Western North Carolina Futures Factory

Organizational Structure and Operational Plan

The Western North Carolina (WNC) Futures Factory is a community-anchored, non-profit corporation guided by an independent Board of Directors that protects mission, sets strategic direction, and safeguards fiduciary integrity. Daily management is vested in an Executive Director/President from a nationally recognized Manufacturing Innovation Institute that also serves as the WNC Futures Factory's long-term operating partner to reduce organizational risk and ensuring immediate access to innovation, talent, and technology pipelines.

Chief Financial Officer (CFO).

Reporting directly to the Executive Director, the CFO provides the enterprise "nervous system" that keeps the WNC Futures Factory compliant, solvent, and audit-ready. Until the WNC Futures Factory reaches steady-state staffing, this officer is supplied by the operating partner and deploys shared-service teams for finance and accounting, grants management, human resources, information technology, contracting, and legal affairs. Key responsibilities include (1) building cost-accounting structures that map external contract revenue to internal program budgets, (2) standing up ERP and HRIS platforms that scale from Phase 1 construction through full operating capability, (3) instituting risk-management and (4) coordinating independent audits to reassure philanthropic donors and federal funders alike. The CFO thus frees the technical and engagement arms to focus on innovation delivery while maintaining institutional credibility.

Technology Business Unit.

Headed by a Vice President of Innovation embedded from the operating partner, this unit is the WNC Futures Factory applied-research and productization engine. Four functionally integrated cells—university-facing research coordination, development/prototyping labs, a pilot-production line, and IP/commercialization—convert basic and applied discoveries into manufacturable solutions for regional industry and federal partners (e.g. U.S. Department of Defense). NCInnovation, linked through a Memorandum of Understanding (MOU), acts as the liaison and connective tissue between the WNC Futures Factory and North Carolina universities, ensuring a bi-directional flow: frontline industrial pain points and strategic technology roadmaps refine academic research, while university breakthroughs in applied research can transition into advanced technology development and pilot production for tech absorption across the regional industrial base and supply chain.

Talent Business Unit.

Led by a Vice President of Workforce Development—again supplied by the operating partner—this unit translates the WNC Futures Factory technology roadmap into human-capital pipelines. Duties include regional skill-gap analysis, curriculum design, credentialing frameworks, and apprenticeship or internship orchestration. NCInnovation maintains curriculum synchronization with universities, while the North Carolina Community College

System—working under its own MOU—executes hands-on training and work force development programs at the WNC Futures Factory and campus facilities using curricula co- authored with the operating partner. The result is a renewable stream of digitally fluent, cyber-aware technicians and engineers ready for Industry 4.0 roles.

Business Development Unit.

Operated by the Asheville-Buncombe Chamber of Commerce and guided by a Vice President of Engagement under an MOU, this outward-facing arm secures the revenue and partnerships that sustain the WNC Futures Factory. Responsibilities span market intelligence, proposal development, membership recruitment, and government-industry outreach— especially to the U.S. Department of Defense and regional manufacturers. Performance metrics focus on funded Research and Development awards, project backlog, and ecosystem expansion. Leveraging the Chamber's business-network reach and the operating partner's technical credibility, the unit converts WNC Futures Factory capabilities into revenue- generating programs that amplify economic impact across Western North Carolina.

	WNC Futures Factory - Priority Research Areas									
										
Manufacturing Institutes	**BIG DATA**	**ADVANCED ROBOTICS**	**SIMULATION**	**INTEGRATION**	**INTERNET OF THINGS**	**AI**	**CYBER SECURITY**	**CLOUD COMPUTING**	**ADDITIVE MANUFACTURING**	**AUGMENTED REALITY**
LIFT	Digital Twin and Digital Thread Integration	Robotic joining systems	Integrated Computational Materials Engineering (ICME)	Digital Thread & System Integration	Smart Sensors and Real-Time Data Collection	AI-Driven Materials Discovery and Design	Not a primary focus area	Not a primary focus area	Wire Arc Additive Manufacturing (WAAM)	Not a primary focus area
	Materials Informatics and Data-Driven Materials Discovery	Reconfigurable automation cells	Process Simulation for Metal Forming and Joining	Process and Equipment Interoperability	Connected Digital Thread Infrastructure	Process Optimization Using Machine Learning	Partnerships with Cybersecurity Experts	Collaboration with National Labs and Partners Using Cloud-Based Tools	Cold Spray Additive Manufacturing (CSAM)	Digital Learning Lab and AR-Enhanced Workforce Training
	Smart Manufacturing and Sensor-Driven Data Collection	Sensor-based robotic control	Digital Twin and Manufacturing Simulation	Integration of Materials and Manufacturing Process Design	Predictive Maintenance and Equipment Health Monitoring	Closed-Loop Manufacturing Systems	Digital Thread & Data Integrity	Remote Access and Training through Cloud Systems	Materials Characterization and Testing	Virtual Work Instructions with AR Overlays
	Learning Lab and Workforce Data Tools	Materials handling via robotics	Multiscale Materials Modeling	Cyber-Physical Systems Integration	Demonstration of IoT-Driven Manufacturing Cells	Predictive Modeling and Failure Analysis		Cloud-Enabled Data Analytics	Design for Additive Manufacturing (DfAM)	Collaborative Projects with AR Tech Providers
	Collaboration with Industry and Government	Industry & DoD collaboration	Simulation-Driven Design for Lightweighting	Workforce and Technology Integration	Integration with AI and Digital Twins	Integration with Digital Twins and Simulation		Digital Thread Data Storage & Access	Hybrid Manufacturing Demonstration	
			Data Integration for Closed-Loop Simulation						Process Simulation and Digital Thread	

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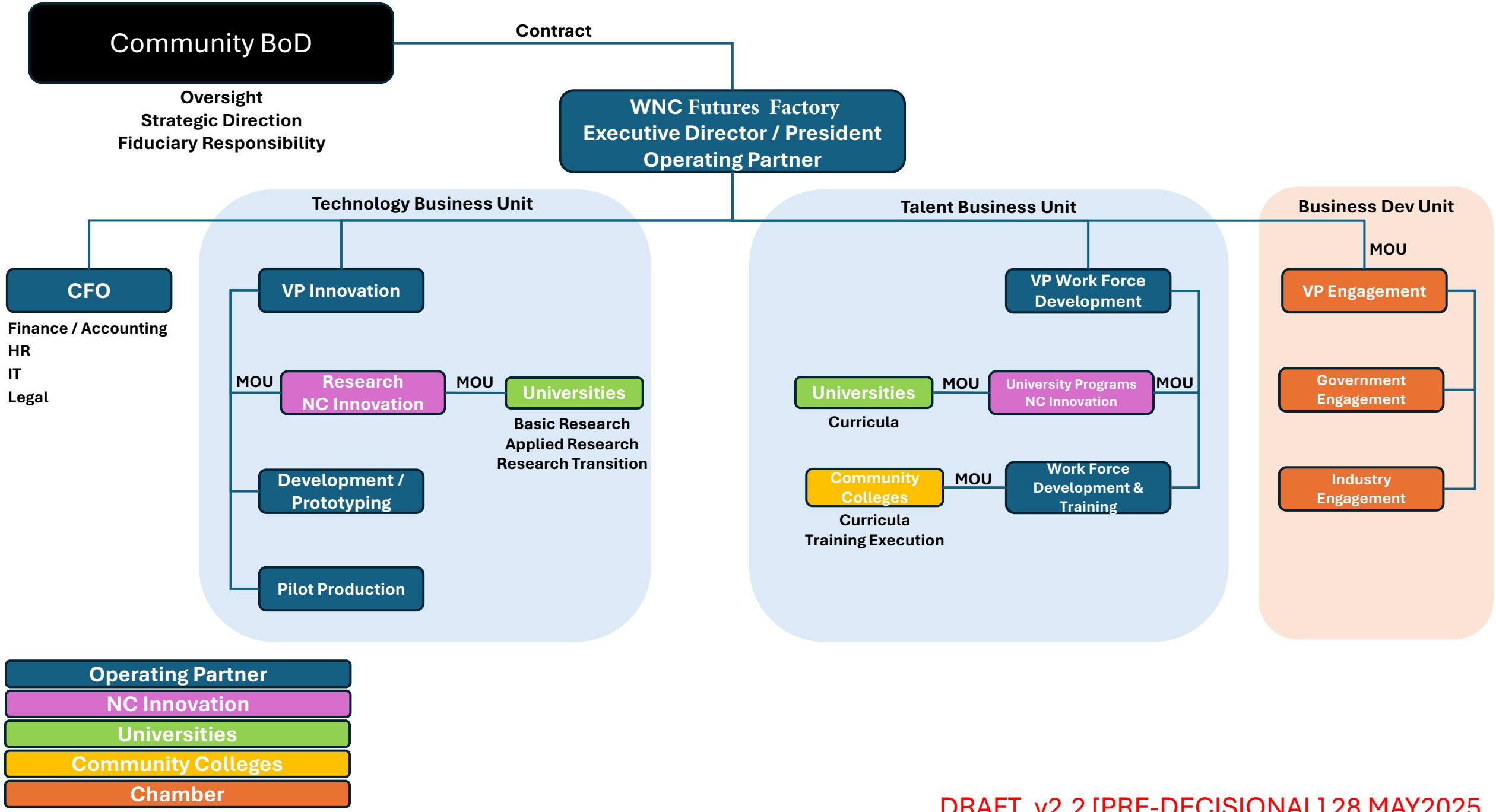
MxD	Digital Manufacturing Playbooks - Data Analytics - Process Improvement	National testbed for robotics innovation	Digital Twin Testbed	Open process automation frameworks for system integration	Develops IoT frameworks for sensor integration	AI for Quality Inspection and Defect Detection	Hosts the National Center for Cybersecurity in Manufacturing	Employs edge computing and cloud analytics for manufacturing processes	Not a primary focus area	Not a primary focus area
	Sensor-rich Factory Floor testbed	Robotic Demonstration Cells	Factory Floor Simulation Integration	End-to-End Digital Thread Implementation	Sensorized Factory Floor	Real-Time Worker Ergonomics and Safety Monitoring	Cybersecurity for Operational Technology (OT) Testbed	Google Cloud Collaboration	Collaborative Projects Enhancing Additive Manufacturing	Trains workforce using augmented reality tools on the factory floor
	Future Factory cloud–sensor architecture	Automated Robotic Painting System	Robotic and Path Simulation	MES-to-ERP-to-OT System Integration on the Factory Floor	IoT Retrofit Kits for Legacy Equipment	AI-Powered Predictive Maintenance	Cyber Playbooks for Manufacturers	Future Factory and Cloud Integration	Digital Manufacturing Playbook	AR Content Development and Integration
	Digital-Twin Testbed for Process Manufacturing	Robotic Retrofit & Smart Automation Integration	Process and Flow Simulation Tools	Open Process Automation Framework (OPAF) Pilots	Edge and Cloud IoT Data Management	Digital Twin + AI Integration	Device-Level Security Projects	Open Process Automation (OPA) Testbed	Cybersecurity in Additive Manufacturing	AR Demonstrations and Training on the Factory Floor
	Sensor retrofit kit for legacy machines	Robotics + AI for Quality and Ergonomics	Predictive Modeling and Scenario Testing	IoT + Analytics + AI System Integration	AI + IoT Integration Projects	AI-Enhanced Cybersecurity for Manufacturing	AI-Driven Cyber Threat Detection	Cloud-Based Data Analytics and AI		Collaborations and Industry Engagement
	Computer-vision retrofit kit	Cyber-Physical Testbed with Robotic Automation		Cyber-Physical Infrastructure for Modular Integration	Interoperability & IoT Standards Testing	AI for Production Optimization	Legacy System Cybersecurity			
					IoT Cybersecurity Pilots		Cyber-Physical System Simulations			
							Workforce Development in OT Cybersecurity			

WNC Futures Factory: Partner Commitment Matrix

Organization	Source	Type	Value	Associated Component Project(s)	Implementation	Outputs and Outcomes
AB Tech Community College	Higher Education	Investment (cash); Matching Funds Investment (cash); Non-matching	$8,200K $1,800K	Facility Construction Facility Owner and maintainer Workforce Development and Training Programs	Construction: Award + 2 years Workforce Development / Training: concurrent with construction and continues in perpetuity	70,000 R&D / Innovation Hub / Training Facility 600 students per year by 2035 at WNC-FF
Biltmore Farms, LLC	Private for-profit	Donation; non-matching funds	$4M	Land donation 13 acres	Land transfer to AB Tech Foundation upon award	Preliminary Engineering Report Construction site Deed transfer
NC Innovation	Nonprofit	Essential partner		Liaison between WNC-FF and Universities	MOA with WNC-FF MOA with universities	Applied research transition pathway; Synchronized R&D and Curricula between UNC System and WNC-FF
Asheville-Buncombe County Economic Development	Nonprofit	Essential partner		Industry Engagement and Outreach Assistance in forming non-profit operating entity	MOA with WNC-FF	Industry needs and gap analysis informing strategic and operational planning
LIFT - National Manufacturing Innovation Institute	Nonprofit	Operating Partner Commitment Letter		WNC-FF Operating Partner Daily operations over WNC-FF Business Units - Technology, Workforce Development and Engagement R&D / Workforce Development collaboration Co-develops curricula with Community Colleges	Contact with WNC-FF BoD MOA with AB Chamber, NCI, AB Tech and regional Community Colleges	Executes WNC-FF operations with BoD oversight Self-sustained WNC-FF operating model and operations Industry 4.0/5.0 R&D, training and workforce development programs Strategic and annual roadmaps aligned with industry need
MxD - National Manufacturing Innovation Institute	Nonprofit	Supporting Partner Letter of Support		WNC-FF Supporting Partner for Digital Manufacturing and Cyber Security R&D / Workforce Development collaboration with WNC-FF Co-develops curricula with Community Colleges	MOA with WNC-FF	Digital engineering and cybersecurity R&D, training and workforce development programs Cyber aware industry - regional infusion of cybersecurity technology
Industry Partners	Private for-profit	Key stakeholder Letters of Support		Industry Partnerships Provides industry needs: Workforce Development and Technological Capability R&D project expenditures	R&D / Innovation Hub operations Workforce Development Programs & Pathways	Skilled / Upskilled workforce Industry 4.0/5.0 transitions University applied research commercialization
NC Community Colleges	Higher Education	Supporting Partner Letters of Support		Workforce Development and Training Program Execution Co-develops curricula with WNC-FF operating partner	MOA with WNC-FF	800 students per year by 2035 at respective local Community College Training sites Skilled / Upskilled workforce
NC Universities -	Higher Education	Supporting Partner Letters of Support		University applied research R&D support to WNC-FF University curricula and programs Lab operations	MOA with NC Innovation	Synchronized/Integrated R&D and academic programming between WNC-FF and Academia University applied research commercialization
Asheville-Buncombe Chamber of Commerce	**Nonprofit**	Supporting Partner		Business Development Market Intelligence, proposal development, membership recruitment, government-industry outreach	**MOA with WNC-FF**	



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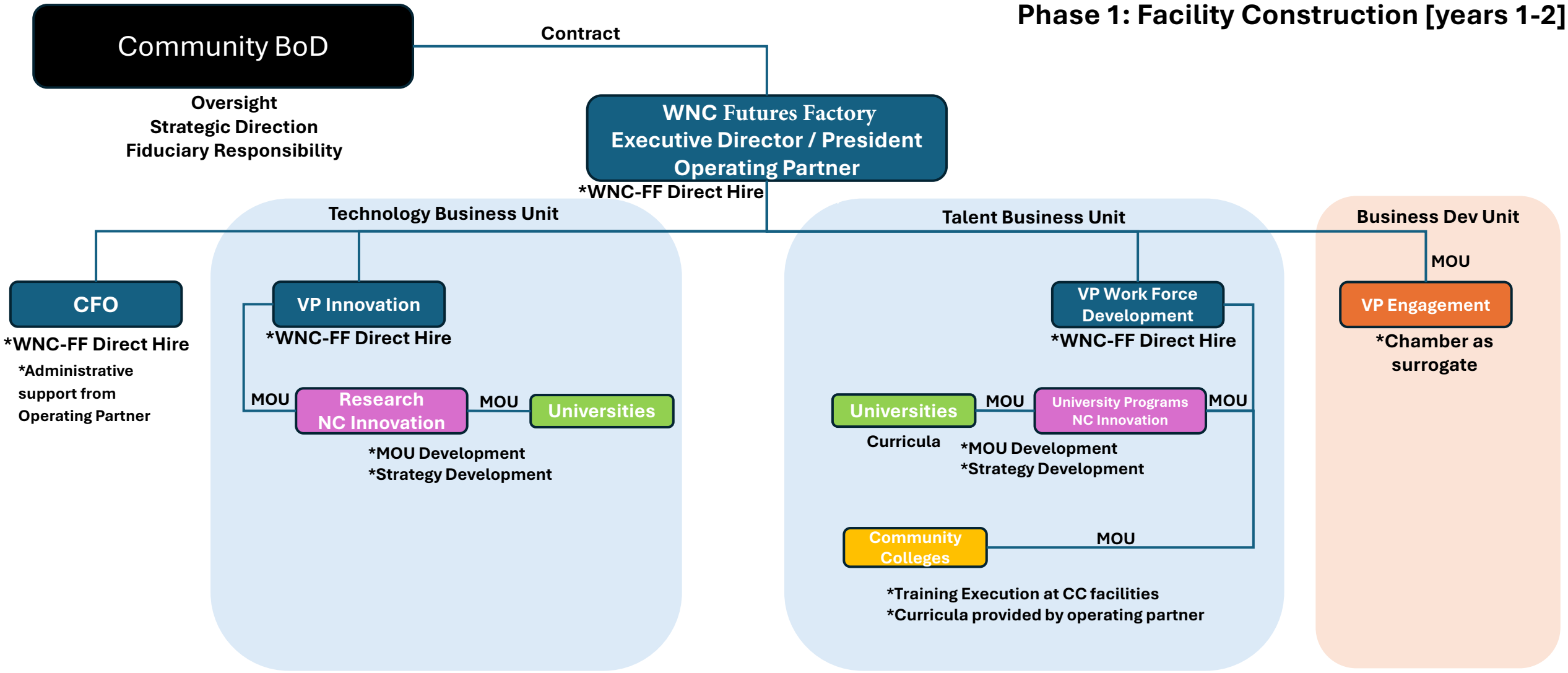
Phase 1: Facility Construction [years 1-2]



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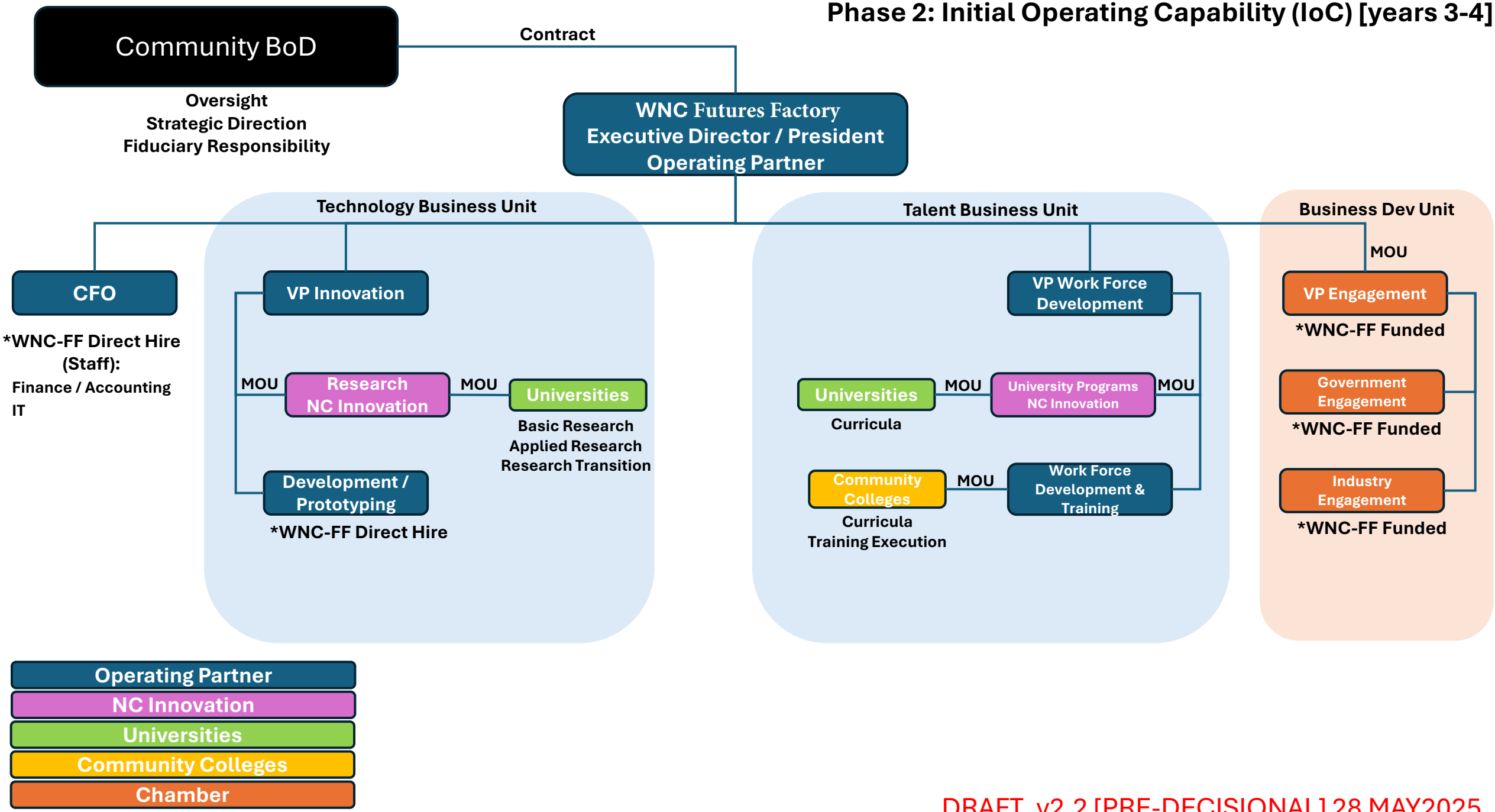
Phase 2: Initial Operating Capability (IoC) [years 3-4]



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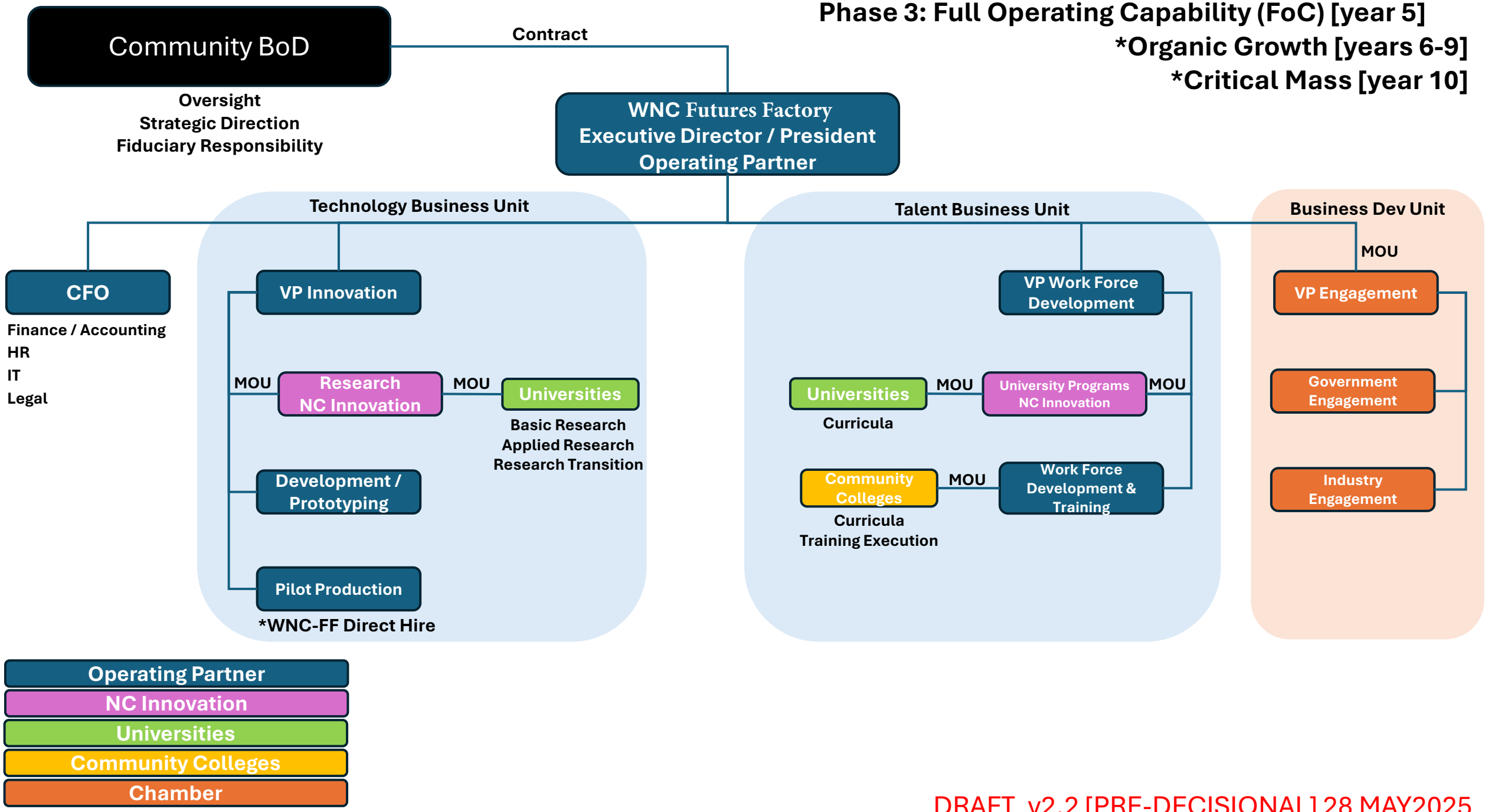
Phase 3: Full Operating Capability (FoC) [year 5]
*Organic Growth [years 6-9]
*Critical Mass [year 10]



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