Marine Innovation Unit

Annual Report

CY 2022

Contents

"Within the Reserve Component there are Marines who have unique skillsets developed in academia and/or the commercial sector that will be essential for Strategic Competition. This diverse talent can be leveraged to advance innovation for the Naval Services."
- Marine Forces Reserve Campaign Plan 2030

Executive Summary

In calendar year (CY) 2022, MIU successfully completed the following milestones.

- ✓ Established the unit and its headquarters in Newburgh, New York
- ✓ Identified, joined, and trained 134 uniquely skilled and experienced Marines, exceeding the initial operating capability (IOC) goal for fiscal year (FY) 22
- ✓ Developed and iterated an innovative Talent Management (TM) accession process to identify and efficiently join Marines with the unique skillsets and experiences required to accomplish MIU's mission
- ✓ Conducted Annual Training structured around Force Design 2030 (FD 2030), Talent Management 2030 (TM 2030), and Marine Corps processes in order to send qualified Marines to meet the needs of future customers
- ✓ Identified, pursued, or conducted 27 engagements[1] supporting multiple commands across the Total Force
- ✓ Placed seven Liaison Officers (LNO) across the Department of Defense (DoD) Science and Technology (S&T) enterprise in order to assist in accelerating capabilities into the service

Engagements Supported

27 Engagements

6 Completed

6 In Progress

**15** Identified

Organizations Supported

MIU attracted diverse talent from a wide range of ranks, military occupational specialties (MOSs), geographic locations, academic backgrounds, and civilian employment. Over 600 applicants competed for only 125 available billets in FY22 and 400 Marines, including many return applicants, competed for the additional 145 open billets in FY23.

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[1]Engagements are projects and supporting activities that align with FD 2030, TM 2030, or MFR Campaign Plan and need attention from the MIU.

CY 2022 In Review

In CY22 MIU identified unique skillsets and experiences that could help Commander Marine Forces Reserve (CMFR) contribute to Commandant of the Marine Corps (CMC) priorities, such as FD 2030, TM 2030, and Training and Education 2030. MIU then developed and executed a TM process to recruit, screen, and hire qualified reserve Marines to form its first cohort. The first cohort executed six engagements in direct support of Service leadership priorities. Based on what the Unit had learned in its first year, and the requirement to double in size to achieve full operating capability (FOC) in its second year, MIU extended offers to join to an additional 154 Marines out of 400 applicants in the last quarter of CY22. Nearly all of those Marines will be joined in time to attend MIU's second ever annual training (AT) in March 2023, only one year after the issuance of the MCBUL 5400 which activated the Unit.
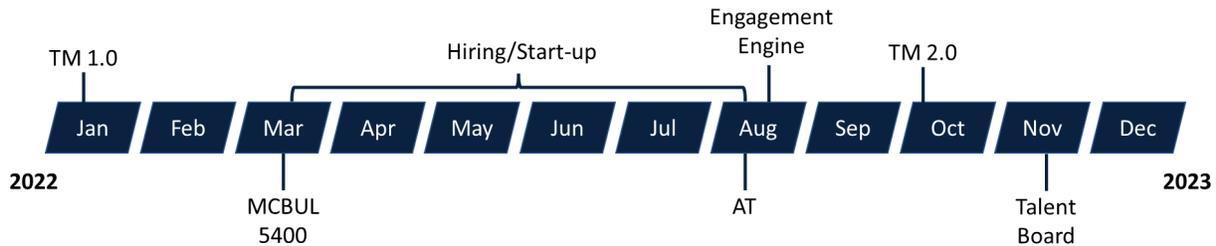
Objectives and Key Results

MIU had four objectives set in CY22. Through stakeholder engagement and rapid iteration of internal processes, MIU met or exceeded all objectives.

Objective 1: Establish the unit via MCBUL 5400.
Key Results: In March 2022, a MCBUL 5400 officially activated the Marine Innovation Unit. The initial table of organization (TO) called for four branches and a headquarters section, including a small number of active reserve (AR) Marines. Leading up to the activation, highly qualified Marines were pre-selected to quickly establish the unit and begin assisting the active component in addressing its most complex challenges.

Objective 2: Establish MIU headquarters in Newburgh, New York.
Key Results: MIU established its headquarters at Stewart Air National Guard Base in Newburgh, NY. The Marine Corps selected this location as part of the CMC's FD 2030 initiative. With VMGR-452's deactivation to facilitate the standup of a new unit in the Indo-Pacific, MIU was able to establish itself within facilities readily available to the Marine Corps. Additionally, this location allows MIU to tap into the deep innovation networks of both New York City as well as Upstate New York.

Objective 3: Advertise, identify, screen, approve, and join 125 Marines by the end of FY 22 to meet initial operating capability.
Key Results: MIU collaborated with Manpower and Reserve Affairs and MFR, to identify and communicate with potentially qualified Marines, across all components and reserve categories. In FY22 134 Marines joined MIU, exceeding the IOC goal by seven percent.

Objective 4: Place five Liaison Officers into the DoD enterprise.
Key Results: In FY22, MIU placed seven LNOs at key innovation or research and development organizations within the DoD ecosystem, exceeding its initial objective by 40 percent.

Liaison Officers

The LNOs mission is to accelerate capability development by identifying existing and emerging efforts across the DOD and applying them to Marine Corps FD 2030 problems. Within CY22, MIU hired seven LNOs at key organizations within the Marine Corps and DoD, to assist in identifying, tracking, and accelerating capabilities into the hands of the Marine Warfighter. LNO Representation at these key organizations ensured:

- ✔ Oversight of transitioning projects
- ✔ Consideration of USMC equities and capabilities in joint programs
- ✔ Guidance in acquisition endeavors across the "valley of death"

MIU recognizes that the acquisition and adoption of new technologies within the DoD is extremely difficult. To support, MIU placed LNO's at Science and Technology organizations to help accelerate technologies transition.

Branches

MIU is organized into five branches: Headquarters, Commercial Engagement, Defense Engagement, Advanced Capabilities and Innovation Laboratory.

Branch Overview

	CEB (20 Marines)	DEB (33 Marines)	ACB (32 Marines)	ILB (14 Marines)
Function	Map industry players and maintain awareness of technological advancements in the commercial sector	Apply technology solutions to solve problems for USMC customers	Lead problem-solving engagements for strategically important USMC challenges across various functions	Provide direct support in priority and emerging technology areas to the Active Component as it relates to FD 2030
Civilian Specialties	Autonomy & Robotics Energy & Materials Advanced Manufacturing & Supply Chain Cyber Technologies Human Systems & Synthetic Biology ML/AI/Quantum Space Technologies	Government R&D FFRDC Intel Community Innovation Service International	Consulting & Strategy Talent Management Experimentation & Prototyping Acquisition support	Unmanned Systems Advanced Cyber Capabilities Development Advanced Manufacturing & Supply Chain Advanced Sensing
Unique Skills	Data Analysis Project Management Commercial Talent Management	Networks in USG S&T ecosystem, industry, venture, academia Experience starting/scaling USG S&T and innovation organizations Project Management	Consulting & Strategy Acquisitions Contracting vehicles Procurement	Cyber Coding Software Development sUAS

Engagements

Engagements are projects and supporting activities that align with FD 2030, TM 2030, or MFR Campaign Plan and need attention from the MIU. Each engagement is staffed by a task-organized engagement team, combining the skillsets of Marines across MIU branches in support of MIU's Lines of Operation.
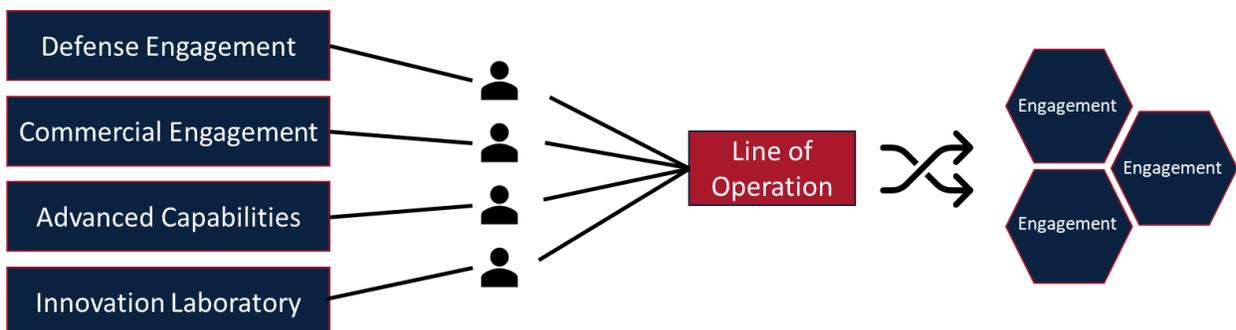

27 Engagements

6 Completed

15 Identified

6 In Progress

Featured Engagements

- ✓ ACMC TMX Initiative
- ✓ MCWL S&T Process Improvement
- ✓ Marine Corps Reserve Policy Board
- ✓ MFR Small Craft Requirement
- ✓ MARFORCYBER Vulnerability Analysis
- ✓ MCTSSA Software Development
- ✓ TSOA Software Development
- ✓ Contested Logistics Wargame
- ✓ Naval Services Game
- ✓ MARFORPAC Operational Logistics Tools
- ✓ Cyber Yankee 2022

Lines of Operation

MIU supports the USMC total force through its eight Lines of Operation (LOOs). LOO leaders propose, pitch, and oversee engagements in support of various Marine Corps organizations. Each engagement team is cross-functional and task organized based on the Marines military and civilian skillsets (with a focus on their civilian experience). MIU LOOs are focused on supporting FD 2030, TM 2030, Training and Education 2030, and MFR Campaign Plan 2030.

Defense Engagement

Commercial Engagement

Advanced Capabilities

Innovation Laboratory

Line of Operation

Engagement

Engagement

Engagement

LOO 0: Unit of the Future

The Unit of the Future LOO focuses on exploring alternative paths to improve efficiency delivering training requirements to the active and reserve components without compromising the quality of Total Force Requirements. This team focuses on streamlining processes involved with accessing, delivering, and tracking training requirements.

In CY22, this LOO focused on using the current systems available within the Marine Corps to make processes more efficient. These include using Microsoft applications in a scalable way that could automate and streamline training, drill tracking, and requirement identification to host within a centralized, easily accessible location for members of the unit.

Additionally, this LOO researched, challenged, and provided alternatives to Marine Corps orders, directives, and policies that were either outdated, ambiguous, or were detrimental to the accomplishment of the mission or talent operations.

This LOO's efforts support the implementation of FD 2030 and TM 2030:

"As a learning organization, we also perform internal reviews focused on process improvement... Continual improvement in our ability to perform organizational design will make the Marine Corps more agile."   - Force Design 2030, May 2022 Annual Update

LOO 1: Talent Management

The Talent Management LOO focuses primarily on the reserve component by pursuing new methods to recruit and retain Marines. MIU took an innovative approach to harness the unique talent in the reserve component to accomplish its mission. MIU collected and analyzed data throughout the application and hiring processes. These insights contributed to process improvement and automation to the greatest extent possible, saving time while maintaining quality during the process. MIU TM had several objectives in its first year.

Objective 1: Build MIU to its IOC of 125 personnel.
Key Results: IOC goal was met and exceeded by 9 Marines with the support of excess billets allocated by MFR.

Objective 2: Identify and recruit required talent to enable MIU's mission.
Key Results: Over the course of the CY22 hiring campaigns, MIU received and processed over 1,000 applications.

Objective 3: Identify innovative ways to identify, screen, and board applicants that makes for a positive user experience and improved efficiency for all stakeholders.
Key Results: JazzHR proved itself as a qualified platform that can be used to pre-screen candidates and streamline automated messaging to alert candidates of their status. Overall, JazzHR saved time with the influx of over 1,000 applications but was not able to meet the demand of integrating sensitive information, mainly in the form for past Marine Corps performance, clearance verification, and other administrative requirements. MIU's TM section continues to iterate its processes and tools to improve quality and efficiency while considering the user experience and security.

In addition to exceeding its Talent Management objectives within MIU, members part of the Talent Management LOO assisted the Total Force in Talent Management Initiatives to include:

Assistant Commandant of the Marine Corps TMX Initiative

Description: MIU team partnered with TMX team to understand the mission and current organizational and evaluative problem of disjointed talent management efforts across the Marine Corps.

2 Marines	Consulting	Academic and Synthesis	TMX Team	15 Drills Applied

Value Added: MIU helped TMX clarify the problem that needed to be solved and identify potential ways to better track progress of talent initiatives.

Marine Corps Reserve Policy Board

The MIU team provided needed assistance for the Marine Corps Reserve Policy Board in a way ahead to develop an IM/KM solution to build out capabilities that will help the board process, track, and action data under a high staff turnover rate. An MIU team was selected with a focus on skillsets from consulting and management.

Membership	Collection	Prioritization	Execution

Engagement Team Problem Identification / Framing / Execution

Membership	Collection	Prioritization	Execution
✔ High application volume and desire to participate on Board ✔ Opportunity for improved voting functionality ✔ Past high rate of board member turnover ✔ Unclear policy issue assignment process	✔ Barriers to submission ✔ Limited submissions reflecting smaller voice of the Fleet ✔ No data analytics on submissions with existing quad chart / collection method	✔ Opportunity to structure issue prioritization process ✔ Current voting system via inorganic tools ✔ Unclear assessment of issue complexity and impact	✔ Opportunity for tracking and accountability ✔ Opportunity for consolidated policy issue "roadmap" ✔ Board at a crossroads with opportunity to make structural changes

Solution Timeline
FY23 Q1-2   FY23 Q2-3

Potential Actions / Solutions / Timeline Identified after Engagement

Membership	Collection	Prioritization	Execution
Build **Wiki** in Teams and **inventory** MCRPB member experience	MS Forms for FY23 policy issue submissions	Agreement on **framework** and **methodology** for issue selection	MS Teams asynchronous **training** and **utilization** for all members
Voting via Forms on Membership applications starting FY23	**Automation** of MS Forms submissions to inform data analytics / insights / actions	Build MS Form **voting functionality** to vote and **plot issues** for FY23	Use **Tasks** within Teams to track progress of policy change actions **roadmap**

Overall, the Marine Corps Reserve Policy Board Engagement team provided needed assistance in a way ahead to develop an IM/KM solution to build out capabilities that will help the board process, track, and action data under a high staff turnover rate.

LOO 2: C5ISR-T

The C5ISR-T LOO focuses heavily on the digital transformation of the Total Force through projects including cyberspace operations, information operations, multi-domain command and control, coding, and software development. As part of this LOO, MIU relaunched the Marine Coders initiative, providing in-demand coding support services to key stakeholders within the Marine Corps.

The organizations the C5ISR-T LOO supports and has supported includes:

Featured Engagements

Cyber Yankee

Description: Joint, regional cyber exercise where National Guard Cyber Protection Teams from five New England states defend critical infrastructure from cyber-attacks in a range environment. MIU supported II MEF DCO-IDM Company, 6th Communications Battalion, 146th Cyber Warfare Company MAANG, USCYBERCOM.

3 Marines	Cyber Threat Intelligence	Cyber Threat Emulation	Industrial Control Systems	60 Drills Applied

Value Added: Provided expert technical guidance to both Active and Reserve Marines serving in the Red Cell. MIU Cyber SMEs led training in Cyber Threat Emulation and built key skills in working with Operation Technology and defending Industrial Control Systems.

Marine Forces Cyber Command

Description: Perform firmware vulnerability analysis in support of developer operations group.

1 Marine	Cyber	MFCC	8 Drills Applied

Value Added: Provided technical assistance with exquisite development and operator skills for vulnerability research and tool development to support cyber operations.

MCTSSA

Description: Provide technical level software development subject matter expertise in support of the advanced capability cell (A2C).

3 Marines	Software Development	Machine Learning	MCTSSA	20 Drills Applied

Value Added: Advised and assisted throughout the development of Spectrum Classification and Reporting System (SCARS) machine learning model.

Tactical Service Oriented Architecture

Description: Performed exploratory engagement leveraging MIU expertise to identify areas to support and collaborate with TSOA team.

1 Marine	Software Development	Data Science	TSOA	6 Drills Applied

Value Added: Provided technical and ground combat expertise to the software development office which requires MIU assistance to redesign in support of FD2030 and stand-in force concepts. MIU Marines' expertise lies in the cross section in software development, data science professional, and special forces on the ground experience as a MARSOC officer.
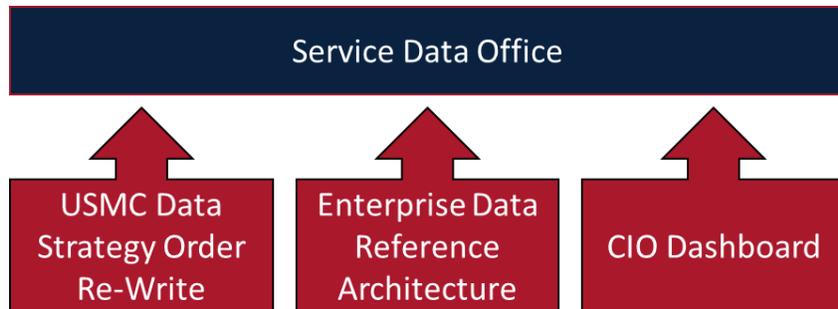
Overall, LOO 2 efforts supports the implementation of Force Design 2030:

"Prioritized investments… An expeditionary C5ISRT/counter-C5ISRT Naval grid that can operate when national connections are lost or degraded." - Force Design 2030, April 2021 Annual Update

LOO 3: Data Management & Integration

The Data Management & Integration LOO provides leadership, advice, and knowledge of best practices to help the Marine Corps enable FD 2030 by efficiently managing data. This team focuses its efforts on the Marine Corps' operational and analytical infrastructure, as well as data discovery, collection, storage, quality, security, visualization, and machine-aided decision support tools.

During CY22, the Data Management & Integration LOO identified three separate engagements in support of the Marine Corp's Service Data Office within Deputy Commandant for Information's division.

Service Data Office

USMC Data Strategy Order Re-Write

Enterprise Data Reference Architecture

CIO Dashboard

Overall, the Data Management & Integration LOO's identified efforts supports the implementation of FD 2030 by assisting in providing key tools, insights, and best practices to enable a more agile Marine Corps.

LOO 4: Contested Logistics

The Contested Logistics LOO focuses heavily on expeditionary problem sets for the Total Force. These include leveraging data for tactical and operational decision-making, supply chain resilience for stand in forces, "golden hour" medical evacuation challenges, and energy availability in distributed environments.

During CY22, the Contested Logistics LOO provided value in the form of:

7 Engagements	2 Completed	3 On-going	2 Identified	26 Drills Applied

The organizations the Contested Logistics LOO supports and has supported includes:

The Contested Logistics LOO participated in several engagements supporting the Total Force with high demand, low density skillsets not commonly found within the Active Component.

MIU helped MFR frame their small craft requirement, conducted liaison with the Marine Corps Warfighting Laboratory and the Defense Innovation Unit, provided input into a roadmap for how capabilities could support the Total Force, and via a non-traditional acquisition method. MIU's expertise in navigating the defense innovation ecosystem was critical in rapidly accelerating this project from ideation to commercial solicitation in under five months.

Featured Engagements

MARFORPAC Operational Logistics Tools

Description: A team of MIU Marines are augmenting MARFORPAC's team in building a linear optimization model of a distribution and supply network for different classes of supply. This tool will help MARFORPAC plan, resource and execute operational level logistics functions.

| 5 Marines | Operations Research | Supply Chain | MARFORPAC | 10 Drills |

Value Added: MIU Marines bring logistics subject matter expertise and operations research skills - specifically the ability to solve and code linear optimization models. MIU Marines will provide their subject matter expertise and assist MARFORPAC's team where needed.

"To persist inside an adversary's weapons engagement zone, our Stand-in Forces must be set and sustained by logistics capabilities designed for distributed operations over long distances in a contested environment." - Force Design 2030, April 2021 Annual Update

Contested Logistics Wargame

Description: CDD sponsored wargame focused on logistics S&T.

| 4 Marines | Wargaming | Analysis | CDD | 8 Drills |

Value Added: MIU will support wargame design, execution, and potential post-game analysis. Ultimately the wargame will inform the CDD requirements process. MIUers bring a knowledge of commercial S&T, wargaming experience, and supply chain/distribution expertise.

Naval Services Game 22

Description: Broadly examined the ways and means the naval services can provide operational level logistics in support of a naval campaign.

| 1 Marine | Wargaming | Analysis | MCWL | 15 Drills Applied |

Value Added: MIU served as an observer/recorder, while also contributing with operations research and operational logistics subject matter expertise. After-action completed; presentation prepared for out-brief at Installations and Logistics Board; follow-on engagements with other logistics community leads/organizations.

LOO 5: Capability & Experimentation

The Capability Experimentation LOO seeks to supercharge key aspects of the capabilities development pipeline, including *transition* of capabilities to the Fleet. Key technology focus areas include small UAS, technical capability assessments, and wargaming support, in direct support of the Marine Corps Warfighting Laboratory.

During CY22, the Capability & Experimentation LOO supported two Marine Corps organizations under two separate engagements. These engagements established common goals, processes and roadmaps for the way ahead of each supported organization.

| 2 Engagements | 1 Completed | 1 On-going | 12 Drills Applied | 60 IDTs Applied |

The organizations the Capability and Experimentation LOO supported includes:

Featured Engagements

MCWL S&T Processes

MIU conducted a six-week engagement with the Science and Technology Division of the Marine Corps Warfighting Laboratory to help identify and document opportunities across people, process, and technology.

The MIU team developed three key deliverables:

Process Model   **Purpose Statements**   **Billet Descriptions**

Building on the identified themes and deliverable conversations, multiple potential opportunities for process improvement were captured:

- ⏵ Standardize project tracking including an archive of stopped / transitioned projects
- ⏵ Socialize office roles and process offices to formalize the intended process while allowing for flexibility and agility
- ⏵ Increase frequency of project reviews to assess cost, schedule, and performance
- ⏵ Re-align select resources across offices to align with stated responsibilities

Projected Cost Leveraged (If proposed, implemented and outsourced to external organization) **$200,000**

These opportunities can drive impact in S&T by helping increase visibility across the Division, enable higher velocity and better-informed decision making, and focus the efforts of offices and personnel, deepening expertise.

LOO 6: Classified Mission

Due to the nature of this LOO, further information can be found at a higher classification. Please contact MIU_COMMSTRAT@usmc.mil for further coordination.

LOO 7: Training & Education

The Training and Education LOO provides access to valuable technical, academic, and industry skill sets in support of major initiatives. While this LOO is among the youngest of the MIU LOOs, in CY 2022 it identified engagements supporting both Training and Education 2030 and Service Level Training Exercises (including the upcoming 3d Marine Littoral Regiment Training Event).

The Training and Education LOO supports the Secretary of the Navy initiatives, Training and Education Command, MARFORRES and other stakeholders.
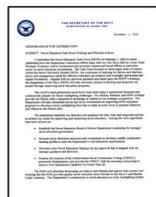
"Develop and implement a plan focused on modernization of all major drivers of training and readiness to better position the force to be more responsive, adaptive, and better prepared to meet the challenges of the future." - MFR Campaign Plan 2030

Marine Innovation Unit

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