Maine Space Complex:

Space Data and Advanced Analytics Center Implementation Plan

Draft Version 6

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Authors: Terry Shehata, Jeremy Ashlock, Emily Dwinnells

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Definitions

Term	Definition

1   Introduction

Document Structure

The following business unit description and implementation plan is meant to inform and instruct future activities of the Maine Space Corporation regarding the envisioned Space Data and Advanced Analytics Center as a piece of the Maine Space Complex. The document seeks to align the Space Data and Advanced Analytics Center with the Mission and Vision of the Maine Space Corporation, Legislative Statute, and the State of Maine's Economic Development Strategy 2020-2029[1]. It further explains how it will fulfill its contribution to these aligning initiatives. The strategic **Goals** are met in part by conducting strategic **Objectives.** These **Objectives** are carried out by the **Operations** of the envisioned Space Data and Advanced Analytics Center, which the **Physical Infrastructure and Capabilities**, **Distributed Infrastructure and Partner Capabilities**, and **Organizational Responsibilities** all support and enable. These **Core Functions** are integral to the **Revenue Streams** derived from the Space Data and Advanced Analytics Center by the Maine Space Corporation. The document goes on to provide a plan through the order of task assignment for the successful Phased Implementation of Core Functions and Enabling Infrastructure of the Space Data and Advanced Analytics Center in order to meet its goals and produce objectives and outcomes that are impactful and attainable for the Maine Space Corporation.

1.1   Maine Space Corporation Mission

Mission: *"*The mission of the Maine Space Corporation is provide faculty, teachers, students, businesses, partners, and entrepreneurs from within and outside of the state access to a plug-and-play infrastructure where innovations, ground-breaking research and development, problem-solving, spacecraft launch, world-class space data, and analytics capability, and dreaming big are routine occurrences and from which virtual learning is available to teachers, students, and others."

Vision: *"*By 2030, Maine will be an integral player in the emerging global network of suborbital and orbital transportation to space, providing a significant return on investment as an engine of economic growth and workforce development to the state and the region."

1.2   Legislative Mandate for the Space Data and Advanced Analytics Center

"The Maine Space Data and Advanced Analytics Center of Excellence, which must be a state-of-the-art computer center with networks equipped to import or downlink, store, cleanse, manage and analyze satellite data in concert with terrestrial data for the purposes of addressing business and public issues in innovative ways and creating new data products and services".[2]

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[1] [Maine Economic Development Strategy 2020-2029](#)
[2] *§13203(A),* 5 M.R.S.A c.393

2 Space Data and Advanced Analytics Center Mission, Vision, Goals and Objectives

2.1 Mission and Vision

Mission: *"*The Space Data and Advanced Analytics Center will demonstrate the power and value of space data through partnership with industry, government, and non-profit organizations to facilitate the use of and extract insights and knowledge from data derived from space to enhance management decision making, scientific inquiry and exploration. It will aggregate and make available space data as well as terrestrial data sets also focus on data and analytics capabilities, including ML and AI, in relation to to space systems and strengthen analytic capabilities to encourage the increasing use of space data to address challenges on earth and in space."

Vision: *"*The Space Data and Advanced Analytics Center is at the forefront of space data research and analytics, machine learning and AI, empowering scientists, policymakers, and industry and community leaders with actionable insights, facilitating data-driven solutions for the benefit of humanity. It will also provide critical data and analysis support for space technology and testing and space missions, including spacecraft navigation, and autonomous systems development."

The Center is part of the vertically integrated Maine Space Complex which designed to accelerate the rate of knowledge acquisition and dissemination across the space value chain by shortening time between R&D testing, SSO/LEO launch and downlink that will ultimately increase speed-to-market by offering all of these services within state. Over time the depth and speed of knowledge transfer will become a primary benefit to attract more companies that stand to benefit from this interaction and the Complex's ease-of-use design.

2.2 Goals and Objectives

The Ultimate Goal of the Maine Space Corporation's Space Data and Analytics Center of Excellence is to use space data to solve use case applications that can grow and improve management decision-making, efficiently use of resources for Maine's existing industries, and grow and improve Maine's New Space economy.

The following goals support the pursuit of the Space Data and Analytics Center of Excellence's ultimate goal:

- **Goal 1:** Create awareness of and prove the value of space data by engaging industry, government and institutions in the use of space data.
- **Goal 2:** Establish the foundational capabilities related to data management and analysis using increasingly powerful and sophisticated tools in order to grow with space industry and compete in an increasingly global, data driven economy and support new space data focused business creation and existing space data business growth.
- **Goal 3:** Foster educational opportunities for Maine's K-PhD educational pipeline in Space.
- **Goal 4:** Develop nationally-competitive space data applications and analysis knowledge cluster in two domains, space-for-earth and space-for-space.

The following **Table A** lists objectives that will serve to accomplish goals and facilitate task planning and will prevail throughout the development and phased implementation of the Maine Space Complex's Space Data and Analytics Center of Excellence.

Table A: Data and Analytics Center Goals and Objectives

Goals	Objectives	Measuring Success
Goal 1: Create awareness of and prove the value of space data by engaging industry, government and institutions in the use of space data.	**1.1:** : Establish a Consortium of stakeholders who are members of the Maine Space Corporation to prioritize and drive research, commercial and education projects critical to the State using the foundation elements of the Space Data and Advanced Analytics Center.	
	1.2: Collaborate with the Maine Department of Economic and Community Development, Maine and Company, the Maine Technology Institute and industry associations to attract mid-sized and large mature corporations to conduct off-premises corporate innovation that benefits from knowledge cluster, shared equipment and services.	
	1.3: Facilitate demonstrations and outreach to engage various legacy industries, government offices/departments, non-profit organizations and academia in space data and advanced analytics (focus on forestry, agriculture, aquaculture, fishing, emergency response, environmental monitoring, etc.)	
Goal 2: Establish the foundational capabilities related to data management and analysis using increasingly powerful and sophisticated tools in order to grow with space industry and compete in an increasingly global, data driven economy and support new space data	**2.1:** Collaborate with the Maine Library of Geographic Information (Maine GeoLibrary), the University of Maine System, the Roux Institute and other stakeholders including businesses to ensure that Maine has a master space data library including a variety of image-based and numerical data sets including time series imagery from multi- and hyperspectral data sets geofenced for Maine that is drawn from a variety of sources including open source and commercial data feeds and a host of terrestrial data that can be collated with space data to refine insights. This collaboration will inform which parts of the library will be managed and maintained by the Corporation. [3]	
	2.2: Provide a "sandbox" at Brunswick landing for various stakeholders to meet and practice using on-premise computer and software services with a data advanced analytics expert.	
	2.3: Establish relationships with local, national, and international institutions of higher education and corporate tech transfer offices to facilitate participation in Space Data and Advanced Analytics Center core functions and to create and expand a local on-site as well as distributed network	

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[3] *An issue staff is addressing is the potential overlap/synergy between the Maine Space Complex and the Maine Library of Geographic Information (Maine GeoLibrary). It is important to note that both organizations are established in law and have very specific mandates specified in law. Also, both organizations have different oversight committees in the Maine Legislature. The oversight committees for the Maine GeoLibrary are the Joint Standing Committees of Environment and Natural Resources and State and Local Government. The oversight committee for the Maine Space Complex is the Joint Standing Committee of Innovation, Development, Economic Advancement and Business.*

On March 4, 2024, Terry, Emily, and Jeremy met with the Staff of the Maine GeoLibrary to share information about the Corporation, the Maine Space Complex and the Maine GeoLibrary. At the end of the brief, it was suggested to work toward crafting a Memorandum of Understanding between the parties to establish potential roles. Three major points of collaboration where the Maine Space Corporation could add value to the Maine GeoLibrary under this MOU were determined to be the development of a dashboard/portal to better access Maine GeoLibrary data, Data and Analytic Services by the Maine Space Corporation to help the GeoLibrary better fulfill its mission, and Maine-dedicated remote sensing capabilities.

focused business creation and existing space data business growth.	capacity for Space data-related activities to make the innovation process accessible to space-focused Maine entrepreneurs.	
	2.4: Raise capital to build a state-of-the-art Space Data and Advanced Analytics Center for the Maine Space Complex.	
Goal 3: Foster educational opportunities for Maine's K-PhD and continuing educational pipeline in Space.	**3.1:** Annual presentation/seminar at the Maine Space Conference to a new target industry/use case.	
	3.2: Contribute to the Maine Economic Strategic Plan's vision of creating a credentialed workforce by exploring and delivering certifications and/or microcredentials to bolster Maine's workforce in topics relevant to the space industry.	
	3.3: Encourage and enable creative new ways for Maine's students to experience STEM and Space curriculum across grades K through 12.	
	3.4: Stimulate pathways between undergrad and graduate education and the new space workforce to strengthen demand for aerospace-related curriculum programs.	
Goal 4: Develop nationally-competitive space data applications and analysis knowledge cluster in two domains, space-for-earth and space-for-space.	**4.1:** Secure and engage Anchor Tenants in innovative projects that utilize the foundational elements of the Maine Space Data and Advanced Analytics Center.	
	4.2: Collaborate with the Maine Department of Economic and Community Development, Maine and Company, the Maine Technology Institute and industry associations to facilitate the attraction or formation of new firms that specialize in the use of space data and advanced analytics to create data and analytic jobs in Maine.	
	4.3: Collaborate with the University of Maine System, the Roux Institute and the Maine Technology Institute to facilitate and engage in technology transfer partnerships and generate intellectual property.	

3   Advanced Analytics Services

The main function of the Space Data and Advanced Analytics Center is to facilitate data processing, curation, and analysis of space data for stakeholders and initiatives here in the state. Two major pillars form to support this function – the data processing and curation capabilities and functions, and the data advanced analytics services and capabilities.

3.1   Data Processing and Curation

Data processing and curation represents the preparing of data derived from space for miscellaneous applications. Examples of envisioned data processing services provided both by the Space Data and Advanced Analytics Center and its Distributed Network of Partners includes the following functions:

3.1.1   Cleansing of Space Data

The center places a focus on preparing data from ground stations, acquired from open-source data feeds, paid data services and proprietary space data for use in applications by industry. **Table B** below documents the process of data cleansing:

Table B: Data Cleansing Process

Data Collection	Receive Data
	Initial Check for Corruption
Data Inspection	Quality Assessment
	Identify Outliers
Data Cleaning	Remove Noise and Errors
	Address Missing Data
	Standardization of Data
Data Validation	Cross-checking with sources
	Consistency Checking
Data Transformation	Normalization
	Aggregation
Data Integration	Integrating with other data sets
	Compatibility with other data sets
Quality Assurance	Final Review
	Documentation of Cleansing Process for future process informing
Release and Use of Data by Third Parties	
Ongoing Procedures	Monitoring Data Quality and Accuracy
	Updating Processes to ensure continued productivity

3.1.2 Data Library Curation and Creation, Use Case Identification, Data Needs, and Advanced Analytics

The Maine Space Corporation will maintains and manage a master space data library including a variety of image based and numerical data, including time series imagery from multi- and hyperspectral data sets geofenced for Maine, that is drawn from a variety of sources including open source and commercial data feeds and a host of terrestrial data that can be collided with space data to refine insights.

Types of Data to be stored in the Data Library:

- Multispectral Imagery
- Hyperspectral Imagery
- Synthetic Aperture Radar
- In-situ Sensors with GPS/PNT Tracking

3.2 Analytic Consulting and Evaluation

Use case management and client-facing advanced analytics is the second major pillar provided by the data processing and advanced analytics function. This function serves as an informing function to channel client, stakeholder, and user needs to the data library curation function.

- Works in tandem with data management function to provide analytic services to end users in industry, etc.
- Serves as principal consultant in projects designed to encourage the use of space data by Maine's industries and stakeholders.

<u>Potential Use Cases</u>

- Industry 4.0 advanced analytics/Precision Manufacturing
  - UMaine Advanced Manufacturing Center
  - Roux Institute
- Climate Change Research
- Environmental Monitoring
- Forestry
- Precision Agriculture
- Geospatial Information
- Fisheries management/Maritime navigation
- Aquaculture
- Disaster Response
- Siting and Planning
- K-12 Programming Technical Support
- Other

3.3 'Sandbox' Environment

Various stakeholders meet and practice using on-premise compute and software services with a data advanced analytics expert.

3.4 Data Support for Innovation Hub Activities

There are multiple data analytic applications for Innovation Hub activities related to Industry 4.0 activities, prototyping, space testing and qualification, etc.

3.5 Data Support for Launch Sites and Services

- Meteorological modeling for launch window identification
- Launch outcome data analysis to inform launch tenants
- Analysis for consistent improvements for reduced environmental impacts
- Analysis for continued improvements to range safety

3.6 Stakeholder Collaboration and Facilitation

The Space Data and Advanced Analytics Center serves as one of three central venues to be utilized by a consortium network to facilitate innovative activities.

Consortium Activities

Standard Legal agreements- The Maine Space Complex plans to leverage existing work done by the University Industry Demonstration Partnership (UIDP), which provides a framework for facilitating agreements in the realm of technology transfer and research conducted by multiple parties. A standard agreement may need to be tailored for specific cases, and companies will have questions about the agreements. The Maine Space Corporation will seek collaborative partnerships with legal counsel to assist consortium members with these bespoke arrangements as a service to consortium members.

Customization - A standard agreement may need to be tailored for specific cases, and companies will have questions about the agreements. As part of the Corporation's contract with a law firm to develop the standard contracts, we should consider asking them to offer a discounted rate to Members who need to discuss or tailor the standard agreements.

Consortium to fund common research - In many instances, a research topic or question will be of interest to multiple companies. The Space Data and Advanced Analytics Center will facilitate the creation of working groups to study such topics.

The Centre for Energy Advancement through Technological Innovation (CEATI), a Canadian industry group for electric utilities, provides a good analogous case for the Maine Space Corporation's vision of having a consortium that forms working groups to pursue common research.[4]

3.7 Business and Industry Ecosystem Development

Business development activities associated with the Maine Space Data and Advanced Analytics Center will strive to build and attract businesses with a focus on developing applications that utilize space data and grow Maine's New Space Ecosystem.

Existing Maine businesses to be considered top candidates for recruitment and placement within the Innovation Hub as tenants would be those in stages such as operating from a founder's home, those looking to expand or gain access to Innovation Hub offerings, or those seeking to gain access to the workforce in the Greater Brunswick area. There will not be a focus placed on attracting businesses who are already satisfied in their current location in other areas of the state.

Maine's quality of life is a large selling point to attract out-of-state businesses, particularly those located in expensive, urbanized areas, which could be considered a contrast to much of Maine. Leading with quality of life, the promise to join a nationally-competitive space knowledge cluster, the offerings that the Maine Space Complex can provide, among other things to be determined by the strategy of the Business Development operations of the Maine Space Corporation are seen as strengths to these efforts.

The major categories of businesses considered 'targets' by the Maine Space Corporation's Business Development team include but are not limited to:

- Existing Maine Businesses
- Early-Stage Out-of-State Businesses
- Mature Out-of-State Businesses
- New Businesses by Mainers
- International Space Businesses seeking a presence in the United States Market

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[4] An example case study involves a working group's pursuit of solving the problem of intermittency that occurs with increased amounts of solar and wind power (these energy generation sources are less continuous and subject to periodic stopping). Hydroelectric plants are capable of providing load balancing, but were not designed for such intermittent operation. Research was needed into the effects of frequent start-stops on equipment lifespan and maintenance requirements. CEATI's Hydropower Working Group members paid for this research and have access to the results. CEATI, working with outside contractors and organizations, performed the research. The Maine Space Corporation, in conjunction with its consortium members and institutions, could provide a similar model as a service to consortium members.

3.8   Virtual Offerings and Services

3.8.1   Access to Maine's Entrepreneurial Ecosystem

Connect tenants/members with faculty at the University of Maine System and the Roux Institute at Northeastern University, and with the Maine Technology Institute (MTI), the Maine Center for Entrepreneurs (MCE), the Maine Manufacturing Extension Partnership (Maine MEP), the Maine International Trade Center (MITC), the Maine Procurement Assistance Centers (PTAC), the Small Business Administration SCORE, the UMaine Advanced Manufacturing Center, and the University of Southern Maine's Composites Engineering Research Laboratory (CERL), among others. Many of these organizations have a presence on Brunswick Landing.

3.8.2   Investment Community Engagement

The Maine Space Corporation will seek to establish relationships and pathways to the global investment community, particularly those with a focus on bridging the gap between research and development and commercialization phases in a company's development.

3.8.3   Programming + Risk Capital Networking

Regular networking events to maintain engagement will be planned by the Maine Space Corporation. There are several venues on-campus at Brunswick Landing capable of hosting networking events. These events, combined with on-premise space developed to hold product and service demonstrations, will be central to the Maine Space Corporation's strategy of sparking innovation and engaging a diverse group of contributors to the cluster.

3.8.4   Procurement Assistance

One difficulty during design and manufacturing is sourcing components and services. The Corporation will work with the Procurement Technical Assistance Center and satellite offices through Maine, the Manufacturers Association of Maine and the Maine Composites Alliance to ensure procurement assistant services are offered to members who have sourcing needs.

4   Physical and Virtual Infrastructure

4.1   Leased space

The Space Data and Advanced Analytics Center is envisioned to be co-located with the Innovation Hub to leverage innovative opportunities and collaborations and minimize redundant infrastructure.

4.1.1   Office Space

Tenants to lease private office space. For earlier stage startups, a business suite where companies could rent desk space.

4.1.2   Meeting Space

Conference rooms, data visualization and product/service demonstration space will be available to tenants and non-tenants for rental. Educational/Demonstration Space

4.1.3   Data visualization lab

The data visualization lab is envisioned to serve stakeholders with data needs who seek to utilize on-premise space in a sandbox environment, potentially with specialists working for or with the corporation for this purpose.

4.2   Equipment

The following list of equipment is expected to encompass either on-site or remote equipment capabilities, with some being represented by service providers and not maintained or owned by the corporation.

- Server Capacity, Local Data Storage
- Computing Capacity
- Processors
- GPUs
- Load Balancers
- RAM Capacity
- Network Infrastructure
- Security Systems
- Power Backup Systems
- Uninterruptible Power Supply
- Backup Generators
- Monitoring and Maintenance
- Environmental Controls/Cooling

4.3   Software

The Data and Analytics Center could include software with capabilities matching those in **Table C** below:

Table C: Data and Analytics Center Software

Manufacturing-Related Software	Solidworks
	SolidEdge
Advanced Analytics Software	ArcGIS/ESRI
	R
	Cognos
	Tableau
Cybersecurity Software and Protocols	Tbd
Hypersonic Testing Software Packages	TBD
Integration of detectors with focal place array electronics and verification with processing software	tbd

4.4   Virtual Infrastructure

4.4.1   Data Library

The Data Library will be housed on a hybrid cloud computing infrastructure, specific architecture to be determined, but most likely will rely on a third-party service provider for storage and computing capabilities.

4.5   Distributed Partner Network Capabilities and Equipment Across the State

The Space Data and Analytic Center of Excellence does not intend to duplicate the efforts or capabilities of existing stakeholders and institutions across the state, and instead intends to supplement its planned facilities with these infrastructure and capabilities to maximize their use and better connect actors. *Table D* below displays the institutions and infrastructure that have been identified as supplemental or supporting of Data and Analytics Center activities.

Table D: Data and Analytics Center Distributed Partner Network

University of Maine	Frontier Institute for Research in Sensor Technologies (FIRST) research center
	Wise-NET Lab
	Advanced Structures and Composites Center
	Advanced Research Computing, Security, and Information Management (ARCSIM)
	Advanced Manufacturing Center
	Innovative Media Research and Commercialization Center
University of Southern Maine	Maker Innovation Studio
	Composites Engineering Research Laboratory (CERL)
	GIS Laboratory
Northeastern University – The Roux Institute	Incubator/Accelerator and Founder Residency Programs
	Thermal Physical and Electrical Characterization
	Mechanical Property Characterization
	Prototyping and Manufacturing
	Industry 4.0
Northeastern University – Kostas Research Institute	Materials and Devices
	Structural Testing
	Additive Manufacturing
	Cybersecurity
	Nanomanufacturing
	Data Analytics
Northeastern University – Institute for Experiential AI	The Institute for Experiential AI commands an industry-leading focus in AI applications and use cases, with a massive network reaching into research labs associated with NASA and other Higher Ed institutions.
Loring Commerce Centre	The Data and Analytics Center is expected to collaborate with Loring Commerce Centre to explore ways to offer Innovation Hub capabilities or supplements located at Loring Commerce Centre.

FirstLight Data Center	On campus at Brunswick Landing in a former NATO Command Center, FirstLight Data Center offers turnkey computing and fiber capabilities, as well as lecture hall-style space and available office space in a secure location.

5 Corporation Operational Responsibilities

The corporation is developing a corporate administrative structure to include at minimum a director-level role within the Data and Analytics Center.

This position would be tasked with the responsibilities listed in *Table E* below:

Table E: Data and Analytics Center Responsibilities

Property Management	Property Maintenance
	Cleaning
	Equipment Maintenance and Repair
Program Administration	Leasing
	Membership
	Procurement Assistance
	Newsletter
	Equipment Scheduling
	Coordinating equipment and facilities training
	Organizing Tours and Networking Events
	Budgeting and Reporting
	Project Management • Working Group Research Updates • Standard Legal Agreements • Technology Transfer
Strategic Operations: Operations to grow and improve the Space Data and Analytics Center	Educating outside agencies
	Soliciting sponsorships
	Business development
	Attending trade shows
	Grant applications
	Data management

6 Revenue Streams

The Maine Space Corporation seeks to generate revenue to be a sustainable business model. It will rely on multiple streams of revenue to accomplish the goal of operational independence, as displayed in *Table F* below.

Table F: Data and Analytics Center Revenue Streams

Revenue Source	Description
Consortium Membership	An important revenue stream that will be included in the overall corporate plan is fees generated from a membership structure as authorized by the enabling law. Membership will include industry, non-profits, government agencies, universities, all eligible. Emphasis on industry voice. Provides subject matter direction to administrators of the facility to inform needs. The benefits of membership include but not limited to (a) access to

	networking events, industry communications, consulting services; (b) fee-for-use access to physical plant; and (c) discounts on conferences, events, and access to space and equipment. The income from the fees will support all business units of the Corporation.
Tenancy	Revenues are intended to be collected from tenants, whose rent constitutes their membership into the Maine Space Corporation's Consortium. The Technical Appendix offers guidance on particular services offered at TechPlace, to give an understanding of what could be provided to Innovation Hub tenants.
Fee for Use	Tenants and non-tenant members will be charged at a differential rate specific to the economics of the equipment, computing, servers, and market rate of use.
Fee for Service	Corporation employees can use the center to conduct activities such as testing, analysis, consulting, etc. that could be available to members and non-members at a differential rate.
Sponsorships	Working with companies to secure software licenses, hardware, cash, etc.
Training Delivery	Fees collected for the delivery of training content and credentialing as developed by the Maine Space Corporation.
Contract Documents	Members and non-members could purchase the contract documents at a differential rate.
Grants	Space Data and Advanced Analytics Center is positioned to apply for grants to enable further growth, expansion, specific programming.

7 Implementation Schedule

The following implementation schedule is broken down into three phases – Phase 0 is a planning phase between March 1, 2024 and September 30, 2024. Phase 1, between October 1, 2024 and September 30, 2027 represents Operational Implementation, standing up the minimum viable product of the Innovation Hub. Phase 2, October 1, 2027 and beyond, represents a more-permanent end-state with incremental improvements and changes.

Table G below outlines the tasks in Phase 0 that will set the stage for the Innovation Hub leading to specific action items to achieve the operational (*Table H*) and physical & virtual infrastructure (*Table I*) outcomes of each of the implementation phases.

Table G: Phase 0 Planning Tasks (March 1, 2024 - September 30, 2024)

Task 1	Determine size-class of componentry/specifications of hardware, services, and participants that enable on-site and distributed network to fulfill end-to-end capabilities needed for successful minimum viable operation of a Maine Space Data and Advanced Analytics Center.
Task 2	Secure Memorandums of Understanding with Institutions that fit within the end-to-end services of Space Data and Advanced Analytics Center for space data applications to serve as distributed network partners.
Task 3	Develop relationships with additional stakeholders and institutions in the Northeast region to identify additional use cases for space data. • Maine GeoLibrary - The Maine Library of Geographic Information • Maine DOT – Maine Department of Transportation - Understanding how the Space Data and Advanced Analytics Center could add value to the DOT's multimodal transportation goals could elevate many potential use cases.

		• CORS – Continuously Operating Reference Station - Working with data from CORS, exploring how this tool could be enhanced and serve expanded applications by Maine industries and stakeholders could add value. • NOAA – National Oceanic and Atmospheric Administration - NOAA has extensive experience collecting satellite data and curating libraries for stakeholders. • USDA/UMaine Cooperative Extension • NASA - National Aeronautics and Space Administration - NASA has extensive experience collecting satellite data and curating libraries for stakeholders. • Industry leaders in Aquaculture, Agriculture, Forestry, Precision Manufacturing, and other target use case industries in Maine.
Task 4	Recruit foundational members of the Maine Space Corporation.	
Task 5	Collaborate with stakeholders and partners to develop an implementable system for delivering workforce development learning modules and credentialing.	
Task 6	Secure Memorandum of Understanding with the Maine GeoLibrary following discussions pertaining to three major points of cooperation: - Develop a Dashboard/Portal to provide better public access GeoLibrary data - Provide support for Data Analytic Services as a function of the GeoLibrary - Create a Maine-dedicated remote sensing capability.	

Table H: Snapshot of Operational Outcomes/Data and Analytic Center Capabilities

	Phase 0 (March 1, 2024 – September 30, 2024)	Phase 1 (October 1, 2024 – September 30, 2027)	Phase 2 (October 1, 2027 and beyond)
Space Data and Analytics Services	Planning efforts to understand best focus point for data and analytics services, including which organizations would provide pilot-level programs to create capabilities within the center.	Center capable of delivering some analytic services and sandbox environment for users.	Center able to deliver full data and analytic services and sandbox environment as determined by planning phases.
Workforce Development	The Maine Space Corporation in Phase 0 will explore essential training programs that do not require extensive equipment or resources through prioritized and identified skills training workshops, certification sessions, online platforms, in collaboration with higher education institutions, CTE schools, K-12	Working with training partners, the Maine Space Corporation will provide continuing education programs that do not require extensive equipment or resources through prioritized and identified skills training workshops, certification sessions, online platforms, in collaboration with higher education institutions, CTE schools, K-12 schools, and other training and industry	Working with training partners, the Maine Space Corporation will provide continuing education programs that do not require extensive equipment or resources through prioritized and identified skills training workshops, certification sessions, online platforms, in collaboration with higher education institutions, CTE schools, K-12 schools, and other training and industry

	schools, and other training and industry development organizations and stakeholders.	development organizations and stakeholders.	development organizations and stakeholders.
Stakeholder Collaboration and Facilitation	Administrative opportunity-seeking and business development representative help to drive and organize stakeholders and potential members of the Maine Space Corporation to collaborate on space-focused projects.	Administrative opportunity-seeking and business development representative help to drive and organize stakeholders and potential members of the Maine Space Corporation to collaborate on space-focused projects.	Consortium members self-directed and independent in their efforts to conduct research and development explorations.
Business and Industry Ecosystem Development	Business Development efforts currently underway by the Maine Space Grant Consortium are leveraged by the Maine Space Corporation.	Business Development efforts to attract anchor tenants and other tenants to the Maine Space Complex.	Business development efforts continue to attract businesses to the Maine Space Complex.
Virtual Offerings and Services	Planning stages to generate interest in future offerings and determine areas of highest need to prioritize.	Administrative staff to connect and socialize members and tenants with organizations like MTI, MEP, MITC, PTAC, SCORE, CERL, etc. where opportunities arrive. Networking events held and miscellaneous stakeholder engagement meetings will occur. Administrative staff in the position to establish system and assist with procurement of componentry, goods, and services.	Administrative staff to connect and socialize members and tenants with organizations like MTI, MEP, MITC, PTAC, SCORE, CERL, etc. where opportunities arrive. Networking events held and miscellaneous stakeholder engagement meetings will occur. Administrative staff in the position to establish system and assist with procurement of componentry, goods, and services.

Table I - Snapshot of Physical and Virtual Infrastructure Outcomes

	Phase 0 (March 1, 2024 - September 30, 2024)	**Phase 1** (October 1, 2024 – September 30, 2027)	**Phase 2** (October 1, 2027 and beyond)
Office Space	Planning phase to understand how best to offer office space to tenants.	The Maine Space Corporation has office space at this stage, and there is office space available for tenants to rent.	Full suite of offices available for rent in a dedicated building that houses both the Innovation Hub and Data and Analytics Center.

Data Visualization Lab	Not constructed in Phase 0, planning stages to determine end-state goals.	Space dedicated with monitors and minimum viable product functionality.	Data visualization lab functional and able to host on-site and virtual explorations of data.
Meeting Space	The conference rooms at TechPlace can serve as primary conference room space, with some additional space in the existing Maine Space Corporation headquarters.	The conference rooms at TechPlace can serve as primary conference room space, with some additional space in the existing Maine Space Corporation headquarters.	Meeting space available for tenants and consortium members.
Educational Training and Product Demonstration Space	Planning efforts to determine best spaces to offer educational training and product demonstration space.	Educational Demonstrations can be conducted in available conference rooms within existing Maine Space Corporation office facilities. Loring Commerce Centre and other locations throughout the state could also serve in some capacity.	Fully fleshed out educational training and product demonstration space available as determined by planning phase.
Equipment	No major data and analytics equipment purchased in Phase 0, planning efforts to determine equipment needs if any in addition to service provider functionality.	No major data and analytics equipment purchased in Phase 1, majority or all of capabilities to be facilitated with a service provider.	All equipment needs determined in phase 0 planning fulfilled.
Software	Planning efforts to ensure complete software procurement.	Software obtained in phase 1 to be carried forward to phase 2.	All software needs obtained in phase 1 and continued review of needs in phase 2 for additional capabilities.
Data Library	Planning efforts to determine best use of data library focus, use cases, collaborative partners, etc.	Collaborative opportunities and use cases explored and pursued with storage and computing capabilities reliant on third-party service providers.	Data library is functional, integrated with key stakeholders, with data and analytics functionality to accompany the library.

8 Cost Schedule

The following *Table J* is a breakdown of Operational and Capital Expenditures for Phase 1. Operational costs are assumed to be recurring yearly, capital expenditures are considered as one-time expenses.

Table J: Annual and Upfront Cost Schedule

Operational Expenses	Rental Expense	Space in Hangar 5 (25% of the space) based on $14,628 per year	$3,657

	Utility Expense	Triple Net Utilities from Hangar 5 space (25% to Data and Analytics Center)	$1,800
	Service Provider Expenses	Data Center/Data Transmission Service Expenses	To be quoted
		IT Contractor Expenses	$12,500
	Office Supplies	Miscellaneous	$10,000
	Subscriptions and Fees	Software License Fees	$10,000
		Data Acquisition Expenses	$500,000
	Personnel Expenses	½ Center Director's Salary	$60,000
		Data Scientist/Data Analyst/Project Management	$150,000
		Payroll Taxes (assumes 35% benefits)	$52,500
	Insurance Expense	General Liability	$25,000
	Legal Expenses	Legal Fees	$25,000
		Total Annual Operating Expenses	**$850,457+**
Capital Expenses	Furniture and Equipment	Monitors	$1,000
		Server/Network Equipment	$500
		Computers and Miscellaneous Needs	$5,000
		Total One-Time Capital Expenses	**$6,500**
		Total Phase 1 Investment	**$866,957+**