I. PURPOSE
This document is designed to provide the US Army Combat Capabilities Development Command Ground Vehicle Systems Center (CCDC GVSC) with purpose, identify its stakeholders and partners, focus its efforts, describe where the organization is headed, and explain how it will make Soldiers more lethal, ensure readiness, and support a Multi-Domain Operations (MDO) capable force by 2028 and a MDO operational force by 2035.

II. INTRODUCTION
GVSC provides the warfighter with enhanced capabilities and ensures readiness by maximizing the research, development, prototyping, transition and sustainment of technologies, and technology integration across ground systems. GVSC provides engineering support for more than 2,800 Army systems, and many DoD/Army high-priority joint development programs.

GVSC provides world-class engineering across the acquisition life-cycle and develops and experiments with the new technologies needed to ensure US Army ground dominance as part of the MDG construct. This is accomplished by being a dedicated member of the Team Warren community, which includes the Tank Automotive Command (TACOM) Life-Cycle Management Command, Program Executive Office Ground Combat Systems (PEO GCS), Program Executive Office Combat Support and Combat Service Support (PEO CS&CSS), the Next Generation Combat Vehicle Cross-Functional Team (NGCV CFT), and Army Contracting Command (ACC)-Warren.

This strategy builds on GVSC’s previously published 30-Year Strategy. This document incorporates new strategic guidance from GVSC’s new headquarters, the Army Futures Command, and other changes as described in Section III, Operational Context. It also reframes the 30-Year Strategy’s value streams to better reflect the Combat Capabilities Development Command’s Campaign Plan, published in 2019.

III. OPERATIONAL CONTEXT
GVSC recognizes its partners’ unique and vital roles within the Army Modernization Enterprise and its critical interdependencies with them. These partners include Army Futures Command (AFC) organizations, acquisition and sustainment partners, and private partners.

AFC, created in 2018, develops and supports the delivery of new warfighting capabilities. It focuses on learning and evolving through more rapid innovation, experimentation, demonstration, and prototyping to support the delivery of next generation weapons, vehicles, and equipment essential to conduct MDO. AFC’s Futures and Concept Center (FCC) provides the Army with threat and future operational environment assessments, develops future concepts and requirements, and lays out an integrated modernization pathway. AFC also directs the eight Cross-Functional Teams (CFTs) that target the Army’s six modernization priorities. AFC’s CCDC, including the Army Research Lab (ARL), GVSC, and six other center partners, provide the research, engineering, and analytical expertise to deliver capabilities. CFTs directly influence S&T investments and priorities.

Acquisition and sustainment partners continue to play a vital role in shaping GVSC’s strategy. GVSC’s acquisition partners, including PEOs and other joint acquisition activities, rely on GVSC to provide functional program engineering support. Sustainment partners, including TACOM, its Integrated Logistics Support Center (ILSC) and depots, DLA, and others look to GVSC to provide sustainment engineering services to support readiness. They also inform GVSC’s teams on challenges and opportunities to improve the readiness of future systems. The continual interaction and free exchange of information between S&T teams and the engineers supporting acquisition and sustainment activities build GVSC’s knowledge and expertise, and significantly shapes the strategy in all lines of effort.

GVSC’s academic and industry partners contribute to the strategy as well. Through open and transparent collaboration with academic and industry partners, GVSC seeks to leverage each organization’s strengths to provide the best return for the Army and its warfighters. It is understood that to be of value to the warfighters, technology must transition. Academic research must transition to technology development. Technology must transition to industry. GVSC’s strategy must facilitate with its private partners for both collaboration in investments and transfers of technology to provide new capabilities to the warfighters.

This strategy links to the Army’s new and evolving operational concept: Multi-Domain Operations. MDO, published in 2018, describes how the Army, as part of a joint force, will militarily compete, penetrate, and exploit its adversaries in the future. Army leadership has set goals to fully integrate the ground component into an MDO capable force by 2028, and an MDO operational force by 2035, even as this concept evolves. To achieve these goals, warfighters will require development of ground platforms and sub-systems that can dominate in operations within and across all domains. This development requires continual collaboration, as technology development informs concepts, and concepts inform technology development. Embracing the challenge of this dynamic environment and fostering collaboration provide the cultural foundation essential to meeting the challenges posed in MDO.

New tools and approaches shape this strategy. In particular, advances in modeling and simulation (M&S) offer significant opportunities to shrink the vehicle development cycle and support virtual experimentation, technology demonstration, and prototyping. Industries such as aviation and automotive have benefited from the application of these capabilities, shortening vehicle design time and reducing cost of development. Similarly, virtual experimentation accelerates learning and innovation by increasing the pace of experimentation, providing for the integration of new technologies and concepts more frequently. Leveraging these new tools and approaches offers the Army significant opportunities to support modernization and concept development. They also offer opportunities to virtually prove and conduct virtual trades during design. These advances provide the Army with significant opportunities to accelerate innovation and deliver new capabilities to the nation’s warfighters.

IV. STRATEGIC FRAMEWORK

MISSION
Develop, integrate, demonstrate, and sustain ground vehicle systems capabilities to support Army modernization priorities and improve readiness

VISION
The center of excellence for DoD ground vehicle systems modernization and sustainment solutions

PRIMARY MISSION AREAS
- Develop and integrate next generation technologies to ensure ground system dominance
- Provide world class functional engineering expertise to PEO CS&CSS and PEO GCS partners
- Provide world class sustainment engineering expertise to TACOM partners
- Recruit and develop the engineering talent to achieve the above

GVSC’s knowledge and expertise, and significantly shapes the strategy in all lines of effort.
V. LINES OF EFFORT (LOEs)

LOE 1: Integrated Technology Development & Modernization

Description: Focus on the current/future Army operating environment and relevant challenges to align technology development and engineering with warfighter needs.

Strategic Goal: Develop and demonstrate innovative technologies which enable modernized capabilities aligned with Army priorities. Accomplish this through partnerships with the CFT, PEOs, Program Managers (PMs), academic institutions, the sustainment community, and industry.

Objectives:

1.1 Inform the Future
GVSC aims to transition and deliver relevant, innovative technology to provide capabilities in support of MDO. GVSC provides superior technologies, patents, and research in foundational vehicle architectures across GVSC’s core competencies, which include Autonomy & Robotics, Electronics & Power Management, Fuels & Lubrication, Propulsion & Mobility, and Survivability & Protection to inform current and future vehicle systems.

GVSC develops the capabilities required to support the Army’s MDO operating concept. In the near future, GVSC aims to develop systems that are resistive to immediate obsolescence and overmatch. In the far term, GVSC will invest in the technologies, competencies, and organic infrastructure that will achieve the exponential capability offset that will guarantee future dominance in the ground domain.

The need to counter emerging threats requires GVSC to rapidly develop, mature, integrate, demonstrate and transition new technologies. To do this, GVSC will apply purposeful synchronization of virtual prototyping with systems engineering expertise to create a true “Virtual Proving Ground” where proposed solutions are validated, transforming operational needs into preferred system configurations. This methodology will allow for physical and functional architectures to be pushed to their performance limits through seamless models and simulations, providing details regarding the impact that system design parameters, system environment interactions, system operational implementation, and system component interactions have on system performance. Future M&S and virtual prototyping validation will help drive down Army Test & Evaluation Center (ATEC) acceptance testing and fielding timelines, thus allowing the warfighter to receive new technology rapidly. GVSC will be the hub of ground domain M&S, testing integration, and technology to inform Army decisions and support the readiness of the current fleet. Built on agile analysis processes, enabling digital engineering and the authoritative digital and virtual representations of its current and future systems, GVSC becomes an M&S and virtual design organization that is trusted by its stake holders to confidently design, develop, and evaluate systems and technologies in the virtual domain.

Continuing partnerships with the CFTs, PEOs, PMs, FCC, other government agencies, industry, academia, and the state of Michigan will marry innovation with need, technology development, and material acquisition. Located in metro Detroit, GVSC is at the center of the automotive capital, well placed to take advantage of technological advancements coming from academia, OEMs, and Tier 1 suppliers, to examine how they can be applied to military vehicles. Transformative ideas and thinking will allow for a better chance at overmatch, and these ideas will be pervasive through operational and tactical levels as well. The future research efforts which do not result in a transition will be used as a learning experience for later efforts, as calculated high-risk pursuits will allow for innovative research to thrive.

GVSC’s core science and technology (S&T) will drive improvements in robotics and autonomy, vehicle protection, architectures, cyber resiliency, mobility, power, materials, virtual prototyping, and M&S. Pushing these advancements and future capabilities to higher levels of technology readiness will allow for innovative capabilities to be developed, increasing the technology improvements in the field.

Finally, GVSC supports modernization by developing secure, modular, government-owned/managed, open architectures. A modular open architecture allows for easier integration of new technologies. Open, secure, modular architectures drive down fielding costs and increase rapid adaptability to the ever-changing operating environment. GVSC vehicle protection architecture provides the ability to rapidly adapt survivability solutions to emerging threats. Through power architecture developments, GVSC has the capability to provide high voltage power for current and future high-energy weapons, active protection systems, and other emerging technologies. Manned and unmanned vehicle architectures allow for integration of autonomous and artificial intelligence (AI) solutions, and will lend themselves to advancements in protection, mobility, and warfighter situational awareness. Advancements in data, virtual, and physical architectures will provide the capability to pull all of the architectures together, permitting the Army to pursue overmatch through quicker and well-understood technology integration and insertion at the system level.

1.2 Support Programs of Record
GVSC supports current programs of record with world-class functional engineering services and support, capability modernization, and sustainment engineering, all of which enable the program offices to rapidly transition high-priority capabilities to the force. Leveraging state-of-the-art tools, defined and documented processes, and knowledgeable associates allow the technology development process to quickly channel technologies into the hands of the user for feedback. GVSC provides conceptual integration, program of record support, technology development and integration, testing and evaluation services, and Army organic engineering services to support current and future platform procurement decisions.

GVSC develops conceptual integrations of emerging components onto current platforms to address basic system-level characteristics, to include size, weight, power, and cost. GVSC establishes System Integration Laboratories (SILs), virtual environments and M&S tools to enable the rapid assessment and development of capabilities in a relevant environment. GVSC’s system-level computational physics, math-based M&S tools, and processes inform customers on the system-level performance of a new system, or impact modifications...
to existing systems. Programs of record will be able to use model-based systems engineering (MBSE) with their actual hardware and software to confirm requirements and verify functionality. An increased focus on MAS will reduce a program’s test cost and accelerate the transition of capability to the field. Simulated environments allow development, testing, and troubleshooting of ground vehicle platforms through natural and induced environments.

GVSC provides programs of record engineering support and services in a variety of ways. Examples include creating and maintaining technical data packages, establishing technical data package best practices and standards to improve manufacturability, reducing discrepancies, providing configuration management, enabling predictive obsolescence part management, and planning for spare part supply. GVSC provides systems engineering lessons learned, engineering best practices, process and tools to support decision confidence, accelerated product delivery, requirements compliance assessments, risk reduction efforts and architectures for adaptability, commonality, and modularity. All of this allows relevant and effective capabilities to be delivered to the warfighter. Testing and evaluation services ensure that requirements are efficiently and effectively validated in a realistic environment, to field effective, suitable, and survivable systems for the warfighter. Quality assurance and quality engineers help to ensure the technologies are conforming to design and production requirements given by the platform. Reliability, availability, and maintainability (RAM) engineering support help to ensure the platforms are delivering a suitable capability to the warfighter that maximizes system readiness. Materials engineering provides PMs with materials solutions for weight reduction/design optimization, testing and characterization of materials in support of system production, advanced manufacturing technologies/processes for design optimization, corrosion prevention and control technologies/processes for evaluation of system design, and environmental compliance and documentation.

GVSC supports technology development and integration for current platforms at the component, subsystem, and integrated vehicle system level by rapidly providing engineering solutions and prototypes to the customer. GVSC provides testing and evaluation support from the physical component, assembled subsystem, to the complete vehicle system. GVSC’s technical competency enables the technical development and maturation of operationally significant capabilities. GVSC integrates technologies developed by other CDEC centers, other government agencies, and industry onto current and future ground vehicle systems platforms to provide an integrated capability. GVSC will continue to maintain and grow cyber-engineering expertise to provide platform information system security expertise to the PMs in order to receive and maintain the authority to operate.

Finally, GVSC continues to establish and maintain a focus on current platforms by providing Army organic engineering services and support through chief integration engineers, platform engineers, and other technical experts. They also use GVSC’s contracting mechanisms to innovate approaches to acquisition, such as rapid prototyping and rapid fielding.

1.3 Readiness
GVSC supports Army leadership’s focus on readiness by providing engineering services for today’s forces, as well as research and development to deliver readiness to tomorrow’s forces.

GVSC provides engineering services, such as world-class sustainment engineering and support, evaluation of product support documents, maintenance of up-to-date technical data and standards, and root-cause failure analysis, provides TACOM, its LMSC and depots, PEOs, and other partners engineering support to ensure readiness for the nation’s Warfighters.

GVSC supports TACOM/LSMC by addressing sustainment concerns, including materials substitution and qualification for spare parts procurements. GVSC facilitates open competition for sustainment parts through application of its technical authority application of the reverse engineering process, including material characterization, implementation, supply chain coordination, and the prototyping required to deliver product-level technical data.

GVSC continues to grow collaboration mechanisms to supplement capabilities, increase capacity, and increase access to research and development of the defense industrial base and non-traditional defense contractors. GVSC is also active in providing additive manufacturing capability at the necessary point by building a repository of technical data to print parts forward and define processes for validation and verification of additive manufacturing produced parts.

Research and development initiatives within GVSC are providing the knowledge and tools necessary to achieve optimal readiness of tomorrow’s Army. This is accomplished by improving efficiency, reducing scheduled and unscheduled maintenance down time, reducing logistics delay time, lowering sustainment costs, driving commonality into acquisition requirements, and reducing sole-sourced components for sub-systems.

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LOE 2: People and Infrastructure
Description: Dedicated to recruiting, hiring, managing, training, and retaining a phenomenal team, including both civilians and military members. It is critical to have a superior workforce along with state-of-the-art facilities.

Strategic Goal: To develop and maintain a diverse workforce and inclusive work environment which values the people and insists upon a culture of dignity, trust, and respect. Investing in state-of-the-art facilities and operating in compliance with all safety requirements. Creating an environment with members that have ownership interest in the mission, clearly understand why they come to work every day, and truly want to be a part of the organization.

Objectives:
2.1 Recruitment, Hiring and Talent Management
GVSC is devoted to attracting and retaining an effective and diverse workforce from recruitment to retirement. GVSC strategically focuses hiring efforts in core competency areas within the applied ground vehicle systems SAT and domain and strives to establish an empowered workforce. Early exposure programs (summer hires, interns, SMART scholars) generate pride in supporting the warfighter and cultivate and attract new talent to GVSC. GVSC invests in individuals’ abilities and talents by providing incentives that encourage continued education and retention, resulting in a well-educated, dedicated, and loyal workforce. Individual achievements are regularly acknowledged through a contribution-based appraisal and awards program, resulting in a sense of accomplishment, empowerment, purpose, and pride.

GVSC retains and empowers its workforce with rich, engaging opportunities to educate and further develop employees. These opportunities include technical and leadership intensive training programs. Rotational assignments available throughout the year allow employees to take advantage of the many opportunities to work for other teams and customers. These developmental assignments allow employees to acquire new competencies, while promoting the Team Warren environment. Training and developmental opportunities ensure that GVSC maintains a competent, well-rounded workforce that can respond and adjust quickly to changes.

GVSC builds a bench of high-caliber future leaders and subject matter experts through active participation from the current workforce and the sharing of successes and challenges. GVSC’s structured mentorship program supports professional development of employees that support developing innovative solutions for the warfighter. GVSC also provides civilians with operational context opportunities to experience activities, duties, and responsibilities of Soldiers by way of opportunities to work closely with them, (“Greening”). In addition, GVSC embraces Army values and instills a mindset of selfless service, duty, respect, and personal courage through a series of organizational and leader development classes available to all government employees. These activities establish a strong foundation that encourages a better connection with the customer, promotes camaraderie, and provides a reminder of GVSC’s overall purpose, to support the warfighter on the battlefield.
2.2 Facilities

GVSC's facility and infrastructure strategy creates a sustainable, secure, safe, and healthy work environment that meets the demands of future missions and Army requirements. This is accomplished by deliberately investing in workspaces and laboratories, modern network and Information Technology (IT) infrastructure, and certification to world-class management systems. As the Army modernizes to meet the challenges of MDO, GVSC continues to modernize its infrastructure with adaptable workspaces and laboratories. Flexible and modern workspaces support the recruitment and retention of GVSC's workforce. Work-class laboratory and test facilities provide this workforce with the capabilities to continuously meet mission requirements, making GVSC a “one-stop-shop” ground vehicle technology development center. Areas of particular focus include facilities and equipment to support increased efforts in M&S, cyber, prototyping, product assurance, and test activities. Use of common architectural design methods and intentional planning supports these infrastructure investments and ensures the best value for the Army.

As a R&D facility, modern IT infrastructure is imperative for GVSC to accomplish its mission. As mission and capabilities expand, so does demand on the IT Infrastructure support. GVSC has deliberately invested in its Defense Research & Engineering Network (DREN) capabilities to support its laboratories as well as technology refresh cycles and modernization of collaborative spaces to enable the workforce to be flexible and adaptably mobile.

GVSC continues certification of its labs and infrastructure to ensure credible, competent, and consistent results. GVSC demonstrates commitment to quality T&E services through the implementation of an ISO/IEC 17025 accredited Laboratory Quality Management System (LQMS) in its test labs. GVSC has deliberately invested in its Defense Research & Engineering Network (DREN) capabilities to support its laboratories as well as technology refresh cycles and modernization of collaborative spaces to enable the workforce to be flexible and adaptably mobile.

GVSC operates DREN and Scientific Computing Network (SCN) enclaves within Risk Management Framework (RMF) cybersecurity accreditation to assure the access and credibility of data, and ongoing customer satisfaction in support of GVSC’s mission and vision. These and other initiatives support a quality management system that provides results.

LOE 3: Business Process and Resource Optimization

Description: Create a world-class suite of business processes that put the customer first and deliver superior technology.

Strategic Goal: To improve knowledge development, integration, and transfer, while implementing best practices and refining current processes across the enterprise. Performing to promise in order to further strengthen partnerships and keep a wide scope to support more than only one program.

Objectives:

3.1 Create GVSC processes which provide a clear view of GVSC investments

GVSC will establish and improve processes that allow GVSC to see the organization accurately within line of effort one and line of effort two investments. To accomplish this objective, GVSC will identify and benchmark business practices and tools leveraged across the organization. Once benchmarked, GVSC will improve or remove ineffective and redundant processes to reduce the resources spent on non-value added efforts and standardize business practices. GVSC will also identify gap areas in need of effective business processes, and evaluate the tools enabling these business processes. Lastly, GVSC will focus on continuous improvement activities that ensure organizational growth and progress as a highly efficient technical organization.

This activity will help to streamline processes for portfolio visibility through effective use of information and knowledge management tools. The concentrated effort towards enhanced knowledge management tools will help the organization consolidate, store, and transmit data and information both internally and externally to key stakeholders. The investment into developing these tools will ensure that GVSC is able to provide timely authoritative information to those who need it, improving communication and awareness of GVSC priorities across the organization and partner organizations. Connected workspaces feeding strategic and operational dashboards will allow GVSC to continuously review and revise its portfolio to align with the changing operational environment, Soldier feedback, and the larger CCDC and Army mission. The ability to communicate any changes in the portfolio to the workforce and key stakeholders will ensure that the organization is always working toward larger Army goals and improving on the art of the possible.

GVSC will define, measure, analyze, improve, and control problem solving methodology for all of its processes. GVSC will continue to provide training opportunities to employees to ensure each and every employee has a thorough understanding of the internal processes and practices of the other business groups across the organization. Open communication of all organizational activities will guarantee the workforce has a secure grasp of the current state of GVSC investments and priorities.

3.2 Implement innovative business practices to increase agility when addressing changing Army priorities

GVSC will continue to use and improve business processes that monitor and analyze emerging Army priorities and doctrine, and propagate that knowledge to the workforce. Identifying, tracking, and balancing resources to support the development of current force and future modernization requirement efforts can also be accomplished through the use of these innovative and streamlined processes, aligning resources to best
support priorities. Thoroughly understanding the way the Army fights and plans to fight will allow GVSC to best posture itself to provide timely, effective, and proactive support to its customers, support CCDC mission priorities, cultivate better communication, and synchronize efforts across the S&T community.

Building a robust relationship with its customers will help GVSC quickly identify changing needs and rebalance priorities to address those needs. GVSC will foster a strong and effective communication network with its Team Warren partners to allow for timely exchange of information and synchronization of efforts between organizations. Embedding the GVSC workforce with its customers will achieve a synchronized relationship enabling effective communication of GVSC capabilities and understanding of customer needs. GVSC will maintain open communication and interactions with the user community, providing analytical support and engineering expertise through collaboration. This ensures timely identification of needs and gaps, plus enables GVSC to inform requirements at an early enough stage to influence decisions, advancing a strong working relationship with its partners. Collaboration also facilitates the communication of requirements, ensuring alignment of S&T efforts with customer needs.

**LOE 4: Strategic Communication**

**Description:** Provide clear messaging in order to strategically tell the GVSC story. Bring awareness to the activities and achievements of GVSC Soldiers and civilians.

**Strategic Goal:** To support GVSC accomplishments both as an organization and as the amazing team of military and civilians who create world-class technology for the warfighter.

**Objectives:**

4.1 Increase exposure to the GVSC brand and messaging among external and internal stakeholder groups and key decision makers

GVSC strategic communications enables GVSC to effectively relate CCDC/GVSC strategic context and future direction appropriately to varied audiences and stakeholders, providing clear messaging to strategically deliver the optimal image of the organization, bring awareness to the activities and achievements of GVSC Soldiers and civilians. This allows GVSC to strategically shape and deliver a clear message to communicate the collective organizational accomplishments and relevance to the warfighter and nation, while ensuring target audiences both externally and internally are reached with effective communications which capture the GVSC story.

Building GVSC brand awareness grows partnerships by effectively communicating the GVSC vision, defining the desired culture, values and behaviors through increasing workforce engagement in existing media efforts. This encourages innovation and creativity. Ultimately, by emphasizing unity of command there is an improvement in the collective outputs for the warfighter.

GVSC implements and synchronizes messaging throughout the command and Team Warren, continuing to increase placement of GVSC-generated content in key media to reach target audiences, mobilizing the entirety of the GVSC workforce to become effective communicators who speak with a unified voice. GVSC uses key leader engagements to speak for the GVSC enterprise, making it clear that Team Warren and southeast Michigan are the center of the universe for ground robotics and autonomy and military ground vehicle systems and integration. Doing these things increases GVSC exposure to members of the American tech base and informs them that GVSC is looking to partner with them to develop and transition the best technology to the warfighter.

4.2 Communicate GVSC successfully, in order to discover, develop, and deliver technologies to the Army

GVSC is focused on increasing collaboration and creativity by encouraging leadership and the workforce to modify behavior to increase conversations that start with “what if.” Including these behaviors in conversations with stakeholders, technology developers, and technology adopters allows GVSC to fully harness the technological innovation of academia and the world economy.

GVSC will establish a roadmap for GVSC corporate communications (internal and external), including recommended strategies and tactics designed to reach GVSC stakeholders. This will build GVSC brand awareness, develop an informed workforce, advance awareness of its key identities, and provide pertinent timely information to its stakeholders, partners, and other strategic audiences. The end goal is to build trustful and productive relationships with key stakeholders, current partners, technology developers, and future innovators.
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