Operationalizing the Quad

Lisa Curtis, Jacob Stokes, Joshua Fitt, and Andrew Adams
About the Authors

Lisa Curtis is the Senior Fellow and Director of the Indo-Pacific Security Program at CNAS. Her more than two decades in the U.S. government include serving as deputy assistant to the president and National Security Council senior director for South and Central Asia (2017–21). Previously she also worked at the CIA, State Department, Senate Foreign Relations Committee, and Heritage Foundation, where she served as Senior Fellow for South Asia from 2006 to 2017.

Jacob Stokes is a Fellow in the Indo-Pacific Security Program at CNAS, where his work focuses on U.S.-China relations, Chinese foreign policy, East Asian security affairs, and great-power competition. He previously served in the White House on the national security staff of then-Vice President Joe Biden. He has also worked as a professional staff member for the U.S.-China Economic and Security Review Commission, an advisor for U.S. Senator Amy Klobuchar, and a senior analyst in the China program at the United States Institute of Peace. He is a term member of the Council on Foreign Relations.

Joshua Fitt is an Associate Fellow with the Indo-Pacific Security Program at CNAS. He focuses on U.S. East Asian security strategy and specializes in Japanese and Korean peninsular affairs. Before joining CNAS, Fitt was a campaign field organizer during the 2018 midterm elections in the Upper Midwest, an earthquake and tsunami disaster relief volunteer with IsraAID in Japan, and an intern with the Council on Foreign Relations’ Japan Program. He earned his BA in East Asian Studies from Yale University.

Commander Andrew Adams is a Senior Military Fellow with the Indo-Pacific Security Program at CNAS. He is a naval officer with deployments in the U.S. Indo-Pacific Command and U.S. European Command areas of responsibility. Additionally, he has planned and led military cyberspace operations for U.S. Fleet Cyber Command and the Cyber National Mission Force. Adams has a BS in information technology from the U.S. Naval Academy, an MS in Cyber Systems and Operations from the Naval Post-Graduate School, and the Certified Information Systems Security Professional certification. The author’s views are his own and do not reflect those of the Department of Defense or the United States Navy.

Acknowledgments

The authors are grateful to the many officials and experts—both in the United States and elsewhere—who shared their perspectives over the course of this project. We are particularly indebted to Zack Cooper, Charles Edel, and Martijn Rasser for their expert reviews of the report. Their comments sharpened both the analysis and recommendations. Finally, this paper would not have been possible without assistance from a host of CNAS colleagues, including Joshua Baker, Melody Cook, Zachary Durkee, Allison Francis, Maura McCarthy, Morgan Peirce, Jake Penders, Rin Rothback, and Emma Swislow. The views presented here do not represent those of CNAS or any other organization, and the authors are solely responsible for any errors in fact, analysis, or omission. This report was made possible with the generous support of the Government of Japan.

As a research and policy institution committed to the highest standards of organizational, intellectual, and personal integrity, CNAS maintains strict intellectual independence and sole editorial direction and control over its ideas, projects, publications, events, and other research activities. CNAS does not take institutional positions on policy issues, and the content of CNAS publications reflects the views of their authors alone. In keeping with its mission and values, CNAS does not engage in lobbying activity and complies fully with all applicable federal, state, and local laws. CNAS will not engage in any representational activities or advocacy on behalf of any entities or interests and, to the extent that the Center accepts funding from non-U.S. sources, its activities will be limited to bona fide scholastic, academic, and research-related activities, consistent with applicable federal law. The Center publicly acknowledges on its website annually all donors who contribute.

About the Indo-Pacific Security Program

The CNAS Indo-Pacific Security Program addresses opportunities and challenges for the United States in the region, with a growing focus on issues that originate in the Indo-Pacific but have global implications. It draws on a team with deep government and nongovernment expertise in regional studies, U.S. foreign policy, international security, and economic statecraft. The Indo-Pacific Security Program analyzes trends and generates practical and creative policy solutions around five main research priorities: U.S.-China strategic competition, India’s growing role in the Indo-Pacific, the North Korea threat, American alliances and partnerships, and challenges in South and Central Asia.
01 Executive Summary
03 Introduction
04 Assessing Progress of Working Groups
13 Exploring Potential for Trade and Economic Cooperation
14 Future Opportunities for Security and Defense Collaboration
18 Quad-Plus Options
19 Policy Recommendations
23 Conclusion
Executive Summary

The Quad—made up of Australia, India, Japan, and the United States—is becoming the principal multilateral group shaping the geo-economic and technological future and the strategic orientation of the Indo-Pacific. Strengthening the Quad is a central pillar in the Biden administration’s strategic plan to compete more effectively with a rising China and to put forth a vision of a free, open, transparent, inclusive, and peaceful Indo-Pacific.

Although the Quad was revived in 2017 under the Trump administration after a 10-year hiatus, it is the Biden administration that has further strengthened U.S. commitment to the group and elevated it to the next level. In the past year, the Quad has held four summit-level meetings—two virtual and two in person—the latest being held in person in Tokyo on May 24, 2022. The Quad leaders released their first joint statement following a virtual meeting on March 12, 2021, and launched three working groups on vaccines, critical and emerging technologies, and climate. They published an even lengthier joint declaration following their first in-person meeting, held at the White House on September 24, 2021, adding three more priority areas to their agenda for cooperation: infrastructure, space, and cybersecurity.

Working to address regional security challenges offers a potential area for further operationalizing the Quad. Quad leaders have consistently emphasized that the group is not a formal military alliance, and the partners do not have treaty-bound mutual defense obligations beyond those the United States has bilaterally with Japan and Australia. Quad leaders have also generally downplayed the role of security issues in the group’s activities, seeking to present an affirmative, rather than defensive, vision for the region and preempt concerns from China as well as other regional states that the Quad will develop into an Indo-Pacific version of NATO.

Still, the four partners have overlapping—although not totally unified—perceptions of the regional security environment as well as the challenges and threats it presents. If the Quad takes up a security and defense agenda, the countries are particularly well positioned to work together across five areas of security policy: joint exercises, interoperability, and patrols; intelligence sharing and maritime domain awareness (MDA); logistics and access; defense technology development and arms sales; and capacity building with regional partners. From the U.S. perspective, coordination in any of these areas would contribute to advancing Washington’s objective of building “integrated deterrence,” which focuses on “developing and combining our strengths to maximum effect.”

This paper assesses Quad activities and the progress the group has made toward its stated objective of promoting a free and open Indo-Pacific. It also provides policy recommendations for strengthening Quad cooperation across the six identified priority areas (vaccines, critical and emerging technologies, climate change, infrastructure, space, and cybersecurity) as well as on trade and economics and security and defense. To operationalize the Quad and realize its stated objective of promoting a free and open Indo-Pacific, the group should focus on these issue areas and associated recommendations:

Vaccines
- Deliver on the Quad commitment to provide one billion COVID-19 vaccines to the Indo-Pacific region by the end of 2022.
- Maintain an open and frank dialogue on vaccine distribution challenges.

Critical and Emerging Technologies
- Coordinate messaging to other Indo-Pacific nations to ensure that these countries’ leaders have a full understanding of the negative impacts associated with relying on technology from untrusted vendors.
- Agree to and publish standards for critical and emerging technologies with a focus on telecommunications, artificial intelligence, microchips, biotech, and other essential technologies.

Climate Change
- Ensure that the climate working group coordinates closely with the critical and emerging technologies, infrastructure, and space working groups.
- Coordinate on prioritization and distribution of climate change assistance in the Indo-Pacific.

Infrastructure
- Focus on mapping the infrastructure needs of the region and sharing information about individual infrastructure investments to ensure that each Quad member’s respective activities complement each other and are mutually reinforcing.
- Incentivize the private sector to invest in strategic infrastructure projects, particularly in the Indo-Pacific.
Explore cooperation on projects that expand the East-West Corridor to connect India to Southeast Asia through the Bay of Bengal.

Coordinate on steps to strengthen international legal frameworks to prevent physical damage and cyberattacks on subsea cables.

**Space**

- Enhance cooperative mechanisms to establish space situational awareness among the Quad nations.
- Launch annual trainings for space personnel to improve interoperability and build people-to-people ties.
- Promote enhanced industry ties in the space sector among Quad countries.

**Cybersecurity**

- Seek to establish a shared set of cybersecurity standards that are influenced by each Quad member’s own internal policies.
- Enhance multilateral cybersecurity actions with a focus on preventing cyber exploitation.
- Support civilian cyber workforce interoperability.

**Trade and Economics**

- Center economic agendas around supply chain diversification while remaining realistic about new trade agreements.
- Coordinate responses to counter Chinese economic coercion.

**Security and Defense**

- Deepen Quad security cooperation by building on existing bilateral and trilateral security cooperation mechanisms.
- Quietly agree to send officials at the assistant secretary level to a working group that would meet periodically to discuss crisis management and responses to regional contingencies.
- Commit to developing a detailed roadmap on improving MDA to fulfill—and eventually expand on—the promise of the Indo-Pacific Partnership for Maritime Domain Awareness.
- Identify opportunities for Quad joint naval patrols.
- Negotiate new, or expand existing, reciprocal access agreements to include strategically located island territories.
- Map each Quad member’s existing maritime law enforcement and military capacity-building efforts.
- Ensure that the United States Senate catches up with its Quad partners in ratifying the United Nations Convention on the Law of the Sea.
- Reserve a portion of the agendas for Quad working groups on critical and emerging technologies and space for consultations on the military and defense applications of those technologies.
- Develop a framework for dealing with nontraditional maritime security threats, such as piracy, threats to marine research activities, and illegal, unreported, and unregulated fishing.

**Other Areas**

- Maintain the Quad’s current membership to keep the group nimble and allow for deeper and wider cooperation among the core four nations, while exploring nonmember partnership mechanisms.
- Establish a strategic communication cell to combine efforts to counter disinformation and misinformation in the region.
Introduction

The Quad—made up of Australia, India, Japan, and the United States—is becoming the principal multilateral group shaping the geo-economic and technological future and the strategic orientation of the Indo-Pacific. Strengthening the Quad is a central pillar in the Biden administration’s strategic plan to compete more effectively with a rising China. Although the Quad leaders currently avoid publicly discussing defense-related initiatives and do not seek to make the Quad into a NATO-like organization, the Quad’s purpose is undeniably strategic. Its aim is to provide a counterweight to China’s growing economic and political influence in the Indo-Pacific and put forth an alternative vision of a free, open, transparent, inclusive, and peaceful region as opposed to one dominated by China’s authoritarian ideology.

The idea of a Quad dialogue among Australia, India, Japan, and the United States was conceptualized by then–Prime Minister of Japan Abe Shinzo around 2007. Abe was inspired by the formation of the Tsunami Core Group, which was created in response to the 2004 tsunami in the Indian Ocean as a way for the four nations to cooperate on disaster relief efforts. The first-ever Quad meeting of senior officials occurred in 2007 on the sidelines of an Association of Southeast Asian Nations (ASEAN) Regional Forum meeting. Days before the meeting, China démarched all four capitals, inquiring about the agenda of the meeting and whether it would have an anti-China focus. That same year the Quad countries plus Singapore participated in the Malabar naval exercise, which India holds annually with the United States and Japan, in the Bay of Bengal. The Australians decided to withdraw from the Quad in 2008, in a move likely aimed at placating China, a major trading partner. The Indians—who share a disputed border with China over which they fought a war in 1962—also indicated a degree of uneasiness with the Quad around the same time.

The Quad, however, was revived 10 years later, in November 2017, during the Trump administration. Building on a series of working-level meetings held in 2017 and 2018, the Quad met at the ministerial level in September 2019 and again in October 2020. In addition, two virtual meetings were held at the deputy national security advisor level in March and May 2020, at the onset of the COVID-19 pandemic. During the same timeframe, then–Deputy Secretary of State Stephen Biegun held a series of virtual biweekly meetings to address issues related to COVID-19 with the Quad countries plus New Zealand, South Korea, and Vietnam. Also in 2020, for the first time in 13 years, India included Australia in the Malabar exercise.

The impact of the COVID-19 global crisis and China’s aggressive military, political, and economic moves in the wake of the pandemic strengthened the desire of all four countries to elevate and operationalize the Quad. Whether it was cutting off Vietnam’s access to its fishing waters, undermining Hong Kong’s self-rule, deploying submarines to threaten Japan, suspending Australian beef, barley, and other imports, or contesting Indian territorial sovereignty along the Line of Actual Control separating India and China, Beijing lashed out on several fronts. These actions have all taken place following an ambitious, multi-decade People’s Liberation Army modernization program, which has resulted in a vastly stronger and more capable force. Substantial new military power appears to be emboldening China’s approach toward regional disputes. Chinese economic coercion aimed at Australia and border aggression toward India reinforced for these countries the benefits of the Quad as a way for powerful like-minded democracies to combine resources and capabilities and take collective action to support the maintenance of a free, open, and rules-based order in the Indo-Pacific.

The COVID-19 pandemic also highlighted the dangers of overdependence on China for critical goods. China’s ability to disrupt medical supply chains led the Quad countries to consider ways they could work together to build more resilient global supply chains for critical minerals and technologies.

Since the Biden administration took power in January 2021, it has strengthened U.S. commitment to the Quad and taken the group to the next level. In the past year, the Quad has held four summit-level meetings—two virtual and two in person—the latest being held in person in Tokyo on May 24, 2022. The Quad leaders released their first joint statement following their virtual meeting on March 12, 2021, and an even lengthier proclamation following their first in-person meeting, held at the White House on September 24, 2021. The increasingly substantial joint statements of the Quad leaders are a testament to their growing commitment to the group and its objectives.

The Biden administration has focused Quad efforts on issues such as economics, technology, climate change, public health, cybersecurity, and maritime domain awareness (MDA) but has shied away from defense-related initiatives. The Quad countries have a mutual interest in meeting the challenges stemming from China’s efforts to dominate the economic and
I

technological landscape in the Indo-Pacific and its attempts to control the supply chains for critical minerals and technologies. The Quad also has a role to play in helping to set standards and norms for the use of emerging and critical technologies to ensure that they are developed and deployed in a manner consistent with a free, open, transparent, and rules-based Indo-Pacific. By combining resources and expertise and bringing to bear shared democratic values, these four powerful nations can shape the environment in which new technologies will emerge and protect global access to critical technologies.

This paper assesses Quad activities and the progress the group has made toward its stated objectives of promoting a free and open Indo-Pacific. It provides a detailed assessment of the Quad’s efforts to address areas that have already been singled out for special focus: critical and emerging technologies, vaccines, climate change, infrastructure, space, and cybersecurity. The paper also examines the prospects and challenges for expanding Quad cooperation on trade and economics as well as security and defense issues. Although the Quad currently downplays security and defense issues, the authors explore future possibilities for defense collaboration in the event increased military aggression or conflict should threaten the overall stability and security of the Indo-Pacific region. Finally, the paper makes policy recommendations for strengthening Quad cooperation on all the issues mentioned above and concludes by noting that a failure to make concrete progress on at least some of these initiatives in the next year will sap regional confidence in the group and provide space for China to assert regional dominance.

Assessing Progress of Working Groups

In the past year, the Quad has begun to formalize its agenda by setting up working and coordination groups made up of subject matter experts who meet regularly to discuss specific areas of collaboration. The first-ever Quad summit, held (virtually) on March 12, 2021, launched three working groups on vaccines, critical and emerging technologies, and climate. These three working groups were supplemented by additional coordination groups to focus on infrastructure, space, and cybersecurity, which were announced following the second Quad summit, held in person on September 24,
2021, at the White House. The four countries have set a broad-based and ambitious agenda, and each of the six areas that have been singled out for priority attention will move at different paces and undoubtedly face obstacles along the way. Still, there are tremendous opportunities for the four nations to share ideas, exchange information, and begin to align their policies on how best to address each challenge.

Vaccines
In March 2021, Quad leaders launched the Quad Vaccine Partnership to enhance equitable access to safe and effective vaccines. They committed to donating one billion COVID-19 vaccine doses globally by the end of 2022. The original initiative envisioned Japan and the United States financing the effort, India producing the vaccines, and Australia distributing them across Asia. However, the Quad has faced several challenges in fulfilling these vaccine promises, including member countries reallocating vaccine doses originally meant for export to domestic stocks when infections surged. Weeks after the first Quad Dialogue meeting in March 2021, India was overwhelmed with COVID-19 cases. Its extensive vaccine production capabilities were needed to fulfill its own internal requirements. India, with financing from Japan, aims to expand its vaccine manufacturing capacity to support the Quad Vaccine Partnership initiative. Progress for now has stalled on the Quad initiative, however, due to issues with the Johnson & Johnson vaccine and with the World Health Organization approval process for the Indian manufacturer.

While the Quad countries, on an individual basis, have made some progress in delivering and funding vaccines globally, much work remains to fulfill the Quad vaccine initiative as originally envisioned. The Quad nations have collectively provided over 670 million vaccine doses globally, with at least 265 million doses going to the Indo-Pacific. After the May 2022 Tokyo Summit, the Quad leaders pledged approximately $5.2 billion to support COVAX, accounting for about 40 percent of worldwide government donor contributions. As of June 2022, the U.S. Department of State reports that the United States has delivered over 543 million vaccine doses globally. As of May 2022, the Ministry of Foreign Affairs of Japan and the Government of Australia have reported the delivery of approximately 44 million and 40 million doses, respectively. As of December 2021, the Indian Government reported having delivered 72.3 million vaccine doses to other countries. Given the difficulties in executing the original Quad Vaccine Partnership initiative, it is imperative that the Quad follows through on its commitment to support the COVAX initiative. Failing to deliver on its vaccine pledges risks undermining the Quad’s ambition to offer a meaningful alternative to Beijing by providing high quality global public goods at sufficient scale, transparently, and without political strings attached.

Critical and Emerging Technologies
A working group on critical and emerging technologies (CETs) was established following the virtual summit held in March 2021. Quad cooperation on CETs could prove vital to maintaining Indo-Pacific security and resilience in an interconnected 21st century. According to the White House Indo-Pacific Strategy released on February 11, 2022, it will be critical for the United States to partner with like-minded nations on technology standards and the development of cutting-edge technologies to promote a free and open, connected, prosperous, secure, and resilient environment. The four Quad members each have something to bring to the table—and have similar goals—when it comes to ensuring secure supply chains for critical technologies and creating open ecosystems for the development of emerging technologies.

U.S. industry has long been a front-runner in these fields, leading the 3G and 4G race, being a major player in the semiconductor field, owning seven of the top 10 life sciences companies, and starting four of the “Seven Giants of the AI age.” India’s technology sector also is thriving. In fiscal year 2022, India’s technology sector brought in over $200 billion in revenue, and it is expected to net an estimated $350 billion in revenue by 2026. For decades, Japan has been an important player in technology, and it has recently increased its relevance in the semiconductor industry. In 2021, the Japanese government approved spending worth 774 billion yen to help the country’s domestic semiconductor industry become a major global provider of essential computer chips. Australia also is set to invest more heavily in technology in the era of the Australia–United Kingdom–United States (AUKUS) partnership. Canberra will invest
Given the multitude of opportunities for expanding cooperation on CETs and the brisk pace of change in the technology industry brought by constant innovation, the Quad countries must carefully scope the challenges and prioritize areas of cooperation.

The joint development of technology standards and norms is particularly important when it comes to 5G and 6G telecommunications. 5G and 6G are a main component of China’s Digital Silk Road, which seeks to shape digital norms across the Indo-Pacific. In 2021, China’s State Council Information Office officially reported assisting 37 private and government telecommunications infrastructure projects around the world—projects that will embed China’s network standards. The Quad can seek beneficial agreements for 5G diversification and deployment, including advancing open radio access networks (open RAN). Open RAN allows interoperability of open hardware, software, interfaces, and cellular wireless networks, promoting a multivendor ecosystem of equipment suppliers. Quad support of open RAN promotes a free and open telecommunication sector by promoting trusted and secure network solutions, rather than networks subject to the vendor lock-in of countries, such as China, that were first to implement proprietary projects.

As with any cooperative engagement in technology that requires investment, a challenge will be balancing the individual capabilities, national security, and economic goals of each country. Although most countries may understand that there is risk in relying on Chinese technology, each has its own calculus for weighing potential economic benefits versus security and privacy risks. Developing better alternatives that regional states can choose should be a central topic in the Quad Track 1.5 industry dialogue on open RAN deployment and adoption, which will be coordinated by the Open RAN Policy Coalition.

Another opportunity for the Quad to operationalize CET policy is through initiatives that build supply chain resilience, including in the vital field of semiconductors. Semiconductors are used in billions of critical devices worldwide and are manufactured in only a few places. The Taiwan Semiconductor Manufacturing Company (TSMC) fabricates more than half of the
The world’s outsourced semiconductors. The Quad can set standards that protect microchip supply chain integrity, mitigate risk, and reduce negative second-order consequences. The risk to semiconductor supply chains due to tensions between China and Taiwan necessitates diversifying locations where chips are produced. Ensuring more supply chain visibility also is vital for accountability. There are many vendors below the top-tier suppliers that may cause problems in the delivery of critical technology; it is essential that countries develop a more robust understanding of the second-tier suppliers. The Quad will not be able to make major changes to microchip supply chains quickly, but it can start the process by setting standards for vendor transparency and supply chain security.

Biotechnology also is a fruitful field for cooperation, because it is a diverse area with applications ranging from agricultural innovation to human genomes and biosecurity. The CET working group’s starting goal in biotech should be to monitor trends to identify opportunities for cooperation. In a field that is at the forefront of everyone’s mind because of the pandemic, the Quad should also start a discussion on standards, ethics, security, and joint research infrastructure, as recommended by the Quad Tech Network. Working on norms can benefit a field of study that is ripe for industrial competition. Ethics and security discussions should include responsible use of biotech data, which is the ultimate form of personal identifiable information. Biologics have enormous potential for misuse, including by adversaries who might consider weaponizing such technology. Finally, in a burgeoning field in which each country requires dedicated research and development, research collaboration can facilitate innovation among the Quad countries and like-minded partners.

Quad officials announced further progress on CET cooperation following the May 24 summit with the unveiling of new agreements, including a Common Statement of Principles on Critical Technology Supply Chains and a Memorandum of Cooperation on 5G Supplier Diversification and Open RAN.

**Climate Change**

The Quad Climate Working Group was one of the three working groups established after the inaugural leader-level Quad summit in March 2021, underscoring the issue’s importance to the Quad and the region. Climate change is a global emergency, but it poses a particular...
threat to the Indo-Pacific. The region’s island population is over 500 million people, greater than three and a half times the rest of the world’s island populations combined. Among the small Pacific island nations, 97 percent of the population lives within 10 kilometers of the coastline. Whether it is because of rising sea levels or increased frequency and intensity of typhoons, monsoons, and wildfires, Indo-Pacific nations are among the most at risk when it comes to climate change. The Quad must address this issue if it is to ensure the long-term prosperity of the region.

The Quad leaders announced the contours of their initial climate action plan in the joint statement after their second summit, in September 2021. The plan includes steps that Quad countries can take among themselves to reduce emissions and promote green economic solutions, as well as a component on boosting the resiliency of the rest of the region. Going forward, the Quad will use the temperature goals set by the Paris Agreement to inform their initiatives and to set national 2030 targets for emissions, renewable and clean energy innovation, and climate change preparedness.

Although cost-effective hydrogen is still several years away, the Quad currently has a comparative advantage on the technology and production capacity that could enable it to get there first.

The White House fact sheet on the September 2021 summit outlines the three primary lines of effort for the Quad on climate. These lines include the implementation of a “green shipping network,” which would reduce the negative climate impact of fuels used to power ships, build green infrastructure at major Quad ports, and eventually establish “low-emission or zero-emission shipping corridors by 2030.” Because 60 percent of global maritime shipping transits the Indo-Pacific, the green shipping network could have an immense impact.

The second line of effort is building a “clean-hydrogen partnership,” focused on making hydrogen a more viable green energy source by reducing the cost and climate impact of its production, transportation, storage, and use. Although cost-effective hydrogen is still several years away, the Quad currently has a comparative advantage on the technology and production capacity that could enable it to get there first.

The third and final initiative is focused on improving climate adaptation, resilience, and preparedness in the Indo-Pacific. This effort will take place through enhanced climate information sharing and technical assistance in constructing or retrofitting disaster-resistant infrastructure. In a step that will facilitate information sharing, the World Meteorological Organization in late September 2021 set a requirement for certain climate data to be collected and shared in and among its 193 member countries. The Quad can look to the Coalition for Disaster Resilient Infrastructure (CDRI), launched by India at the 2019 U.N. Climate Action Summit, to further its goals on disaster-relief infrastructure. The CDRI includes all four quad countries, several other Indo-Pacific nations, and eight international organizations.

During the May 2022 Quad summit in Tokyo, these initiatives were repackaged into the Quad Climate Change Adaptation and Mitigation Package (Q-CHAMP). Q-CHAMP also introduced new initiatives including promoting sustainable agriculture, advancing the carbon market to make carbon capture more realistic, and pooling information about subnational climate actions and commitments. The Quad leaders also announced two new Quad ministerial meetings among transportation and energy ministers. Discussions at these two new ministerial meetings will likely touch on the work of other working groups, but the impetus and initial framing is to advance the Quad’s coordination on combating climate change.

While the first two lines of effort from the September Quad summit are mostly focused on what the Quad can achieve internally, direct assistance to other Indo-Pacific nations would mostly fall under the third line of effort. Actions could include following through on commitments made at the 2021 U.N. Climate Change Conference in Glasgow (COP26) or in the Paris Agreement. Developed nations pledged at the COP26 to provide $100 billion annually in climate finance for developing countries. The United States, Australia, and Japan have made commitments under that pledge, with Australia specifically earmarking almost half of its contribution toward developing nations in the Indo-Pacific. India also made several major pledges at COP26, including a pledge to achieve net-zero emissions by 2070.
**CLIMATE COMMITMENTS OF QUAD COUNTRIES AFTER COP26**

<table>
<thead>
<tr>
<th>AREA OF COMMITMENT</th>
<th>QUAD COUNTRIES</th>
<th>Australia</th>
<th>India</th>
<th>Japan</th>
<th>United States</th>
</tr>
</thead>
<tbody>
<tr>
<td>Slash methane emissions by 30% by 2030</td>
<td></td>
<td></td>
<td>🔻</td>
<td>🔻</td>
<td>🔻</td>
</tr>
<tr>
<td>End coal use</td>
<td></td>
<td></td>
<td>🔻</td>
<td>🔻</td>
<td>🔻</td>
</tr>
<tr>
<td>Climate finance</td>
<td>2 billion AUD total 2021–2025 (700 million AUD earmarked for Indo-Pacific)</td>
<td>🔻</td>
<td>N/A</td>
<td>$70 billion total from 2021 to 2025</td>
<td>Double existing annual commitments to $11.4 billion by 2024</td>
</tr>
<tr>
<td>All new cars will be zero-emission by 2040</td>
<td></td>
<td>🔻</td>
<td>🔻</td>
<td>🔻</td>
<td>🔻</td>
</tr>
<tr>
<td>Halt and reverse deforestation by 2030</td>
<td></td>
<td>🔻</td>
<td>🔻</td>
<td>🔻</td>
<td>🔻</td>
</tr>
<tr>
<td>National net-zero target date</td>
<td>2050</td>
<td>2070</td>
<td>2050</td>
<td>2050</td>
<td>2050</td>
</tr>
</tbody>
</table>

The Quad countries made many important commitments during the 2021 U.N. Climate Change Conference in Glasgow (COP26), though they refused to join in on several others, such as pledging to end the use of coal.

The remit of the working group on climate overlaps in part with those of the other groups, namely critical and emerging technologies, infrastructure, and space. Because of the massive scale of the climate challenge, these other working groups must consider the issues of sustainability and natural disaster resilience. Whether it’s partnering on sustainably implementing new technology, identifying green infrastructure needs, or leveraging innovation in space capabilities to address climate challenges, these working groups will need to collaborate closely.

The Quad’s focus on addressing climate change is commendable but combating the problem will remain an uphill battle. Even in the most optimistic scenarios, climate experts believe that full implementation of current pledges and policies worldwide would still fail to achieve the Paris Agreement goal of limiting global warming to 1.5 degrees Celsius above the preindustrial average temperature. Competing national priorities and other Quad initiatives will almost certainly pull bandwidth away from climate change. Still, through this working group, the Quad can make a difference by being bold with its own climate targets and assisting developing countries in the region with setting and supporting their sustainable development goals.

**Infrastructure**

The Quad has identified cooperation on infrastructure as a priority and announced the launch of a Quad Infrastructure Coordination Group in the joint statement following the September 2021 summit. Given the enormous infrastructure needs in the Indo-Pacific region—the Asian Development Bank in 2017 estimated that the infrastructure financing gap in Asia was nearly $460 billion per year—the Quad countries are well placed to provide the region with infrastructure financing options that are transparent, fair, and reliable. The Quad’s assistance in helping to close the infrastructure financing gap is important not only for sustaining long-term economic growth in the region but also for providing countries with alternatives to the Chinese investment and loans that are part of Beijing’s signature Belt and Road Initiative (BRI).

Chinese President Xi Jinping launched the BRI in the fall of 2013 in the capital of Kazakhstan during a conference on China’s diplomacy with its neighbors. China’s largest BRI investment in any one country so far has been in the China Pakistan Economic Corridor, with pledges so far running at about $60 billion. China makes BRI investments in the form of loans; however, Beijing is not committed to transparent lending, and the risks of its infrastructure loans are often hidden from recipients.
In 2014, China started the Silk Road Fund to finance BRI projects through the China Development Bank and the Export-Import Bank of China. The Chinese loans can come with strings attached—including the relinquishment of control of strategic assets. Take, for instance, the case of the Hambantota Port in Sri Lanka, in which the Sri Lankan government was forced to lease the port to China for 99 years in exchange for $1 billion in debt relief.54

To better compete with China’s BRI, on October 5, 2018, the U.S. Congress passed the Better Utilization of Investment Leading to Development Act (BUILD Act), which created the U.S. International Development Finance Corporation (DFC). The purpose behind creating the DFC, which replaced the Overseas Private Investment Corporation (OPIC), was to better mobilize private sector investment in low- and middle-income countries.55 The act also authorized the DFC to operate in upper-middle-income countries for national security purposes or in underdeveloped parts of such countries. The DFC’s funding cap was more than doubled to $60 billion (from OPIC’s $29 billion) and the new organization was authorized to make loans or loan guarantees, acquire equity in projects as a minority stakeholder, insure private entities, provide technical assistance, and collect market-based fees. Because the United States is unable to match the levels of investment made by China’s state-owned entities in BRI projects, the goal for establishing the DFC was to better leverage private capital in investments in overseas infrastructure projects. Unfortunately, nearly four years after the creation of the DFC, it has invested few resources in the Indo-Pacific region, where competition with China’s BRI is most acute.

To deal with the challenges of China’s BRI, the Trump administration launched the Blue Dot Network (BDN), an effort to bring governments, the private sector, and civil society together to promote high-quality standards for global infrastructure development. The concept included the BDN serving as a clearinghouse for proposed infrastructure projects that would be graded on whether the projects were transparent, commercially viable, sustainable, and beneficial for the local community. The BDN was first announced in late 2019 by the United States, Australia, and Japan at the Indo-Pacific Business Forum, held in Bangkok. Support for the BDN concept was mentioned in the joint statement signed by President Trump and Indian Prime Minister Narendra Modi during Trump’s February 2020 visit to India.56 The Biden administration has committed to...
sustainable infrastructure projects.” Welcoming the meeting of the consultation group, a State Department official said, “The Blue Dot Network will be a globally recognized symbol of market-driven, transparent, and sustainable infrastructure projects.”

A more high-profile initiative to support global infrastructure was unveiled at the June 2021 G7 summit. The White House described the Build Back Better World (B3W) initiative as aimed at meeting the infrastructure needs of low- and middle-income countries through a “values-driven, high-standard, and transparent infrastructure partnership led by major democracies.” The G7 leaders’ communiqué further explained that their infrastructure partnership will employ development finance tools toward supporting resilient infrastructure that addresses climate change, health security, digital solutions, and gender equality. The G7 leaders expanded on the B3W initiative at the June 2022 G7 summit held in Germany by committing $600 billion to a global infrastructure fund and renaming it the “Partnership for Global Infrastructure.”

Because China provides loans that are generally nontransparent and sometimes for commercially questionable projects, it is important for the Quad countries to provide alternatives for countries that desperately need infrastructure investment. There are growing indications that countries in the region prefer high-standard, financially sustainable infrastructure projects, especially as these nations struggle with debt in the wake of the COVID-19 pandemic.

Within the Quad, Japan has played a dominant role in infrastructure financing in the Indo-Pacific and thus can take a leading role in coordinating the four countries’ efforts to increase public financing, while also leveraging private capital, for infrastructure projects. The Quad can also learn lessons from the recent experience the United States, Australia, and Japan had with trilaterally financing a subsea cable to the Pacific Island nation of Palau. The trilateral cooperation was made possible through a memorandum of understanding signed in 2018 by the three countries to allow the U.S. Development Finance Corporation, Japan’s Bank for International Cooperation, Australia’s Department of Foreign Affairs and Trade, and Australia’s Export Finance and Insurance Corporation to work together to mobilize private capital to support infrastructure projects.

There is further potential for the Quad to work together to protect undersea cables. As the Indo-Pacific region becomes more digitally integrated, it is critical to guard these massive cable lines against sabotage and/or espionage. It is especially important for less-developed countries to have access to trusted and secure subsea cables to protect their sovereignty and the resilience of their critical infrastructure. While American tech giants such as Google, Facebook, Microsoft, and Amazon own or lease about half of global undersea cables, China is increasing its global market share. Each Quad country has unique interests in and capabilities to bring to bear on the subsea cable issue. U.S. company SubCom and Japan’s NEC account for 70 percent of the subsea fiber optic cable market, and Australia has been a leader in developing regulations for the protection of subsea cables. India, for its part, will be a major landing point for these cables in the future.

One lesson that has become apparent from the trilateral Palau subsea cable project mentioned above involves the difficulties in reconciling the national financing mechanisms of each country. Given the challenges with comingling funding from the different countries, the Quad members should focus instead on jointly mapping the infrastructure needs of the region and then finding ways their individual efforts can be complementary and mutually reinforcing in providing quality infrastructure alternatives in the region. A mapping exercise is critical to understanding how the Quad countries’ resources can best be used. The Quad can also spearhead new standard-setting initiatives in infrastructure investment and financing that incentivize the private sector to participate. Leveraging the private sector is essential, because the Asian Development Bank estimates that 60 percent of the infrastructure financing for the region should come from the private, not public, sector.

Space
The Quad Space Working Group was established during the September 2021 leader-level summit in Washington. Because it is one of the more recently established working groups, its agenda is relatively slim—but because of the uptick in space-related policy initiatives over the past several years, there is already a solid foundation of bilateral space ties among the Quad countries. Still, there is much work to be done in terms of fleshing out the space working group’s agenda and aligning existing bilateral priorities with those of the Quad as a whole.

At the outset, the space working group will focus on data sharing, new opportunities for collaboration, and building norms and principles related to the use of space. Enhanced data sharing can lead to more effective disaster response and ocean resource use through improved MDA. Pooling information and resources will...
also enable Quad countries to analyze and predict the impact of climate change in the region. During the U.S.-India 2+2 meeting in April 2022, the countries signed a memorandum of understanding on space situational awareness.68 Though the agreement is characterized by a defense focus, it enables improved bilateral space situational awareness overall and is an important step toward closer collaboration on space.

Enhanced data sharing can lead to more effective disaster response and ocean resource use through improved MDA. Pooling information and resources will also enable Quad countries to analyze and predict the impact of climate change in the region.

In addition to bilateral and intra-Quad space initiatives, the working group is tasked with developing new ways to collaborate on space activities with other Indo-Pacific countries. South Korea would be a natural partner in this endeavor. It is already technologically developed, but South Korea’s space program was previously limited in part by an agreement between Washington and Seoul that capped the range of South Korean ballistic missiles at 800 kilometers. This agreement was ended by the Biden and Moon Jae-in administrations in May 2021.69 Only a few months later, in August, Seoul announced a $13 billion plan to improve space capabilities over the next decade. By October, South Korea launched its first “homegrown” rocket and satellite into space.70 The countries of the Quad can collaborate with partners such as South Korea to share best practices, and work with Seoul to develop its space capacity in a sustainable manner. Through building out these types of relationships with other Indo-Pacific partners, the Quad can then also involve like-minded countries in Quad conversations on norms and principles related to the use of space.

Cybersecurity
The Quad Senior Cyber Group met in March 2022 to discuss ways for members, partners, and industry to “extend our cybersecurity cooperation and uplift cyber resilience and critical infrastructure protection in our region.”71 The group’s first priority was similar to the CET working group’s in that it addressed the issue of developing shared standards. This task may prove even more difficult than establishing norms in emerging technology because of evolving cybersecurity requirements, which are difficult to coordinate within a single country, much less among many countries. For example, the United States has a long-term, concerted effort underway to standardize cybersecurity policies between government entities and contractors.72 The fact that many cyber threats are undetected until they make impact means cooperation between different countries must first focus on best practices and lessons learned. At the May 2022 Tokyo Summit, Quad leaders introduced initial means for this sharing through Computer Emergency Response Teams (CERT) and a Cybersecurity Day campaign.73 Cyber security professionals and the public can engage on best practices, cyber hygiene, and vulnerability awareness to collectively strengthen understanding about Indo-Pacific cybersecurity.

Comprehensive cybersecurity also requires a wide array of prevention activities, such as real-time information sharing on cyber threats and ongoing attacks, combating disinformation, and publicly acknowledging cyber threat actors. The full breadth of these cyber defense topics will necessarily include helping to secure military networks. The Quad can build on standing information-sharing agreements to expand everyday cyber defense to the same level achieved during combined military exercises.

Development of secure software is another important element in cyber cooperation. Supply chain challenges often hinder secure software delivery. Another challenge for the joint use of critical software is the differences in foreign sharing agreements among member states. Individual country national security concerns must influence combined software development in this endeavor, just as they must influence moves to protect the microchip supply chain. In software, the full trust and integrity of the product is sometimes unknown until the code is executed on a critical system.

Finally, improving Quad members’ workforce talent offers a promising area for collaboration. The joint statement from the September 2021 summit unveiled a new pilot program to provide 100 graduate fellowships to science, technology, engineering, and mathematics graduate students across all four nations.74 This plan was further solidified at the Tokyo Summit, where Quad leaders provided more details of the Schmidt Futures–administered graduate student exchange program that will begin in late 2023. This initiative can facilitate global integration in the cybersecurity workforce, educational institutions, and trade schools. Cross-training a generation of cybersecurity professionals can help expand professional networks and understanding of standards in the future. An extension of the cross-learning is conducting cybersecurity and hacking
Operationalizing the Quad

Exploring Potential for Trade and Economic Cooperation

Quad cooperation on trade and economic issues has lagged behind other areas; however, there is likely to be greater scope for moving forward on a limited Quad economic agenda following the release of the much-awaited White House Indo-Pacific Economic Framework (IPEF) on May 23, 2022. The IPEF is not a standard trade agreement involving the negotiation of tariffs or market access. Instead, it is a framework for economic engagement and cooperation that includes four main pillars: fair trade (including digital trade); supply chain resilience; clean energy and infrastructure; and tax and anti-corruption. Seventeen countries have signed up to the U.S. framework, including Australia, Brunei, Fiji, India, Indonesia, Japan, South Korea, Malaysia, New Zealand, the Philippines, Singapore, Thailand, and Vietnam.

The Quad is poised to cooperate more closely on two of the IPEF pillars—supply chains and clean energy—while collaboration on trade and digital issues will likely remain elusive. The Quad has already begun work to address supply chain and climate change challenges, as noted above, and as the Biden administration fleshes out broader Indo-Pacific initiatives in these areas, it is likely to reinforce the Quad's work. On the other hand, given protectionist policies in both India and the United States, it is difficult to imagine that the Quad will make much headway as a group in opening market access and lowering barriers to trade. The countries in the Quad can work bilaterally on opening trade with one another, as demonstrated by the recently concluded free trade agreement between India and Australia. The interim agreement, which was concluded in April, had been under discussion for a decade and is expected to double the countries' bilateral trade to $50 billion within five years. There also may be opportunities to expand trade in the Indo-Pacific through "Quad-plus" efforts involving other like-minded countries. One example is the ASEAN-India Free Trade Agreement.

The Quad countries can also develop strategies to deal with Chinese economic coercion and reduce Chinese leverage points. Australia has taken steps to diversify its supply chains to reduce economic dependency on China and has shown that it can maintain economic ties with China without succumbing to its policies of economic coercion. Bringing the private sector into the discussions is essential to point out vulnerabilities in business models that can be strengthened against coercive economic practices.
Quad agreement on digital issues also will be difficult because of the diversity of digital standards and regulations among the Quad nations, especially India. India’s data localization policies contrast sharply with the United States, Australia, and Japan’s commitment to the “Osaka Track” framework for free and open flow of data across borders with protections for privacy, cybersecurity, and intellectual property. Then–Japanese Prime Minister Abe Shinzo called the framework “Data Free Flow with Trust.” In contrast, India’s data localization policies seek to maintain storage of data where they originate, rather than allowing them to be processed at a different location. The U.S. government has indicated that India’s proposed data localization requirements will be a barrier to bilateral digital trade. With the digital economy expected to be 24 percent of the total global economy by 2025, the differences with India on data localization will take on greater significance in the years to come.

**Future Opportunities for Security and Defense Collaboration**

Working to address regional security challenges offers another potential area for operationalizing the Quad. Quad leaders have consistently emphasized that the group is not a formal military alliance, and the partners do not have treaty-bound mutual defense obligations beyond those the United States has bilaterally with Japan and Australia. Quad leaders have also generally downplayed the role of security issues in the group’s activities, even though the group was originally referred to as the Quadrilateral Security Dialogue. Instead, they have sought to present an affirmative, rather than defensive, vision for the region and preempt concerns from China as well as other regional states that the Quad will develop into an “Indo-Pacific version of NATO.”

Still, the four partners have overlapping—although not totally unified—perceptions of the regional security environment, as well as the challenges and threats it presents. First, each Quad country has individually identified China’s assertive, and at times aggressive, behavior as a major challenge to regional peace and stability. Washington says Beijing is its “most consequential strategic competitor and the pacing challenge.” New Delhi and Tokyo have active territorial disputes with China on the Line of Actual Control (the de facto China-India border) and in the East China Sea, respectively. And Canberra remains wary of Chinese economic coercion and the potential for China to gain access to military facilities in the Pacific Islands.

The Quad countries also harbor concerns about China’s overarching challenge to the regional political and security order and are seeking to collectively counterbalance Beijing’s growing economic and military might. Discussions of issues related to China in the Quad context, however, usually focus on supporting specific principles rather than calling out China directly. Many of those goals fall under the general category of enhancing maritime security. These include ensuring freedom of navigation and overflight; promoting the safety and security of sea lines of communication; protecting states’ ability to develop offshore resources, consistent with the United Nations Convention on the Law of the Sea (UNCLOS); and combating challenges such as illegal, unreported, and unregulated fishing. Beyond China, the Quad partners speak more directly and in unison about terrorism, the threats posed by North Korea’s nuclear and missile programs, and nontraditional security challenges such as providing humanitarian assistance and disaster relief.

The four Quad partners bring sizeable capabilities to the task of addressing these security concerns. The United States ranks first, India third, Japan ninth, and Australia 12th in defense spending globally, according to the 2022 military expenditure rankings from the Stockholm International Peace Research Institute (SIPRI). Those resources mean that each country can draw on significant military and security capacity when contributing to Quad activities directly or, as is more often the case, indirectly, when working in small groups or unilaterally. Most cooperation among Quad members on security issues takes place bilaterally or trilaterally instead of in the full Quad format.

Those defense ties are accelerating rapidly, though. Following the inaugural 2+2 ministerial meeting between Australia and India, in September 2021, each of the six bilateral relationships between Quad members now has a standing 2+2 dialogue of foreign and defense ministers. In addition, Canberra, Tokyo, and Washington have forums for trilateral cooperation on foreign and security policy issues in the Trilateral Strategic Dialogue and the Trilateral Defense Ministers Meeting. From the U.S. perspective, coordination in any of those arrangements contributes to advancing Washington’s objective of building “integrated deterrence,” which focuses on “developing and combining our strengths to maximum effect.” Prominent among those strengths is America’s “unmatched network of Alliances and partnerships.” The Quad is particularly well positioned to work together across five areas of security policy: joint exercises, interoperability, and patrols; intelligence sharing.
and MDA; logistics and access; defense technology development and arms sales; and capacity building with regional partners. The remainder of this section will briefly examine each of those categories.

**Joint Exercises, Interoperability, and Patrols**
Quad countries are focused on deepening interoperability among themselves and with like-minded partners. Joint exercises are key to improving their ability to conduct military operations together. The most prominent example related to the Quad is the Malabar exercise, in which Australia participated in 2020 for the first time since 2007. Japan joined as a permanent member in 2015, linking up with existing members India and the United States. The 2021 Malabar exercise was conducted in both the Philippine Sea and the Bay of Bengal and included “a variety of high-end tactical training, including specific interactions that are designed to enhance interoperability.” All four Quad countries also take part in the Rim of the Pacific (RIMPAC) exercise, which happens every two years. And as in other areas, the four countries also exercise together in various subset groups that include two or three Quad members and sometimes other like-minded countries as well.

### SELECT MILITARY EXERCISES INVOLVING TWO OR MORE QUAD MEMBERS

<table>
<thead>
<tr>
<th></th>
<th>AUSTRALIA</th>
<th>INDIA</th>
<th>JAPAN</th>
<th>UNITED STATES</th>
<th>OTHER PARTICIPANTS</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>MALABAR</strong></td>
<td>![Australia Flag]</td>
<td>![India Flag]</td>
<td>![Japan Flag]</td>
<td>![United States Flag]</td>
<td></td>
</tr>
<tr>
<td><strong>RIM OF THE PACIFIC (RIMPAC)</strong></td>
<td>![Australia Flag]</td>
<td>![India Flag]</td>
<td>![Japan Flag]</td>
<td>![United States Flag]</td>
<td>27 planned participants for 2022 installment</td>
</tr>
<tr>
<td><strong>AUSINDEX</strong></td>
<td>![Australia Flag]</td>
<td>![India Flag]</td>
<td>![Japan Flag]</td>
<td>![United States Flag]</td>
<td></td>
</tr>
<tr>
<td><strong>JAPAN-INDIA MARI-TIME EXERCISE (JIMEX)</strong></td>
<td>![India Flag]</td>
<td>![Japan Flag]</td>
<td>![United States Flag]</td>
<td>![Australia Flag]</td>
<td></td>
</tr>
<tr>
<td><strong>ANNUALEX</strong></td>
<td>Occasional participant</td>
<td>![Japan Flag]</td>
<td>![United States Flag]</td>
<td>![Canada and Germany participated in 2021]</td>
<td></td>
</tr>
<tr>
<td><strong>TALISMAN SABRE</strong></td>
<td>![Australia Flag]</td>
<td>Invited for 2023</td>
<td>![Japan Flag]</td>
<td>![United States Flag]</td>
<td>Canada, Republic of Korea, UK, New Zealand</td>
</tr>
<tr>
<td><strong>SEA DRAGON</strong></td>
<td>![Australia Flag]</td>
<td>![India Flag]</td>
<td>![Japan Flag]</td>
<td>![United States Flag]</td>
<td>Canada, Republic of Korea</td>
</tr>
<tr>
<td><strong>LA PÉROUSE</strong></td>
<td>![Australia Flag]</td>
<td>![India Flag]</td>
<td>![Japan Flag]</td>
<td>![United States Flag]</td>
<td>Led by France</td>
</tr>
</tbody>
</table>
Beyond exercises, Japan’s Self-Defense Forces (JSDF) took on a new operational role by conducting their first asset protection mission—helping defend a partner’s ships and aircraft—on behalf of Australian forces in November 2021.\textsuperscript{101} Japan assumed those responsibilities on behalf of the United States in May 2017, and in 2021, the JSDF conducted a total of 22 asset protection patrols.\textsuperscript{102} Exercises and joint patrols provide special benefits in areas where the Quad partners operate compatible platforms. One example is anti-submarine warfare, where Australia, India, and the United States rely on Boeing P-8 Poseidon maritime patrol aircraft and Japan flies the similar Kawasaki P-1.\textsuperscript{103}

Synchronizing tactical communications systems is also critical. To that end, the United States and India signed the Communications Compatibility and Security Agreement (COMCASA) in September 2018. COMCASA enables the Indian military to use high-end secured and encrypted communication equipment on the American weapons platforms that India operates instead of having to rely on commercially available technology; the agreement was modified from standard agreements between the United States and its partners to account for India’s special concerns about its being too intrusive.\textsuperscript{104} Prior to COMCASA, India could not communicate or gain access to a common tactical picture using the secure voice, Link 11, or Link 16 systems.\textsuperscript{105}

Finally, the Quad partners conduct patrols together. For example, navies from India, Japan, the United States, and the Philippines did a “group sail” or joint patrol through the South China Sea in May 2019.\textsuperscript{106} Important limitations on Quad military cooperation remain, though. Quad partners will likely continue to refrain from joint freedom of navigation operations (FONOPs)—specific challenges to excessive maritime claims—of the type that the United States has been undertaking since 1979.\textsuperscript{107} FONOPs are seen as especially provocative toward Beijing, and India has expressed frustration at occasionally having its own maritime claims challenged.\textsuperscript{108}

**Intelligence Sharing and Maritime Domain Awareness**

Obtaining an accurate picture of the situation across a geographic space as expansive and diverse as the Indo-Pacific presents a massive challenge. Quad partners have identified intelligence sharing and improving MDA as priority areas for cooperation. Once again, much of the tangible progress to date has come through bilateral actions between Quad members, rather than from the full group acting in unison. The United States manages intelligence sharing with Australia through the bilateral alliance as well as the Five Eyes partnership, which also includes Canada, New Zealand, and the United Kingdom. The possibility of Japan becoming a member of the Five Eyes, resulting in a “Six Eyes” pact, has been floated, but the addition does not appear imminent and would likely require Tokyo to institute legal and institutional changes.\textsuperscript{109}

Regardless, Quad partners have taken some important steps in recent years to improve intelligence-sharing arrangements. Australia, Japan, and the United States signed a trilateral information-sharing agreement in October 2016.\textsuperscript{103} In July 2020, Japan took a major step toward facilitating intelligence sharing with close partners, including India and Australia, by broadening the scope of its state secrets law to include exchanges with countries other than the United States.\textsuperscript{110} The United States and India in October 2020 signed a basic exchange and cooperation agreement, which, according to the Congressional Research Service, “allows India to access a range of topographical, nautical, and aeronautical data, engage in subject matter expert exchanges, and receive training at the U.S. National Geospatial Intelligence College.”\textsuperscript{112} In addition, India signed agreements on the security of classified military information with Japan in 2015 and the United States in 2002.\textsuperscript{111}

Improving MDA is a special area of focus. MDA means, in essence, keeping watch over a region’s oceans and waterways. It can be divided into general maritime awareness from persistent monitoring of maritime spaces,\textsuperscript{114} Its heavy reliance on satellite imaging underscores the importance of Quad cooperation on space issues (as discussed earlier in this report). The aspirational goal of increasing regional situational awareness could be to develop a common operational picture on which all Quad partners could rely to monitor civilian and military maritime activity, expose misbehavior in real time, and help orient collective action in response.\textsuperscript{115} Quad leaders took a major step forward in this area when, following their May 2022 Tokyo summit, they announced the Indo-Pacific Partnership for Maritime Domain Awareness.\textsuperscript{116} That initiative promises to “build a faster, wider, and more accurate maritime picture of near-real-time activities in partners’ waters” that integrates three critical regions in the Indo-Pacific: the Pacific Islands, Southeast Asia, and the Indian Ocean region.\textsuperscript{117} It plans
to leverage commercially available data using existing technologies and improve information-sharing across regional information fusion centers located in India, Singapore, the Solomon Islands, and Vanuatu.  

**Logistics and Access**

The four partners are geographically distributed at the four corners of the Indo-Pacific region. Military forces operating across this sprawling space need logistics and access support. Recent years have witnessed progress in this area mainly through bilateral agreements among Quad members. The United States manages logistics and access issues through alliance mechanisms with Japan and Australia, including recent agreements with Tokyo on host nation support and a special measures agreement that will last through 2026. Washington and New Delhi signed a logistics exchange memorandum of agreement (LEMOA) in August 2016.  

The other Quad partners have signed a series of similar agreements in recent years. Australia and India signed a mutual logistics support arrangement in June 2020. India and Japan signed an acquisition and cross-servicing agreement in September 2020. And Japan and Australia filled in the last outstanding Quad bilateral without such an agreement when they inked a reciprocal access agreement in January 2022. These agreements vary in scope and depth and—presumably—level of progress on implementation, although precisely judging headway is difficult from the outside. The Quad could potentially identify opportunities in this area related to coordination and standardization of procedures to make logistics and sustainment activities more efficient. The members might also negotiate new, or expand existing, reciprocal access agreements to include strategically located island territories such as Diego Garcia and Guam.

**Defense Technology Development and Arms Sales**

Quad partners also collaborate in subsets of the full group on developing and fielding cutting-edge defense technologies as well as arms sales. Most prominently, the United States, Australia, and the United Kingdom work together closely on defense technology through the AUKUS partnership. While much of the media and analytical focus related to AUKUS has concentrated on Australia's acquisition of conventionally armed, nuclear-powered submarines, the partnership extends to many other areas of advanced defense technologies. Separately, the United States and Japan agreed in January 2022 to conduct a joint analysis on future cooperation and carried out a formal exchange of notes that “will advance and accelerate collaboration on emerging technologies.” In the Japan-Australia bilateral, the two countries agreed in February 2022 to “work strenuously” toward revising their 2007 joint declaration on security cooperation. India and Japan also signed an agreement in December 2015 on the transfer of defense equipment and technology, which complemented a larger “Vision 2025” document that called for increasing “two-way collaboration and technology cooperation, co-development and co-production.”

Quad cooperation on military capabilities also benefits from arms sales between the members. According to the SIPRI database on international arms transfers, in the period from 2017 through 2021, the United States provided 98 percent of Japan’s arms imports, 67 percent of Australia’s, and 12 percent of India’s. In June 2016, Washington designated India a “Major Defense Partner” of the United States, in a signal of the importance it attaches to strengthening U.S.-India security and defense cooperation and of its willingness to provide India access to some of its most sophisticated defense technology. Indeed, in August 2018, the United States granted India Strategic Trade Authorization-I status, easing export controls and providing India access to dual-use technology. In 2019, Washington cleared the way for India to receive armed drones from the United States, making India the first non-NATO ally allowed to receive such technology, and offered India integrated air and missile defense systems.

Efforts to work with India on developing advanced defense technologies are moving forward, but not as quickly as U.S. collaborations with Japan and Australia. One of the major reasons for this lag is India’s deep military ties to Russia, including its continued reliance on Moscow for replacement parts and support for its legacy weapons systems. Those hurdles could grow higher if the United States imposes sanctions on India under the Countering America’s Adversaries Through Sanctions Act (CAATSA) or related authorities in the wake of India’s recent purchase of Russian S-400 air defense systems. The next phase of bilateral and trilateral defense cooperation could include co-development of some cutting-edge capabilities. Increased co-development could help save scarce resources for research, development, testing, and evaluation and ensure that the resulting systems are interoperable. The India-United States and Japan-United States bilaterals are particularly well positioned to undertake more co-development initiatives.
Capacity Building with Regional Partners
The Quad members have identified building up the law enforcement and military capacities of regional partners as an area where they seek to coordinate. As the foreign ministers noted after their February 2022 meeting, “We are determined to deepen engagement with regional partners, including through capacity-building and technical assistance...” U.S. capacity-building activities focus on Southeast Asia and the Pacific Islands but are spread across the Indo-Pacific. Washington authorized $488 million for improving security and defense capabilities of allies and partners as part of the $7.1 billion Pacific Deterrence Initiative for fiscal year 2022. That comes on top of the Indo-Pacific Maritime Security Initiative, which started under the Obama administration, and whose authority the U.S. Congress extended to 2027 in the FY22 National Defense Authorization Act, with additional guidance to focus on multilateral maritime security cooperation and maritime domain awareness. Other vehicles for U.S. security assistance include foreign military financing and international military education and training, although the majority of assets of both programs are currently allocated outside the Indo-Pacific.

Australia, India, and Japan similarly have various technical and security assistance programs that help build the capacity of partners throughout the Indo-Pacific. The members have tended to focus the majority of their activities in their geographic neighborhoods:

Quad-Plus Options
Maturing cooperation among the Quad partners has prompted questions about whether the group might eventually add new members and become a “Quad-plus” or “Quint.” Quad leaders have generally dismissed the possibility of expanding the group’s ranks, at least for now, explaining that they are more focused on broadening and deepening cooperation among the existing four partners. Still, the prospect of bringing other like-minded countries into the group remains an important consideration.

There are some Indo-Pacific democracies that would seem to be natural partners. South Korean President Yoon Suk Yeol has clearly stated a desire for Seoul to participate in some Quad activities—specifically the working groups on vaccines, climate change, and emerging technologies—and perhaps even to pursue membership in the group, although that would come later and be dependent on the willingness of Quad members to welcome a new member. New Zealand could be another potential Quad partner given Prime Minister Jacinda Ardern’s endorsement of the goal of ensuring that the region stays free and open, the country’s role in the Five Eyes, and actions...
such as the April 2022 decision to open negotiations with Japan on an intelligence-sharing agreement. At the same time, however, Wellington has been cautious and apprehensive about taking actions that could be seen as provocative by Beijing and has not sought membership in the Quad or the AUKUS agreement, although New Zealander officials have indicated a willingness to cooperate on issues outside of nuclear-powered submarines.

Others would be more likely to work with the Quad as partners without a clear prospect of formal membership. In Asia, these countries include Singapore, the Philippines, Vietnam, and Taiwan. European states with interests in the Indo-Pacific such as France, the United Kingdom, and Germany would also be natural partners for the Quad. Finally, regional organizations such as ASEAN or the European Union might offer opportunities to collaborate with the Quad. One challenge that could hold back nonmembers from engaging with the Quad is its lack of a headquarters or secretariat, which most organizations with dialogue partners have; special mechanisms would have to be set up to facilitate interaction.

**Policy Recommendations**

The Quad leaders have set a broad and ambitious agenda focused primarily on economic, technology, and public health issues. The goal in the short term should be to make concrete and visible progress on at least a few items to demonstrate that the Quad can deliver on its pledges. Issues such as digital trade and market access are likely to remain too divisive for forward movement by the Quad and would be more appropriately addressed in a bilateral format.

The extent to which the Quad will take up security and defense issues will likely be driven by the evolving security environment in the Indo-Pacific and the degree to which China continues to exercise its military might to intimidate countries in the region or extend its territorial claims. As and when the Quad focuses greater attention on security and defense issues, it should address areas such as enhancing joint secure communications, increasing intelligence and information sharing, aligning defense systems, moving toward common operating platforms, and making strategic and operational plans for military contingencies in the Indo-Pacific region. To operationalize the Quad and realize its stated objective of promoting a free and open Indo-Pacific, the group should focus on these issue areas and associated recommendations:

**Vaccines**

*Deliver on the Quad commitment to provide one billion COVID-19 vaccines to the Indo-Pacific region by the end of 2022.*

Failing to deliver on its vaccine pledges risks undermining the Quad’s goal to offer a meaningful alternative to Beijing by providing high-quality global public goods at sufficient scale, transparently, and without political strings attached.

*Maintain an open and frank dialogue on vaccine distribution challenges.*

Vaccine donation and delivery is fraught with challenges. Quad leaders must be open to discussing their ongoing challenges in export development, internal COVID surges requiring redirection of vaccines, and risk of failure in fulfilling public commitments.

**Critical and Emerging Technologies**

*Coordinate messaging to other Indo-Pacific nations to ensure that these countries’ leaders have a full understanding of the negative impacts associated with relying on technology from untrusted vendors.*

Quad nations should convey to Indo-Pacific nations the need to factor geopolitical considerations into their decisionmaking on foreign investments in the critical and emerging technology sectors. At the same time, they must frame the issue as a challenge to countries' sovereignty and independence, not as a matter of choosing sides in a great-power competition.

*Agree to and publish standards for critical and emerging technologies with a focus on telecommunications, AI, microchips, biotech, and other essential technologies.*

Doing so will facilitate global commerce and enhance trust in the supply chain. In addition to promoting interconnected partnerships, these efforts will reduce reliance on untrustworthy products and technologies, and on technologies that are generally used to suppress civil society and bolster authoritarian practices.
Climate Change

Ensure that the climate working group coordinates closely with the critical and emerging technologies, infrastructure, and space working groups.

The Quad can deliver effectively on its climate pledges by ensuring climate and sustainability perspectives are considered when decisions are made within the other working groups. This cross-fertilization of working groups can provide the means for sustainably implementing new technology, leveraging innovation in space capabilities to address climate challenges, and identifying green infrastructure needs. The fact sheet from the September 2021 leader-level Quad summit mentions that the space working group will act in coordination with the climate working group; this kind of coordination should be solidified and expanded to the other working groups referenced above.

Coordinate on prioritization and distribution of climate change assistance in the Indo-Pacific.

Whether it adopts a collaborative or divide-and-conquer approach, the Quad can more efficiently support green transitions and climate resiliency by forming a common operating picture of top priorities and then coordinating on prioritizing and providing support (including infrastructure, resources, and know-how) to the most vulnerable Indo-Pacific nations.

Infrastructure

Focus on mapping the infrastructure needs of the region and sharing information about individual infrastructure investments to ensure that each Quad member’s respective activities complement each other and are mutually reinforcing.

Seeking joint financing arrangements has proved difficult and posed a major obstacle to concluding infrastructure deals in the region. Instead, the Quad nations should coordinate on identifying best practices, prioritizing needs in the region, and determining how to best target resources.

Incentivize the private sector to invest in strategic infrastructure projects, particularly in the Indo-Pacific.

The Quad countries should each steer more of their capital resources toward financing strategic Indo-Pacific projects in ports, energy and power, and information and telecommunications. The Quad countries should incentivize their respective private sector companies to take greater risks with infrastructure investments and should facilitate creative investment and financing solutions, including development of public-private investments. This was the original intent of the BUILD Act, passed on October 5, 2018, which created the DFC. However, the DFC has been underperforming in the Indo-Pacific region. In addition to the DFC, the U.S. Agency for International Development and the U.S. Trade and Development Agency also have important roles to play in helping ensure that projects are ready for private sector investment.

Explore cooperation on projects that expand the East-West Corridor to connect India to Southeast Asia through the Bay of Bengal.

The transportation corridor would provide Thailand, Myanmar, Laos, and Vietnam with access to trade routes in the Indian Ocean, strengthening regional connectivity between India and Southeast Asia.

Coordinate on steps to strengthen international legal frameworks to prevent physical damage and cyberattacks on subsea cables.

UNCLOS recognizes the freedom of states to construct and protect subsea cables within their exclusive economic zones or on the continental shelf, but there is no treaty to protect against cyberattacks on undersea cables.144

Space

Enhance cooperative mechanisms to establish space situational awareness among the Quad nations.

Bilateral agreements and dialogues exist between pairs of Quad countries, but until there is a more complete space situational awareness framework among all four, cooperation as a Quad on some important space-enabled initiatives—such as maritime domain awareness—will not reach its full potential.

Launch annual trainings for space personnel to improve interoperability and build people-to-people ties.

All four Quad countries have established space-focused agencies, commands, or branches within their armed forces in the past four years. As soon as possible, these
nascent bodies should launch bilateral and multilateral trainings and exercises that will help solidify ties among their nations’ services. Because all four organizations are so new, it is an excellent opportunity to build interoperability into their operational concepts from the very start.

Promote enhanced industry ties in the space sector among Quad countries.

While government-to-government ties on space have begun to grow among Quad countries, industry-led collaboration has been left behind. Because the private sector is consistently at the cutting edge of technology innovation, closer industry ties among Quad countries would help advance space technology.

Cybersecurity

Seek to establish a shared set of cybersecurity standards that are influenced by each Quad member’s own internal policies.

The Quad members are unlikely to be able to fully synchronize their cybersecurity standards but could feasibly agree on a viable framework of best practices.

Enhance multilateral cybersecurity actions with a focus on preventing cyber exploitation.

The Quad nations should increase cyber intelligence sharing and coordinate efforts for delivering software securely and transparently. The Quad should hold military cyber exercises to prepare for cyberattack contingencies that could occur in an environment of heightened tensions in the Indo-Pacific.

Support civilian cyber workforce interoperability.

The Quad also has an opportunity to promote a multinational workforce better suited for combined cybersecurity. Developing policies that encourage collaboration among universities, nonprofit organizations, and cybersecurity employees can lead to a more interoperable workforce of cyber professionals concerned with Indo-Pacific security. These ventures should include academic exchange, civilian certification equivalency, and cybersecurity competitions.

Trade and Economics

Center economic agendas around supply chain diversification while remaining realistic about new trade agreements.

There have been suggestions that the Quad should develop a more robust trade and economic agenda, but it is unrealistic to expect the Quad as a group to become a major driver of regional trade. There are no bilateral investment or trade treaties among the four Quad members, and there are no plans to try to negotiate any such foundational agreements in the near term. Instead, the Quad should focus its economic attention on diversifying supply chains for critical minerals and technologies. In this way, the Quad members can focus on their core interest of reducing overdependence on China for critical items and ensuring the establishment of resilient supply chains.

Coordinate responses to counter Chinese economic coercion.

The Quad should coordinate on ways to assist countries that become victims of Chinese economic coercion, as happened to Australia in 2020 when Beijing cut beef, barley, and other imports from Canberra after it called for an investigation into the origins of the coronavirus.

Security and Defense

Deepen Quad security cooperation by building on existing bilateral and trilateral security cooperation mechanisms.

One option could be to eventually invite India as an observer to the existing U.S.-Japan-Australia Defense Ministers Meeting. Alternatively, the Quad foreign ministers’ meeting could be expanded into a Quad 2+2 by adding defense ministers. Meanwhile, the United States and Australia should use their bilateral 2+2 meetings to proactively brief Japan and India on AUKUS activities. Those briefings should include select nonpublic activities that are suitable for sharing with close partners.
Quietly agree to send officials at the assistant secretary level to a working group that would meet periodically to discuss crisis management and responses to regional contingencies.

Potential crises related to Taiwan, the East and South China Seas, the Korean Peninsula, and the China-India border should be on the agenda. Quad officials in this group should also exchange views on the crisis management mechanisms each has with China to build a common understanding of which mechanisms have value, which do not, and how they might be improved.¹⁴⁵

Commit to developing a detailed roadmap on improving MDA to fulfill—and eventually expand on—the promise of the Indo-Pacific Partnership for Maritime Domain Awareness.

That roadmap should establish as its goal creating a common operating picture for the region on which the Quad can rely. Along the way, the Quad should expand information and data exchanges to improve maritime surveillance capabilities. This sharing will involve investment in the software required to create a digital common operating picture. The four countries have a mutual interest in deterring aggressive maritime behavior and in ensuring that the seaways remain open for trade and commerce.

Identify opportunities for Quad joint naval patrols.

Through joint patrols, the Quad countries’ navies can help build interoperability and habits of cooperation while demonstrating support for a free, open, and rules-based maritime order to the rest of the region. Still, the United States should recognize that its Quad partners are likely to remain hesitant about performing FONOPs in the near or medium terms.

Negotiate new, or expand existing, reciprocal access agreements to include strategically located island territories.

These could include the Andaman and Nicobar Islands, the Cocos (Keeling) Islands, Diego Garcia, and Guam.

Map each Quad member’s existing maritime law enforcement and military capacity-building efforts.

The Quad should jointly allocate resources to the most critical areas to fill gaps, prevent duplication, and facilitate interoperability. The Quad partners should also seek out targeted efforts that encourage each country to play to its own strengths and bolster its own security where possible. The Quad countries should also coordinate closely with ASEAN countries on a bilateral or trilateral basis. Quad partners should frame those engagements in terms that resonate with Southeast Asian states, namely protecting sovereignty and independence, rather than emphasizing great-power competition. Expanding ties between coast guards in addition to navies offers one practical step in that direction.

Ensure that the United States Senate catches up with its Quad partners in ratifying UNCLOS.

Doing so would constitute a major concrete step in support of a rules-based international order and remove one of Beijing’s most potent critiques of Washington’s policy on maritime issues.

Reserve a portion of the agendas for Quad working groups on critical and emerging technologies and space for consultations on the military and defense applications of those technologies.

Most of those working group discussions will focus on civilian matters. However, the military implications for both critical and emerging technologies and space are substantial and growing, and they would benefit from deeper Quad coordination.

Develop a framework for dealing with nontraditional maritime security threats, such as piracy, threats to marine research activities, and illegal, unreported, and unregulated fishing.

The framework should be shared with other Indo-Pacific nations and form the basis of an informal code of conduct for the region.

Other Areas

Maintain the Quad’s current membership to keep the group nimble and allow for deeper and wider cooperation among the core four nations, while exploring nonmember partnership mechanisms.

The Quad nations can explore a process for welcoming dialogue partners and allowing countries to align with specific Quad initiatives. For example, technology leaders such as South Korea and Taiwan should be included in
discussions on setting standards for emerging technologies and improving supply chain resiliency for critical technologies. South Korea—which has recently signed an agreement with the United States to strengthen infrastructure financing cooperation—also has much to offer discussions on meeting the infrastructure needs of the region. The Quad leaders should also consider organizing a Quad-ASEAN conference to discuss post-pandemic economic recovery or another issue important to Southeast Asian leaders.

Establish a strategic communication cell to combine efforts to counter disinformation and misinformation in the region.

Setting up a strategic communication cell would allow Quad member countries to coordinate messaging about the Quad and broader trends in the region. It would also allow them to combine information, research, and ideas with the mutual goal of countering unhelpful narratives and communicating coherent, unified messages about the Quad and its activities.

Conclusion

Within 18 months, the Quad has transformed from being an informal gathering of countries without a clear agenda to a premiere group that is poised to shape the economic, technological, and maritime future of the Indo-Pacific. The four nations’ commitment to advancing and elevating the Quad has been driven by concerns over China’s rise and increasing aggressiveness across a range of issues.

With the development of a broad and ambitious agenda, the Quad now must start to deliver on its pledges, beginning with the delivery of one billion COVID-19 vaccines to the people of the region by the end of the year. Although the Quad has so far avoided addressing security and defense issues, the degree to which it might do so in the future will depend largely on whether the region faces increasing threats of maritime aggression or conflict. Even without the specter of regional conflict, the Quad will continue to pursue cooperation based on the four countries’ need to pool their resources and capabilities to compete effectively with China and to ensure that the region maintains the liberal, rules-based order that has sustained it over the past 75 years.


21. Bismah Malik, “India’s tech industry clocks highest-ever


29. Pearson, “Understanding Open RAN.”


33. “Fact Sheet: Quad Leaders' Summit.”


36. “Fact Sheet: Quad Summit.”


40. “Fact Sheet: Quad Leaders’ Summit.”


45. “Quad Joint Leaders' Statement.”

46. “Fact Sheet: Quad Leaders’ Tokyo Summit 2022.”


52. “Joint Statement from Quad Leader,” and “Fact Sheet: Quad Leaders’ Summit.”


59. “Fact Sheet: President Biden and G7 Leaders Launch Build Back Better World (B3W) Partnership.”


64. Comment by participant in CNAS-hosted private roundtable held on March 9, 2022.

65. Comment by participant in CNAS-hosted private roundtable discussion held on February 3, 2022.

66. “Joint Statement from Quad Leaders.”

67. “Fact Sheet: Quad Leaders’ Summit.”


71. “Statement by National Security Council Spokesperson Emily Horne on Quad Senior Cyber Group Meeting.”


74. “Joint Statement from Quad Leaders.”


78. Comment by participant in CNAS-hosted private roundtable discussion held on March 9, 2022.

79. Comment by participant in CNAS-hosted private roundtable discussion held on February 3, 2022.


83. This is the term used by Chinese State Councilor and Foreign Minister Wang Yi. Others use the similar term “Asian NATO.” See “China lashes Washington over Quad, North Korea.”


112. K. Alan Kronstadt, Shayerah I. Akhtar, William A. Kandel,


117. “Fact Sheet: Quad Leaders’ Tokyo Summit 2022.”


126. “Joint Statement of the U.S.-Japan Security Consultative Committee (‘2+2’),”


133. “Joint Statement on Quad Cooperation in the Indo-Pacific.”


About the Center for a New American Security

The mission of the Center for a New American Security (CNAS) is to develop strong, pragmatic and principled national security and defense policies. Building on the expertise and experience of its staff and advisors, CNAS engages policymakers, experts and the public with innovative, fact-based research, ideas and analysis to shape and elevate the national security debate. A key part of our mission is to inform and prepare the national security leaders of today and tomorrow.

CNAS is located in Washington, DC, and was established in February 2007 by co-founders Kurt M. Campbell and Michèle A. Flournoy. CNAS is a 501(c)3 tax-exempt nonprofit organization. Its research is independent and non-partisan.

© 2022 by the Center for a New American Security.

All rights reserved.