremony and “Operation Bright Eyes” will not in and of themselves give Djibouti cause to expel the United States, but when viewed through the prism of great-power competition they do contribute to broader Chinese efforts to gain leverage and influence over the Djibouti government. In conjunction with Belt and Road Initiative (BRI) investments, such goodwill missions deepen could alter Djibouti’s decision-making on important strategic issues such as, for example, future PLA efforts to expand its base or potential petitions to limit U.S. in-country activity.

China’s recent military engagement with Germany is another example of China’s use of its joint logistics organizations as tools in a broader strategy of military engagement with U.S. allies and partners. In July 2019, China and Germany held a joint logistics exercise known as “Combined Aid-2019” that included 91 Chinese military personnel and more than 80 observers from the United States, Japan, Austria, and France. The exercise was built on a scenario of a health crisis at a fictitious refugee camp and designed to test Chinese and German capacity to respond to “non-conventional security challenges.”<sup>27</sup> It was the second China-Germany joint logistics-focused exercise. The first was held in Chongqing in 2016 and revolved around response to a “fictitious earthquake scenario.”<sup>28</sup> This exercise was explicitly mentioned in the 2019 defense white paper as an example of the “sound progress” China was making in “actively developing its military relations with European countries.”<sup>29</sup>

As with the PLA’s medical support in Djibouti, these exercises do not signal an imminent fracture in US-German relations. However, they should be seen as important components of China’s broader efforts to strengthen ties with Germany, Europe’s largest economy, during a time of relative friction with the United States on defense and security issues. According to Wang Yiwei, an expert in European studies at Renmin University of China, “as the leader of the EU, Germany has said that Europe should take charge of its own security. It is also a brand-new world security situation now, as both China and Europe would want to hedge their risks in dealing with the US.”<sup>30</sup>

Combined Aid-2019 also helps normalize perceptions of China’s military and expansion of its activities outside of the Indo-Pacific as being benign and consistent with global norms, international institutions, and humanitarian objectives. Retired PLA colonel Yue Gang observed that the strategic value of the exercise surpassed its operational value, assessing that “given that NATO has been suspicious and wary of China’s military development, and this is a member of NATO this breakthrough underscores the considerable trust-building taking place between Germany and China, and it may even set an example for others to follow.”<sup>31</sup> Significantly, German military statements on the exercise focused on the potential for combined China-Germany medical operations as part of “a UN scenario.”<sup>32</sup> This theme was central to reporting from German news outlet *Deutsche Welle*, which noted that “even these tentative first steps help these UN peacekeeping partners gain a better understanding of each other.”<sup>33</sup>

In addition to these two examples, since its founding the LSD has also held joint logistics exercises with Laos, Vietnam, and Russia, among others, while LSD leadership have had high-level meetings with logistics leaders from the militaries of Israel<sup>34</sup>, the United Kingdom<sup>35</sup>, several Latin American countries<sup>36</sup>, and New Zealand.<sup>37</sup> The LSD also has held high-level meetings with South Africa<sup>38</sup>, a country that continues to play a conspicuously important role in supporting the PLAN's growing Atlantic Ocean operations.<sup>39</sup>

## Logistics Support Department and Joint Logistics Support Force

China's logistics reforms must be seen in the context of the sweeping CMC-led reforms begun in late 2015 that codified PLA emphasis on joint operations rather than services-based operations and guaranteed "the Party's absolute leadership of the military and the CMC's centralized leadership."<sup>40</sup>

Crucial reform components included the February 2016 announcement of the replacement of the PLA's seven military districts with five theater commands subordinate to the CMC (see figure 1). Theater commands are largely responsible for combat operations and control the services components within their respective district. The creation of this three-layered CMC-Theater-Services construct is based on the principle that "CMC takes charge of the overall administration of China's armed forces, Theater Commands focus on combat, and different military services pursue their own construction"<sup>41</sup> and was an essential step in moving toward unified joint operations.

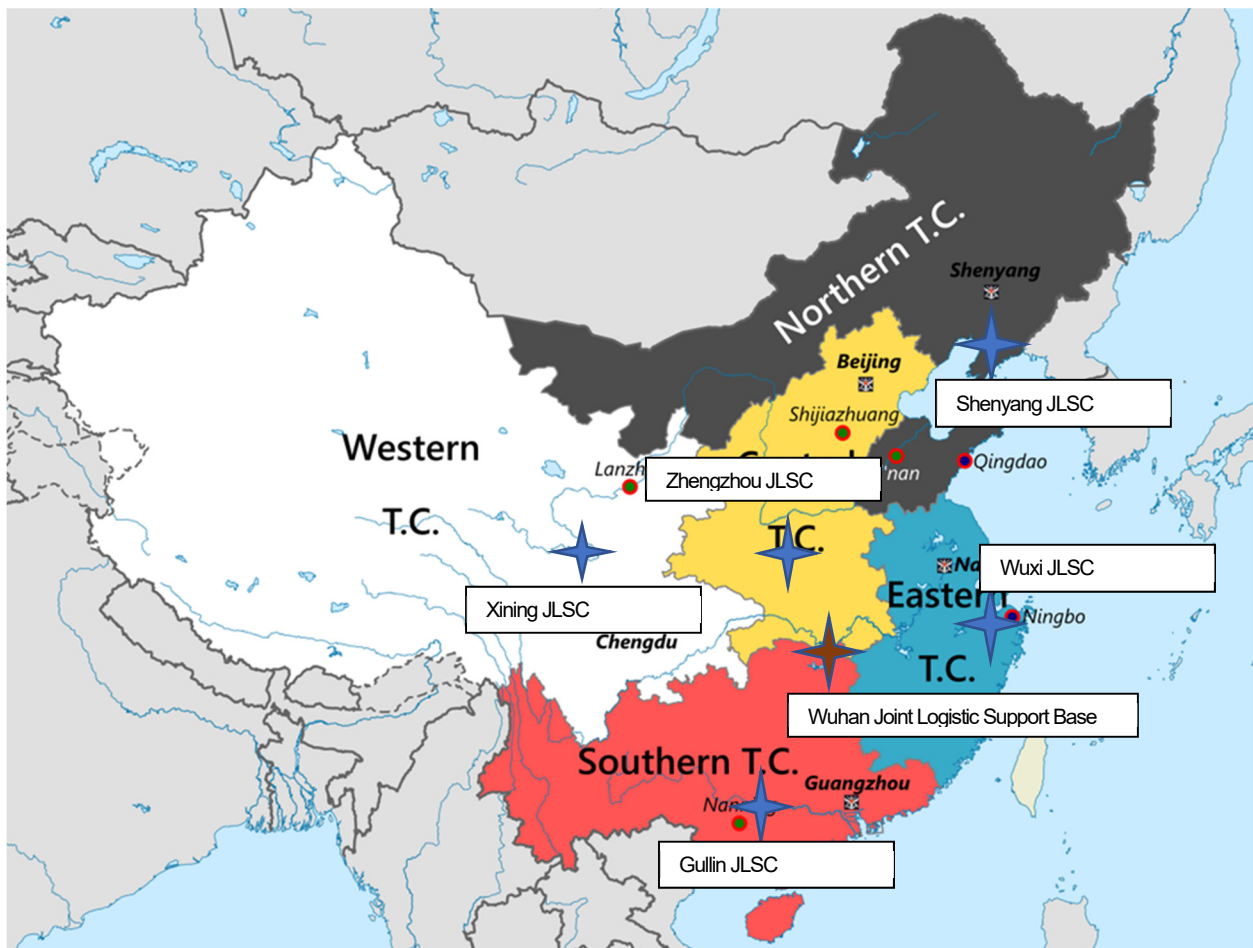


Figure 1: Map from [Wikipedia](#), edited by Jane's.

A second piece of joint logistics reform occurred in March 2016 when the CMC replaced the four headquarters / departments of the CMC – the General Logistic Department (GLD), the General Staff Department, General Political Department, and General Armaments Department – with 15 “functional segments, including seven departments, three commissions and five directly affiliated bodies.”<sup>42</sup>

Among the 15 new organizations created was the Logistic Support Department (LSD). Elimination of the GLD and creation of the LSD was more than just a rebranding exercise. The LSD retained the GLD’s responsibility for “planning the logistics support for the whole military, policy study, standards setting, inspection and supervision”<sup>43</sup> as well as materiel management, facilities management, and procurement. However, the LSD did not retain responsibility for the implementation of this strategic planning that previously was owned by GLD direct subordinate units. In addition, the GLD, in particular, had “developed into a sprawling, semi-independent fiefdom (s) with limited external oversight”, inviting rampant corruption.<sup>44</sup>

Ultimately, LSD activities are aligned with the broader CMC mandate of macro-management and strategic planning and include determining policy and priorities, commissioning research projects, and establishing standards. For example, in December 2019 the LSD announced that the PLA will increase use of modular buildings and prefabricated structures in the construction of military facilities. The decision was intended to increase efficiency by shortening construction time, reducing resource consumption and environmental pollution, and increasing standardization. The LSD also arranged for the commission of pilot projects to “promote prefabricated buildings in the military and then conduct synchronous research on the results of those pilot projects so as to formulate the construction standards that meet the requirements of actual combat as soon as possible.” The initiative is expected to reduce consumption of resources and environmental strain associated with current practice of “using reinforced concrete and heavy masonry” and also to increase the flexibility of PLA forces to deploy to locations characterized by “harsh natural condition, short construction period and insufficient raw material supply.”<sup>45</sup>

The third main reform that has shaped China’s current joint logistics system was the establishment of the Joint Logistic Support Force under the Joint Staff Department in September 2016. The JLSF was established to manage the implementation of a joint logistics support system, working closely with the theater commands to provide the appropriate general logistics support as required.

The JLSF is based at Wuhan Joint Logistics Support Base (JLSB) and directs five joint logistics support centers (JLSC), which are aligned to a specific theater command. These JLSCs are subordinate to the Wuhan JLSB but provide direct support to the theater commands in which they reside. The U.S. DoD in 2019 noted that the JLSF has assigned a representative to each of the theater joint command centers, thereby allowing support forces to operate in the same command network as combat forces during an exercise, which results in better coordination of various support missions.<sup>46</sup> The leadership of the JLSF and JLSCs are somewhat unclear, though announcements of the JLSF establishment indicate that the commander (司令员) of the Wuhan JLSB is Li Shisheng (李士生, image bottom right) and the Wuhan JLSB political commissar (政治委员) is Yin Zhihong (殷志红).<sup>47</sup> The deputy political commissar is Chen Jian.<sup>48</sup> The JLSF commander is Li Yong (李勇, image top right), also the Lieutenant General of the PLA AF, his deputy is Bai Zhongbin, and the JLSF political commissar is Xu Zhongbo (徐忠波).<sup>49</sup>

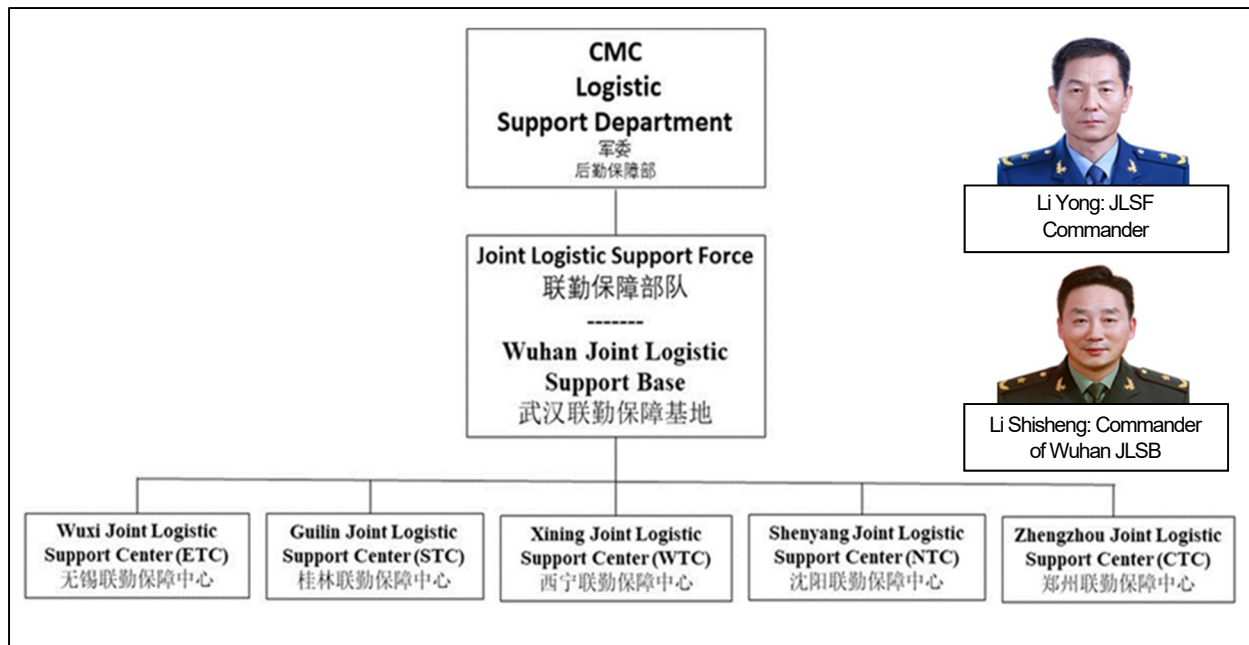


Figure 2: The Joint Logistics Support Base and Joint Logistics Support Center structure. Source: McCauley, "Modernization of PLA Logistics: Joint Logistic Support Force", Testimony before the U.S.-China Economic and Security Review Commission: China's Military Reforms and Modernization: Implications for the United States,

A series of events in 2018 and 2019 reflect the strong CMC support for the JLSF and the broader logistics systems reform effort. In July 2019, JLSF member Wu Yong became the first JLSF soldier to be awarded the title of "most admirable serviceman in the new era" by the Publicity Department of the Chinese Communist Party for his support to the maintenance of oil pipelines.<sup>50</sup> More than 300 JLSF personnel marched during the October 1, 2019 military parade marking the 70<sup>th</sup> anniversary of the founding of the People's Republic of China. Reporting from China's MND noted that "compared with previous parades, Tuesday's event highlighted the armed forces' enhanced capabilities in carrying out joint combat and logistical support operations."<sup>51</sup> Later in the month, General Secretary Xi met with delegates at the first Party Congress of the JLSF in Wuhan on October 18, 2019, encouraging the JLSF to "faithfully perform their duties, push for new progress and contribute to fulfilling the dream of a strong military."<sup>52</sup>

Together the LSD and JLSF are charged with leading the development, implementation, and refinement of a joint logistics force responsible for implementing integrated joint operations, supporting joint training, and providing strategic and campaign joint logistics. Specifically, the two organizations are responsible for inventory and warehousing, medical services, transport, force projection, oil pipelines, engineering and construction management, reserve assets management, and procurement in line with the below four principles:<sup>53</sup>

- Combat effectiveness through the establishment of an effective joint logistics organization and system
- Maintaining a strong focus on joint combat, training, and support in peacetime and wartime
- Commitment to the concept of "integrating those can be integrated and differentiating those have to be differentiated." This guidance applies both to resource allocation and separation of responsibilities between the JLSF (which is responsible for general-purpose materials and equipment)-and the services (which are responsible for special-purpose materials and equipment).

- Persistent emphasis on military-civil fusion and engagement of non-military resources such as Chinese commercial shipping companies to improve the overall efficiency of joint logistic support.

Within this system, three important distinctions between the organizational responsibilities of the LSD, JLSF, theater commands, and military services are worth exploring. First, it is important to understand the different roles of the LSD and JLSF. Critically, the separation of the LSD – a department within the CMC – and the JLSF, which is administratively under the CMC Joint Staff Department, separates force management from logistics implementation and operations support, as reflected in the table of reported responsibilities of each organization below.<sup>54</sup>

| <b>Logistic Support Department: Force Management and Strategic Planning</b>                             | <b>Joint Logistic Support Force: Implementation and Operations Support</b>                                   |
|---|--|
| <b>PLA-wide strategic logistics planning</b>  | Coordination of logistics support to theater commands  |
| <b>Materials management and procurement and facilities management</b>                                   | Managing the storage and distribution of material, fuel, ordnance  |
| <b>International military engagement</b>  | Directing transportation, field medical, and subsistence support to PLA units assigned to theater operations |
| <b>Overall administrative of PLA hospitals and medical programs</b>                                     |  |
| <b>Coordination of military-civil integration strategy</b>  |  |
| <b>Science and technology priority determination and development</b>                                    |  |
| <b>Integration of land, air, rail, and maritime transportation integration of military requirements</b> |  |
| <b>Improving logistics reserve forces</b>   |  |
| <b>Standardizing information technology standards</b>   |  |

Second, there is also a distinction between peacetime and wartime command and control. During peacetime, the JLSF through the JLSCs is largely responsible for the provision of logistics support to the theater commands and operates separately from the theater commands. However, during wartime, the theater commands assume control of the JLSCs located within their geographic area. The JLSF can also form contingency logistics support brigades – “modular ad-hoc units to provide rapid comprehensive logistics support in a main operational direction” – and reserve logistics support brigades are available for mobilization.<sup>55</sup>

Reserve logistics support brigades are an important part of the joint logistics system<sup>56</sup> and of China’s national defense efforts to deal with both “emergencies and wars.” The International Institute of Strategic Studies “Military Balance” estimates that China’s reserve forces in 2018 totaled 510,000 troops.<sup>57</sup> According to China’s MND, these reserve forces are separated by service and consist of the “Army Reserve, Navy Reserve, Air Force Reserve and the Second Artillery Force Reserve.” The chart below lists the various components of each service’s reserve force<sup>58</sup>:

| <b>Service</b>                 | <b>Components</b>  |
|--------------------------------|--|
| Army Reserve                   | <ul style="list-style-type: none"> <li>• Infantry, artillery, antiaircraft artillery, antitank artillery, tank, engineering, chemical defense, signals, coastal defense, and other specialized forces</li> </ul> |
| Navy Reserve                   | <ul style="list-style-type: none"> <li>• Reconnaissance, mine-sweeping and mine-laying, radar observation and communications, and other specialized forces</li> </ul>  |
| Air Force Reserve              | <ul style="list-style-type: none"> <li>• Ground-to-air-missile, radar, and other specialized forces</li> </ul>   |
| Second Artillery Force Reserve | <ul style="list-style-type: none"> <li>• Specialized missile support force and special equipment and maintenance force</li> </ul>  |

Reserve units are organized mainly on a regional basis. The MND explains that “divisions are set up in provinces and brigades in prefectures. A division can be set up in a region covering more than one prefecture, and a regiment in a region covering more than one county.”<sup>59</sup>

In 2017, the PLA reduced Army reserve forces while increasing the size of the reserves of other services. The move was made as part of other significant changes – including an overall reduction in PLA size of 300,000 troops by the end of 2017—designed to better align PLA structure and personnel skills with the changing nature of conflict and PLA missions.<sup>60</sup>

The lack of specific mention of logistics reserves does not mean that services reserve forces are not focused on logistics issues. PLA reporting from 2017 on the annual training of the Chongqing Army Reserve Logistics Support Brigade reflects the nature of the specialized support specified by the MND. According to the description of the exercise: “100 cubic tactical oil depots were opened in 10 minutes, and tankers from PetroChina’s Chongqing branch quickly entered the area to complete the task of receiving, storing, distributing oil and refueling vehicles.” The exercise also included ambulances, tents hidden in camouflage, and different rooms for triage, serious injury, X-ray, and surgery.<sup>61</sup>

The effectiveness of China’s reserves is unclear due to several structural challenges, most notably around a lack of sufficient and standardized training. For example, in a February 2019 article in *The National Interest*, Lyle Goldstein, a research professor at the US Naval War College’s China Maritime Studies Institute, profiles an article on PLA military logistics written by two professors from China’s National Defense University. One of the author’s recommendations to improve PLA joint logistics is to increase Chinese exercises of reserve forces in respect to “missions”, “time”, “content”, and “quality.”<sup>62</sup>

The need for improved training has secondary effects that could create dilemmas for both the PLA and for the commercial enterprises from which reserve personnel are taken. According to veteran Asia analyst and USCC Commissioner Larry Wortzel, training reserve units for modern warfare is “far more complex than in the past, involving skills such as network services, computer defense, missile repair, and aircraft maintenance.” Standardized training solutions will take longer, potentially leading to complaints from “provinces, counties and enterprises” over “lost time, wages, and material.”<sup>63</sup>

The third important distinction is between generalized and specified logistics support. The JLSF and JLSCs are responsible for the provision of generalized joint logistics support; that is, support that is applicable across the joint force. However, there remains a role for the services, providing specialized and service – specific logistics support to the theater command operations. As the MND explained, the joint logistics system has the JLSF “as the backbone, military services as the complement, integration of centralized and decentralized logistic support, and two support lines including generalization and specialization.”<sup>64</sup>

The JLSF is the primary focus of the state media reporting on PLA logistics activities. For example, PLA media coverage of the on-going coronavirus crisis has placed the JLSF at the center of the response and largely praised the efficiency and effectiveness with which it has moved since late January to help stem the crisis,<sup>65</sup> the epicenter of which is ironically in Wuhan.

Nonetheless, Chinese authors have consistently highlighted the challenges and persistent tensions associated with the transition to a joint logistics system with the JLSF rather than the former military regions and supporting services at the center. A 2017 article on PLA medical services notes that the 2015 and 2016 reforms have “presented new challenges to the organization and implementation of medical services. Now the military medical service belongs to the command of joint security forces which is an independent arm instead of being led by the military region.”<sup>66</sup>



# Jane's

A January 2019 article by Major General Huang Tainxin, the political commissar of the joint logistics center in Shenyang, assesses that the reformed logistics system shows characteristics of a fragmented organizational structure. It argues that a modern joint logistics system requires further work to take advantages of the efficiencies of the new flat structure, including a focus on strengthened centralized and unified leadership and political training.<sup>67</sup>

## Continuing Development Priorities and Challenges

The result of China's joint logistics reform has been an increasingly competent joint logistics force that is capable of delivering joint logistics support to the five theater commands in both peacetime and in combat and is beginning to leverage the processes and mechanisms created by these reforms to sustain operations to protect China's global interests. But the development of China's joint logistics system is at a relatively early stage and is still evolving to respond to changes in the operational environment and technological development as well as adapting lessons learned from ongoing reform efforts.

A review of Chinese sources and U.S. observers of China's military reform and modernization identifies five prioritized development areas or continued challenges slowing the full realization of organizational reform, in some cases both. Significantly, many of these priorities and challenges are not unique to the joint logistics support system and are consistent with identified challenges facing the PLA's broader shift to joint operations.

### Integration and Bureaucratic Resistance

A common theme across most analyses of China's logistics systems reforms is the persistent need for comprehensive transition to a joint approach and more complete integration of the legacy logistics systems of the individual services. In other words, there is growing urgency and importance to replacing the old concept of "single service victory" [danyi junzhong zhisheng, 单一军种制胜] with winning as a joint force.<sup>68</sup>

And as noted above, the engagement between JLSF and the services in the theater commands appears to still suffer from the persistence of this instinct.

The 2018 DoD report to Congress highlights this organizational challenge, noting that China's successful transition to a joint force "depends greatly on strong centralized leadership and direction that can dispel inter-service rivalries."<sup>69</sup> U.S. National Defense University's 2019 book "Chairman Xi Remakes the PLA" frequently touches on the theme of organizational resistance to PLA reforms, emphasizing at a broad level that "inter-service rivalry and competition for resources and missions remain powerful obstacles to jointness."<sup>70</sup> More specifically, it asserts that PLA logistics organizations have "resisted numerous previous efforts to reform the system to more effectively support joint logistics."<sup>71</sup>

Institutional rivalry and resistance are felt in and across China's joint logistics systems as are inefficiencies stemming from a lack of integration of related functions within the joint logistics systems. In an October 2018 article, Zhang Aimin, a professor at the Equipment Support Department of the Army Military Transportation University in Tianjin, stresses the need for unified command, close coordination, and clear delineation and delegation of responsibilities. However, it also recommends the integration of planning, training, standards, and operations of sub-sets of the logistics and equipment support system, such as combat readiness, emergency response, post command, emergency mobilization, and equipment support.<sup>72</sup>

### Enhancing Military-Civil Fusion

Military-civil fusion is one of the four guiding principles articulated by the CMC (listed on page 7 above) for the operation of the JLSF and is a prominent area of continued focus and improvement.

# Jane's

The PLA calls upon civilian transportation, logistics assets, and infrastructure as part of its support to operations, deployments, and exercises along its internal supply lines and in the five theater commands. A profile of the Wuxi Joint Logistic Support Base published four months after the establishment of the JLSF offers insight into the ways in which the new joint logistics system calls on support of “deep military-civil integration.” Examples include using local air, land, and maritime transportation to support medical evacuations and deployments and even the use of local subways to bypass rush hour traffic in transporting troops across the city.<sup>73</sup>

Enhanced military-civil fusion is also a key component of China's logistics support to the PLA's growing overseas deployments and activities. The *National Defense Transportation Law*, passed in September 2016, the same month as the establishment of the JLSF, improved the PLA's ability to leverage civilian carriers to support expeditionary operations and power projection by “placing obligations on Chinese transportation enterprises located abroad or engaged in international shipping overseas.” The law also requires large and medium-sized Chinese companies to provide “rapid, long-distance, and large-scale national defense transportation support.”<sup>74</sup>

And there is some evidence of progress in the increased coordination and use of civilian transportation assets and infrastructure capable of filling gaps in China's current long-range strategic logistics support. In late 2019, the PLAN conducted a test to establish a modular underway replenishment system (UNREP) on a civilian ship, “successfully providing logistics support to naval ships at sea.” According to the MND, the test involved the commercial ship transferring supplies to the frigate Linyi across a wire rope between the two ships, a process that took approximately 30 minutes. The MND claims that “using civilian ships to carry out UNREP for naval ships is a new attempt in the field of naval logistics support” and that “the breakthrough provides a strong logistics support for the Chinese navy to go to the high seas.”<sup>75</sup>

Some observers, both in China and outside, view integration of military and civilian logistics planning and operations as a potential strategic vulnerability. Especially concerning is a gap in standards as well as training between the military and its civilian / commercial partners. Large numbers of ships, for example, were built before the 2015 release of the *Technical Standards for New Civilian Ships to Implement National Defense Requirements*, meaning that most of these ships will require “significant modification.” A December 2019 report on “Civil Transport in PLA Power Projection” by Conor Kennedy of the Naval War College cites a 2017 assessment from the deputy commander of the Northern Theater Command Army that out of 200,000 transport vessels in China at the time, fewer than 2,000 were suited for “direct mobilization.”<sup>76</sup>

Some efforts are being made to bridge this gap, especially in training, through increasing interactions and exercises between military and civilian stakeholders. For example, the JIDI BAOZHANG exercise took place in the Tibet Military District in June 2018. The exercise stressed military-civil fusion and included LSD components working closely with local civilian entities to construct temporary bridges, transport fuel, and deliver food to troops in the field.<sup>77</sup>

## Informatization of Logistics Systems

The PLA drive for precision joint logistics in a highly-informatized operational environment requires integration of innovative and advanced information technologies into logistics equipment and support processes. Integrating military support and command systems and those of civilian partners is critical to avoiding gaps in information and strategic or operational situational awareness.

Enhancing automation of the joint logistics process and integrating advanced information technologies has been an important priority for PLA logistics reform since the establishment of the JLSF in 2016. In fact, the

2017 profile of the Wuxi JLSC that appeared in *China Youth Daily* prominently mentions the efficiencies gained through automation and the use of advanced information technologies, including recounting an anecdote of how within half-an-hour of the click of a mouse, four oil tankers carrying 80 tons of fuel were rushed to a PLA Rocket Force base.<sup>78</sup>

But clear technology and integration gaps remain. Leigh Ann Luce, an independent analyst, and Erin Richter, a senior intelligence officer at the U.S. Defense Intelligence Agency, identified initial technology requirements to further information technology and integration:

- Unified military logistics standards—a requirement also prominently referenced in evaluations of organizational integration
- Military logistics sensing and collecting capabilities, to include “Internet of Things sensing and identification technology that allows for real-time, dynamic visualization and control
- Construction of a ubiquitous information transmission network
- A robust information management platform to enable data storage, efficient processing, rapid retrieval
- Development of comprehensive enterprise applications<sup>79</sup>

The LSD has taken the lead in meeting these requirements. In June 2017, the organization released calls for research on “logistical cloud data center transformation and design and implementation”, which “marked a groundbreaking step in the military’s logistics science and technology field.”<sup>80</sup> Another indicative LSD – led research effort – “Key Technologies in a Planning, Command, and Simulation Platform for Transport and Projection in Joint Operations” – is designed to “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.”<sup>81</sup>

### Combat Readiness: Training, Talent Recruitment and Retention, and Exercises

Developing and maintaining joint combat readiness is a force-wide PLA priority – as identified in the 2019 defense white paper– and efforts to achieve this heightened level of readiness have consistently focused on talent recruitment and retention, training, especially in “real combat conditions,” exercises, and inspections.<sup>82</sup>

A 2017 article in the *Journal of Military Logistics University* prominently references the need for more focused, standardized, and consistent professional training for operations in peacetime and combat, especially in the specialized areas that comprise LSD focus areas and JLFS operations, such as transportation, supply management, and medicine.<sup>83</sup>

The PLA also sees talent recruitment and retention as important priorities for further development of an efficient and effective Chinese joint logistics system, including developing systems for selection and promotion of highly skilled and motivated science and technology personnel.

Exercises have been one prominent means through which the LSD and JLSF personnel have gained experience and developed skills to support more efficient precision logistics and support. According to the 2019 white paper, “logistics units have been incorporated into [theater command]-level joint training, trans-theater training by services and arms.”<sup>84</sup> And there is evidence that these exercises – both for the joint logistics community and broader joint PLA forces – have “grown in scale, complexity, and number reflecting the priority the PLA has assigned to developing joint operations capability in a number of potential scenarios.”<sup>85</sup> In total, over the first three-plus years of their existence, logistics support forces have

conducted more than 50 drills with various theater commands and branches of military.<sup>86</sup> Reporting on these exercises frequently references both the complexity and realism of the scenarios explored.

Among the most prominently cited logistics exercises is the Joint Logistics Mission 2018, referred to by the U.S. Department of Defense as “the first comprehensive, logistics support exercise since the establishment of the JLSF.” The exercise involved a joint logistics support force unit, service-level logistics units, as well as PLA Army, Air Force, and civilian national defense mobilization forces from the Western Theater and featured tasks such as delivering blood-bags using drones to wounded soldiers at the “front line” and setting up refueling depots via helicopters and vehicles at remote terrains.<sup>87</sup>

JLSF forces are also being folded into large multi-dimensional joint exercises. For example, more than 360 JLSF troops participated in an expansive nation-wide January 2018 exercise involving 4,000 troops from all branches of the PLA.<sup>88</sup> As noted above, China’s JLSF and LSD are both actively engaging with foreign partners both through high-level meetings and joint exercises in order to “strengthen the integrated training of logistical and operational forces”. Recent indicative exercises include:

- **“Combined Aid-2019”**: The July 2019 China-Germany joint logistics exercise simulated an international humanitarian medical rescue mission where casualties are scattered in a location ravaged by infectious diseases like cholera. It focused on developing new concepts and best practices for joint command and control, treatment and evacuation of casualties, epidemic prevention and control, and rescue missions. Chinese representatives arrived with new medical equipment for the drill, including its latest field tent hospital system, armored ambulances, and epidemic prevention vehicles, in order to exhibit advances in Chinese medical technology.<sup>89</sup>
- **“Peace Train 2019”**: On August 16, 2019 China and Laos kicked-off the “Peace Train 2019” humanitarian and medical joint rescue exercise in Vientiane, Laos. The exercise focused on joint response to and medical rescue in mudslide disasters and involved approximately 500 individuals. Key components included mass treatment of wounded, transportation and evacuation of critically wounded by road, waterway and air; and epidemic prevention and pathogen monitoring.<sup>90</sup> Peace Train was also held in July and August 2018 and reportedly focused on flood disaster relief. The event was most notable largely because of the intrusion of a real- world disaster outside of the context of the exercise. On 23 July, the Sepien-Senamnoi Hydropower Dam in Attapeu Province, Laos actually collapsed, leading to extensive flooding and leaving hundreds missing, many dead, and thousands displaced.<sup>91</sup> The visiting Chinese medical team sent 32 members of its exercise contingent to support relief efforts on July 25.<sup>92</sup>
- **China-Vietnam Joint Exercise**: From August 22 – 29, 2018, China and Vietnam held a joint seven-day exercise in which military medical teams from both countries provided free medical services to residents of Hoa Thuan township of Vietnam’s northern border of Cao Bang and Longzhou County in southwestern China’s Guangxi Zhuang Autonomous Region. More than 4,100 individuals were treated.<sup>93</sup>

In addition to these humanitarian exercises, Chinese forces also have participated in combat-focused exercises with partner states that have included prominent logistics components. From September 16 – 21, 2019, Chinese troops supported the Russian “Center 2019” exercise held in Russia’s central military district. A total of 1,600 Chinese troops participated along with an undisclosed number of Type 96A main battle tanks, H-6K strategic bombers, JH-7A fighter bombers, J-11 fighter jets, Y-9 transport aircraft, an-10 attack helicopters.<sup>94</sup> According to Senior Colonel Ren Guoqiang, spokesperson for the MND, “the exercise fully tested and improved the capabilities of the Chinese troops in trans-border projection, overseas

command, joint operation and logistics and released the effects of the Chinese defense and military reform.”<sup>95</sup>

## Discipline and Corruption

Corruption has frequently been cited as a constraint for PLA organizational reform and modernization, an assessment that has been especially relevant for the PLA logistics community. Processes and regulations established in the 1990s enabled the PLA to run businesses in the private sector. The PLA officially divested from these businesses in the late 1990s and 2000s, however there is evidence that many of these enterprises “remained under control of relatives or close associates of active duty officers”, enabling the continued direction of contracts to PLA-run businesses. As a result, logistics personnel have been a prominent target for General Secretary Xi Jinping’s anti-corruption efforts.<sup>96</sup>

Concern over the dilutive effects of corruption on the still evolving PLA joint logistics system persists among Chinese observers. Major General Huang Tianxin, a political committee member with the Shenyang JLSC, stresses the need to confront corruption in a 2019 *National Defense* article on strengthening joint logistical reform and identifies a range of unprofessional practices, including the unwillingness of new leaders to fully address legacy practices that are affecting the efficiency and effectiveness of the new joint logistics system. He advocates for enhanced organizational and party supervision, increased spot inspections, and ultimately, zero tolerance even for the smallest act of corruption – a “‘sharp sword’ to strengthen the deterrent” (悬利剑强化震慑力).<sup>97</sup>

## 2. Bases and Basing Objectives

This section seeks to understand where China may pursue overseas military bases and/or preferred access to commercial facilities abroad. Jane's analyzes the likelihood of 18 overseas sites as future PLA bases.

In its pursuit of expeditionary capabilities, Jane's assesses that China is likely to rely on a combination of commercial facilities and light-footprint, dedicated military logistics bases to support PLA expeditionary operations throughout the medium term. Christopher Yung and Ross have previously argued that China will pursue a "Dual Use Logistics Facility" model, which mixes "access to overseas commercial facilities and a limited number of military bases."<sup>98</sup> This assessment also builds on that of the DoD's *2019 Annual Report to Congress: Military and Security Developments Involving the People's Republic of China*, which argues that "China's leaders may assess that a mixture of military logistics models, including preferred access to overseas commercial ports and a limited number of exclusive PLA logistics facilities, probably collocated with commercial ports, most closely aligns with China's overseas military logistics needs."<sup>99</sup>

Jane's assessment of Chinese expeditionary capabilities, potential overseas basing sites, and strategic goals suggests that China will primarily rely on overseas military logistics support from commercial facilities throughout the Indian Ocean Region, Red Sea, and Africa through approximately 2030. Additionally, there are a few sites in friendly countries, such as Pakistan and Cambodia, that could serve as military logistics facilities similar to China's first overseas military base in Djibouti. However, as its expeditionary capabilities improve – including the introduction of new naval surface combatants, amphibious warfare ships, anti-submarine warfare capabilities, aircraft carriers, and strategic airlift and tanker fleets – China may pursue more formal military bases with prepositioned offensive capabilities and weapons as well. China may also increasingly consider access arrangements with countries in West Africa and in Latin America.

The PLA's expansion of its expeditionary capabilities is designed to support several broader Chinese goals. The PLAN is at the center of a broader PLA strategic shift from "offshore waters defense" to a mixture of offshore waters defense and "open seas protection."<sup>100</sup> According to Michael McDevitt, a senior fellow at CNA, the force structure for open seas protection is roughly equivalent to what the U.S. Navy might term a "Blue Water Navy," which includes amphibious ships with helicopter capabilities and multi-mission large surface combatants with anti-submarine warfare and long-range air defense capabilities.<sup>101</sup> These in-development capabilities could be used for a wider range of expeditionary operations, including amphibious assaults and strategic sea lines of communication protection on the high end, to humanitarian assistance and noncombatant evacuation operations on the low end.

However, Chinese analysts note that offshore defense is an "active defense" – one that requires "offensive actions and tactics" to achieve defensive strategic effects.<sup>102</sup> Therefore, offshore waters defense and open seas protection can be interpreted as existing upon a continuum, but sharing the use of expeditionary combat capabilities. Chinese writers make this point explicitly: "In fact, the Chinese navy is gradually possessing defense-in-depth combat capabilities, thereby protecting the country from attacks from the sea, and can move towards an ocean-going navy with expeditionary combat capabilities."<sup>103</sup>

In addition to supporting the PLA's broader active defense strategy, basing decisions and expeditionary combat capability development are designed to protect overseas investments through the Belt and Road Initiative (BRI). The expansion in the PLA's expeditionary capabilities – and the Chinese government's use of civilian and dual-use capabilities for expeditionary operations – must be understood within the context of how the PLA considers its power projection needs over the short, medium, and long term. Central Military Commission (CMC) Transport and Projection Bureau chief of staff Liu Jiasheng wrote that China's expeditionary goals include:

# Jane's

- **Short-term (2020-2025):** Fighting and winning an “informatized limited war in the maritime direction”, requiring novel strategic sealift and airlift capabilities.
- **Medium-term (2025-2030):** Projecting power to “countries and regions along the ‘Belt and Road’ and areas crucially related to key interests around the globe.” Notably, medium term goals add “overseas” to the goal of fighting and winning an “informatized limited war.”
- **Long-term (After 2030):** Projecting power globally: “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.”<sup>104</sup>

Chinese defense analyst Jian Wu echoed the requirement that the PLA be capable of supporting its BRI investments: “It can be seen that with China's deep integration into international economic activities, the significant increase in overseas interests requires the navy to go to the distant sea, escort China's economic activities overseas, and safeguard China's overseas interests.”<sup>105</sup>

There is likely a connection between China’s repression and mass surveillance of citizens in the Xinjiang Uighur Autonomous Region and China’s concerns over protecting its BRI and other overseas economic interests.<sup>106</sup> As Mollie Saltskog and Colin P. Clarke argue in *Foreign Affairs*, Xinjiang is critical to its land-based BRI interests, motivating the CCP’s repressive tactics to secure the region. They further argue that “terrorism has come to pose a growing threat to Chinese interests and nationals abroad... In 2019, terrorist organizations such as al Qaeda and ISIS explicitly mentioned China in many of their propaganda materials—citing the CCP’s abuse of Muslim minorities as a justification for going after China and Chinese nationals. On the messaging application Telegram, jihadi groups use images of Chinese atrocities against Uighurs to recruit and radicalize Muslims throughout the world. The situation in Xinjiang serves to rally extremists across the globe, just as U.S. abuses in Abu Ghraib Prison became a potent recruitment tool for al Qaeda in Iraq in 2004.” This could in turn motivate China to increase its military presence at BRI sites and in overseas locations with significant concentrations of Chinese nationals.<sup>107</sup>

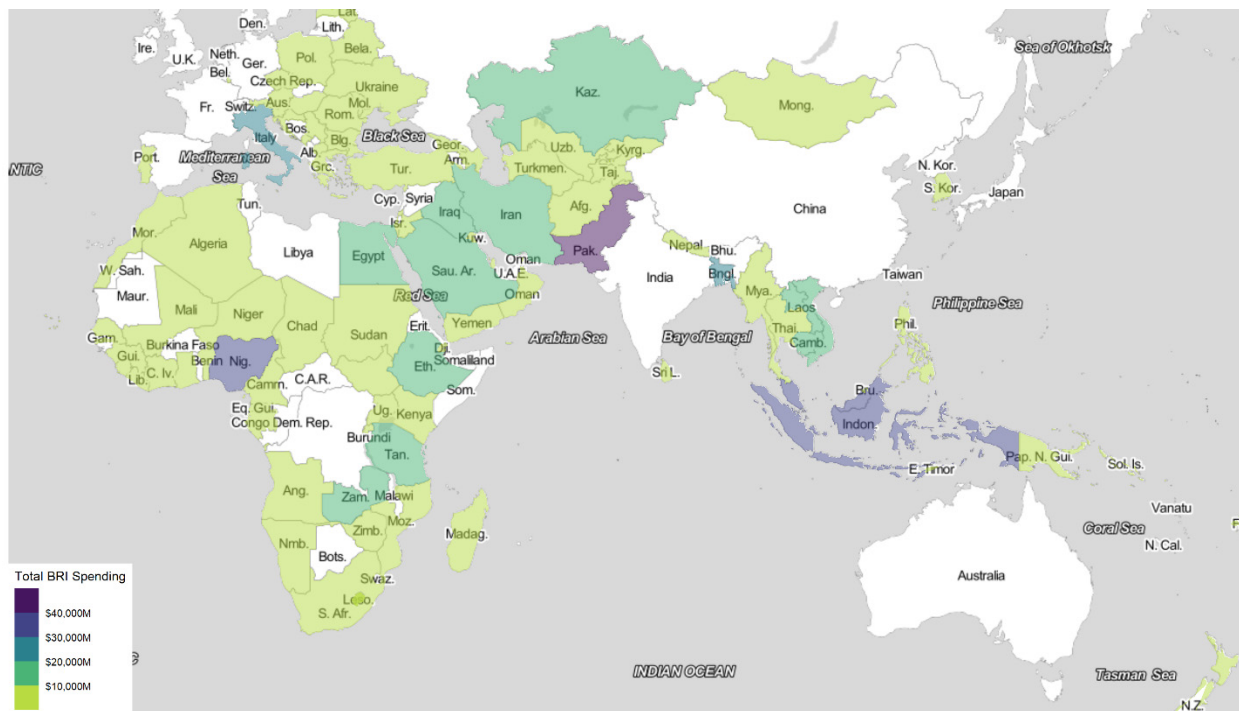


Figure 3: China's BRI investments since 2013, colored by total spending. Pakistan, Indonesia, Russia, Singapore, Nigeria, and Malaysia have all received over \$30 billion in investment funding. Data from the China Global Investment Tracker – American Enterprise Institute and the Heritage Foundation.

First articulated in 2004 through the Booz Allen Hamilton report “Energy Futures in Asia”, the “String of Pearls” theory of Chinese overseas basing strategy argues that “Construction of commercial port infrastructure could serve as cover for construction of secret munitions stockpiles and other port infrastructure that could support combat operations. Chinese commercial ties with host countries could potentially translate into secret agreements to allow PLAN access to the facilities in a conflict.”<sup>108</sup> As Yung and Rustici explain, this model differs from the Dual Use Logistics Facility model primarily based on the potential for China’s overseas commercial ports to eventually transition fully into military bases.

Jane’s analysis supports that of Yung and Rustici in that many or all of these facilities are unlikely to house covert military stockpiles. Any prepositioned supplies would likely be dual-use goods, including petroleum, oil, lubricants, food, and water, rather than weapons, ordnance, or military platforms. Jane’s also argues that Chinese investments in commercial port facilities – particularly as part of the BRI – could nevertheless allow for commercial replenishment support of PLAN activities even if the ports themselves never transition into dedicated military facilities. China has begun experimenting with incorporating civilian organizations, ships, and aircraft into its logistics model.<sup>109</sup> Therefore it is likely that China could incorporate overseas commercial facilities as nodes in its military expeditionary logistics network.

Based on the emerging evidence, it is likely that nodes in China’s future overseas logistics network can be divided into several prominent categories, in order of their increasing dedication to supporting PLA activities:

1. **Commercial – indirect:** Commercial facilities that indirectly support PLA operations via commercial ships for PLAN replenishment (i.e. a COSCO Shipping vessel departs from a BRI port to replenish a PLAN ship in open waters).
2. **Commercial – direct:** Commercial facilities that directly support PLA operations (i.e. a PLAN task force docks at a commercial port for replenishment).





3. **Military logistics:** Formal overseas military logistics facilities – following the model set by the Djibouti Logistics Facility.
4. **Military base:** Formal overseas military bases with prepositioned weapons and platforms capable of offensive operations

Unlike the String of Pearls argument, a reliance on Chinese capital for infrastructure development is not a *necessary* condition for any of the three logistics node categories. This distinction includes instances where China has been accused of predatory lending – also known as its “debt trap diplomacy” – such as with Sri Lanka’s Hambantota Port.

Several Chinese sources have suggested criteria or actual sites for overseas bases or logistics access points. The 2013 *Science of Military Strategy* argues that, “we must build overseas strategic strongpoints that depend on the homeland, radiate into the periphery, and moves us in the direction of the two oceans [i.e. the Pacific and Indian Oceans]. These sites are to provide support for overseas military operations or act as a forward base for deploying military forces overseas, exerting political and military influence in relevant regions. We should form a posture with the homeland strategic layout that takes account of both the interior and the exterior, connects the near with the far, and provides mutual support.”<sup>110</sup> A 2014 article by the Chinese Naval Research Institute (NRI) suggested seven sites for an overseas military base, including the Bay of Bengal, Sittwe, Myanmar, Gwadar, Pakistan, Djibouti, Seychelles, Hambantota, Sri Lanka, and Dar es Salaam, Tanzania.<sup>111</sup> A report from the Army Transportation Academy suggests “Pakistan, United Arab Emirates, Sri Lanka, Burma, Singapore, Indonesia, [and] Kenya.”<sup>112</sup>

Besides a site’s geopolitical and security value, there are several factors that may increase the likelihood of a location becoming a military logistics node (see table below), including:<sup>113</sup>

| Factor   | Icon  |
|--|---|
| <p><b>Presence of major BRI infrastructure investments</b><sup>114</sup><br/>China’s 2015 defense white paper makes explicit China’s evolving commitment to protect its overseas economic interests, noting the importance of “the security of overseas interests concerning energy and resources, strategic sea lines of communication (SLOC), as well as institutions, personnel and assets abroad.”<sup>115</sup></p>   |  |
| <p><b>Debt to China</b><sup>116</sup><br/>China’s BRI projects are primarily financed through loans that carry commercial interest rates often unsustainable for the host countries. A 2018 report from the Center for Global Development found that eight BRI recipient countries have a particularly high risk of defaulting on their loans.<sup>117</sup> Two of these countries, Djibouti and Pakistan, either already have an overseas military base or have been rumored as a candidate for a future PLA base. When Sri Lanka was unable to pay its BRI loan for the construction of the Hambantota Port, China agreed to a 99-year lease for the port and 15,000 acres of land around the site. Some analysts and policymakers have expressed concern that this model was an intentional predatory lending strategy designed to secure access to site of geostrategic importance, while others have argued the deals are not an intentional, coherent “debt trap” strategy, but the result of domestic interest groups or poor political risk assessment.<sup>118</sup></p> |  |
| <p><b>Replenishment port calls on China’s Gulf of Aden deployments</b><br/>The PLAN’s Gulf of Aden anti-piracy escort missions have allowed the PLAN to gain expeditionary experience without provoking significant international concern. On these deployments China has made numerous port calls for diplomatic and friendly visits as well as military replenishment. Sites with prior replenishment port calls are evidence that they could be used in the future for at least commercial direct/indirect replenishment.</p>   |  |

|   |   |
|---|---|
| <p><b>Government support for Chinese presence (via arms sales, international visits, military exercises)</b><sup>119</sup></p> <p>Support from the host country's political and military elite would be a requirement for any long-term basing option. This could be signaled through a high volume of arms sales, international visits between high-ranking political and military leaders, and joint military exercises.</p>                                      |  |
| <p><b>Prior openness to foreign military basing</b></p> <p>A country's prior willingness to host a foreign military base could be a good indication that might do so for China. For example, Djibouti notably had already allowed six countries to build a military base in the country before China.</p>   |  |
| <p><b>Open source reporting on either a basing offer (from the host country) or a basing request (from China)</b></p> <p>China has been rumored to request basing rights in numerous countries throughout the last few decades, including (but not limited to) sites in Cambodia, Vanuatu, Pakistan, and the Seychelles. Additionally, there have been some Chinese-language military analyses that consider potential overseas basing locations.<sup>120</sup></p> |  |

Based on these factors as well as a site's geostrategic value, Jane's selected 18 of China's most probable potential overseas base locations over the next ten years for satellite imagery analysis. In selecting which sites to analyze in-depth, Jane's first collected reports of potential overseas basing sites, then gathered data for each of the factors above. We used this data to both add sites that were not previously been the subject of news reports or speculation as well as to evaluate each site's potential probability as an overseas military base or logistics node. The more risk factors a site has – i.e. the site of major BRI investments in a country that has close military and government ties to China, with high-level international visits and Gulf of Aden task force port visits – the more likely that the site was included for satellite imagery analysis. The 18 sites included:

- Luanda Port, Angola
- Chittagong Port, Bangladesh
- Ream Naval Base, Cambodia
- Mombasa Port, Kenya
- Kota Kinabalu, Malaysia
- Naval Intelligence Base, Myanmar
- Sittwe Port, Myanmar
- Port of Walvis Bay, Namibia
- Lekki Port, Nigeria
- Duqm Port, Oman
- Port Salalah, Oman
- Gwadar Port, Pakistan
- Karachi Port, Pakistan
- Port Victoria, Seychelles
- Hambantota Port, Sri Lanka
- Colombo Port, Sri Lanka
- Dar es Salaam, Tanzania
- Luganville Wharf, Vanuatu

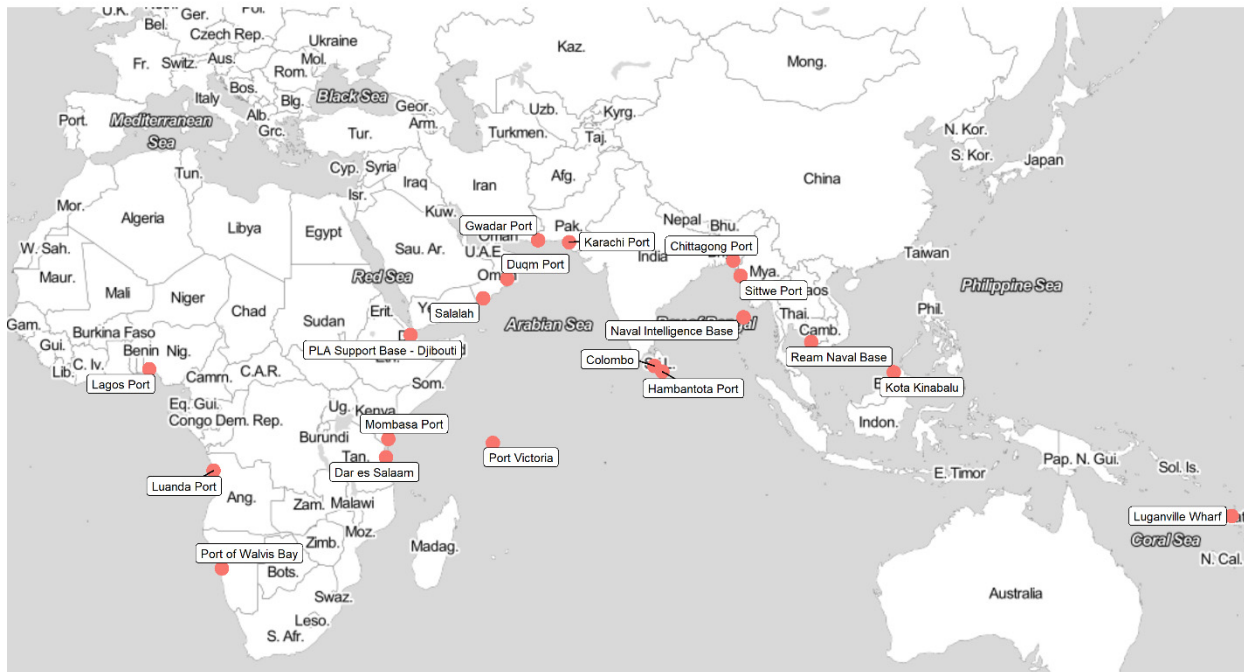


Figure 4: Potential PLA overseas military base sites analyzed by Jane's.

Many past analyses of Chinese overseas basing strategy focus on naval bases instead of access to overseas airfields or airbases. In large part this is because China's expeditionary air capabilities were extremely limited. However, with the expanding production of the PLAAF's Y-20 strategic transport aircraft and tanker variant, this is likely to change by 2030. According to military logistics experts interviewed by Yung and Rustici, air operations "require extensive practice, access to an airfield that can handle the type of aircraft being used, that is close to transportation assets, and that has the necessary fuel and maintenance capability." As a result, air logistics are often based at a different location from naval logistics support.<sup>121</sup> Therefore, we capture airfields that may be collocated with the port facilities at the sites above, but also separately consider additional airfields that could be of interest to the PLAAF, particularly after 2025.

Other longer-term basing options are considered separately, as satellite imagery analysis is less relevant for sites unlikely to support a Chinese military base until after 2030. Most of the locations analyzed already have some degree of infrastructure to support PLA logistics needs, usually through civilian commercial infrastructure and/or foreign military facilities.

Data for the full list of locations may be found in Appendix B. However, the six most likely candidates for PLA overseas basing may be found below:

## Ream Naval Base, Cambodia

Potential use: Military logistics base



## Jane's Satellite Imagery Analysis

Ream, Cambodia

10.505580 N 103.611292 E

Image Date: 2 May 2019 / WorldView-3



Satellite image © 2019 Maxar Technologies / © 2020 Jane's

In mid-2019 the *Wall Street Journal* reported that China had signed a secret deal for a 30-year lease of part of Ream Naval Base, which would allow the PLA to station troops and store weapons within the 192-acre installation. The article also noted the “construction of a military-grade airport and a development project of dubious commercial viability.”<sup>122</sup> Cambodia has denied the agreement and there are currently no indications of PLA development of the port for military use.

Cambodia is incredibly reliant on its relationship with China, with 21.7% of its 2017 GDP from China, and 22.4% of GDP as Chinese debt, according to the Council on Foreign Relations.<sup>123</sup> Cambodia has received nearly \$10.3 billion in BRI-related construction projects and investments. A potential logistics facility at Ream would be representative of China’s anticipated overseas basing strategy through 2030, and likely similar to its facility in Djibouti.

For comparison, the Djibouti Logistics Support Base has a pier that was constructed in mid-2018 that allows for 4-ship docking (including for the new Type 901 replenishment ships). It features a 400 m runway (unsuitable for fixed wing strategic military aircraft), eight hangars (seven of which are 27 x 30 m, and one that is 35 x 49 m), hardened bunkers for possible ammunition storage, heliport, barracks, a support complex, and a hardened underground complex. The port can support all major PLAN surface combatants, including four Type 054A frigates, 6 Type 056A corvettes, one Type 001 / 002 aircraft carrier, or two Type 052D destroyers. The base was more geopolitically feasible because of support from the host

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country as well as the fact that its size suggested limited utility for expeditionary offensive platforms and weapons. Djibouti was one of seven sites considered by experts from China's Naval Research Institute (NRI) in 2014 for China's next overseas facility.<sup>124</sup>

Satellite imagery suggests that Ream Naval Base could be used as a PLAN support base option, as maintenance facilities and floating docks make repairs possible. The site currently features two 60 x 17 m floating docks, barracks, 2 helipads, and one 140 m dock. It can support small surface combatants up to Type 056A corvette size, two Type 054A frigate or a 056A corvette.

Ream is located near the Dara Sakor land deal, which includes 20% of Cambodia's coastline and was leased to China for 99 years in an unusual agreement. The Dara Sakor International Airport is currently under construction by China's Development Group and set for completion in 2020. The company's only international footprint is the Dara Sakor acquisition, and it won the contract without an open bidding process despite the fact that the land deal was triple the size allowed by Cambodian land laws. The airport itself will feature the longest runway in Cambodia, "complete with the kind of tight turning bay favored by fighter jet pilots," according to the *New York Times*.<sup>125</sup>

Pentagon spokesperson Lt. Col. Dave Eastburn told the *New York Times*, "We are concerned that the runway and port facilities at Dara Sakor are being constructed on a scale that would be useful for military purposes and which greatly exceed current and projected infrastructure needs for commercial activity. Any steps by the Cambodian government to invite a foreign military presence would disturb peace and stability in Southeast Asia."<sup>126</sup> The Cambodian government denied allowing a Chinese military presence in the country. Based on Chinese developments related to the Dara Sakor land deal and reporting on PLA access to Ream Naval Base, Isaac Kardon argues, "Cambodia, like Pakistan and North Korea, is among the countries most likely to cooperate in non-public ways with Beijing to provide reliable military access to the PLA."<sup>127</sup>

## Gwadar Port, Pakistan

Potential use: Military logistics base



### Jane's Satellite Imagery Analysis

Gwadar, Pakistan

25.109337 N 062.338391 E

Image Date: 26 December 2019 / WorldView-3



Gwadar port is a critical component of the BRI through the China–Pakistan Economic Corridor (CPEC) and one of the primary sites mentioned in open sources for China’s potential next overseas base.<sup>128</sup> Pakistan has received the most BRI funding of any country worldwide, at nearly \$44 billion. Pakistan’s other two ports in Karachi and Qasim reportedly have no further space for expansion. In early 2018, the *South China Morning Post* reported that China was close to setting up a naval base similar to that in Djibouti, quoting Beijing-based military analyst Zhou Chenming that “China needs to set up another base in Gwadar for its warships because Gwadar is now a civilian port.” A PLA source argued that it must be separate from the commercial port because “Gwadar port can’t provide specific services for warships... Public order there is in a mess. It is not a good place to carry out military logistical support.” Other reports suggest that PLAN marines could be deployed to protect Gwadar from terrorist threats.<sup>129</sup> The Pakistani Navy often uses facilities in Gwadar so supporting PLAN activity would be possible, particularly in joint operations. Like Djibouti, Gwadar was one of seven sites considered by experts from China’s NRI in 2014 for China’s next overseas facility.<sup>130</sup>

The site would also make sense from a military logistics perspective, as it is within the Y-20’s maximum range from Chengdu-Qionglai airbase in China. However, to date, there have been no open source indications – either through reporting or through satellite imagery – that China and Pakistan have moved forward with plans to develop a formal military base.<sup>131</sup> As another study noted, “there seems little or no

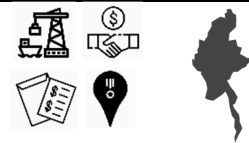
# Jane's

evidence that a naval base facility is part of the package, or indeed that China has any current intention or capacity to maintain an Indian Ocean fleet for which Gwadar could be a base.”<sup>132</sup>

The Pakistani Navy often uses the facility, so supporting PLAN activity would be possible, particularly in joint operations. The facility features helipads in the local area and minimal bunkering. Depending on port activity levels, berthing space can accommodate a large number of PLAN surface combatants including carriers. The smaller dock can berth one Type 056A corvette, while the larger dock can berth two Type 052D or Type 055 destroyers, or one carrier and one destroyer, or four Type 054A frigates.

## Sittwe Port, Myanmar

Potential use: Commercial direct / military logistics base



Like Djibouti, Sittwe was one of seven sites considered by experts from China's NRI in 2014 for China's next overseas facility.<sup>133</sup> China is building a deep-water port near Sittwe and also proposed building an economic corridor through Rakhine that would include roads and rail lines from China's Yunnan Province.<sup>134</sup> A naval base at Sittwe (or at the nearby Chinese-developed Kyaukpyu port), combined with the China-Myanmar Economic Corridor, would give the PLA convenient access to the Indian Ocean with overland resupply potential through the economic corridor. As Monica Wang noted at the Council on Foreign Relations, "building a military facility [at Sittwe] could help the Chinese manage traffic passing through the Strait of Malacca from the west. It also marks the start of the Myanmar pipeline, which supplies crude oil to southwestern China."<sup>135</sup>

China has sought closer military ties with Myanmar and has been “restrained” in its comments about the Rohingya despite international condemnation of Myanmar, and has attempted to mediate the crisis.<sup>136</sup> 56.5% of 2017 inward foreign direct investment came from China.<sup>137</sup> In 2019 it was estimated that 40% of Myanmar’s debt is held by China.<sup>138</sup>

The port currently contains one larger berth (274 m) that could support most PLAN surface combatants, including three Type 056 corvettes, two Type 054A frigates, or one larger destroyer. There is a berth with crane for supply loading and three storage facilities, but no significant petroleum, oil, and lubricant (POL) storage, which would be important for naval replenishment.

It should also be noted that Chairman Xi visited Myanmar on 17-18 January 2020, with the two sides agreeing to strengthen their BRI commitments, pushing to finalize a deal for Kyaukpyu port for US\$1.3 billion. During the visit Xi was expected to meet with Myanmar military chief General Min Aung Hlaing.<sup>139</sup> Kyaukpyu port could be an additional long-term option for PLAN / PLAAF development, assuming successful conclusion of the BRI investment and deepening of military ties.

However, Myanmar’s 2008 constitution explicitly forbids the deployment of foreign troops on Myanmar soil, meaning that the constitution would need to be changed for China to establish a permanent military presence.<sup>140</sup> Unless this occurs, preferred access to commercial facilities is significantly more likely.



## Duqm Port, Oman

Potential use: Commercial direct



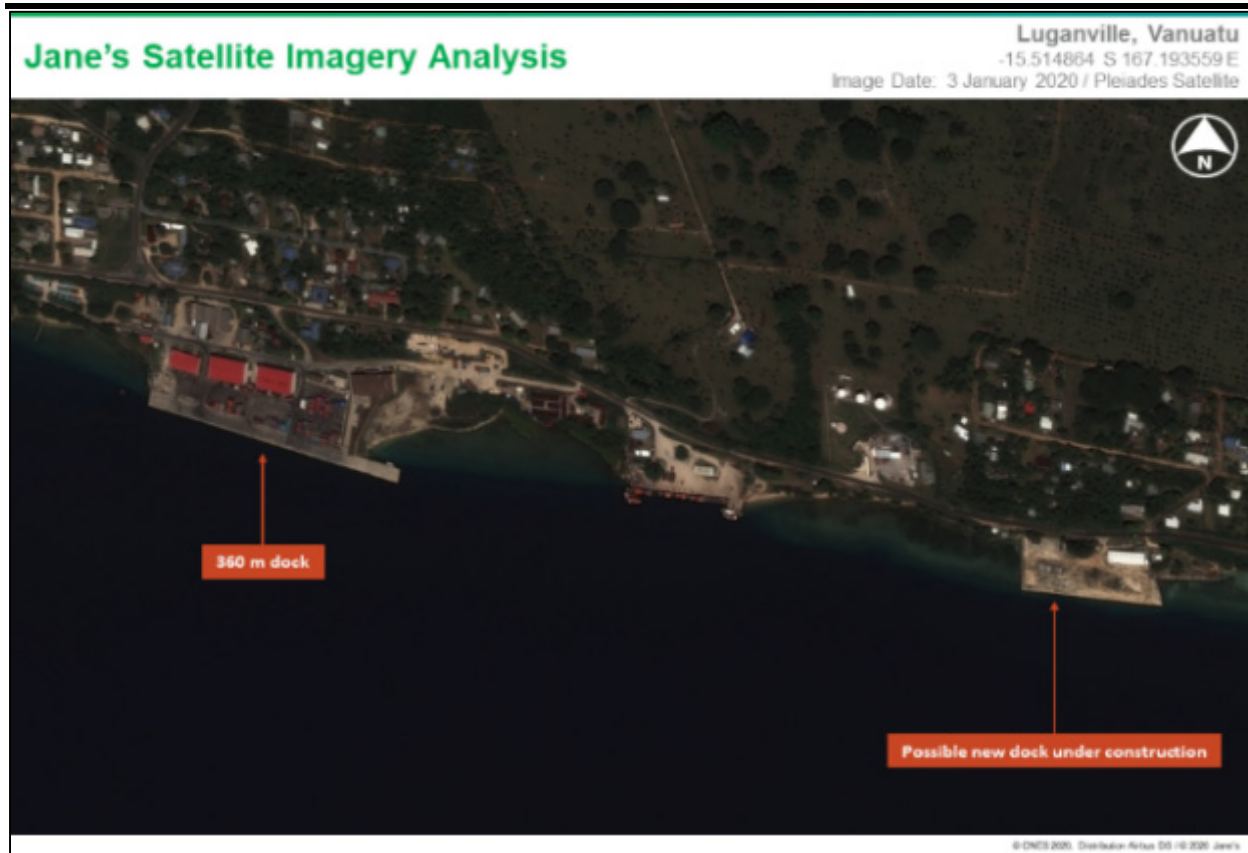
A logistics or dual-use facility at or near Duqm would expand the PLAAF's Y-20 range into the MENA region. Duqm Port is of significant geostrategic importance due to location along Gulf of Aden, Gulf of Oman, and Strait of Hormuz. Duqm is at the western edge of the Y-20's maximum range (5,200 km with 51,000 kg payload) from the Chengdu-Qionglai airbase, meaning that it could provide pivotal replenishment access to Africa and Middle East for the PLAAF from China (see map at Figure 5). Duqm could decrease the importance of the Strait of Hormuz, as fewer ships would need to enter the Strait to access oil and other products.<sup>141</sup> Oman is a critical part of the BRI, joining in 2018.

The United States also signed a port deal for facilities and ports at Salalah and Duqm in March 2019 in case access through the Strait of Hormuz is denied by Iran.<sup>142</sup>

Large sections are under construction, so its capabilities for PLAN vessels and infrastructure are unknown, although there are few concrete indications that Duqm will evolve into anything more than a replenishment stop for PLAN vessels. However, large docks (2260 m, 1020 m, 800 m, 747 m, and 450 m, with two 400 m drydocks) make berthing a large PLAN surface group possible. The amount of regular commercial traffic is unknown at this time due to ongoing construction.

## Luganville Wharf, Vanuatu

Potential use: Military logistics



In 2018, several news organizations reported that China approached Vanuatu about developing a permanent military presence in the country. Vanuatu has been a key recipient of Chinese BRI funding, particularly for the Chinese-built and financed Luganville Wharf. Australia has expressed particular concern over the loan (that it could fall victim to a “debt equity swap” similar to Sri Lanka’s Hambantota Port) and reports of a permanent base given its close proximity.<sup>143</sup>

In response to reports that China has informally approached Vanuatu about a potential military base, analysts have argued that such a move could be to protect foreign Chinese nationals living and working in Southeast Asia, as the island’s location is not otherwise of obvious geostrategic importance due to its location east of Australia in the Pacific Ocean. According to the *Sydney Morning Herald*, “Multiple sources said Beijing’s military ambition in Vanuatu would likely be realized incrementally, possibly beginning with an access agreement that would allow Chinese naval ships to dock routinely and be serviced, refueled and restocked. This arrangement could then be built on.”<sup>144</sup>

Limited dock space (currently only one 360 m dock) and limited support facilities would require additional activity, including possible prepositioning of resupply materials to support PLAN operations. There is a possible second dock under construction approximately 1 km east of existing dock.

## Walvis Bay, Namibia

Potential use: Military logistics

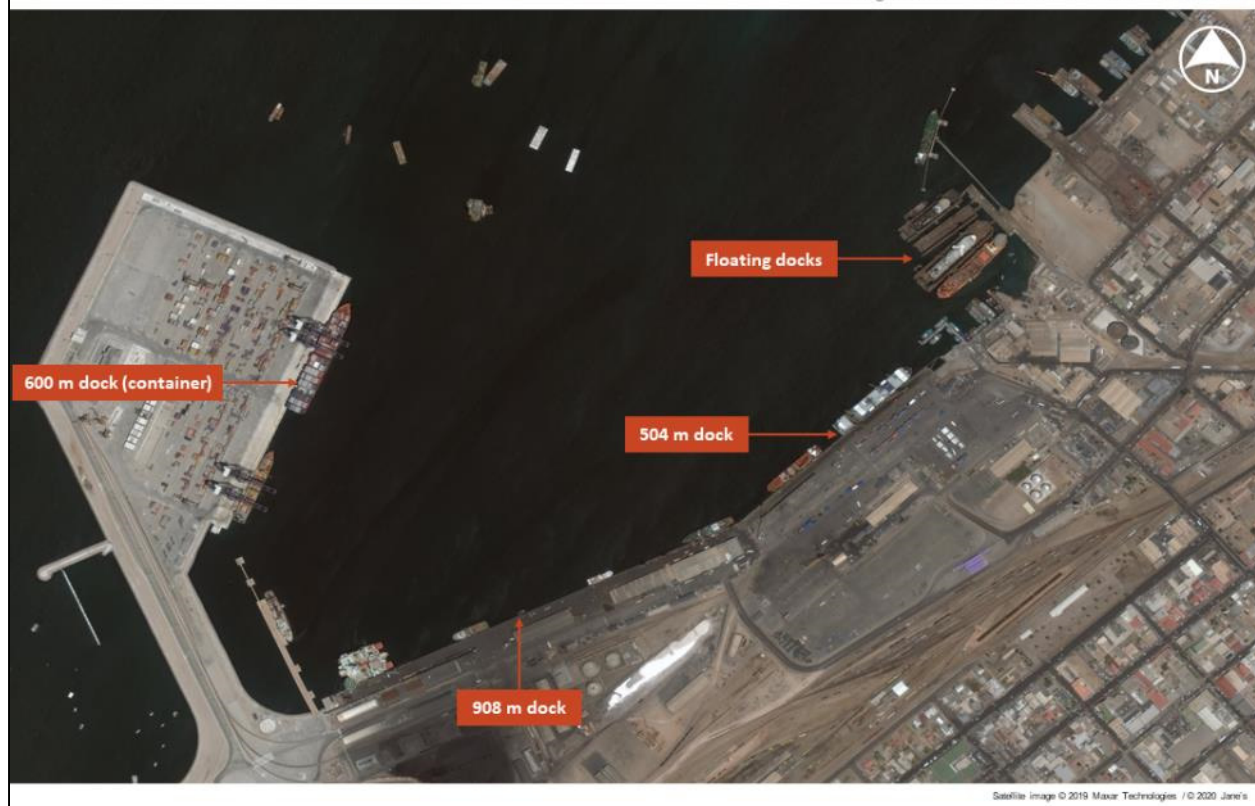


### Jane's Satellite Imagery Analysis

Walvis Bay, Namibia

-22.949332 S 014.492790 E

Image Date: 18 December 2019 / WorldView-2



In 2014 reports emerged that China was in discussions to establish a military base at Walvis Bay, in addition to other locations. The Walvis Bay Expansion Project is a critical BRI project for China.<sup>145</sup> As the Africa Center for Security Studies' Paul Nantulya wrote, "The Namibian press has speculated that China seeks to establish naval facilities in Walvis Bay using the Djibouti model, pointing to similarities with the approach China used to acquire its Djibouti base, a process that started with the construction of a deep water port."<sup>146</sup> In 2018 China's ambassador to Namibia called the Walvis Bay port China's "most brilliant pearl" on Africa's Atlantic coast.<sup>147</sup>

Existing infrastructure could support nearly all PLAN surface combatants. Berthing will depend on commercial activity. Theoretically any PLAN surface combatant can be berthed. Non-container docks (908 m, 600 m, and 504 m) can berth at least 12 x Type 056 corvettes, or at least 8 x Type 052D destroyers, for example. There are also three floating docks (2 x 139 m, 1 x 192 m).

Over the next 5-10 years, it is more likely that the PLAN will use Walvis Bay for direct replenishment support through commercial facilities rather than the creation of a military logistics base. China's security requirements on Africa's Atlantic coast are nascent but could expand in parallel with its BRI projects in the region. In 2016, Ifeng news reported that several years prior a country on the west coast of Africa intended to let China build a military base, but China rejected the plan, which was a signal that "China has no

intention of confronting the United States” in the Atlantic Ocean.<sup>148</sup> The country in the report is unknown, but the principle that China seeks to avoid confrontation with the U.S. in the Atlantic Ocean will likely hold for the next ten years as China develops its expeditionary capabilities, modernizes its surface combatant fleet to have the capacity to deter U.S. action, and refines its basing needs. Therefore, a commercial facility is much more likely over the next ten years.

## PLA Basing Strategy 2020 – 2030

Most of the locations analyzed could accommodate PLAN ships for replenishment, are collocated with airports or airbases, and/or could be used as logistics nodes for civilian solid cargo ships and/or tankers, which might then replenish PLAN ships in open waters. The primarily civilian cargo ports were analyzed because of their strategic locations and BRI investments but are likely limited to replenishment via civilian vessels due to commercial traffic.

The PLA's actual fixed overseas footprint may continue to remain light until approximately 2030 because it can still rely on civilian infrastructure and platforms to support its expeditionary operations. The PLA's strategic goals through approximately 2030 will likely be limited to (1) the protection of its overseas economic investments through the BRI, (2) the protection of Chinese nationals living and working abroad, and (3) its participation in international community operations. In particular, fulfilling the international responsibilities of a great power is frequently emphasized in Chinese-language reports on the PLAN's Gulf of Aden participation.<sup>149</sup>

China is likely to focus on PLAN basing opportunities and commercial access arrangements through 2030 because it can project a larger force via ocean transport than through the air. This disparity between Chinese naval and air power projection capabilities is stark and will likely remain so until the PLAAF is able to introduce more Y-20s into service. A robust strategic airlift fleet will provide the PLAAF with the ability to rapidly respond to crises.

If and when the PLAAF does pursue additional overseas logistics nodes, they are likely to share several characteristics. First, China would likely meet significant resistance to the establishment of a dedicated overseas airbase capable of supporting fixed wing aircraft – as they reportedly did in Djibouti before the establishment of the PLAN's logistics base (which cannot support fixed wing aircraft).<sup>150</sup>

Second, and similar to the PLAN, the PLAAF could use civilian airports and/or airbases of friendly foreign militaries. These options risk being unavailable during wartime, but China may pursue this arrangement for logistical support on operations short of war, particularly until approximately 2030. For example, the PLA has used Gao airport in Mali for its 2013 peacekeeping mission and El Fasher Airport in Egypt for a peacekeeping medical operation in Sudan.<sup>151</sup> Similarly, the four PLAAF Il-76 transport aircraft used during the 2011 Libya evacuation operation stopped for refueling in Karachi, Pakistan and in Khartoum, Sudan.<sup>152</sup>

Third, nearly all of the sites above either already have runways onsite or have airbases or civilian airports nearby. It is also probable that a PLAAF base would be located within the Y-20's maximum range so that it would not need inflight refueling in transit from its domestic base. The Y-20 has a maximum range of 3,700 km with its max payload of 66,000 kg, or 5,200 km with a 51,000 kg payload. The map below shows

potential PLA overseas base sites color coded based on whether they are within the Y-20's maximum range of 5,200 km.

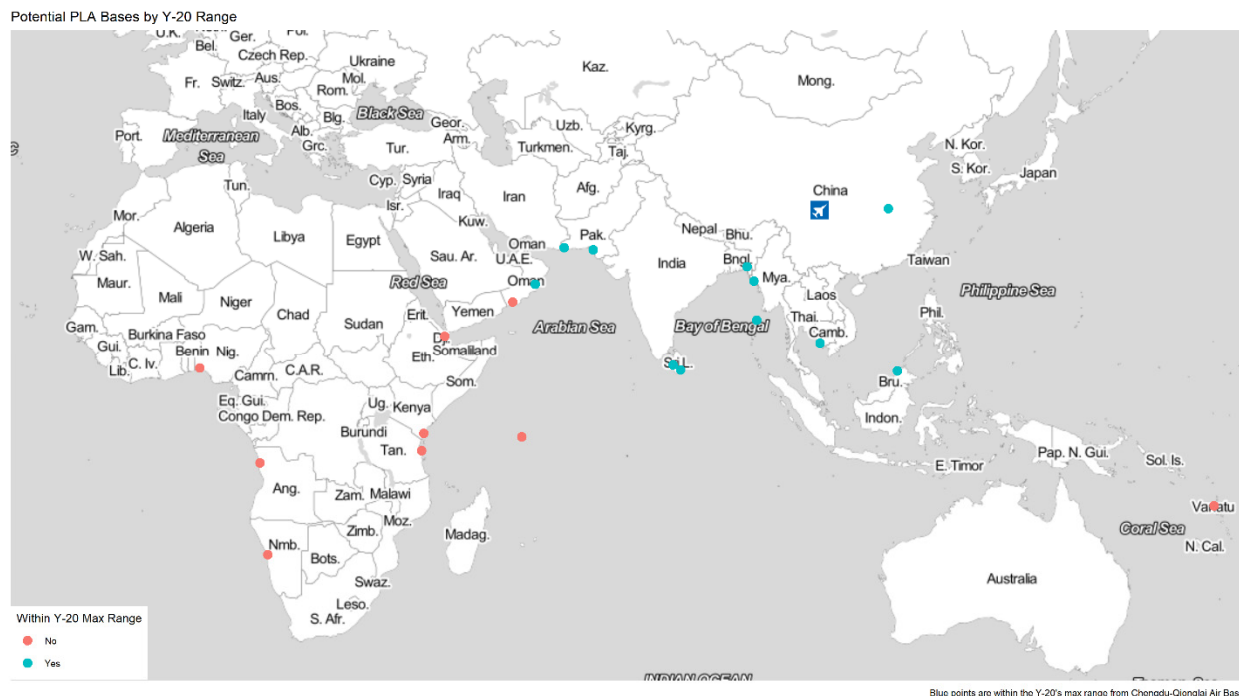


Figure 5: Of the potential overseas basing location considered above, 10 are within maximum range from the Y-20's first domestic base at Chengdu-Qionglai. Source: Jane's

The PLAN is likely to use most, if not all, of the above facilities for replenishment on expeditionary operations short of armed conflict – including humanitarian assistance and disaster relief (HA/DR), noncombatant evacuation operations (NEO), anti-piracy missions, and United Nations deployments.

However, as RAND noted in their analysis of the future of the PLAAF's expeditionary capabilities, "Insufficient facilities abroad impose another serious constraint. To date, the most-common PLAAF overseas deployment remains the deployment of two to four large-transport aircrafts at a time for HA/DR, personnel recovery, or other nonwar missions. Security, logistics, and maintenance needs for larger groups of dissimilar aircraft impose serious constraints on the ability of the PLAAF to carry out expeditionary activities on a larger scale. In the future, the PLAAF will need to establish reliable access to overseas airfields if it hopes to operate missions of a broader variety and higher tempo abroad."<sup>153</sup> Jane's analysis suggests that this is far more likely during the longer term, particularly after 2030, when the PLA has introduced sufficient quantities of expeditionary capabilities into service to require dedicated overseas facilities.

## PLA Basing After 2030

It is important to recognize that this is far from an exhaustive list of PLA overseas basing candidates. Here we briefly consider sites that could be considered as overseas basing options after ~2030.

- Dara Sakor, Cambodia:** As noted above in the analysis of Cambodia's Ream Naval Base, China could intend to use the in-development Dara Sakor airport for military operations. Preferred access to a civilian airfield or the development of a formal military base in Cambodia would expand the reach of China's airborne capabilities throughout Southeast Asia. From 2025 and beyond, Jane's

expects China to increasingly pursue access to overseas airfields for logistical purposes for the PLAAF's growing strategic airlift fleet.

- **Khartoum, Sudan:** One potential site for overseas airfield access could be Khartoum, Sudan, which PLAAF Il-76 strategic transport aircraft used as a stopover on the inbound and outbound legs of China's 2011 Libya NEO operation. As Andrew Erickson and Gabe Collins note, "[A]s Chinese economic and human presence in Africa continues to rise, the fact that military aircraft were allowed to land and refuel there also suggest that the Sudanese government may be comfortable with the idea of fitting into a Chinese 'places, not bases' strategy whereby the [People's Republic of China] ensures that it has access to various airfields to support future evacuation operations and other missions in Africa."<sup>154</sup> The Il-76s involved with the 2011 Libya NEO also conducted a refueling stop in Karachi, Pakistan (separately analyzed in Appendix B), which could also be a future site for overseas airfield access.
- **Terceira, Portugal:** A 2016 letter from Representative Devin Nunes to then-Defense Secretary Ashton Carter noted that China was interested in expanding its presence on the island of Terceira, including the use of the runway at Lajes Field.<sup>155</sup> Terceira, located in the Atlantic Ocean, is home to a U.S. military base at Lajes Field (which includes the Air Force's 65<sup>th</sup> Air Base Group) that was downsized in the mid-2010s. Several Chinese delegations used the island for stopover flights between China and Latin America. There is concern that China could develop a formal or informal military presence if the U.S. withdraws from the island, particularly as the Azores regional government is interested in developing a deep-water port at the nearby harbor of Praia da Vitória.<sup>156</sup>
- **East Timor:** In 2011, leaked U.S. diplomatic cables noted that East Timor rejected a Chinese proposal to develop a surveillance radar facility on East Timor's northern coast in 2007. The offer was rejected because China wished to staff the facility with Chinese technicians, to which Deputy Prime Minister Jose Guterres argued "the radars could be used for purposes other than those touted by the Chinese. They could instead be used to extend China's radar-based intelligence perimeter deep into South East Asia."<sup>157</sup>
- **Las Lajas, Argentina:** China also has a space monitoring station in a remote location in Argentina that became operational in March 2018. According to the Chinese government, the site is only used for peaceful space observation and exploration, and the contract with Argentina was revised in 2016 to specify that it could only be used for nonmilitary purposes. However, the Chinese space program is military-run, and while the agreement requires China to notify Argentina of its activities, there is little actual Argentinian oversight or enforcement.<sup>158</sup>
- **Venezuela, Panama, and other countries throughout Latin America:** The development of the Argentinian space center coincided with increased Chinese involvement in Latin America more broadly. In 2015 the Chinese Ministry of Defense held a military logistics forum "Strengthening Mutual Understanding for Win-Win Cooperation" that included officials from 11 Latin American countries.<sup>159</sup> Admiral Craig Faller, head of U.S. Southern Command, said in mid-2019 testimony that the U.S. cannot compete with Chinese financial influence in Latin America, but must instead rely on long-standing relationships between the U.S. and regional defense leaders, as well as increased intelligence, surveillance, and reconnaissance (ISR) assets, and the presence of high-end U.S. naval assets like the littoral combat ship.<sup>160</sup> Venezuela has purchased a relatively significant amount of Chinese weapons since 2010, including infantry fighting vehicles, Y-8 transport aircraft, self-propelled mortars and multiple rocket launchers, and various missiles.<sup>161</sup> According to Admiral Faller's testimony, China is the largest creditor to the Maduro regime "saddling the Venezuelan people with more than \$60 billion in debt."<sup>162</sup> Further, China has increased its port visits to the region by 70% over the last five years, while Chinese companies

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have “over 50 active port projects in the hemisphere. . . In the future, China could use its control of deep-water ports in the Western Hemisphere to support global military deployments.”<sup>163</sup> Adm. Faller particularly notes China’s presence in Panama, where Chinese firms Huawei and China Railways have won significant contracts. Former Panamanian president Juan Carlos Varela hosted Chairman Xi on a visit and voiced his support for the BRI.<sup>164</sup>

As seen in the locations above, China’s post-2030 basing and logistics network is likely to expand beyond east Africa and the Middle East as its interests expand across the globe. China’s BRI relationships in Latin America are critical to monitor, as a PLA base or preferred access in the Western Hemisphere would undoubtedly be of concern to the U.S. military and policymakers. Beyond geographic dispersion, we should also increasingly expect PLA access to overseas airfields as its Y-20 strategic transport fleet grows.

The United States should recognize that China’s overseas basing agreements, which flow from broader diplomatic and economic relationships, may allow it to supplant the U.S. as a security partner in key regions. This could lead to the export of authoritarian ideology, tactics, and tools – including mass surveillance technologies and other tools of digital authoritarianism. According to the *New York Times*, 18 countries have already received Chinese mass surveillance systems.<sup>165</sup> Further, Chinese basing agreements and deepening relationships could lead to “diminished access for U.S. military forces during peacetime and in a conflict,” as Joel Wuthnow argues.<sup>166</sup>

## 3. PLA Expeditionary Operations Capabilities and Sustainment

In section 3, Jane’s analyzes PLA expeditionary capabilities, with a focus on new logistics and expeditionary platforms within the PLAN, PLANMC, and PLAAF.

China’s expeditionary logistics network has quickly matured thanks to over a decade of Gulf of Aden deployments, the introduction of two new supply ship variants, the establishment of the Djibouti logistics support base, and practice with new military-civil fusion / dual-use replenishment concepts of operation (CONOPS) that make use of China’s rapidly-expanding Belt and Road Initiative (BRI)-funded infrastructure. As a result, China can rapidly deploy limited naval and air capabilities in support of military operations other than war (MOOTW) but is unable to support major combat operations – including military operations in a hostile country or conflict with a peer or near-peer power – or deploy troops and equipment in large numbers overseas.

While China’s expeditionary capabilities are rapidly improving qualitatively, the PLAN and PLAAF currently lack sufficient numbers of dedicated military strategic lift aircraft and auxiliary ships to project power for major combat operations overseas.<sup>167</sup> Additionally, as Kristen Gunness explains, “The PLA has not yet had to face a sustained deployment of ground forces overseas—other than the small number of soldiers in permanent UN peacekeeping operations in Africa—and would likely encounter difficulties with maintaining a long-term presence in a land-based contingency.”<sup>168</sup>

Despite the rapid increase in capabilities, the PLA is still in the early stages of its transition to an expeditionary force, especially in terms of the development, refinement, and dissemination of expeditionary concepts of operation and logistics. The following section will concentrate on the PLA’s dedicated military expeditionary capabilities, while section four will also consider the role of civilian and dual use organizations and capabilities in the pursuit of the short, medium, and long-term goals above.

### PLAN Expeditionary Capabilities

The introduction of new PLAN surface combatants, including the Type 052D Luyang III class destroyer, Type 055 Renhai class destroyer, Type 071 amphibious assault ship, Type 075 landing helicopter dock,

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and Type 002 aircraft carrier, have been in parallel with the modernization of the PLAN's supply ship fleet.<sup>1</sup> Principally these include the Type 903A Fuchi class and Type 901 combat support ships, which are large and fast enough, and are being produced in sufficient numbers, to support expeditionary operations. The Type 903A class replenishment ship has an estimated top speed of 19 knots, faster than any previous supply ships, while the two Type 901 replenishment ships in service have an estimated top speed of 25 knots, allowing them to keep pace with aircraft carrier deployments.<sup>169</sup> Type 901s are approximately 35% longer and twice as large as Type 903As.

In August 2013 the first modified Type 903A was commissioned, with seven Type 903As introduced over the next six years. China had more limited auxiliary ship capacity until 2013, with only five total ships between the Type 905, Type 908, and original Type 903, which were first commissioned in 1979, 1996, and 2004 respectively. The two Type 905 replenishment ships are rapidly aging, having been first commissioned in 1979, while the single Type 908 reportedly had much of its large cargo tanks converted to dry storage and state rooms. Aside from being newer and offering the PLAN more total ships, the Type 903A also improves on the original Type 903 class by featuring an improved flight deck and hangar capable of accommodating medium-lift helicopters such as the Z-8 or newer Z-18, as well as more cargo space.<sup>170</sup> This likely allows it to increase Gulf of Aden task forces' time-on-station during deployments.

Type 903 replenishment ships have gained extensive experience in expeditionary operations supporting Gulf of Aden deployments. Gulf of Aden deployments typically consisted of two surface combatants along with a Type 903 or Type 908 (of which there is only one ship in its class, the ex-Ukrainian Qinghai Hu) supply ship in support. As the *PLA Daily* explains, for the first four years of PLAN deployments, only three resupply ships (the *Weishanhu* (Hull 887), *Qiandaohu* (Hull 886), and *Qinghaihu* (Hull 885)) continuously rotated on deployments. The *PLA Daily* explains that in this era of "supply ship troika", "excluding regular maintenance, the three largest supply ships of the Chinese Navy at that time were always conducting escort missions."<sup>171</sup>

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<sup>1</sup> The Type 055 Renhai class (11,000 – 13,000 tons) is similar in size to the USN Aegis cruisers and destroyers – the Ticonderoga (CG-47) class (10,100 tons) and Arleigh Burke (DDG-51) class (9,300 tons). The Type 052D Luyang III destroyer displaces approximately 7,500 tons. The Type 071 LPD has an estimated displacement of nearly 20,000 tons, compared with the USN's 25,900 ton San Antonio class. The new Type 075 displaces 30,000 to 40,000 tons compared with the USN's 40,500 ton Wasp class LHD. Comparisons via "China Naval Modernization: Implications for "U.S. Navy Capabilities – Background and Issues for Congress," U.S. Congressional Research Service, January 22, 2020 and Jane's.



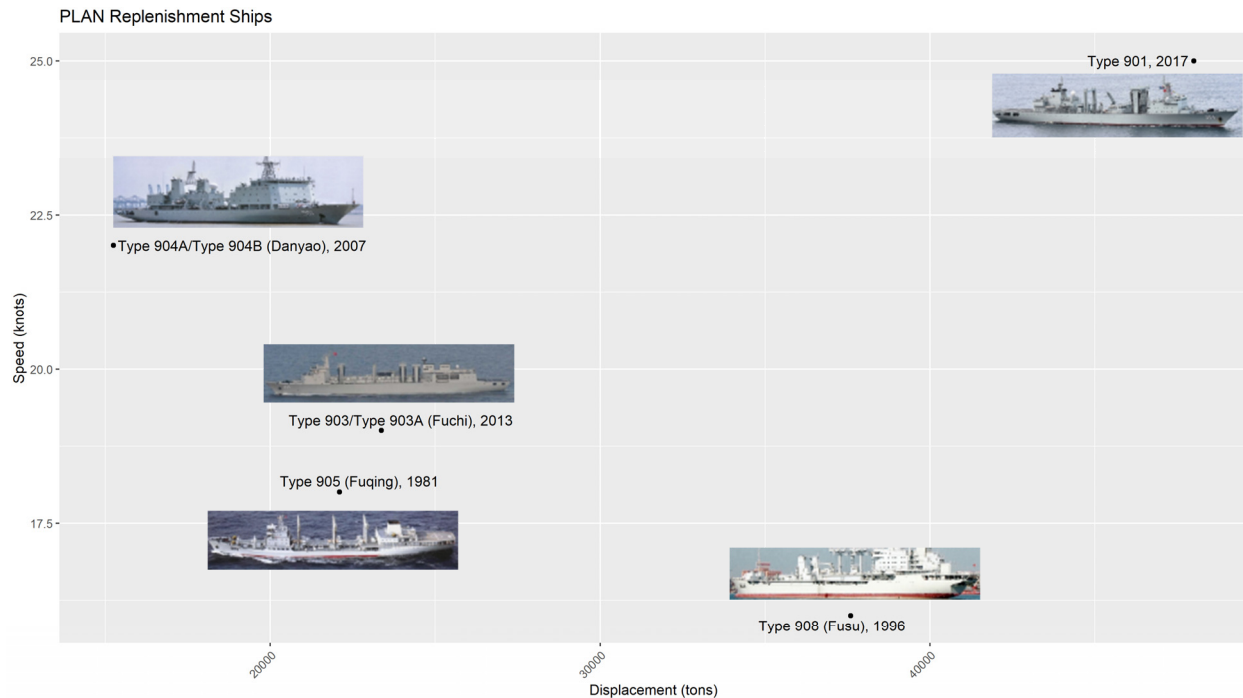


Figure 6: Comparison of PLAN auxiliary ships by displacement and top speed, with colors representing ship class. Data compiled from Jane's Fighting Ships. Note that the Type 903A was first introduced in 2013, but the Type 903 was introduced in 2003.

Because of the introduction of new supply ships, the PLAN is no longer forced to send supply ships on back-to-back deployments to the Gulf of Aden. For example, the *PLA Daily* noted in August 2018 that the Type 903A ship *Dongpinghu* hadn't deployed since 2016.<sup>172</sup>

The Type 903As have been identified under construction at the Guangzhou Shipyard International and Hudong-Zhonghua Shipyard in Shanghai. Because China's current inventory of seven Type 903As (and two Type 903s) appears sufficient for the PLAN's responsibilities in Gulf of Aden escort missions – Type 903As or base Type 903s were used in 11 of the last 13 Gulf of Aden Task Forces dating back to mid-2015 – additional satellite imagery noting new builds at these shipyards could be indicative of the PLAN's intent to prepare for future expeditionary operations outside of their current escort missions and sporadic overseas NEO and HA/DR missions. (Note that there is some confusion over the exact total of Type 903 replenishment ships in service; while open sources have identified nine total, the *PLA Daily* reported in 2018 that "According to reports, China has completed ten Type-903 supply ships, with one still under construction.")<sup>173</sup>

Gulf of Aden missions employ one replenishment ship and two surface combatants, with two task forces deployed at any single time. China could allow each individual Type 903/A vessel a year between deployments with only five or six Type 903/A ships in inventory. Additional ships allow for either a longer time between deployments (which has been the case thus far, with the *PLA Daily* noting that the *Dongpinghu* hadn't been deployed in over a year and a half) or for excess Type 903A to support additional overseas missions beyond just the task forces.

| Platform             | In service (Planned) | Delivery | Max Speed | Tonnage | Fueling Stations | Fuel capacity | Total cargo | Helicopters  |
|----------------------|----------------------|----------|-----------|---------|------------------|---------------|-------------|--------------|
| <b>Type 901</b>      | 2 (4-8)              | 2017     | 25 kt     | 48,000  | 3P/2S            | 20,000        | 25,000      | 2 Z-8 / Z-18 |
| <b>Type 903/903A</b> | 9 (9)                | 2004     | 19 kt     | 23,369  | 1P/1S            | 10,500        | 11,400      | 1 Z-8 / Z-18 |
| <b>Type 908</b>      | 1 (1)                | 1996     | 16 kt     | 37,594  | 2P/2S            | 9,630         | 23,000      | 1 Z-8        |
| <b>Type 905</b>      | 2 (2)                | 1979     | 18 kt     | 22,099  | 2P/2S            | 12,000        | 12,500      | 1 medium     |
| <b>Type 904A/B</b>   | 3 (3-7)              | 2007     | ~22 kt    | 15,241  |                  | 10,550        |             | 1 medium     |

Figure 7: PLAN replenishment ships. Data compiled from Jane's Fighting Ships

Contemporary Gulf of Aden deployments are exemplified by the 31<sup>st</sup> deployment, which included the Type 071 amphibious dock landing ship *Kunlunshan*, the Type 054A Jiangkai II guided-missile frigate *Xuchang*, and the Type 903A comprehensive supply ship *Luomahu*.<sup>174</sup> The *Kunlunshan* featured embarked helicopters carrying special operations forces that were used to deter a suspected pirate ship.<sup>175</sup> The standard Gulf of Aden Task Force is composed of a Type 903A replenishment ship and one or two Type 054A frigates, occasionally rotating the second Type 054A with a destroyer or amphibious assault ship. Type 054A frigates have accompanied each of the last 13 deployments, while Type 903As have joined nine. On the 34<sup>th</sup> deployment, which left Sanya port on 23 December 2019 and included a Type 052D destroyer, Type 054A frigate, and Type 903 replenishment ship, the fleet carried two helicopters, “dozens of special operations personnel” and more than 690 troops.<sup>176</sup>

Overall, Gulf of Aden deployments take roughly two weeks to sail to the region, with the 31<sup>st</sup> Task Force taking 15 days on an “uninterrupted voyage” over the approximately 5,400 nautical miles from China’s coastline.<sup>177</sup> The speed of a PLAN overseas deployment would be limited by the slowest ship in its task group, which is likely to be the replenishment ship in the case of a Type 903A (at 19 knots). The Type 901 was designed to keep pace with aircraft carriers and has a maximum speed of 25 knots. We have limited information on how much advance notice would be necessary for a larger overseas mobilization. The PLAN’s nine in-service Type 903 and Type 903As are evenly divided between the North, East, and South Sea Fleets.<sup>178</sup>

The following chart shows all task force deployments from November 2013 to the present – since the end of the “supply ship troika” with the introduction of the first Type 903A (the *Haihu*) into service. As seen in the table in Appendix A, the PLAN maintains two task forces deployed at any single time, with new task force departures operating on a steady schedule of one departure every four months, beginning every April, August, and December. The typical deployment is approximately 209 days, or nearly seven months. PLAN ships can transit between the Chinese mainland and Gulf of Aden in approximately two weeks, but nearly all task forces conduct friendly visit port calls on their way back to China. The Type 903A can support 2-3 ships for approximately two weeks before needing replenishment. This suggests that PLAN ships are capable of operating for approximately two weeks of sailing time from the Djibouti Logistics Base (i.e., around the Horn of Africa or in the Mediterranean) before requiring replenishment. Without guaranteed access to a friendly civilian port or establishing a military base in the Pacific, PLAN vessels would be capable of operating a similar distance in the Pacific (approximately half of 5,400 nautical miles to ensure supplies for the return journey home).

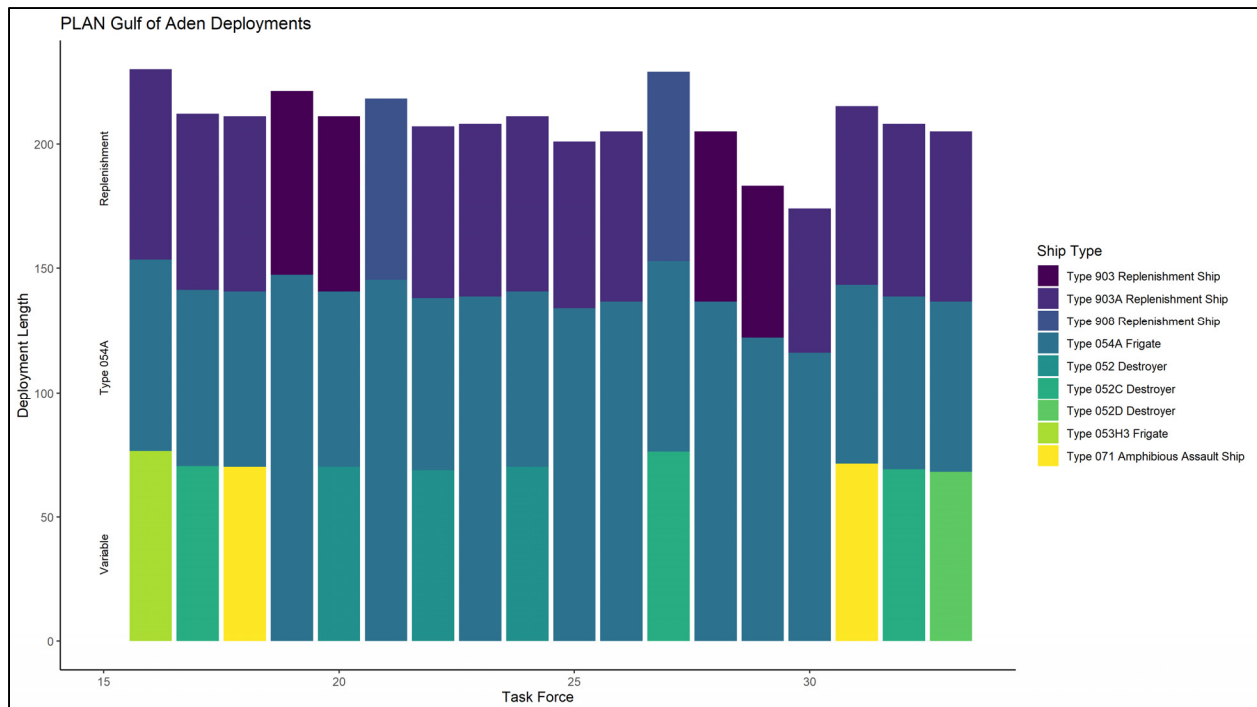


Figure 8: PLAN Gulf of Aden Task Force deployments by deployment length. Bar color refer to the ship composition of each task force. The Type 054A frigates have accompanied each of the last 13 deployments dating back to mid-2015, while Type 903 and Type 903A replenishment ships have joined all but two of the last 13 task forces. Note that exact deployment lengths for the 18<sup>th</sup>, 20<sup>th</sup>, 26<sup>th</sup>, 28<sup>th</sup>, and 33<sup>d</sup> task forces were estimated based on previous missions. Data in chart compiled primarily from chinamil.com.cn.

The PLAN is beginning to develop and refine logistics operations for its aircraft carrier battle group operations. The Chinese Ministry of National Defense reported in December 2019 that the Type 901 class *Hulunhu* combat support ship conducted its first replenishment mission.<sup>179</sup> According to an anonymous “Beijing-based military expert” who spoke with China’s *Global Times*, the Type 901 class will allow the PLAN to deploy “farther from coastal areas into deep blue waters without having to worry about logistics.”<sup>180</sup> Type 901 class *Hulunhu*’s political commissar Ni Jingdong said on *China Central Television* (CCTV) in December 2019 that the *Hulunhu* was “now fully capable of comprehensively replenishing the carrier battle group.”<sup>181</sup>

Type 901 combat support ships are principally designed for carrier strike groups, with the first-in-class *Hulunhu* supporting the Type 001 Liaoning aircraft carrier and the second (*Chaganhu*) supporting China’s first indigenously produced carrier, the Type 002 *Shandong* (commissioned in 2019). The class is much larger than the Type 903A, with a length of 241 meters to the Type 903A’s 178.5 and displacing an estimated 48,000 tons to the 903A’s 23,369. The Type 901 was designed specifically for aircraft carrier replenishment, with photographs indicating that the class features gas turbine engines that would enable a max speed of the claimed 25 knots, as well as its arrangement of refueling stations, with three to port and two to starboard. This is because China’s aircraft carriers have their islands – that is, the flight deck command center – to starboard; China’s carriers are not nuclear powered, so require fuel for both the carriers themselves and their aircraft. As Andrew Erickson and Christopher Carlson previously noted in *Jane’s Navy International*, “It is clear that US oiler designs greatly influenced this PLAN tanker class. In fact, aside from largely cosmetic changes in the superstructure configuration and the use of large kingposts for the replenishment gear, the Type 901 is, arguably, identical to the USN Supply class.”<sup>182</sup> The Type 901s however appear to be more focused on the replenishment of fuel and provisions compared to the USN

Supply class based on the fact that it has only dry cargo delivery station compared to the Supply class's three per side (which assists with UNREP of ordnance).<sup>183</sup>

According to a CCTV report mentioned in the MoD article, the *Hulunhu* had spent over 200 days at sea for exercises in 2019. It is likely paired with China's first aircraft carrier, the Liaoning, while China's second Type 901 replenishment ship, the *Chaganhu*, will likely be paired with China's first domestically-built aircraft carrier, the *Shandong*.<sup>184</sup> Future aircraft carriers – two to four more are expected, for a total of four to six in PLAN service – would likely require (at least) their own dedicated Type 901 replenishment ships as part of carrier battle groups. A CCTV report suggests the need for additional Type 901s as the PLAN introduces new aircraft carriers, as well as the potential to provide redundancy beyond the 1:1 aircraft carrier to Type 901 ratio.<sup>185</sup> It is also possible that additional Type 901s might be expected for the 40,000 ton displacement Type 075 LHD (of which Jane's expects the class to number six to eight ships, and potentially up to 12, with 2-3 per fleet by 2030) in addition to additional aircraft carriers.<sup>186</sup> Jane's projects that China could acquire between four and eight Type 901s by 2030.<sup>187</sup>

It will be important to monitor whether the Type 901s rotate into the Gulf of Aden deployments, particularly alongside the PLAN's larger surface combatants like the newly introduced Type 055 or the Type 052D destroyers, or with the Type 075 LHD. Because these capabilities are of several magnitudes beyond what is necessary for anti-piracy escorts, it can be assumed that such an overseas deployment would be designed to provide the crews of the Type 901 (as well as its accompanying task force ships) experience conducting far seas replenishment operations.

However, as Shanghai-based defense analyst Ni Lexiong argued in the *South China Morning Post*, "bigger supply ships were no substitute for more overseas bases when it came to supporting the expanding mission of China's naval fleets... No matter how big the supply vessels are, they are still small compared to harbour cities... The vessels can only provide support for a limited amount of time."<sup>188</sup>

The PLAN has important domestic bases for expeditionary operations at Zhanjiang, where the South Sea Fleet, including the 2<sup>nd</sup> Destroyer Flotilla, the 1<sup>st</sup> and 2<sup>nd</sup> Marine Corps Brigades, and the 6<sup>th</sup> Landing Ship Flotilla, are located, as well as at Yulin Naval Base, where the 9<sup>th</sup> Destroyer Fleet is located.

## PLAN Future Force Requirements

China's naval modernization and increasing activity in the Indian Ocean Region has fueled a strategic competition with India. As Yang Xiaoping, a senior research fellow at the National Institute of International Strategy within the Chinese Academy of Social Sciences, wrote, "India's concerns about China's encirclement are real, given China's enabling of Pakistan as well as competition for influence among small states in the region."<sup>189</sup> Yung and Rustici have previously noted that the PLAN would likely require a minimum force equivalent to its current force structure as well as that of the Indian Navy in order to address both its local maritime security needs as well as an armed conventional conflict against India. This would be equivalent to approximately three aircraft carriers, 41 destroyers, 77 frigates, and 87 submarines.<sup>190</sup>

While the focus of this report is on the development of China's expeditionary capabilities particularly as relevant to the United States, the comparison with India's navy is nevertheless useful as an indication of China's broader long-term expeditionary capabilities and intentions. For example, as we argue, if China's expeditionary naval capabilities are insufficient to sustain major combat operations against India before approximately 2025-2030 in the Indian Ocean, they would also be unable to sustain major expeditionary combat operations against the United States. As Yung and Rustici note, "The bottom line is that if China wants military dominance in the Indian Ocean (which implies the ability to fight and win major combat

operations), it would need a much larger navy and a logistics and support infrastructure that far exceeds current capabilities.”<sup>191</sup>

Given that a “replenishment relay” was required for the one-month journey to the Joint Sea 2017 exercise, while a single Type 903A replenishment ship is sufficient for the two-week voyage to the Gulf of Aden, operations beyond two to three weeks would likely require support for forward deployed vessels, civilian ships, and/or overseas bases and/or civilian ports (with much depending on the politics surrounding the contingency). Relying on civilian ports during a conflict with another state would be risky, given that PLAN use of civilian ports could give cause to consider the foreign state as an enemy combatant.

At present, China is capable of deploying 3-6 surface warfare groups for several weeks at distances of approximately 2,500 to 3,000 nautical miles throughout the Indian Ocean Region. These groups would be principally comprised of Type 054A frigates and Type 052D destroyers. These groups have an expanding but still limited ASW capability. The first “stretched” Type 052D destroyer recently entered service, featuring an extended flight deck thought to be intended for a naval variant of the Z-20 medium-lift helicopter. The naval Z-20s will likely require an integrated surveillance radar, dipping sonar, and the ability to carry torpedoes. However, PLAN helicopter and ASW capabilities remain limited.

Jane's assesses that in 5-10 years these groups will begin to introduce the new Type 055 destroyers. Future deployable surface warfare group capacity will be dependent on the number of in-service replenishment ships and/or overseas bases. Assuming increased production of Type 901 fast replenishment ships beyond those necessary for carrier groups, the PLAN will have modernized surface combatants of Type 052D destroyer, Type 055 destroyer, and Type 054A frigate (and a potential future frigate class) classes available for overseas deployments. The Type 055 destroyers appear more optimized for ASW as well as ASUW, vastly improving the PLAN's surface strike capabilities.

China's current carrier strike group capabilities are limited. Of its two aircraft carriers, only the Type 002 *Shandong* is intended for operational service, but as described, its Short Take-Off Barrier-Arrested Recovery (STOVAR) system, oil-fired engines, and small airwing of J-15s limit its operational effectiveness for expeditionary operations. The PLAN is less likely to use its existing Type 001 and Type 002 aircraft carriers in an expeditionary role outside of its near seas and will likely instead wait for a future indigenous Type 003 aircraft carrier with a catapult-assisted take-off but arrested recovery (CATOVAR) – reportedly a locally developed Electromagnetic Aircraft Launch System (EMALS) that would enable it to “launch fighters carrying heavier fuel and mission payloads – significantly expanding on the carrier's striking range and lethality options.”<sup>192</sup> It is reasonable to expect that the Type 003 could be closer in capability to the U.K.'s Queen Elizabeth carrier.<sup>193</sup> By 2030-2035, the introduction of additional Type 003 aircraft carriers and Type 901 fast replenishment ships could allow for 2-3 carrier strike groups, with approximately 48 combat, ASW, and reconnaissance aircraft such as the J-15 fighter, and J-20 or J-31 stealth fighters.

Other auxiliary ships, including additional hospital ships (of which the PLAN only has the lone Type 920 *Daishan Dao*, or *Peace Ark*), submarine rescue ships (China has three Type 926 Dalao class), and semi-submersible vessels, would also be needed.

Jane's projects the PLAN of 2035 to include:

- 12 Type 055 destroyers
- 17+ Type 052D destroyers
- 28 Type 054A frigates
- 4-6 aircraft carriers
- 6-8 Type 075 LHDs

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- 8-10 Type 071 amphibious warfare ships
- 4-8 Type 901 replenishment ships
- 9 Type 903A
- 2+ Type 054A follow-on frigates (and building)

The PLAN will have a significantly more formidable force by 2030-2035, but it likely will not have the surface combatants and logistical support ships necessary to sustain a protracted overseas campaign. Instead, the PLAN's force structure projected to ~2030 suggests a focus on protecting its overseas investments – including overseas physical infrastructure, sea lanes, and overseas nationals. Similarly, the PLAAF has only nascent expeditionary capabilities, with few bombers, strategic airlift, or tankers. A robust strategic airlift fleet will enable the service to rapidly respond to limited contingencies by 2030.

## PLAN Marine Corps (PLANMC) deployment

The PLAN Marine Corps has rapidly expanded since 2017, from a force of 10,000 to 12,000 personnel to approximately 35,000 at present. The PLANMC was able to achieve this expansion through the transfer of PLA ground forces. The PLANMC may ultimately number 40,000, with six brigades supplemented by aviation and special forces units.<sup>194</sup>

With the rapid expansion of the PLANMC and the increase in available Type 071 LPDs, there is a possibility that the PLANMC could adopt a concept of operations similar to that of a U.S. Marine Expeditionary Unit (Special Operations Capable) (MEU(SOC)). This would allow the PLANMC to conduct land operations, including noncombatant evacuation operations (NEO), humanitarian assistance/disaster relief (HA/DR), and limited counterinsurgency operations without forward, ground-based stationing of weapons and supplies.<sup>195</sup> Prior testimony to the USCC has attested to this possibility, with Christopher D. Yung noting in 2016 that, “the PLA is probably not far off from deploying PLA ground forces like the USMC deploys MEUs on [amphibious ready groups (ARGs)],” without necessarily requiring an onshore basing presence.<sup>196</sup>

MEUs are composed of an amphibious assault ship, a landing platform dock (LPD), and landing ship dock (LSD), along with their onboard air and amphibious platforms. MEUs carry approximately 2,600 Sailors and Marines and are able to sustain combat operations for up to 15 days with organic supplies, while regularly being deployed for six-month rotations.<sup>197</sup>

China could field a similar amphibious unit by 2030 that would allow for air and ground contingency operations overseas, as seen in the notional layout in Figure 9. With the upcoming Type 075 LHD, Type 071 LPD, and either a second Type 071 LPD or a Type 072A landing ship, the PLAN could conduct and sustain sea-based amphibious and ground combat operations of a similar length of time (approximately two weeks) as a USMC MEU. The PLAN launched its first Type 075 LHD in September 2019, which is likely to enter service in 2020 or early 2021. Jane's identified a third Type 075 LHD under construction at the Hudong-Zhonghua shipyard in Shanghai in November 2019.<sup>198</sup> A three-ship package as described above could include approximately 36 helicopters, approximately ten LCACs, and likely more than 30 amphibious IFVs for amphibious operations.

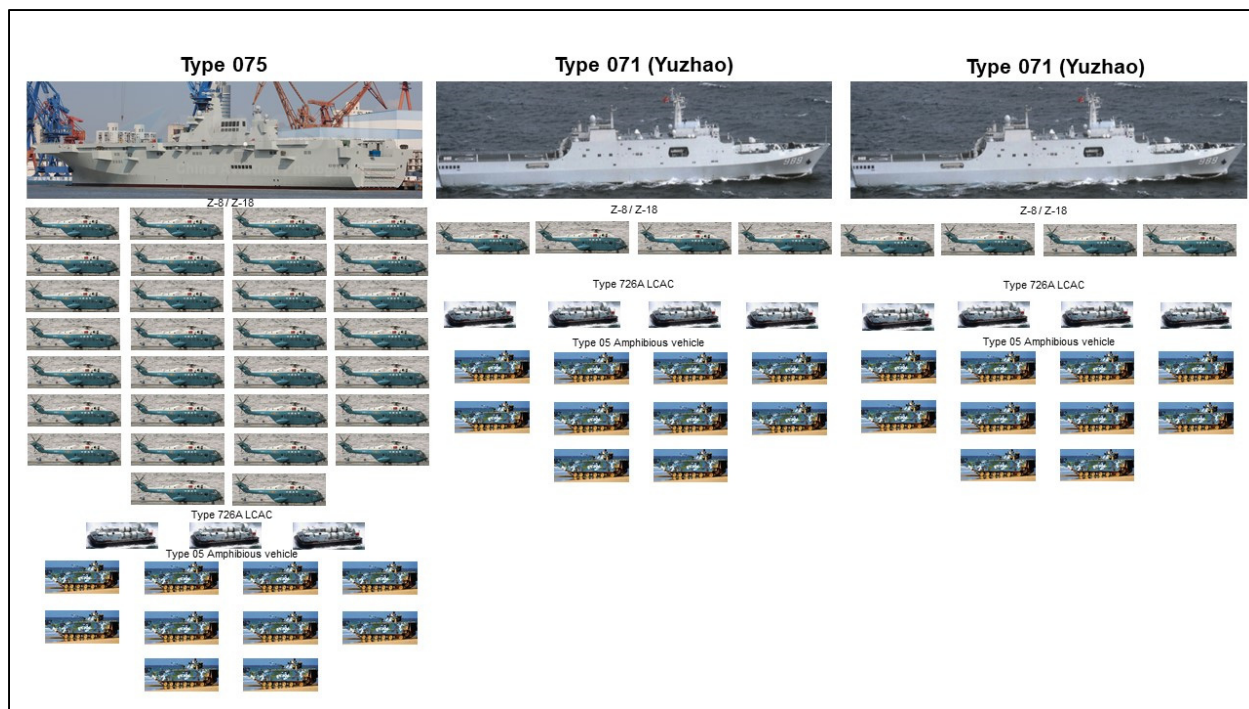


Figure 9: Notional layout of a MEU in comparison with a potential layout of a projected similar PLAN rapid reaction force.

It is probable that the PLAN has permanently shifted production from the Type 071 LPDs to the Type 075 LHDs.<sup>199</sup> The Type 075 has a top speed of between 23 and 25 knots (similar to the Type 901 replenishment ship), allowing it to cross the Taiwanese Strait in approximately a day. Based on interviews with Taiwanese Defense Minister Yan Defa, Taiwan has closely monitored the Type 075's development and impact on China's amphibious warfare capabilities.<sup>200</sup> However, the introduction of the Type 075 should be viewed not only in the context of Taiwan contingencies, but also in regards to potential expeditionary operations outside of China's near seas.

China is likely currently capable of deploying two limited amphibious task forces at once, for roughly six-month deployments, anywhere in the Middle East, Indian Ocean region, or potentially into southeast Asia and the Pacific. This would include unit strengths of approximately four battalions of infantry between approximately four Type 071 LPDs. These groups would currently be highly unlikely to sustain combat operations overseas for more than a few weeks.

By 2030-2035 the PLAN and PLANMC could increase to approximately six MEU-sized amphibious groups, depending on the final number of Type 075s (or follow on variants) the PLAN opts for. A future MEU-style contingent of a Type 075 LHD, and either two Type 071 LPDs or one Type 071 LPD and a Type 072A landing ship could contain approximately 35 helicopters, 50 Type 05 amphibious vehicles, and ten Type 726 LCACs, as well as approximately 2,500 marines and sailors. These groups would provide the PLANMC with a self-contained amphibious combat force for operations up to two weeks. Jane's estimates that the PLAN could be capable of deploying approximately four of their six MEU-sized amphibious groups, which could combine for over a brigade's worth of personnel supported by organic helicopter capabilities.<sup>201</sup>

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China will likely gradually introduce Type 075 LHDs into expeditionary deployments over the next ten years to gain operational experience, and it will test the international reaction to increasing distant deployments of its aircraft carriers and Type 075 LHDs as they are introduced into service.

The rapid expansion in the number of PLAN replenishment ships, an increase in their capability to transport solid cargo, an increase in helicopters available to the PLAN and PLANMC, and/or the pre-positioning of ordnance overseas are liminal moments for Chinese expeditionary ambitions and capabilities. These incidents would signal an improved ability to conduct and sustain expeditionary amphibious and naval surface combat operations for the PLAN and PLANMC.

There are numerous challenges China must overcome before using such an amphibious ship package, however. As is common to the entire PLA, the PLANMC does not have combat experience. Many PLAN marines are new recruits or were converted from PLA ground forces. Further, “neither the PLAN nor PLANMC have the number of troop-carrying helicopters that would be required for a significant amphibious airborne assault (air assault by helicopter or vertical assault in a contested environment) and they appear to be competing with the PLA” Army for new helicopters.<sup>202</sup>

Any Chinese MEU would require a significant number of PLANMC troop transport and assault helicopters. The East Sea Fleet’s rotary wing assets are the 11<sup>th</sup> Regiment in the 4<sup>th</sup> Division at Ningbo-Zhuangqiao. The North Sea Fleet’s rotary wing assets are in the 5<sup>th</sup> Regiment of the 2<sup>nd</sup> Division at Qingdao-Cangkou. The South Sea Fleet’s rotary wing assets are in the 23<sup>rd</sup> Regiment of the 8<sup>th</sup> Division at Guiping.

While a U.S. Wasp-class LHD can accommodate F-35 fighters, the Type 075 LHD is only expected to be able to accommodate rotary wing assets. This suggests that even the future PLANMC of 2030 would struggle to penetrate adversary air defense systems without carrier support.

In addition to known projects underway, China observers should expect an increased focus on incorporating unmanned assets into the PLAN’s force structure. For example, a PLANMC equivalent of the Leidos/US Marine Corps’ Marine Warfighting Laboratory autonomous beach landing capability should be expected.<sup>203</sup> The PLANMC is already experimenting with unmanned amphibious platforms, as the Wuchang Shipbuilding Industry Group (under China Shipbuilding Industry Corporation (CSIC)) announced the world’s first unmanned amphibious assault vehicle, known as the Marine Lizard, in April 2019.<sup>204</sup>

## PLAN Expeditionary Logistics Models

The PLAN is developing five basic logistics models for conducting expeditionary operations. Any individual operation may combine multiple models depending on the duration of the deployment and the size of the expeditionary force.



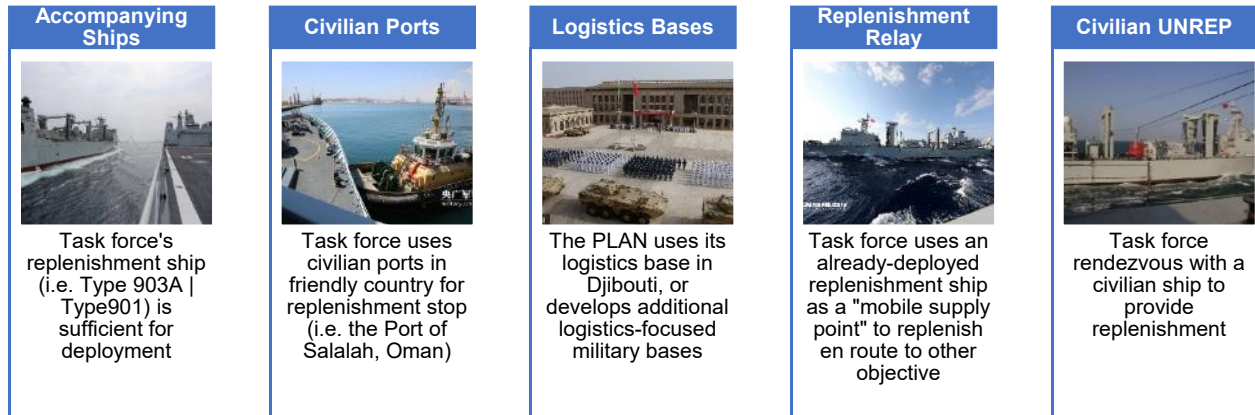


Figure 10: PLA military logistics models. Images from chinamil.com.cn

## Accompanying Ships

The standard logistics model, the PLAN has sent a replenishment ship – either a Type 908, Type 903, or Type 903A – on every Gulf of Aden deployment, and Type 901 replenishment ships accompany the PLAN's two aircraft carriers. A single replenishment ship is rarely sufficient to supply a task force or other expeditionary group by itself. Based on past deployments, a single replenishment ship can likely support 2-3 surface combat ships for 2-3 weeks at a time before the group requires external support via UNREP or docking in a foreign civilian or military port.

## Civilian Ports

The PLAN often stops at foreign civilian ports for replenishment and friendly visits. The PLAN has stopped at numerous foreign ports on Gulf of Aden missions and en route to overseas exercises, including ports in Djibouti, France, Greece, Indonesia, Italy, Oman, Pakistan, Portugal, Saudi Arabia, Singapore, South Africa, Spain, Sri Lanka, and Yemen. Civilian port calls are valuable for PLAN soft power and broader diplomatic goals “by facilitating interaction and dialogue between China and the many countries whose ports and geographic locations heighten the strategic value of these relationships.”<sup>205</sup> In addition to logistical considerations (i.e. distance to destination, harbor depth and space, local security concerns), the choice of civilian ports to use for replenishment will increasingly be driven by broader strategic needs.

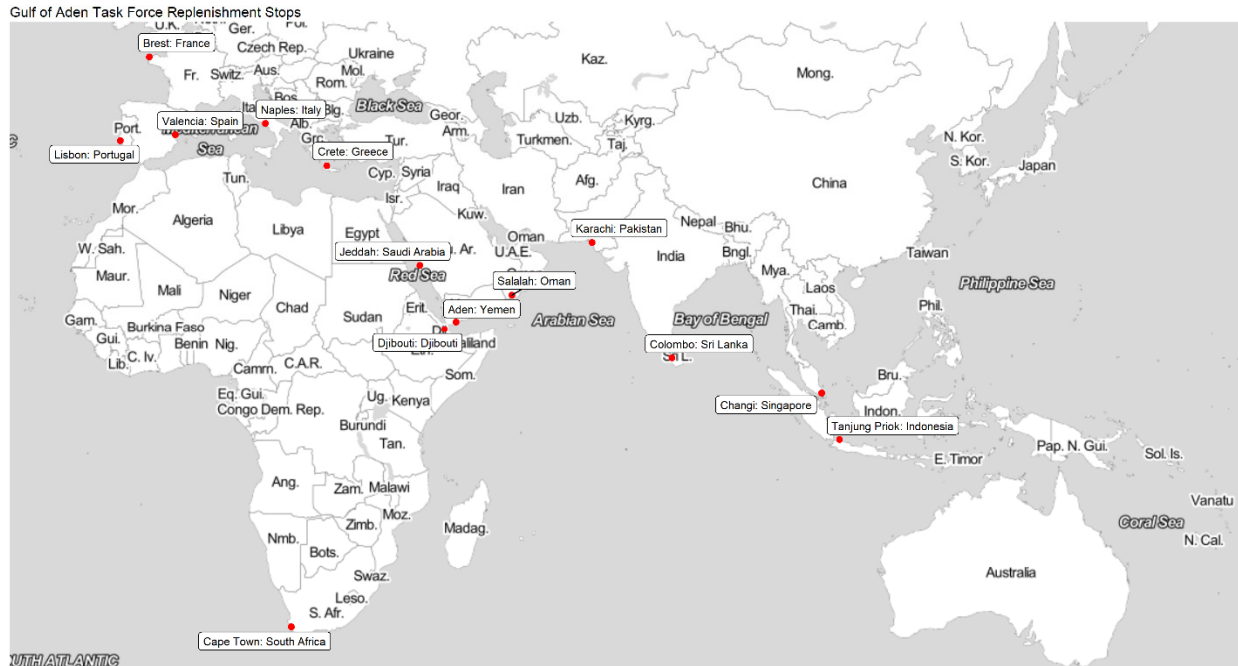


Figure 11: Confirmed PLAN replenishment port calls during Gulf of Aden anti-piracy deployments. The task forces are likely to have received replenishment at other ports that were not explicitly identified as replenishment stops through Chinese news sources. Source: Jane's, compiled from PLA Daily reports

## Logistics Bases

While the PLA currently only has one military logistics base in Djibouti, additional logistics bases and/or larger bases with pre-positioned troops, weapons, and other supplies would offer the PLAN a dedicated location for rest and resupply that would offer fewer constraints on its use, particularly during military conflicts. Purpose-built military facilities also offer additional advantages over dual use facilities and infrastructure.

Of note, the JLSF has reportedly improved its ability to replenish supplies in urgent and emergency situations. A late December 2019 report noted that a fuel shortage caused by an increase in flight trainings. The JLSF “accelerated the establishment of a new military transport delivery mechanism and a military transport delivery plan in the theater” in early 2019, which helped mitigate the shortage.<sup>206</sup> This was a domestic replenishment and it is currently unknown how the improvement could translate to overseas bases and operations, although the increased numbers of available Y-20 should increasingly facilitate emergency replenishment overseas, pending the ability to land at friendly civilian airfields.

## Civilian UNREP

In late November 2019, China’s MND reported that the PLAN had successfully tested underway replenishment (UNREP) from a civilian container ship, the COSCO *Fuzhou*. The *Fuzhou* provided logistics support for the Type 054A frigate *Linyi* as well as the accompanying Type 903 replenishment ship *Taihu*. The MND’s report concluded that, “Using civilian ships to carry out UNREP for naval ships is a new attempt in the field of naval logistics support. The civilian vessels cover a wide range of routes, thus have large potential for replenishment at sea, which implies remarkable military economic benefits. The success of the test provides important technical support for the future development of underway replenishment control technology.”<sup>207</sup>

The MND reported on the UNREP test on 21 November 2019. According to open source ship tracking data, the *Fuzhou's* last port call was at Dar es Salaam, Tanzania, between 15 and 18 November. Over the last three months the *Fuzhou* also visited Mombasa, Kenya, in addition to locations in Singapore and China.<sup>208</sup>

It is therefore possible that the PLAN could use sites such as Dar es Salaam and Mombasa, among other COSCO ports, not as formal military resupply bases, but as dual-use nodes for a largely civilian port network that nevertheless serves PLAN ships in an expeditionary capacity. COSCO has numerous container ships operating in the region as part of its fleet of 1,318 vessels (the third-largest in the world).<sup>209</sup> Other COSCO ships stop at Port Colombo, Sri Lanka, Karachi, Pakistan, and Jeddah, Saudi Arabia, all of which are both notable Belt and Road Initiative locations and/or are locations visited previously by PLAN ships on Gulf of Aden deployments.<sup>210</sup>

As Jane's noted following the MND's report on the *Fuzhou's* UNREP test, "The PLAN's requirement for this capability is not entirely clear... If the PLAN has a requirement for additional 'ships taken up from trade' (STUFT), it suggests that the PLAN envisages the need to support multiple task groups on extended or distant operations, beyond the capacity of the existing 11 auxiliaries." Chinese media reports tended to emphasize the civilian UNREP transfer of dry cargo replenishment – that is, food, weapons, and other miscellaneous supplies. The U.S. and other navies often practice vertical replenishment via shipborne helicopter for solid stores. Further from Jane's November 2019 report, "If the PLAN sees a future requirement to be able to replenish solids by jackstay transfer from commercial vessels, rather than by vertical replenishment, this suggests that the PLAN does not envisage the currently limited capacity of its embarked helicopters increasing significantly in the near future."<sup>211</sup>

It could also suggest that the PLAN might be considering alternative replenishment models as a backup to the availability of larger Type 901s. Type 903As have relatively limited solid cargo capacity, with a total cargo capacity of 11,400 tons but with 10,500 tons for fuel alone. The Type 901s have approximately 25,000 tons of total capacity with 20,000 tons for fuel, but if their availability is limited then civilian ships could help close the gap for solid cargo replenishment on expeditionary missions over two weeks.

Noticeably, photographs of the *Fuzhou's* fuel transfer show only a small-bore hose between the two ships during the UNREP, suggesting a slow fuel transfer rate comparable to astern refueling rather than that of a conventional refueling at sea rig.<sup>212</sup>

## Replenishment Relay

Additional information regarding China's ability to sustain expeditionary operations is provided by PLAN participation in overseas military exercises. En route to the "Joint Sea 2017" exercise in St. Petersburg in July 2017, the Type 052D destroyer *Hefei* and Type 054A frigate *Yuncheng* received a "replenishment of fuel and fresh water" from the Type 903A *Gaoyouhu* in the Indian Ocean, despite being accompanied by the Type 903A *Luomahu*. According to an anonymous military expert interviewed by the *PLA Daily*, "the amount of supplies it carries is limited and not capable of meeting the needs of the other two warships for fuel, fresh water and other supplies during the one-month-long voyage" that would see the group pass through the Suez Canal, the Mediterranean, and the Baltic Sea.<sup>213</sup> This transit was approximately twice the length (in days) as the voyage from China to the Gulf of Aden anti-piracy missions.

The *PLA Daily* referred to this expeditionary logistics model as a "replenishment relay" or "mobile supply point", contrasting this method with other PLAN models that rely on either replenishment in foreign countries' ports (primarily civilian ports, but also including the Djibouti Naval Support Base) or accompanying replenishment ships. The *PLA Daily* suggested that this model reduces the cost of

replenishment in foreign countries' civilian ports. According to the military expert quoted in the article, "It is a useful exploration for the Chinese navy to take advantage of its escort taskforce in the Gulf of Aden to conduct front-end replenishment for Chinese warships passing by this water, which will be of great help for Chinese navy's similar ocean-going operations in the future."<sup>214</sup>

## PLAAF Expeditionary Capabilities

While the PLAN has been at the center of China's expeditionary capabilities modernization and strategy, Chinese strategists are increasingly concentrating on the need to improve the PLAAF's strategic airlift. In 2016, a *PLA Daily* article noted that "In the future, long-range combat areas will mostly be located in global 'public domain frontiers' far from the country," requiring the rapid delivery of materials for which strategic airlift is the only viable option. The author notes the example of the U.S. military: "In recent local wars, the U.S. military was the first to call an airlift unit to deliver troops, and its forces were about 20 times the speed at sea."<sup>215</sup>

In 2017, then-new commander of the PLAAF, Lieutenant General Ding Laihang, told *China National Radio* that the service would increasingly focus on long-range missions to realize its goal of becoming a "strategic" service capable of conducting operations in the service of the national interest "wherever they exist." As quote in *China Daily*, General Laihang said that "In the past, our strategies and guidelines focused on territorial air defense. Now we have been shifting our attention to honing our ability in terms of long-range strategic projection and long-range strike."<sup>216</sup>

In response, Wang Yanan, editor of the *Chinese Aerospace Knowledge* magazine, was quoted by *China Daily* as saying that the PLAAF will prioritize ensuring its new aircraft are combat-ready and maintained: "For instance, the air force now has Y-20 heavy-lift transport jets, but it needs to design methods and gain experience when it comes to airdropping armored vehicles... owning advanced weapons does not equate to being able to use them well."<sup>217</sup>

These comments reinforce the observation that the PLAAF, like the PLAN, is becoming an expeditionary service, and will begin to conduct trainings and exercises over the next few years to ensure the readiness and interoperability of its new equipment with the joint force, as well as to test expeditionary logistical support models.

In parallel with the PLAN, the PLAAF's transition to an expeditionary force has been hindered by a lack of transport and replenishment capabilities, including strategic lift and tanker aircraft. The PLAAF has pursued both short- and long-term solutions to this problem. In the short term, the PLAAF acquired ten Il-76MD strategic transport aircraft between 2012 and 2015 as well as three Il-78 tankers from Ukraine between 2011 and 2016. The Il-76MDs more than doubled the PLAAF's 13th Transport Division's fleet of Il-76 strategic transport aircraft, while the Il-78s augmented the PLAAF's limited fleet of H-6U/DU tankers.<sup>218</sup>

These aircraft are stop-gap capabilities until China can complete the development and production of indigenous designs, which are focused on the Y-20 transport aircraft, as well as a probable Y-20 tanker variant. As PLAAF Senior Colonel Shen Jinke noted, "The Y-20 heavy transport aircraft is a crucial element for improving China's aerial logistics and delivery abilities."<sup>219</sup> Approximately 12 Y-20s have been confirmed as in service based on their serial numbers, nine of which are serving at the PLAAF 4<sup>th</sup> Transport Division 12th Air Regiment at Chengdu/Qionglai. However, 15-20 additional platforms are known to have been built and identified at the Xi'an Aircraft Corporation (XAC) factory in Xian-Yanliang, and could be only waiting for engine integration.<sup>220</sup> In February 2020 images emerged of two additional Y-20s bearing serial numbers that suggest their operation by the 13<sup>th</sup> Transport Division (37<sup>th</sup> Air Regiment) at

Keifeng.<sup>221</sup> An additional Y-20 is in service with the Central Theater Command. The number of Y-20 dedicated to special operational forces is currently unknown.

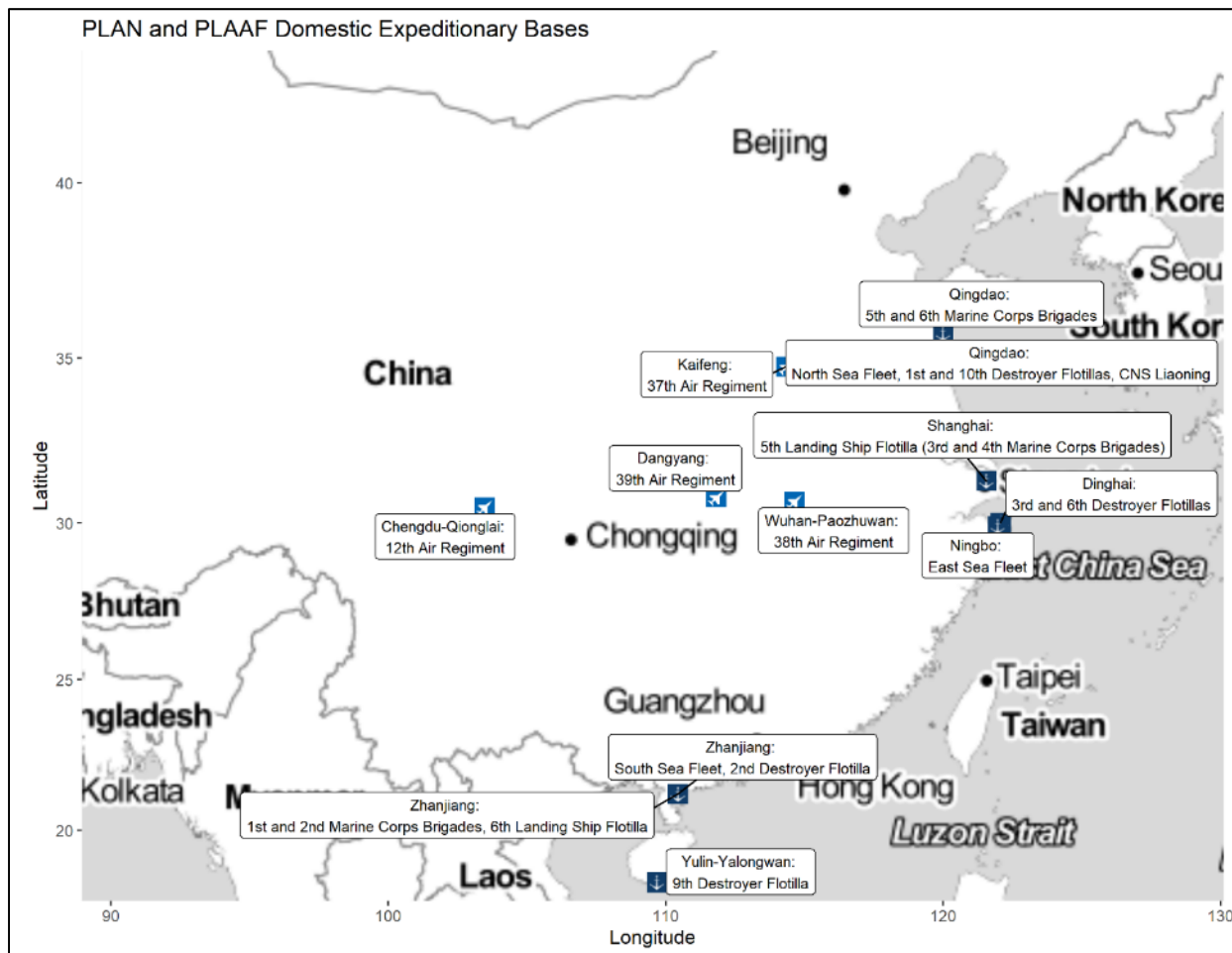


Figure 12: China's PLAN and PLAAF bases that contain expeditionary capabilities. Source: Jane's

Production was limited for years by engine availability, as the PLAAF signed a contract for an additional 224 Russian-made D-30KP II-Series turbofan engines in 2016. China has tested the indigenously produced WS-20 engine, although recent updates have been limited. Chinese news sources have quoted the Y-20's max payload as 66 tons, or 51 tons at a range of 5,200 km.

In June 2018 China announced that the PLAAF had completed its first heavy equipment airdrop training with multiple infantry fighting vehicles. This significantly increases the ability of the PLAAF to conduct expeditionary operations in remote areas with more than just paratroopers.<sup>222</sup>

In November 2018 Jane's identified a Y-20U tanker variant with a probable underwing inflight refueling pod at XAC's main manufacturing facility. An in-flight image later appeared on Chinese online forums in October 2019.<sup>223</sup> The PLAAF was previously reliant on its 20 H-6U and three Il-78 tankers, while the PLANAF had converted several H-6D aircraft into tankers. The H-6Us are capable of offloading 18.5 metric tons of fuel out of a total of 37 metric tons carried. A 2019 report in *Ordnance Industry Science Technology*, a Chinese defense industry periodical, suggested that a Y-20 tanker variant would carry 90 tons of fuel, suggesting that a tanker variant triple China's existing tanker capabilities in the H-6.<sup>224</sup> Reports suggest that the refueling pod may be based on the Il-78's Russian UPAZ-1A pod.

According to the Xi'an-based *Ordnance Industry Science Technology* magazine, the PLAAF could install underwing and rear refueling pods on the Y-20 in the short term (similar to the Il-78 and A400M), while a longer term option would be to integrate the refueling platform within the fuselage (similar to the KC-767). The Y-20's chief designer said in March 2019 that the Y-20 "can serve as a general platform from which a variety of variants can be derived." According to *Xinhua News*, China aims for the PLAAF to be a "modern" strategic air force by 2035.<sup>225</sup> A senior PLAAF commander told CCTV on 24 February 2020 that a Y-20 tanker variant would appear in public in the near future.<sup>226</sup>

At present, China has approximately 12 Y-20s and six Il-76s available for deployment, although their availability would be dependent on domestic requirements. Further, their overseas deployment would be limited by access to overseas airfields in friendly countries, likely in the context of various humanitarian assistance missions. As a recent RAND report notes, "In the future, the PLAAF will need to establish reliable access to overseas airfields if it hopes to operate missions of a broader variety and higher tempo abroad."<sup>227</sup> The PLAAF's deployment capacity of combat fixed wing fighter and bomber aircraft is currently extremely limited outside of military airshows and exercises, and is limited by the lack of dedicated overseas military bases and tanker aircraft.

Jane's sources indicate that the Y-20 is able to transport approximately 120 fully equipped troops when configured as a tactical transport or approximately 250 individuals without equipment or civilians. China's current Y-20 fleet, and its estimated paratrooper capacity of 110 – 120 troops, suggests the capability to conduct a tactical airborne insertion of up to approximately 1,200 – 1,300 paratroopers, followed by approximately 22 Type 05 infantry fighting vehicles or 33 parachutable ZBD-05 fighting vehicles per sortie.<sup>228</sup>

In the event of a NEO or rescue operation with host country support, Jane's believes China could currently evacuate approximately 2,750 individuals per day. This estimate is based on 250 individuals per aircraft, with all 11 confirmed in-service aircraft participating. According to Chinese media reports from the 2011 NEO of Chinese nationals from Libya, four Il-76s completed two evacuation sorties each in 46 hours between Sebha Airport in Libya and Khartoum International Airport in Sudan, moving 1,655 individuals, or an average of 207 individuals per flight.<sup>229</sup> The PLAAF's current capability to conduct NEOs in hostile territory would be extremely limited. This estimate also suggests that as the Y-20 fleet expands to 100 aircraft, observers may continue to expect the capacity to conduct at least one sortie per day per aircraft, with approximately 250 individuals per sortie, for a maximum capacity of 25,000 individuals per day.

Over the next 5-10 years, Jane's expects that the PLAAF could have up to 70 strategic lift assets by 2025, including 18 Il-76s and roughly 50 Y-20s, with 100+ Y-20s possible by 2030. The China National Defense University's Center for Economic Research produced a "Chinese Military and Civilian Integration Development Report, 2014" report that recommended the PLAAF acquire up to 400 Y-20s, although a more realistic goal for ~2030 is 100-125.<sup>230</sup> This would allow for tactical airborne insertion of up to approximately 10,000 paratroopers. Deployment of fighter and bomber will remain constrained by the lack of overseas airbases.

## 4. Role of Civilian Organizations in Expeditionary Operations

Section 4 assesses how civilian organizations contribute to PLA expeditionary operations through dual-use technologies and broader military-civil fusion.

In addition to PLA capabilities, China has focused in recent years on integrating civilian and dual-use capabilities into its expeditionary CONOPS through the "strategic projection support ship fleets" (战略投送

支援船队), “strategic projection air support fleets” (战略投送支援机队), and the potential development of additional overseas bases.<sup>231</sup>

In June 2015 China issued the *Technical Standards for the Implementation of National Defense Requirements for Newly Built Civil Ships*, which requires new civilian ships to be built to standards allowing for conversion for military use if required. This is in addition to laws such as *Regulations on National Defense Mobilization of Civil Transport Capacity* and the *National Defense Traffic Law*.<sup>232</sup> The standards apply to five types of ships – container, roll-on/roll-off, multipurpose, bulk carrier and break bulk. At the time of its introduction, *China Daily* reported that the national legislature was working on a National Defense Transport Law that would allow civilian shipbuilders to receive funds to cover the costs of higher standards for military ship use as well as insurance in case of damage during conflict. The PLAN reportedly based its standards on the example set by the United Kingdom during the 1982 Falklands War.<sup>233</sup> Civilian shipping companies repeatedly emphasize the importance of contributing to the national defense effort by participating in exercises and adapting ships for military use in addition to merely complying with regulations.<sup>234</sup>

Chinese analysts explicitly connect BRI investments with the need for military-civil fusion partnerships to safeguard their investments, proposing increased use of civilian container ships and roll-on roll-off ships (RO-RO) for expeditionary military operations. An analysis from the Ocean University of China noted that there was a “deep internal relationship between the two,” referring to military-civil fusion and the BRI, and that “Chinese enterprises participating in the ‘Belt and Road’ construction, whether state-owned or private, must consciously establish... assistance and support for China’s national defense construction and military industry development.”<sup>235</sup> Further, in an analysis of the overlap between the BRI and military-civil fusion, a professor from the Chinese Academy of Social Sciences Institute of Contemporary Political History argues that, “It is necessary to comprehensively consider national security needs through various types of [Belt and Road] infrastructure construction and form a resource sharing mechanism.”<sup>236</sup> CMC Transport and Projection Bureau chief of staff Liu Jiasheng noted that the PLA will focus on developing the ability to project power to BRI countries through the medium-term.<sup>237</sup>

## Civilian overseas port facilities

In addition to frequently using civilian ports for rest and replenishment on Gulf of Aden missions, China joined the international community in the destruction of Syrian chemical weapons in 2013. Colonel Cao Weidong of the Naval Academy of Military Research analyzed China’s participation, which included naval escorts in the Mediterranean. Col Weidong said that, “[I]n the Mediterranean region, China Ocean Shipping Group (COSCO) has a lot of supply points, which provide daily services for civilian ships. Chinese naval warships can also enter the port for supply.”<sup>238</sup>

COSCO has over 53 container terminals, with 197 container berths in 37 ports worldwide, and is actively looking for new terminals for expansion.<sup>239</sup> Its container ships have global routes between, with notable transit routes that link strategically important ports in Port Klang, Malaysia, Djibouti Port, Djibouti, Karachi, Pakistan, Gwadar, Pakistan, Port Qasim, Pakistan, Jakarta Port, Indonesia, and Colombo, Sri Lanka, among many others.<sup>240</sup>

## RO-Ros and Container ships

China’s civilian shipping industry is large and can significantly augment PLAN expeditionary capabilities. According to PLA experts, there are currently approximately 63 RO-RO ships capable of supporting military operations over long distances. For example, the Bohai Ferry Group has 11 RO-RO that have been organized into the “Eight Transport *Dadui*” within the strategic support ship fleet. While there are

questions as to the strength of the deck structures for the heaviest platforms (such as PLA Type-96 and Type-99 main battle tanks), recently-built ships like the *Bohai Cuizhu* have been built explicitly to defense standards.<sup>241</sup> Kennedy notes that RO-ROs from the Hainan Strait Shipping Co. Ltd. have joined the “Ninth Transport *Dadui*”, and CSC RORO Logistics Co. of the China Merchants Group contains the “Fifth Transport *Dadui*”.<sup>242</sup> In February 2018, the Wuxi JLSC “practiced transporting ammunition on a civilian roll-on/roll-off ship that met military transportation standards.”<sup>243</sup>

Authors Liu Baoxin and Su Chunhua suggest that container ships could be used for both transporting military equipment in containers as well as for “personnel living containers” on ship decks. The authors note that, “In recent years, China has advocated and proposed the “Belt and Road” strategy, and urgently requires military forces to ‘go out’ in a peaceful posture to provide a strong guarantee for the expansion of China’s overseas interests... Due to the limited number of equipment required for these military operations, it is often difficult to find suitable cargo ships or RO-RO ships for short periods of time, which affects the completion of military operations, while container ships have stable schedules, high speeds, and long sailing times... [I]f military equipment can be transported in containers, container ships will surely become the preferred tool for overseas transportation of military equipment.”<sup>244</sup>

Chinese defense analysts have extensively studied U.S. container-based multimodal transport. Yuan Mu and Liu Baoxin note that “The supply of U.S. military supplies and equipment abroad mainly relies on container multimodal transport from home to foreign military bases” noting that “about 90% of the U.S. military’s existing materials have been containerized.” In recommendations for the PLA, the authors argue that China should focus on “a strong military-civilian integrated container transport capacity”, as well as “advanced information technology” to monitor and track shipments, as well as advanced technologies – including self-loading and unloading technologies – particularly at the point of delivery in the field.<sup>245</sup> Other analysts have further emphasized the need to utilize military-civil fusion (军民融合) particularly in “the last thousand meters” to unloading at an overseas base using ruggedized civilian equipment.<sup>246</sup>

China COSCO Shipping operates over 360 container ships, with the third-largest container fleet capacity worldwide. Of COSCO’s container ships, 64 can both transport over 10,000 Twenty-Foot Equivalent Units (TEUs) and travel at more than 20 knots (for comparison, PLAN Type 903As and Type 901s are capable of top speeds of 19 and 25 knots, respectively).<sup>247</sup> Issac Kardon has argued that COSCO is “a most-likely candidate for facilitating military utilization of its port facilities (and its shipping, container, and general logistics capacity)” because of its lack of transparency and heavy government subsidization.<sup>248</sup>

In November 2018, Sinotrans & CSC’s subsidiary Shanghai Changjiang Shipping Co., Ltd. participated in a military exercise under the Eastern Theater Command’s Transport and Projection Bureau’s Dispatch Center.<sup>249</sup> The exercise included coordination of “transportation support forces, ship-shore communications, fire rescue and other emergency situations” between the company and the Strategic Marine Brigade. The two organizations set up a working group “with the guidance and support of the military theater delivery dispatch center in the eastern theater.”<sup>250</sup>

China has also conducted its first UNREP with a civilian ship with a COSCO cargo ship, as detailed above. The PLAN installed a “modular navigation horizontal replenishment system” on the *Fuzhou* container ship with technologies such as an “all-electric drive, super capacitor energy storage, and constant tension control.” The focus appears to have been on the transfer of solid cargo. A Chinese news article notes that China has plentiful civilian container ships that operate on a wide range of routes, offering a “great potential for building maritime supply forces and has significant military economic benefits.”<sup>251</sup>



# Jane's

The *Fuzhou* is far smaller than many COSCO container ships – it has a length of 231.5 m, beam of 32.2 m, and a maximum speed of 22.5 knots. Those are similar measurements to the Type 901s, although the Type 901s are slightly faster. COSCO has over 230 ships of equal or larger size and of comparable speeds.

## Tankers

Civilian tankers have also been used for PLAN replenishment. Among others, the Ningbo East Sea Shipping Co. signed agreements with the military to build tankers that meet military specifications and created a marine brigade after delivering its first tanker that was constructed to military specifications.<sup>252</sup> The China Shipping Group's *Huachuan* was featured in a 2014 article on military-civil fusion, noting that it had been constructed with stronger engines for speed, extra personnel accommodation cabins, military communication equipment, and military refueling equipment. The *Huachuan* conducted alongside UNREP with the Type 053H3 frigate *Putian* in 2014.<sup>253</sup> The *Ruiyuan-5* tanker also was called for refueling trials in 2016.<sup>254</sup>

## Strategic airlift

Similar to the PLAN, the PLAAF employs civilian assets to supplement military lift capabilities, with “strategic air support fleets” since 2013. Chinese analysts view military-civil fusion as particularly important for strategic airlift: “Air strategic projection capabilities can promote military-civilian integration. Air strategic projection is the largest integration of national air transport capacity. It is manpower-intensive, technology-intensive, and capital-intensive. It is difficult for the military itself to form a ‘strategic’ level of delivery capability. Therefore, it is necessary to rely on the entire national system to promote the organic use of military and civilian transportation Integration.”<sup>255</sup>

A division director within the PLAAF Logistics Department Transport and Projection Bureau said in 2019 that “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.”<sup>256</sup> He further notes that Chinese experts within the Chinese Army Military Transportation University estimate that China will have approximately 8,000 civilian passenger aircraft and over 2,600 cargo aircraft by 2035, up from 3,160 total passenger aircraft and only 143 medium and large civilian cargo aircraft today.<sup>257</sup>

Several companies have disclosed agreements with the PLAAF Logistics Department for military-civil fusion, including SF Express and JD Logistics, two logistics and e-commerce companies, to provide logistics support through their mature supply chains and delivery experience. JD Logistics will “jointly build an information sharing platform for system docking to provide real-time logistics information sharing and data visualization. ‘We will also provide personnel training and support services for the Air Force Logistics Department.’” SF Express will reportedly provide support via unmanned aircraft, including an unmanned amphibious aircraft.<sup>258</sup> SF Express operates a fleet of 58 aircraft, and JD Logistics, through its partnership with HNA Group’s Tianjin Air Cargo, plans to purchase or lease between 50-100 cargo aircraft within the next few years.<sup>259</sup>

China Postal Airlines has long supported PLA operations by participating in HA/DR missions, but also conducted its first PLAAF strategic combat readiness exercise in September 2017.<sup>260</sup> The airline has 33 cargo aircraft in its inventory and formed a strategic support cargo brigade in 2015. Many other civilian and military organizations attended the exercise as well, including the Wuhan JLSF base, Air China, and China Eastern Airlines. Civilian aircraft from China Eastern Airlines and China Cargo Airlines were used in November 2014 to transport nearly 300 medical staff and 767 tons of supplies to Guinea, Liberia, and Sierra Leone.<sup>261</sup> Further, Chinese reports reference the National Defense and Transportation Law, which

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“puts forward clear requirements for the postal industry to do a good job in national defense and transportation, and gives the industry a new mission.”<sup>262</sup>

## Recommendations for Congress

Based on China's overseas basing strategy and future military and dual-use expeditionary capabilities, Jane's has several recommendations for the United States:

**First, Congress should carefully monitor the transfer of enabling technologies for expeditionary operations. In conjunction, Congress should provide oversight to ensure that the DoD fully implement the National Defense Strategy's modernization goals. This would include investing in federally funded basic science research and in applied research and development for emerging technologies to counter potential Chinese advances.**

China is rapidly developing capability in emerging defense technologies, including but not limited to unmanned and autonomous systems, artificial intelligence, cyber capabilities, quantum capabilities, hypersonic weapons, and directed energy weapons. These could allow China to impose significant costs on adversaries or deter adversaries disproportionate to the number of physical platforms it possesses. As the Center for a New American Security (CNAS) report "Rising to the China Challenge" notes, "China is now a global powerhouse in a number of strategic technologies, equal to or ahead of the United States in critical areas such as quantum computing, artificial intelligence, and genomics. If current trends continue, the downstream military, economic, and political consequences could tip the scales toward China's vision of regional order in the Indo-Pacific."<sup>263</sup> While this report focused on conventional military and dual-use expeditionary capabilities, China's advances in conventional expeditionary capabilities must be viewed within the larger context of China's military modernization, where significant progress has been made in emerging technologies.

As a result, the United States must increase its own investment in emerging technologies to counter any Chinese advances. While U.S. defense R&D budgets have hit record highs in nominal terms, Congress must provide enhanced oversight of DoD budget requests to ensure investment in promising emerging technologies and basic research and development. Congress should also regulate the transfer of emerging technologies that could further China's expeditionary capabilities. Congress can accomplish this through:

- Demanding DoD transparency through regular classified and unclassified updates on progress, long-term program management strategy, and long-term funding guarantees for programs related to key emerging technologies R&D, such as hypersonic weapons, directed energy weapons, and artificial intelligence.<sup>264</sup>
- Support funding for DoD programs that increase the resiliency of U.S. forward-deployed forces and improve U.S. capabilities to operate in contested environments. This involves programs related to secure and resilient communications networks, hardened facilities and platforms, terminal missile defense technologies for protecting high-value targets, unmanned assets to operate in high risk areas, and long-range strike capabilities that are effective outside of Chinese air defense networks.<sup>265</sup>
- Congressional additions and budgetary rebalances where necessary to ensure the prioritization of emerging technology R&D in the National Defense Authorization Act. Funding requests for emerging technologies has been uneven and insufficient to fully implement the modernization goals within the National Defense Strategy.<sup>266</sup> These technologies reinforce deterrence against the use of Chinese force overseas while also increasing the capability of the United States to operate in contested environments if deterrence fails.<sup>267</sup>

- Considering a law to incentivize Chinese nationals studying in the U.S. to remain rather than return to China. Student visas issued to Chinese nationals have declined since 2016, while the overall level of international students studying in the U.S. has plateaued during the same time frame. International students are critical to U.S. research in high-technology areas and U.S. national security would be improved by retaining top talent from abroad.
- Reviewing and potentially regulating trade between U.S. exporters and Chinese companies that could facilitate the expansion of Chinese expeditionary capabilities. As detailed in this report, China prioritizes military-civil fusion, using dual-use technologies, companies, and facilities around the world to enable and extend its expeditionary capabilities. The Committee on Foreign Investment in the United States process should review the transfer of dual-use technologies that China has prioritized for expeditionary operations, including containerization and palletization technologies, unmanned systems that enable automated loading and unloading, precision airdrop technology, and oil pipeline monitoring technologies, among others.<sup>268</sup>

## **Second, the U.S. should bolster its non-military tools to engage with countries in which China seeks to develop an overseas presence.**

The U.S. should recognize that China may pursue overseas logistics nodes in countries that experience a vacuum of U.S. engagement. Particularly after 2030, China will likely pursue additional dedicated military bases overseas. U.S. economic and diplomatic engagement with these countries – both bilateral and through multilateral international organizations – will be critical to managing Chinese military ambitions.

The USCC has previously recommended that Congress “provide resources for programs that support independent media and the free flow of information to prioritize Indo-Pacific countries in their efforts to counter China’s influence and propaganda efforts.”<sup>269</sup> To this Jane’s would add support for African countries as well. By providing resources to counter Chinese propaganda, Congress can help countries around the world make more transparent decisions on when and how to engage with Chinese investors.

Congress should be a vocal proponent of State Department actions to engage with foreign governments to provide “legal and managerial advice on how best to retain control over important operational elements of their infrastructure.”<sup>270</sup>

Center for Strategic and International Studies’ fellow LtCol William Pacette proposed the creation of an Infrastructure Development Coalition (IDC) initially funded through the Asia Reassurance Initiative Act of 2018 (ARIA) to counter China’s expeditionary strategy through the BRI. According to the report, the IDC would meet countries’ infrastructure needs while limiting the ability of the BRI as a geopolitical tool with the ability to: “limit the BRI’s continued expansion; establish or enhance allied presence and influence that can directly counter Chinese influence; provide a better program that may force China to change its BRI practices so it can remain competitive with the IDC; salvage poor BRI projects; or potentially provide selective bail-outs to prevent BRI recipients from becoming beholden to Beijing.”<sup>271</sup> Such a strategy – multilateral and based on increased holistic engagement with countries in which China might seek an expeditionary base or logistics node – would limit China’s ability to establish overseas bases. Absent a unifying strategy like the IDC, Congress should support multilateral regional dialogues that increase information sharing between U.S. regional security partners and allies. The 2019 U.S.-Australia-India-Japan (“The Quad”) consultations are one manifestation of this strategy.

**Third, China's expeditionary strategy includes the proliferation of digital authoritarian technologies to legitimize illiberalism abroad. Congress should take the lead in creating a legal framework for maintaining privacy and civil liberties in the face of emerging mass surveillance technologies. By passing laws to ensure Americans' civil liberties are protected against digital authoritarian technologies, Congress can then support international treaty efforts to limit the spread of these technologies globally.**

China's pursuit of expeditionary capabilities is designed not only for the protection of its overseas economic interests, but are also relevant for its diplomatic goals, which include the international legitimacy of illiberalism. As China pursues both overseas access arrangements and dedicated military facilities the U.S. should recognize the likelihood for China to also export its tools for digital authoritarianism, which include mass surveillance systems aided by artificial intelligence. CNAS argues: "Overseas, China has reoriented its Belt and Road strategy to focus more on digital connectivity, exporting infrastructure not only for communications, but also surveillance and censorship. Through the provision of technology, funding, and know-how, Beijing's digital expansion is making repression easier and more attractive to governments with weak democratic institutions, and further entrenching the rule of fellow authoritarian regimes. As China increases its role in the digital ecosystem of the developing world, Beijing is leveraging its influence to encourage a global shift toward a more closed model of internet governance. Left uncontested, already burgeoning trends of democratic decline and digital repression are certain to accelerate."<sup>272</sup>

A 2019 *New York Times* report noted that, "Under President Xi Jinping, the Chinese government has vastly expanded domestic surveillance, fueling a new generation of companies that make sophisticated technology at ever lower prices. A global infrastructure initiative is spreading that technology even further. . . . With China's surveillance know-how and equipment now flowing to the world, critics warn that it could help underpin a future of tech-driven authoritarianism, potentially leading to a loss of privacy on an industrial scale."<sup>273</sup> 18 countries are already using Chinese intelligence monitoring systems.

These capabilities are fundamentally at odds with American values of civil liberties, democracy, and human rights. The United States should both set the example in data privacy as well as pursue international agreements to stem the proliferation of these systems worldwide. As Naazneen Barma, Brent Durbin, and Andrea Kendall-Taylor argue, "if the United States hopes to shape the future use of these technologies, it must have a political and legal framework in place that other countries want to replicate. Without congressional action, this is unlikely to happen."<sup>274</sup>

In agreement with Barma, Durbin, and Kendall-Taylor, Jane's recommends revisiting section 230 of the Communications Decency Act to incentivize the moderation of authoritarian social media tactics, as well as considering export controls on American-made surveillance tools abroad.<sup>275</sup>

## Appendix A: Gulf of Aden Task Forces

| Task Force | Departure  | Return      | Deployment Length | Surface Combat Ship 1            | Surface Combat Ship 2 | Replenishment Ship |
|------------|------------|-------------|-------------------|----------------------------------|-----------------------|--------------------|
| 33         | 8/29/2019  |             |                   | Type 052D Destroyer              | Type 054A Frigate     | Type 903A          |
| 32         | 4/4/2019   | 10/29/2019  | 208               | Type 052C Destroyer              | Type 054A Frigate     | Type 903A          |
| 31         | 12/9/2018  | 7/12/2019   | 215               | Type 071 LPD                     | Type 054A Frigate     | Type 903A          |
| 30         | 8/6/2018   | 1/27/2019   | 174               | Type 054A Frigate                | Type 054A Frigate     | Type 903A          |
| 29         | 4/4/2018   | 10/4/2018   | 183               | Type 054A Frigate                | Type 054A Frigate     | Type 903           |
| 28         | 12/3/2017  | 6/26/2018*  | 205*              | Type 054A Frigate                | Type 054A Frigate     | Type 903           |
| 27         | 8/3/2017   | 3/20/2018   | 229               | Type 052C Destroyer              | Type 054A Frigate     | Type 908           |
| 26         | 4/1/2017   | 10/23/2017* | 205*              | Type 054A Frigate                | Type 054A Frigate     | Type 903A          |
| 25         | 12/15/2016 | 7/4/2017    | 201               | Type 054A Frigate                | Type 054A Frigate     | Type 903A          |
| 24         | 8/10/2016  | 3/9/2017    | 211               | Type 052 Destroyer               | Type 054A Frigate     | Type 903A          |
| 23         | 4/7/2016   | 11/1/2016   | 208               | Type 054A Frigate                | Type 054A Frigate     | Type 903A          |
| 22         | 12/6/2015  | 6/30/2016   | 207               | Type 052 Destroyer               | Type 054A Frigate     | Type 903A          |
| 21         | 8/3/2015   | 3/8/2016    | 218               | Type 054A Frigate                | Type 054A Frigate     | Type 908           |
| 20         | 4/3/2015   | 10/31/2015* | 211               | Type 052 Destroyer               | Type 054A Frigate     | Type 903           |
| 19         | 12/1/2014  | 7/10/2015   | 221               | Type 054A Frigate                | Type 054A Frigate     | Type 903           |
| 18         | 8/1/2014*  | 2/28/2015*  | 211               | Type 071 Amphibious Assault Ship | Type 054A Frigate     | Type 903A          |
| 17         | 3/24/2014  | 10/22/2014  | 212               | Type 052C Destroyer              | Type 054A Frigate     | Type 903A          |
| 16         | 11/30/2013 | 7/18/2014   | 230               | Type 053H3 Frigate               | Type 054A Frigate     | Type 903A          |




Data compiled from various Chinese news sources, primarily the PLA Daily at chinamil.com.cn. \* Signifies an estimated date.




## Appendix B: Djibouti Base and Potential Base Locations


Jane's analyzed 18 sites as potential overseas PLA bases. These included:

- Luanda Port, Angola
- Chittagong Port, Bangladesh
- Ream Naval Base, Cambodia
- Mombasa Port, Kenya
- Kota Kinabalu, Malaysia
- Naval Intelligence Base, Myanmar
- Sittwe Port, Myanmar
- Port of Walvis Bay, Namibia
- Lekki Port, Nigeria
- Duqm Port, Oman
- Port Salalah, Oman
- Gwadar Port, Pakistan
- Karachi Port, Pakistan
- Port Victoria, Seychelles
- Hambantota Port, Sri Lanka
- Colombo Port, Sri Lanka
- Dar es Salaam, Tanzania
- Luganville Wharf, Vanuatu

The sites are organized below based on their likelihood of being used as a PLA base.

| Factor  | Icon  |
|---|---|
| <p><b>Presence of major BRI infrastructure investments</b><sup>276</sup><br/>           China's 2015 defense white paper makes explicit China's evolving commitment to protect its overseas economic interests, noting the importance of "the security of overseas interests concerning energy and resources, strategic sea lines of communication (SLOC), as well as institutions, personnel and assets abroad."<sup>277</sup></p>   |    |
| <p><b>Debt to China</b><sup>278</sup><br/>           China's BRI projects are primarily financed through loans that carry commercial interest rates often unsustainable for the host countries. A 2018 report from the Center for Global Development found that eight BRI recipient countries have a particularly high risk of defaulting on their loans.<sup>279</sup> Two of these countries, Djibouti and Pakistan, either already have an overseas military base or have been rumored as a candidate for a future PLA base. When Sri Lanka was unable to pay its BRI loan for the construction of the Hambantota Port, China agreed to a 99-year lease for the port and 15,000 acres of land around the site. Some analysts and policymakers have expressed concern that this model was an intentional predatory lending strategy designed to secure access to site of geostrategic importance, while others have argued the deals are not an intentional, coherent "debt trap" strategy, but the result of domestic interest groups or poor political risk assessment.<sup>280</sup></p> |    |
| <p><b>Replenishment port calls on China's Gulf of Aden deployments</b><br/>           The PLAN's Gulf of Aden anti-piracy escort missions have allowed the PLAN to gain expeditionary experience without provoking significant international concern. On these deployments China has made numerous port calls for diplomatic and friendly visits as well as military replenishment. Sites with prior replenishment port calls are evidence that they could be used in the future for at least commercial direct/indirect replenishment.</p>   |  |







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| <p><b>Government support for Chinese presence (via arms sales, international visits, military exercises)</b><sup>281</sup></p> <p>Support from the host country's political and military elite would be a requirement for any long-term basing option. This could be signaled through a high volume of arms sales, international visits between high-ranking political and military leaders, and joint military exercises.</p>                                      |  |
| <p><b>Prior openness to foreign military basing</b></p> <p>A country's prior willingness to host a foreign military base could be a good indication that might do so for China. For example, Djibouti notably had already allowed six countries to build a military base in the country before China.</p>   |  |
| <p><b>Open source reporting on either a basing offer (from the host country) or a basing request (from China)</b></p> <p>China has been rumored to request basing rights in numerous countries throughout the last few decades, including (but not limited to) sites in Cambodia, Vanuatu, Pakistan, and the Seychelles. Additionally, there have been some Chinese-language military analyses that consider potential overseas basing locations.<sup>282</sup></p> |  |



| Location   | Reasons for inclusion  | Distance (nautical miles) <sup>283</sup> | Description  | Docks  | Imagery Assessment  | Potential use < 2030      |
|--|--|--|--|--|---|---------------------------|
| <p><b>PLA Support Base, Djibouti</b></p>  |       | <p>6,200 nm</p>                          | <p><b>BRI:</b> Djibouti has only received slightly over \$1 billion in BRI-related investments and construction. For context, that is 82<sup>nd</sup>-most out of 112 countries receiving BRI investments. BRI investments include the Doraleh Multi-Purpose Port (China State Construction Engineering) and the Djibouti-Ethiopia Railway (China Railway Construction). The median level of investment by country is \$3.16 billion.</p> <p><b>Debt:</b> However, the Council on Foreign Relations estimates that over 79% of Djibouti's GDP is indebted to China.<sup>284</sup></p> <p><b>Gulf of Aden:</b> Task forces regularly stop at Djibouti for replenishment, as that was the PLAN's stated goal for the base.</p> <p><b>Government support:</b> China's first overseas military facility, the support base is a prototype for future logistics and support sites that are not capable of supporting major offensive combat operations.</p> <p><b>Foreign basing:</b> Djibouti hosts more foreign military bases than any other country.</p> | <p>1, two sided: 370 m left, 330 m right</p> | <p>PLAN forward support complex. 1 runway, 400 m. 8 hangars, 27 x 30 m (x7), 35 x 49 m. Hardened bunkers for possible ammunition storage, heliport, barracks, support complex, hardened underground complex. Can support all major PLAN surface combatants; 4 Type 054A frigate, or 6 Type 056A corvette, or 1 Type 001/002 carrier and 2 Type 052D destroyers.</p> | <p>Military logistics</p> |








# Jane's








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|  |  | <p><b>Chinese basing:</b> However, the PLA has conducted live-fire drills at the Djibouti Logistics Support Base with anti-tank infantry fighting vehicles (IFVs) in November 2017.<sup>285</sup> Additionally, the mid-2018 construction of pier should allow for 4-ship docking, including for new Type 901 replenishment ships.</p> <p><b>Strategic requirement:</b> As Jane's has noted in its analysis of the Djibouti support base, "China has presented its first military base in a foreign country as a facility that supports counter-piracy and peacekeeping operations in the region. However, the apparent port call by a Chinese submarine in April 2018 raised the possibility that it could be used to extend the endurance of diesel-electric attack boats operating in the Indian Ocean."<sup>286</sup> As noted by <i>China Military Online</i>, "The geographical position of Djibouti provides favorable access for global naval escort troops to rest and conduct replenishment. Many vessels including Chinese ships will choose Djibouti to rest and replenish when travelling to the Gulf of Aden for escort missions."<sup>287</sup> A key feature of the Djibouti support base, and potential future support bases in its mold (such as Ream Naval Base in Cambodia) is that it is more politically tenable for both the host country and for China's potential adversaries like the U.S. and India, because these facilities theoretically lack the capacity to support prepositioned weapons and platforms that would allow for sustained offensive combat operations.</p> |  |  |  |
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| <p><b>Ream Naval Base, Cambodia</b></p>      |    | <p>~2,220 nm</p>                      | <p><b>BRI:</b> Cambodia has received nearly \$10.3 billion in BRI-related construction projects and investments. Major projects include the Lower Sesan Two Hydropower Dam.</p> <p><b>Debt:</b> Cambodia is incredibly reliant on its relationship with China, with 21.7% of its 2017 GDP from China, and 22.4% of GDP as Chinese debt, according to the Council on Foreign Relations.<sup>288</sup></p> <p><b>Gulf of Aden:</b> No known replenishment stops.</p> <p><b>Government support:</b> Reporting on Chinese naval base, as well as major BRI investments suggest high-level support.</p> <p><b>Foreign basing:</b> No known foreign military bases.</p> <p><b>Chinese basing:</b> In mid-2019 the Wall Street Journal reported that China had signed a secret deal for a “30-year lease on the port and permit the stationing of troops and storing of weaponry in an installation that covers 192 acres and includes one pier and other facilities. Images have also shown the construction of a military-grade airport and a development project of dubious commercial viability.”<sup>289</sup> Cambodia has denied the agreement.</p> <p><b>Strategic requirement:</b> A potential logistics facility at Ream would be representative of China’s anticipated overseas basing strategy through 2030, and likely similar to its facility in Djibouti.</p> | <p>1: 140 m</p>               | <p>Possible PLAN support base option, maintenance facilities and floating docks make repairs possible. 2 x 60 x 17 m floating docks. Barracks, 2 helipads. Can support small surface combatants up to Type 056A corvette size; 2 Type 054A frigate or 056A corvette.</p>              | <p>Military logistics</p> |
| <p><b>Port of Walvis Bay, Namibia</b></p>  |     | <p>8,622 nm via Cape of Good Hope</p> | <p><b>BRI:</b> The Walvis Bay Expansion Project is a critical BRI project for China.<sup>290</sup></p> <p><b>Debt:</b> Debt to China is not seen as a significant factor in Namibian-Chinese relations.</p> <p><b>Gulf of Aden:</b> Namibia has no known replenishment port calls on Gulf of Aden deployments.</p> <p><b>Government support:</b> No significant military sales, however in 2018 Namibia’s president said</p>  | <p>3: 908 m, 600 m, 504 m</p> | <p>Berthing will depend on commercial activity. Theoretically any PLAN surface combatant can be berthed. Non-container docks can berth at least 12 x Type 056 corvettes, or at least 8 x Type 052D destroyers, for example. Three floating docks (2 x 139 m, 1 x 192 m). Minimal.</p> | <p>Military logistics</p> |







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|  |  |          | <p>China was not colonizing Africa, indicating some level of support.<sup>291</sup></p> <p><b>Foreign basing:</b> No known permanent foreign military bases.</p> <p><b>Chinese basing:</b> In 2014 reports emerged that China was in discussions to establish a military base at Walvis Bay, in addition to other locations. As the Africa Center for Security Studies' Paul Nantulya wrote, "The Namibian press has speculated that China seeks to establish naval facilities in Walvis Bay using the Djibouti model, pointing to similarities with the approach China used to acquire its Djibouti base, a process that started with the construction of a deep water port."<sup>292</sup></p> <p><b>Strategic requirement:</b> In 2018 China's ambassador to Namibia called the Walvis Bay port China's "most brilliant pearl" on Africa's Atlantic coast.<sup>293</sup> Existing infrastructure could support nearly all PLAN surface combatants.</p>    |                 |   |                    |
| <p><b>Gwadar Port, Pakistan</b></p>  |     | 5,500 nm | <p><b>BRI:</b> Gwadar is a critical component of the BRI through the China–Pakistan Economic Corridor (CPEC) and one of the primary sites mentioned in open sources for China's potential next overseas base.<sup>294</sup> Pakistan has received the most BRI funding of any country worldwide, at nearly \$44 billion. Pakistan's other two ports in Karachi and Qasim reportedly have no further space for expansion.</p> <p><b>Debt:</b> Pakistani debt to China is significant, with the Council on Foreign Relations estimating nearly 7% of Pakistan's GDP.</p> <p><b>Gulf of Aden:</b> The PLAN frequently stops at Karachi Port for replenishment on Gulf of Aden task force missions.</p> <p><b>Government support:</b> China-Pakistan cooperation is significant, with multiple joint military exercise including Warrior VII and joint naval drills in 2020. It has also supplied Pakistan with significant arms sales, including eight Type</p> | 2: 600 m, 100 m | <p>Pakistani Navy often uses facility so supporting PLAN activity would be possible, particularly in joint operations. Helipads in the local area. Minimal POL bunkering. Dependent on port activity levels but berthing space can accommodate a large number of PLAN surface combatants including CVs; smaller dock can berth 1 x Type 056A corvette, larger dock can berth 2 x Type 052D/055 destroyers, or 1 x CV and 1 x DDG/CG, or 4 x Type 054A frigates.</p> | Military logistics |

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|  |  | <p>041 submarines, Wing Loong UAVs, JF-17 fighters, helicopters, and Type 054A frigates.</p> <p><b>Foreign basing:</b> No permanent foreign military bases.</p> <p><b>Chinese basing:</b> In early 2018, the <i>South China Morning Post</i> reported that China was close to setting up a naval base similar to that in Djibouti, quoting Beijing-based military analyst Zhou Chenming that “China needs to set up another base in Gwadar for its warships because Gwadar is now a civilian port.” A PLA source argued that it must be separate from the commercial port because “Gwadar port can’t provide specific services for warships... Public order there is in a mess. It is not a good place to carry out military logistical support.” Other reports suggest that PLAN marines could be deployed to protect Gwadar from terrorist threats.<sup>295</sup> The Pakistani Navy often uses facilities in Gwadar so supporting PLAN activity would be possible, particularly in joint operations.</p> <p><b>Strategic requirement:</b> The site would also make sense from a military logistics perspective, as it is within the Y-20’s maximum range from Chengdu-Qionglai airbase in China. However, to date, there have been no open source indications – either through reporting or through satellite imagery – that China and Pakistan have moved forward with plans to develop a formal military base.<sup>296</sup> As another study noted, “there seems little or no evidence that a naval base facility is part of the package, or indeed that China has any current intention or capacity to maintain an Indian Ocean fleet for which Gwadar could be a base.”<sup>297</sup></p> |  |  |  |
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| <p><b>Karachi Port, Pakistan</b></p>      | <p>5,350 nm</p> | <p><b>BRI:</b> Overall Pakistan has the highest amount of BRI investment of any country, with 57 projects. Karachi is home to the Peshawar-Karachi Motorway project as well as the Karachi Circular Railway.</p> <p><b>Debt:</b> Pakistani debt to China is significant, with the Council on Foreign Relations estimating nearly 7% of Pakistan's GDP.</p> <p><b>Gulf of Aden:</b> The PLAN frequently stops at Karachi Port for replenishment on Gulf of Aden task force missions.</p> <p><b>Government support:</b> China-Pakistan cooperation is significant, with multiple joint military exercise including Warrior VII and joint naval drills in 2020. It has also supplied Pakistan with significant arms sales, including eight Type 041 submarines, Wing Loong UAVs, JF-17 fighters, helicopters, and Type 054A frigates.</p> <p><b>Foreign basing:</b> No permanent foreign military bases.</p> <p><b>Chinese basing:</b> As noted above, Gwadar has frequently been rumored as China's next overseas military base.</p> <p><b>Strategic requirement:</b> A previous study has suggested that the "port at Karachi would be better able to satisfy PLAN requirements than the new port at Gwadar."<sup>298</sup> Massive commercial complex suggests PLAN is likely to use military berths unless advance notice is given. However, 1235 m dock, capable of supporting larger surface combatants, has been used to support PLAN port visits in the past. Additionally, the Il-76s involved with the 2011 Libya NEO also conducted a refueling stop in Karachi, which could also be a future site for overseas airfield access.</p> | <p>6: 1235 m, 960 m, 600 m, 575 m, 500 m, 340 m</p> | <p>Massive commercial complex suggests PLAN is likely to use military berths unless advance notice is given. Substantial maintenance facilities in the area. Multiple commercial facilities. Naval base in area could accommodate up to 7 x Type 052D DDGs. Smaller number of vessels and/or smaller ships likely due to Pakistani Navy presence.</p> | <p>Military Logistics</p> |
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| <p><b>Luganville Wharf, Vanuatu</b></p>  |    | <p>4,103 nm</p>   | <p><b>BRI:</b> Vanuatu has been a key recipient of Chinese BRI funding, particularly for the Chinese-built and financed Luganville Wharf.</p> <p><b>Debt:</b> Australia has expressed particular concern over the loan (that it could fall victim to a “debt equity swap” similar to Sri Lanka’s Hambantota Port) and reports of a permanent base given its close proximity.<sup>299</sup></p> <p><b>Gulf of Aden:</b> No known replenishment stops on Gulf of Aden missions.</p> <p><b>Government support:</b> China’s support for Vanuatu has primarily been financial without significant arms sales.</p> <p><b>Foreign basing:</b> No known foreign military bases.</p> <p><b>Chinese basing:</b> In 2018, several news organizations reported that China approached Vanuatu about developing a permanent military presence in the country. According to the Sydney Morning Herald, “Multiple sources said Beijing’s military ambition in Vanuatu would likely be realized incrementally, possibly beginning with an access agreement that would allow Chinese naval ships to dock routinely and be serviced, refueled and restocked. This arrangement could then be built on.”<sup>300</sup></p> <p><b>Strategic requirement:</b> In response to reports that China has informally approached Vanuatu about a potential military base, analysts have argued that such a move could be to protect foreign Chinese nationals living and working in Southeast Asia, as the island’s location is not otherwise of obvious geostrategic importance.</p> | <p>1: 360 m</p> | <p>Limited dock space and limited support facilities would require additional activity such as possible prepositioning of resupply materials to support PLAN operations. Possible second dock under construction approximately 1 km east of existing dock.</p> | <p>Military logistics</p>                     |
| <p><b>Lekki Port, Nigeria</b></p>      |     | <p>~10,480 nm</p> | <p><b>BRI:</b> In October 2019, the China Development Bank loaned \$629 million to “accelerate the completion of Lekki Deep Seaport project”, of which China Harbour Engineering Company (CHEC) owns the majority of shares.<sup>301</sup></p> <p><b>Debt:</b> Nigeria reportedly owes more debt to China than any other country.<sup>302</sup></p>   | <p>1: 129 m</p> | <p>Massive commercial complex suggests PLAN is likely to use military berths unless advance notice is given. Massive port facility serving commercial interests. Maintenance facilities in the area. Multiple tank farms</p>                                   | <p>Commercial direct / military logistics</p> |





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|   |  |                 | <p><b>Gulf of Aden:</b> No known replenishment port calls on Gulf of Aden deployments. The PLAN has had a port call at other ports in the Gulf of Guinea that are also BRI / Maritime Silk Road sites, including the Tincan Island port.<sup>303</sup></p> <p><b>Government support:</b> Nigerians have high views of China, with 80% expressing positive opinion of China in 2014.<sup>304</sup></p> <p><b>Foreign basing:</b> No known permanent foreign military bases.</p> <p><b>Chinese basing:</b> Unlike Walvis Bay, there does not appear to be significant local media speculation about a future PLAN base.</p> <p><b>Strategic requirement:</b> Similar to Walvis Bay in that the site is one of major BRI investment that could give the PLAN a replenishment node on the Atlantic Ocean in Africa.</p>   |  | <p>suggest refueling capability, container port, military dock. 129 m dock can accommodate 1 x Type 056 corvette or 1 x Type 054A frigate. Larger vessel is possible depending on positioning. 77 m piers can possibly berth 1 x Type 056 corvette each, or a Type 054A frigate depending on positioning. 101 m pier may be civilian and therefore less likely to be used.</p>   |   |
| <p><b>Port Victoria, Seychelles</b></p>  |     | <p>5,530 nm</p> | <p><b>BRI:</b> No major BRI projects.</p> <p><b>Debt:</b> Debt to China does not appear to be a significant impediment to relations.</p> <p><b>Gulf of Aden:</b> No confirmed replenishment stops on Gulf of Aden missions.</p> <p><b>Government support:</b> President Danny Faure visited China to further Chinese investment in the Seychelles through the BRI in September 2018.<sup>305</sup></p> <p><b>Foreign basing:</b> The Seychelles signed a revised deal with India for a military base on the Seychelles' Assumption Island.<sup>306</sup></p> <p><b>Chinese basing:</b> In December 2011, Seychelles announced that it had invited China to establish a military presence on the island of Mahe to further its antipiracy operations. Seychelles Foreign Minister Jean Paul Adam said: "China is studying this possibility because [it] has economic interests in the region and Beijing is also involved in the fight against piracy." Like Djibouti, the Seychelles were one of seven sites considered by experts from China's NRI in 2014 for China's next overseas facility.<sup>307</sup></p> | <p>8: 60 m, 73 m, 106 m, 121 m, 158 m, 220 m, 265 m, 370 m</p> | <p>Multiple smaller docks suggest the possibility of berthing a large number of ships. However, the 370 m dock is likely not an option given it is a relatively busy container port. The 60 and 73 m docks are possibly too small to be of use. The 106 m dock could berth a Type 056A corvettes. The 121, 220, and 265 m docks could berth a large combatant such as a Type 052D destroyers, while the 158 m dock's proximity to the 265 m dock makes berthing a smaller combatant such as a Type 054 frigate or 056 corvette more likely. Airport nearby. Tank farm suggests refueling capability, multiple berths, possible maintenance facilities.</p> | <p>Commercial direct / military logistics</p> |






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|--|---|-----------------|---|---------------------------|---|---|
|  |   |                 | <p><b>Strategic requirement:</b> The Djibouti base likely obviates the immediate need for a similar base in Seychelles, particularly as the Djibouti base was developed following the offer from the Seychelles. The port does have multiple smaller docks that suggest the possibility of berthing a large number of PLAN ships.</p>   |                           |   |   |
| <p><b>Sittwe Port, Myanmar</b></p>  |      | <p>3,828 nm</p> | <p><b>BRI:</b> China is building a deep-water port near Sittwe and also proposed building an economic corridor through Rakhine that would include roads and rail lines from China's Yunnan Province.<sup>308</sup> Other BRI projects include the Kyaukpyu Deep Sea Tanker Port and Kyaukpyu Special Economic Zone, Dawei Port, Myistone Dam, and Muse-Mandalay Railway.</p> <p><b>Debt:</b> 56.5% of 2017 inward foreign direct investment came from China.<sup>309</sup> In 2019 it was estimated that 40% of Myanmar's debt is held by China.<sup>310</sup></p> <p><b>Gulf of Aden:</b> No known Gulf of Aden replenishment stops.</p> <p><b>Government support:</b> China has sought closer military ties with Myanmar and has been "restrained" in its comments about the Rohingya despite international condemnation of Myanmar and has attempted to mediate the crisis.<sup>311</sup> It should also be noted that Chairman Xi visited Myanmar on 17-18 January 2020, with the two sides agreeing to strengthen their BRI commitments, pushing to finalize a deal for Kyaukpyu port for US\$1.3 billion. During the visit Xi was expected to meet with Myanmar military chief General Min Aung Hlaing.<sup>312</sup></p> <p><b>Foreign basing:</b> Myanmar's 2008 constitution explicitly forbids the deployment of foreign troops on Myanmar soil, meaning that the constitution would need to be changed for China to establish a permanent military presence.<sup>313</sup> Unless this occurs, preferred access to commercial facilities is significantly more likely.</p> | <p>2: 274 m,<br/>73 m</p> | <p>Possibly useful as a resupply base provided supplies are prepositioned. Berth with crane for supply loading. No observed significant POL storage. Three possible storage facilities. Smaller berth likely unusable. Larger berth can support most major PLAN surface combatants. 3 x Type 056 corvettes or 2 x Type 054A frigates may be possible. One larger DDG or CG also possible.</p> | <p>Commercial direct / military logistics</p> |











# Jane's

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|---|---|------------|--|--|---|-------------------|
|   |   |            | <p><b>Chinese basing:</b> Like Djibouti, Sittwe was one of seven sites considered by experts from China's NRI in 2014 for China's next overseas facility.<sup>314</sup></p> <p><b>Strategic requirement:</b> A naval base at Sittwe (or at the nearby Chinese-developed Kyaukpyu port), combined with the China-Myanmar Economic Corridor, would give the PLA convenient access to the Indian Ocean with overland resupply potential through the economic corridor. As Monica Wang noted at the Council on Foreign Relations, "building a military facility [at Sittwe] could help the Chinese manage traffic passing through the Strait of Malacca from the west. It also marks the start of the Myanmar pipeline, which supplies crude oil to southwestern China."<sup>315</sup>The port currently contains one larger berth (274 m) that could support most PLAN surface combatants, including three Type 056 corvettes, two Type 054A frigates, or one larger destroyer. There is a berth with crane for supply loading and three storage facilities, but no significant petroleum, oil, and lubricant (POL) storage, which would be important for naval replenishment. Kyaukpyu port could be an additional long-term option for PLAN / PLAAF development, assuming successful conclusion of the BRI investment and deepening of military ties.</p> |  |   |                   |
| <p><b>Duqm Port, Oman</b></p>  |  | ~ 5,600 nm | <p><b>BRI:</b> Oman is a critical part of the BRI, joining in 2018. In addition to Duqm are various oil and gas projects including several with China's Power Construction Corp. Duqm could decrease the importance of the Strait of Hormuz, as fewer ships would need to enter the Strait to access oil and other products.<sup>316</sup></p> <p><b>Debt:</b> Oman has a high amount of sovereign debt, although the amount to China is unclear.</p> <p><b>Gulf of Aden:</b> While Duqm has not been a replenishment stop for Gulf of Aden missions,</p>  | 5: 2260 m, 1020 m, 800 m, 747 m, 450 m | Large docks available make berthing a large PLAN surface group possible. Amount of regular commercial traffic is unknown at this time due to ongoing construction. Large sections under construction. Two 400 m drydocks. | Commercial direct |





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|   |   |          | <p>Port Salalah has been the PLAN's most frequent stop.</p> <p><b>Government support:</b> The two countries agreed to increase cooperation in November 2019.</p> <p><b>Foreign basing:</b> Hosts several foreign military bases.</p> <p><b>Chinese basing:</b> Duqm's potential as a Chinese base is primarily a result of significant Chinese investment and the geostrategic logic rather than concrete evidence.</p> <p><b>Strategic requirement:</b> Of significant geostrategic importance due to location along Gulf of Aden, Gulf of Oman, and Strait of Hormuz. Large sections are under construction, so its capabilities for PLAN vessels and infrastructure are unknown, although there are few concrete indications that Duqm will evolve into anything more than a replenishment stop for PLAN vessels. However, Duqm is at the western edge of the Y-20's maximum range (5,200 km with 51,000 kg payload) from the Chengdu-Qionglai airbase, meaning that it could provide pivotal replenishment access to Africa and Middle East for the PLAAF from China (see map at Figure 5). The United States also signed a port deal for facilities and ports at Salalah and Duqm in March 2019 in case access through the Strait of Hormuz is denied by Iran.<sup>317</sup></p> |                 |  |                   |
| <p><b>Chittagong Port, Bangladesh</b></p>  |    | 3,980 nm | <p><b>BRI:</b> Chinese imports were 5.8% of 2017 GDP and Bangladesh is an important BRI country, with \$23.3 billion in BRI investments and construction projects (eighth most worldwide).<sup>318</sup> These include the Padma Rail Link, Natural Gas project, and the Shaka-Chattogram Rail Route. Notably however, a May 2019 Lowy Institute analysis said that none of China's Bangladeshi BRI projects were "strategically controversial", although India has voiced concerns over</p>  | 2: 127 m, 104 m | <p>Possible PLAN support base option, can support submarines, experienced naval base, maintenance facilities and floating dock make repairs possible. 117 m floating dock. Naval base experienced with serving surface combatants and submarines, bunkering facilities in the area. Can support small surface combatants including</p> | Commercial direct |

|   |   |                 |   |                               |   |                          |
|---|---|-----------------|---|-------------------------------|---|--------------------------|
|   |   |                 | <p>proposed Chinese-constructed ports at Chittagong.</p> <p><b>Debt:</b> Debt to China represents 4.4% of GDP according to the Council on Foreign Relations.</p> <p><b>Gulf of Aden:</b> No known replenishment stops on task force missions.</p> <p><b>Government support:</b> Bangladesh is a major importer of Chinese weapons, including naval vessels, missiles, tanks, and fighters. China also donated two aging Type 053H3 frigates to Bangladesh in December 2019.<sup>319</sup></p> <p><b>Foreign basing:</b> No permanent overseas military bases.</p> <p><b>Chinese basing:</b> Jane's satellite imagery analysis echoes that of Yung and Rustici, in that the port meets many criteria necessary for military use. Yung and Rustici note that "only Chittagong port in Bangladesh has most of the physical features necessary to support major combat operations."<sup>320</sup> The Chinese-sponsored Payra port is unlikely to be used for Chinese surface vessels as the port "must be approached by a 75-kilometre-long canal being dredged through mudflats."<sup>321</sup></p> <p><b>Strategic requirement:</b> A base would provide China access and replenishment in the Indian Ocean.</p> |                               | <p>Type 054A frigates and 056 corvettes; smaller dock can berth 1 Type 056 corvettes, larger dock can berth 1 Type 056 corvette or Type 054A frigate.</p>                         |                          |
| <p><b>Kota Kinabalu, Malaysia</b></p>  |     | <p>1,911 nm</p> | <p><b>BRI:</b> Malaysia has received the sixth-most BRI-related construction and investment funding worldwide, with \$31.4 billion. Projects include the East Coast and Gemas-Johor Bahru Railways, among others.</p> <p><b>Debt:</b> China is Malaysia's largest export market and Malaysia's Prime Minister Mahathir Mohamad has resisted what he calls China's "debt trap" although debt to China does not currently seem to be a problem.<sup>322</sup></p> <p><b>Gulf of Aden:</b> There have been no known replenishment port calls on Gulf of Aden</p>   | <p>3: 350 m, 250 m, 200 m</p> | <p>Naval base experienced with serving surface combatants and submarines, bunkering facilities in the area. Airport nearby, hardened bunkers for possible ammunition storage.</p> | <p>Commercial direct</p> |





|   |   |           |   |  |  |                   |
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|   |   |           | <p>deployments or any known news reports on a basing offer or request.</p> <p><b>Government support:</b> Malaysia purchased four offshore patrol vessels from China in 2017. The two countries have overlapping claims in the South China Sea.<sup>323</sup></p> <p><b>Foreign basing:</b> Malaysia does have experience permanently hosting foreign militaries, with the Royal Australian Air Force at Royal Malaysian Air Force Base Butterworth.</p> <p><b>Chinese basing:</b> In 2015, following a visit from PLAN commander Admiral Wu Shengli, Malaysia granted China stopover rights at Kota Kinabalu Port. The port is already open to stopovers by Western navies. According to Hoo Tiang Boon of Singapore's Nanyang Technological University, this move should be seen as a "gesture of neutrality" rather than an indication that the port was necessarily destined to become a PLAN base.<sup>324</sup></p> <p><b>Strategic requirement:</b> Access would provide replenishment opportunities directly outside the first island chain.</p> |  |  |                   |
| <p><b>Port Salalah, Oman</b></p>  | <br> | ~5,600 nm | <p><b>BRI:</b> Duqm is to date the most important BRI project in Oman. In addition to Duqm are various oil and gas projects including several with China's Power Construction Corp. Duqm could decrease the importance of the Strait of Hormuz, as fewer ships would need to enter the Strait to access oil and other products.<sup>325</sup></p> <p><b>Debt:</b> Oman has a high amount of sovereign debt, although the amount to China is unclear.</p> <p><b>Gulf of Aden:</b> A frequent replenishment stop for PLAN Gulf of Aden task force visits.</p> <p><b>Government support:</b> Chinese top advisor Yang Wang visited Oman in November 2019, with the two countries agreeing to increase BRI investment, including infrastructure construction, industrial parks, and energy and innovation.<sup>326</sup></p>  | 8: 2200 m, 1267 m, 602 m, 515 m, 445 m, 284 m, 195 m, 67 m | <p>Berthing will depend on commercial activity. Theoretically any PLAN surface combatant can be berthed. Non-container docks can berth at least 17 x Type 052D destroyers, for example, indicating space exists for a substantial surface warfare group. Airport nearby. Apparent bunkering facilities, tank farm and apparent facility for refueling.</p> | Commercial direct |

|   |   |          |   |   |  |                          |
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|   |   |          | <p><b>Foreign basing:</b> Oman hosts several foreign military bases.</p> <p><b>Chinese basing:</b> Port Salalah is primarily considered because it is the most frequent Gulf of Aden replenishment stop and would provide refueling at the edge of the Y-20's range.</p> <p><b>Strategic requirement:</b> Similar to Duqm Port; of significant geostrategic importance. Likely outside of Y-20 range from Chengdu-Qionglai without in-flight refueling. PLAN berthing would depend on commercial traffic, although there is space for any PLAN surface combatant.</p>   |   |  |                          |
| <p><b>Colombo Port, Sri Lanka</b></p>  |     | 4,030 nm | <p><b>BRI:</b> The Port City and harbor is the largest BRI project in Sri Lanka, and is developed by the China Communication Construction company.</p> <p><b>Debt:</b> Debt to China represents 9.5% of Sri Lanka's GDP.</p> <p><b>Gulf of Aden:</b> Several stops on Gulf of Aden replenishment missions.</p> <p><b>Government support:</b> China donated a Type 053 frigate to Sri Lanka in June 2019.<sup>327</sup></p> <p><b>Foreign basing:</b> No permanent foreign military bases.</p> <p><b>Chinese basing:</b> Several Chinese submarines docked at Colombo in late 2014 despite Indian concerns, although Sri Lanka later rejected a Chinese request to dock its submarines in 2017, following "fierce opposition" from India.<sup>328</sup></p> <p><b>Strategic requirement:</b> The port has significant capacity to dock PLAN vessels, but the large scale of commercial traffic renders this less likely. Potential PLAN use / creation of facilities in Sri Lanka must be viewed within context of broader India – China rivalry, which includes economic and military competition. Following the January 2020 visit to Myanmar by Chairman Xi, Archana Atmakuri, a research analyst at the National University of Singapore, said that port development projects (including those in Sri Lanka) are feel like an "encirclement strategy</p> | <p>13: 1200 m, 940 m, 650 m, 645 m, 600 m, 425 m, 410 m, 380 m, 367 m, 362 m, 273 m, 200 m, 128 m</p> | <p>13 large docks and multiple smaller piers suggest a large number of vessels can be accommodated. However, the large scale of commercial traffic renders this less likely. It is possible that PLAN surface combatants could make use of the sheltered harbor or maintenance facilities to a degree dependent on the amount of commercial traffic in the area. Multiple dry docks. Large maintenance area.</p> | <p>Commercial direct</p> |



# Jane's

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|   |   |          | <p>towards India.<sup>329</sup> This echoes the String of Pearls theory, although there are limited indications that many of these sites – including those are Hambantota and Colombo – are intended to be developed into formal military bases or even military logistics bases. Regardless of China's intentions, India has expanded its military basing in the Indian Ocean Region partly as a result, including signing a revised deal for a military base on the Seychelles' Assumption Island.<sup>330</sup></p>   |  |   |                   |
| <p><b>Dar es Salaam, Tanzania</b></p>  | <br><br> | 6,504 nm | <p><b>BRI:</b> Tanzania has received \$10.9 in BRI related investments and construction funding, 17<sup>th</sup>-most worldwide. Tanzania and the China Merchants Holdings have had a setback over the development of the Bagamoyo Port (75 km from Dar es Salaam), with Tanzania suspending the project indefinitely in June 2019 and the two sides failing to come to an agreement in October 2019 follow-up talks. The disagreements center on terms of deal, related to factors like the length of the lease, taxes, and ability to operate other businesses.<sup>331</sup></p> <p><b>Debt:</b> Debt to China does not appear to be a major factor in relations.</p> <p><b>Gulf of Aden:</b> The PLAN has visited Dar es Salaam port for friendly and replenishment visits.</p> <p><b>Government support:</b> Tanzania and China have expanded ties, with the more than 350 Chinese nationals living and working in the country.<sup>332</sup> The two countries conducted a 25-day-long military exercise known as Sincere Partners 2019 from December 2019 to 16 January 2020.</p> <p><b>Foreign basing:</b> No permanent foreign military bases.</p> <p><b>Chinese basing:</b> Like Djibouti, Dar es Salaam was one of seven sites considered by experts from China's NRI in 2014 for China's next overseas facility.<sup>333</sup></p> | 4: 74 m (military), 326 m, 770 m, 1260 m | <p>Large amount of civilian traffic suggests PLAN presence would most likely take advantage of military dock unless advance notice is given. Two-sided 74 m dock could possibly berth 2 x Type 056A corvettes. Multiple tank farms suggest refueling capability, container port, military dock.</p> | Commercial direct |






# Jane's


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| <p><b>Mombasa Port, Kenya</b></p>  |    | <p>6,448 nm</p> | <p><b>Strategic requirement:</b> If the Bagamoyo deal does go through, that could be an additional site for long-term monitoring as a PLAN logistics node.</p> <p><b>BRI:</b> Overall Kenya has received \$9.2 billion in BRI-related investments and construction projects, including the SGR, Africa Economic Zone (AEZ) industrial park from the Guangdong New South Group.</p> <p><b>Debt:</b> In December 2018 it emerged that Kenya risks losing control of Mombasa Port to China if it defaults on a \$2.3 billion loan for the Mombasa-Nairobi standard gauge railway (SGR) to China Exim Bank, for which the port's assets are collateral.<sup>334</sup> There is concern that Mombasa Port is another example of predatory lending. However, interviews by scholar Huang Zhengli suggest that China is unlikely to actually take control of Mombasa Port even in the event of default, as doing so would be a strategic and public relations disaster for the BRI following the predatory lending accusations following Hambantota. China would reportedly be concerned that another port takeover would undermine its larger BRI strategy.<sup>335</sup></p> <p><b>Gulf of Aden:</b> No known replenishment port calls on Gulf of Aden deployments.</p> <p><b>Government support:</b> Chinese arms sales have been relatively limited.</p> <p><b>Foreign basing:</b> Kenya hosts a British Army training unit.</p> <p><b>Chinese basing:</b> No known news reports on a basing offer or request.</p> <p><b>Strategic requirement:</b> A large amount of civilian traffic suggests PLAN presence would most likely take advantage of the existing military dock unless advance notice is given. 245 m dock could berth 2 Type 056 corvette or one larger surface combatant. 164 m dock could</p> | <p>8: 880 m, 840 m, 780 m, 730 m, 350 m, 245 m (military), 230 m, 164 m (military)</p> | <p>Large amount of civilian traffic suggests PLAN presence would most likely take advantage of military dock unless advance notice is given. 245 m dock could berth 2 Type 056 corvettes or one larger surface combatant. 164 m dock could berth one surface combatant up to Type 052D DDG, possibly Type 055 DDG. Airport nearby. Tank farms suggest refueling capability. Naval base in the area. Multiple commercial facilities.</p> | <p>Commercial indirect / direct</p> |
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# Jane's

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| <p><b>Luanda Port, Angola</b></p>  |    | <p>9,519 nm via Cape of Good Hope</p> | <p>berth one surface combatant up to Type 052D destroyer, possibly Type 055 destroyer.</p> <p><b>BRI:</b> Angola has received \$9.5 billion in BRI investments and construction contracts, including for the Benguela Railway (by the China Railway 20 Bureau Group Corporation).<sup>336</sup></p> <p><b>Debt:</b> Angola is heavily indebted to China with US\$22.8 billion in debts as of Q1 2019, and has used its oil as collateral for Chinese credit. Dependent on oil market prices for collateral stability.<sup>337</sup></p> <p><b>Gulf of Aden:</b> No known replenishment port calls on Gulf of Aden deployments.</p> <p><b>Government support:</b> Visited by Chinese military delegation in June 2019 with pledge to increase defense ties. According to Angolan President Joao Lourenco, "Angola and China have the same or similar positions on many international affairs, understanding and supporting each other's concerns on core interests."<sup>338</sup></p> <p><b>Foreign basing:</b> No permanent foreign military bases.</p> <p><b>Chinese basing:</b> No known news reports on a basing offer or request.</p> <p><b>Strategic requirement:</b><br/>A base or host country on the West African coast would be very beneficial for China's long-term presence in the Atlantic.</p> | <p>6: 1473 m, 1093 m, 1073 m, 385 m, 345 m, 161 m</p> | <p>Berthing will depend on commercial activity. Theoretically any PLAN surface combatant can be berthed. Non-container docks can berth at least 19 Type 052D destroyers, for example, indicating space exists for a substantial surface warfare group. Airport nearby. Apparent bunkering facilities, tank farm, and apparent facility for refueling.</p> | <p>Commercial indirect / direct</p> |
|---|---|---------------------------------------|---|---|---|-------------------------------------|



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| <p><b>Hambantota Port, Sri Lanka</b></p>  |     | <p>~ 3,900 nm</p> | <p><b>BRI:</b> In addition to Hambantota, the Colombo Port City and harbor is the largest BRI project in Sri Lanka and is developed by the China Communication Construction company.</p> <p><b>Debt:</b> Hambantota has been one of the primary examples that critics use to accuse China of predatory lending through the BRI.</p> <p><b>Gulf of Aden:</b> Colombo, rather than Hambantota, is a frequent replenishment stop on Gulf of Aden missions.</p> <p><b>Government support:</b> Relatively minor arms sales, including second-hand frigate sale in 2016.</p> <p><b>Foreign basing:</b> No known permanent foreign military bases.</p> <p><b>Chinese basing:</b> The BRI-financed port of Hambantota has long been rumored as the potential site for a PLA base, particularly following its handover to China in December 2017. The <i>New York Times</i> notes that “Though Chinese officials and analysts have insisted that China’s interest in the Hambantota port is purely commercial, Sri Lankan officials said that from the start, the intelligence and strategic possibilities of the port’s location were part of the negotiations.” Indian officials were fearful that the deal always had a military component, leading them to ask Sri Lanka forbid use by the PLA: “Sri Lankan officials are quick to point out that the agreement explicitly rules out China’s military use of the site. But others also note that Sri Lanka’s government, still heavily indebted to China, could be pressured to allow it.”<sup>339</sup> Like Djibouti, Hambantota was one of seven sites considered by experts from China’s NRI in 2014 for China’s next overseas facility.<sup>340</sup></p> <p><b>Strategic requirement:</b> PLAN use would be dependent on commercial port activity levels, but berthing space can accommodate a large number of PLAN surface combatants. China</p> | <p>4: 2 x 836 m, 460 m, 720 m</p> | <p>PLAN support is dependent on civilian activity. Bunkering facility and 2 refueling berths make expeditionary support logical. Dependent on port activity levels but berthing space can accommodate a large number of PLAN surface combatants including CVs</p> | <p>Commercial indirect</p> |
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|--|---|------------------|---|-----------------|--|---------------------|
| <p><b>Great Coco Island, Myanmar</b></p>  |    | <p>~3,600 nm</p> | <p>donated a Type 053 frigate to Sri Lanka in June 2019.<sup>341</sup></p> <p><b>BRI:</b> BRI projects include the Kyaukpyu Deep Sea Tanker Port and Kyaukpyu Special Economic Zone, Dawei Port, Myistone Dam, and Muse-Mandalay Railway.</p> <p><b>Debt:</b> In 2019 it was estimated that 40% of Myanmar's debt is held by China.<sup>342</sup></p> <p><b>Gulf of Aden:</b> No known replenishment port calls on Gulf of Aden deployments.</p> <p><b>Government support:</b> It should also be noted that Chairman Xi visited Myanmar on 17-18 January, with the two sides agreeing to strengthen their BRI commitments, pushing to finalize a deal for Kyaukpyu port for US\$1.3 billion. During the visit Xi was expected to meet with Myanmar military chief General Min Aung Hlaing.<sup>343</sup></p> <p><b>Foreign basing:</b> Myanmar's 2008 constitution explicitly forbids the deployment of foreign troops on Myanmar soil, meaning that the constitution would need to be changed for China to establish a permanent military presence.<sup>344</sup></p> <p><b>Chinese basing:</b> Long rumored (since the 1990s) to house a secret PLA SIGINT base, but satellite imagery suggests there is not significant evidence to support these rumors. Myanmar has admitted that China has assisted with local civil and military infrastructure upgrades (there is currently a runway under construction near the dock, for example), but has denied a Chinese facility on the island. In 2005 India's Chief of Naval Staff told reporters that India has "firm information that there is no listening post, radar or surveillance station belonging to the Chinese on Coco Islands."<sup>345</sup></p> <p><b>Strategic requirement:</b> Jane's previously detailed the geostrategic advantages of a base at Sittwe, but a base at Great Coco Island would</p> | <p>1: 100 m</p> | <p>Dock could theoretically berth a large surface combatant, but apparent shallow water around dock makes this problematic without dredging. 1 runway under construction, 2432 m (estimate).</p> | <p>Unlikely use</p> |
|--|---|------------------|---|-----------------|--|---------------------|

# Jane's

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|  |  |  | not have the same overland access advantages that Sittwe would. |  |  |  |
|--|--|--|---|--|--|--|

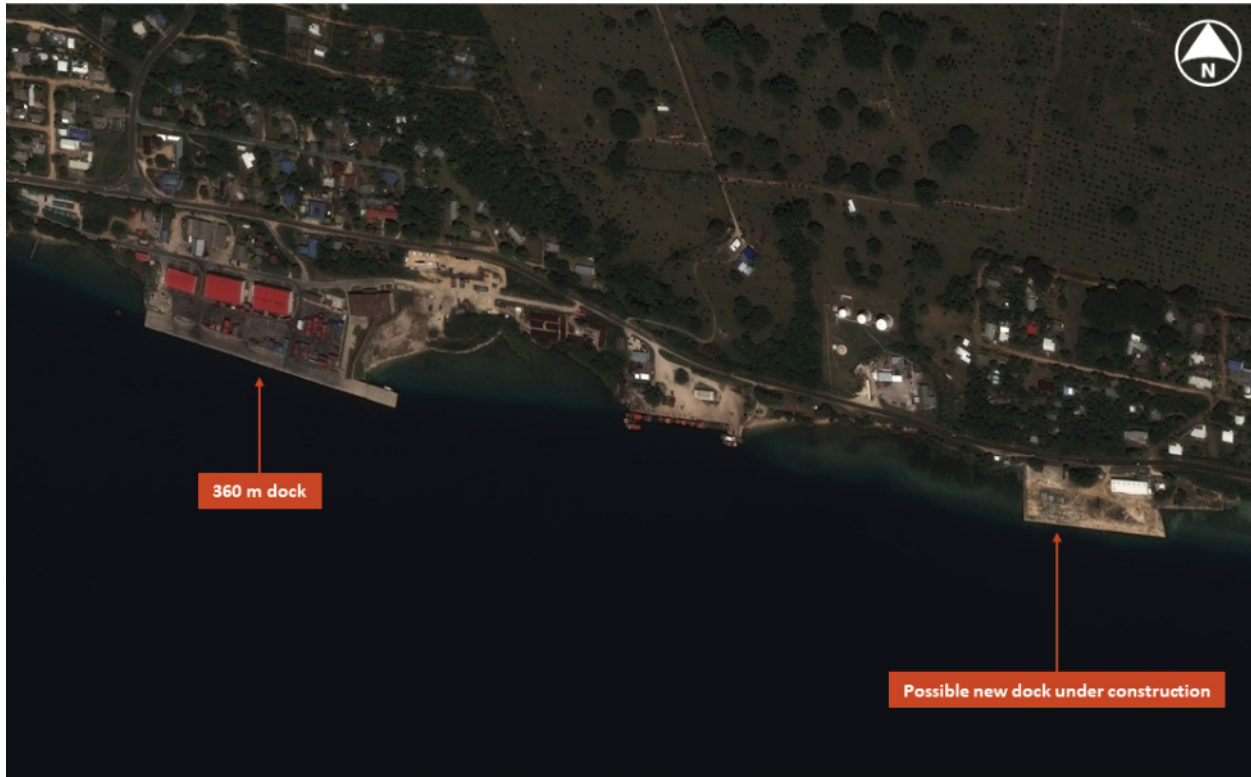
## Appendix C: Satellite Imagery of Potential Overseas Chinese Bases

### Jane's Satellite Imagery Analysis

Luganville, Vanatu

-15.514864 S 167.193559 E

Image Date: 3 January 2020 / Pleiades Satellite



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## Jane's Satellite Imagery Analysis

Salalah, Oman

16.943936 N 054.010675 E

Image Date: 6 November 2019 / Pleiades Satellite



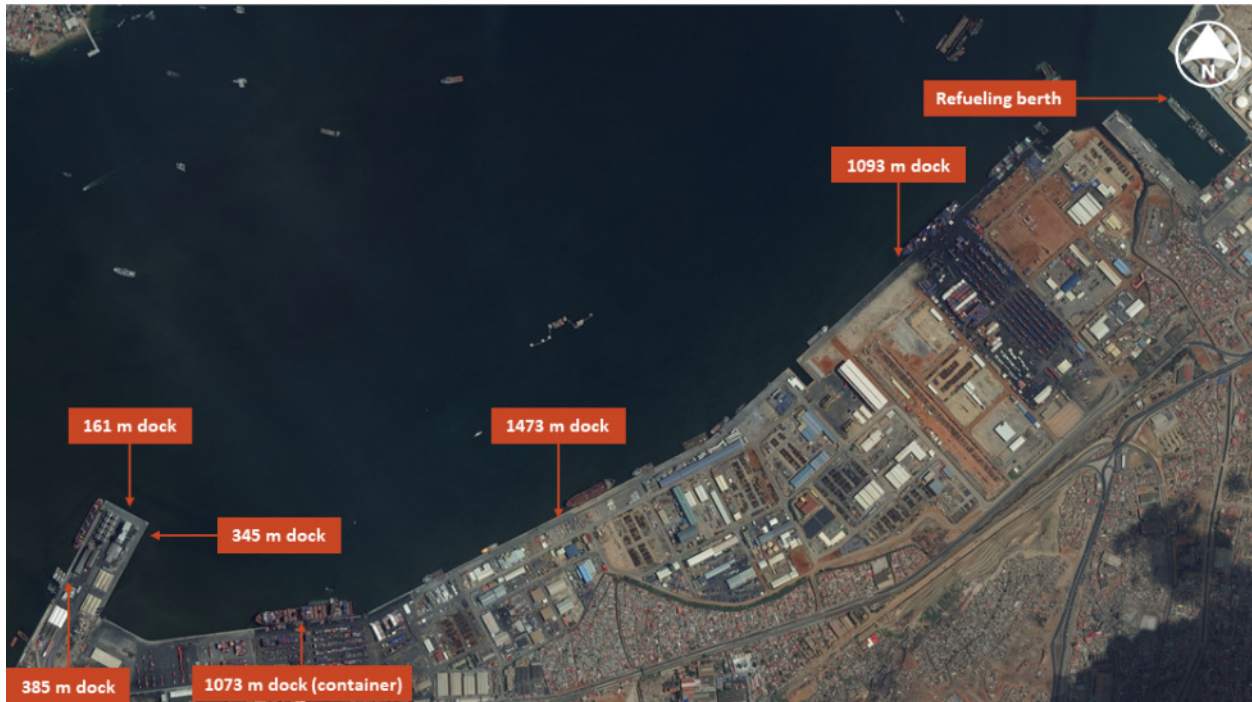
© CNES 2019, Distribution Airbus DS / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Luanda, Angola

-08.791304 S 013.261463 E

Image Date: 28 December 2019 / WorldView-2



Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Lagos, Nigeria

06.460959 N 003.373063 E

Image Date: 3 June 2019 / WorldView-3



Small text at the bottom right of the image: Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Mombasa, Kenya

-04.050874 S 039.635066 E

Image Date: 15 April 2019/ GeoEye-1



Small text at the bottom right of the image: Satellite image © 2019 Maxar Technologies / © 2020 Jane's

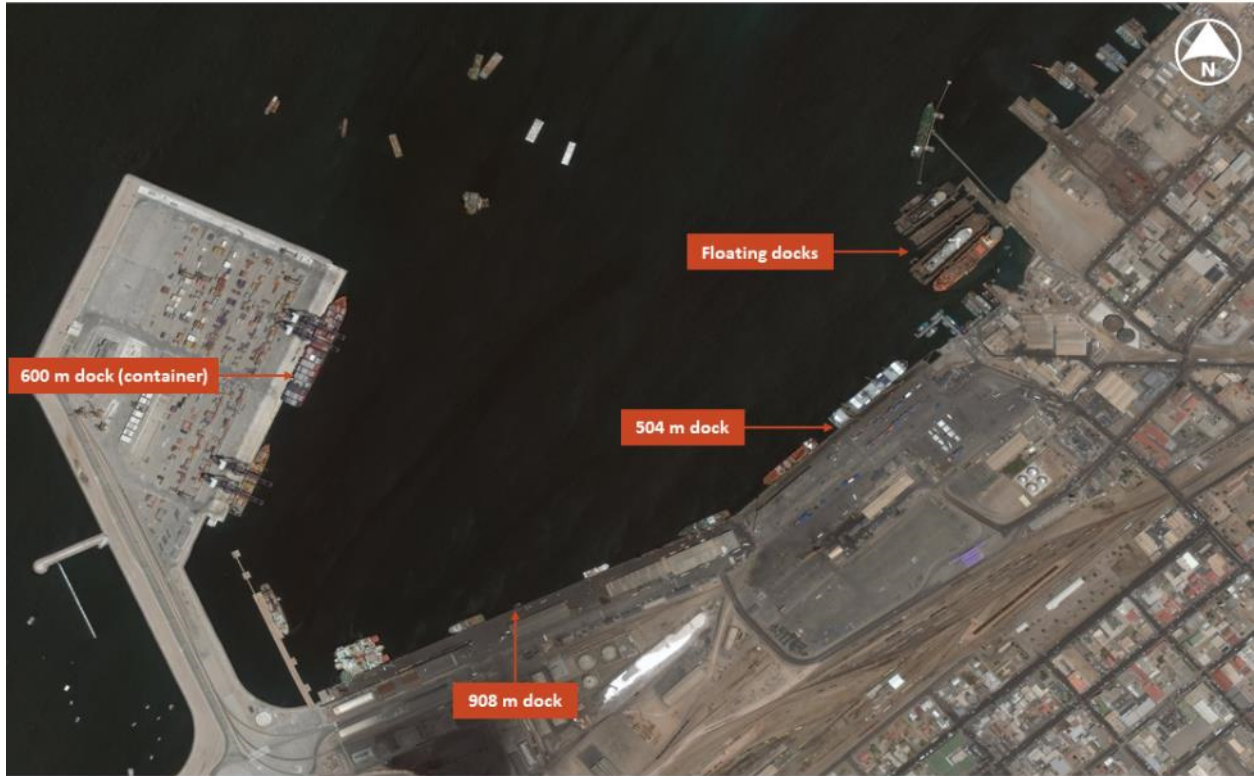


## Jane's Satellite Imagery Analysis

Walvis Bay, Namibia

-22.949332 S 014.492790 E

Image Date: 18 December 2019 / WorldView-2



Small text at the bottom right of the image: Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Karachi, Pakistan

24.832361 N 066.980124 E

Image Date: 13 December 2019 / GeoEye-1



Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Duqm, Oman

19.676159 N 057.699306 E

Image Date: 19 December 2019 / GeoEye-1



Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Colombo, Sri Lanka

06.950413 N 079.842073 E

Image Date: 8 December 2019 / GeoEye-1



Small text at the bottom right of the image: Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Chittagong, Bangladesh

22.284352 N 091.794479 E

Image Date: 14 December 2019 / WorldView-2



Small text at the bottom right of the image: Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Victoria, Seychelles

-04.623161 S 055.461054 E

Image Date: 3 November 2019 / WorldView-2



Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Dar es Salaam, Tanzania

-06.834176 S 039.295874 E

Image Date: 15 December 2019 / WorldView-2



satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Sittwe, Myanmar

20.139552 N 092.901732 E

Image Date: 17 December 2019 / WorldView-2



Satellite image © 2019 Maxar Technologies / © 2020 Jane's





Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Hambantota, Sri Lanka

06.126739 N 081.101620 E

Image Date: 19 August 2019 / WorldView-2



Small text at the bottom right of the image: Satellite image © 2019 Maxar Technologies / © 2020 Jane's

## Jane's Satellite Imagery Analysis

Great Coco Island, Myanmar

14.137513 N 093.371154 E

Image Date: 28 December 2019 / WorldView-2



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## Jane's Satellite Imagery Analysis

Ream, Cambodia

10.505580 N 103.611292 E

Image Date: 2 May 2019 / WorldView-3



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## Jane's Satellite Imagery Analysis

Doraleh, Djibouti

11.593229 N 43.061478 E

Image Date: 12 December 2019 / WorldView-3



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## Endnotes

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