Enhancing Joint Logistics Over-the-Shore Operations: Lessons From the Gaza Humanitarian Mission

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In his "2024 State of the Union" address, President Joseph R. Biden Jr. directed the U.S. military to establish a temporary pier off the coast of Gaza to lead the international effort in providing humanitarian aid to the region.[1] Less than a week later, the Army announced that the 7th Transportation Brigade (Expeditionary) (TB[X]) had been assigned this mission due to its specialization in Joint Logistics Over-the-Shore (JLOTS) operations.[2] However, after operating for only 2 months at a cost of $230 million, Pentagon Press Secretary Major General Patrick S. Ryder announced that the pier would be shut down and towed to Israel, where it is expected to remain.[3] The abrupt end to this military operation raises concerns about the deployment of forces during large-scale combat operations in contested environments, especially if the lessons learned are not adequately addressed and integrated into future planning.[4] To enhance the efficiency of JLOTS operations, it is crucial to increase JLOTS training for Army engineers, integrate geospatial engineers into critical brigades through adjustments in force structure, and invest in U.S. military unmanned aerial systems for collecting multispectral imagery (MSI).

The construction of a pier is a critical aspect of JLOTS operations. The pier is established by digging a slot trench on the beach, creating an entry point for the pier to securely embed itself. In alignment with the President's 2024 directive, which stated that no U.S. boots would be on the ground in Gaza, Israeli engineers supervised the preparation of the beach at Gaza. After several weeks of challenges involving the stability of the pier, rough seas, and inadequate embedding into the beach, the pier ultimately broke loose. Following unsuccessful attempts by several Army watercraft to reanchor the pier, the decision was made to shut down operations.[5]

Engineers play a vital role in JLOTS operations, as they are responsible for ensuring the ground conditions necessary for the emplacement of the floating trident pier. One of the significant challenges faced by the Israeli engineers was the task of digging a trench deep enough to allow the pier to be securely embeded into the beach. While other, specific challenges encountered by Israeli engineers during horizontal site preparation are not fully known, the Israelis' experience highlights the importance of engineer training in JLOTS operations, as their contributions are critical to mission success.

The 7th TB(X) is currently the only U.S. Army unit that specializes in JLOTS operations, and it is comprised of only six Military Occupational Specialty (MOS) 12N–Horizontal Engineer Soldiers assigned to the brigade, resulting in just one blade team for each of the three battalions.[6] Due to the lack of depth in units across the Army, most engineers do not gain exposure to JLOTS operations until a critical need arises. Therefore, it is essential that the Engineer Regiment urgently incorporate JLOTS training into annual military exercises, similar to the increased focus on wet-gap crossing training in response to Russia's failed crossing in Ukraine. Alongside training in JLOTS-related horizontal-engineering tasks, Army engineer officers must also be familiar with the terrain requirements for pier emplacement and understand how to effectively utilize geospatial engineers to gather the necessary information.

According to the current force structure, there are no geospatial engineers assigned to the 7th TB(X); instead, the brigade engineer officer on the port analysis team fulfills this role. This is a significant deficiency, as geospatial engineers are essential to JLOTS operations. While Army engineer officers are generally expected to be knowledgeable in all areas of Army engineering, including geospatial engineering, this is not always the case. Consequently, the Army relies heavily on the technical expertise of its MOS 125D–Geospatial Engineer Warrant Officers and MOS 12Y–Geospatial Engineers. Based on the fact that the pier in Gaza broke loose, it is evident that the engineers faced challenges in conducting on-site soil analysis and site surveys before horizontal-construction operations began.[7] Adjusting the current force structure to allocate a dedicated geospatial cell to such a critical brigade could have improved the use of available geospatial information throughout the operations process, enabling better analysis of the physical environment. Incorporating direct geospatial support at the brigade level within the force structure would facilitate ongoing and timely analysis of newly collected data.

One of the most effective ways to prepare for a JLOTS operation is to conduct a thorough reconnaissance of the site. However, such reconnaissance is not always feasible. For example, the coastal area of the Gaza Strip is politically constrained, which has resulted in limited and outdated critical data from in-situ survey measurements.[8] Fortunately, engineers can use geospatial data to conduct terrain analysis beforehand to mitigate the inability to conduct reconnaissance.[9] In the case of Gaza, U.S. military engineers were likely unable to conduct a site reconnaissance before selecting the pier emplacement site; they probably relied solely on geospatial and imagery information, such as MSI—which is essential for JLOTS planning, as it can be analyzed (in place of site surveys) to determine soil composition, sea floor depths, existing infrastructure conditions, and sea levels. It can also be used to detect various areal changes. MSI is primarily collected using the European Space Agency Sentinel-2 satellite.[10] While the United States maintains a positive and close relationship with its European allies in the European Space Agency, the inherent risk of depending on a foreign collection platform is a potential challenge for geospatial engineers. To address this issue, the U.S. military should pursue the development of MSI sensors that could be integrated into existing unmanned aerial system platforms. With the retirement and replacement of the RQ-7B Shadow Tactical Unmanned Aircraft System, the Army has a unique opportunity to invest in a new modular platform that can incorporate additional sensors for collecting the necessary data based on mission requirements.

JLOTS expertise is a unique joint U.S. Army/Navy capability. Although rarely trained, the JLOTS mission is crucial for future large-scale combat operations. The recent conflict in Gaza has served as a valuable opportunity to practice JLOTS tasks in a real-world mission. The challenges encountered with horizontal engineering, geospatial support at the brigade level, and the availability of data used for planning have provided the U.S. Army with lessons learned; corrections can be made and implemented before the JLOTS capability is needed again.

Endnotes:

[1]Joseph R. Biden, "2024 State of the Union," *The White House* website, <https://bidenwhitehouse.archives.gov/state-of-the-union-2024/>, accessed on 12 February 2025.

[2]Joseph Clark, "Specialized Army Unit Underway to Support Humanitarian Aid Delivery to Gaza," *U.S. Army*, 13 March 2024, <https://www.army.mil/article/274495/specialized_army_unit>, accessed on 6 January 2025.

[3]Joey Garrison et al., "U.S.-Built $230 Million Pier in Gaza is Shutting Down After 2 Months of Troubles," *USA Today*, <https://www.usatoday.com/story/news/world/2024/07/11/us-pier-in-gaza-closes/74366780007/>, accessed on 6 January 2025.

[4]Joseph W. Tereniak, "Pier to Peer: Using JLOTS to Deploy Forces During LSCO," *Army Sustainment*, Winter 2024, pp. 34–36, <https://alu.army.mil/alog/ARCHIVE/PB7002401FULL.pdf>, accessed on 6 January 2025.

[5]Garrison.

[6]Mike Harris and Randy Nelson, "The 7th Transportation Brigade (Expeditionary)," Army Sustainment, July–August 2014, pp. 44–49, <https://alu.army.mil/alog/2014/JulAug14/PDF/128704.pdf>, accessed on 6 January 2025.

[7]Ziezulewicz.

[8]Khaldoun Abualhin and Irmgard Niemery, "Deriving Bathymetric Maps of Shallow Coastal Water of the Gaza Strip Coastal Zone Using Passive Remotely Sensed Imagery," Journal of Indian Society of Remote Sensing, 22 June 2018, <https://doi.org/10.1007/s12524-018-0778-y>, accessed on 6 January 2025.

[9]Joint Publication (JP) 2-03, *Geospatial Intelligence Support to Joint Operations*, 5 July 2017.

[10]"How Does Data From Sentinel-2A's MultiSpectral Instrument Compare to Landsat Data?" U.S. Geological Survey, <https://www.usgs.gov/faqs/how-does-data-sentinel-2as-multispectral-instrument-compare-landsat-data>, accessed on 6 January 2025.

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