

Synergist Mobility Accelerator

**Shared Services Operations Center
White Paper**



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Executive Summary

The replacement of the Beaver Island Ferry marks a critical juncture for both the island community and the Beaver Island Transportation Authority (BITA), as it seeks to modernize transportation services to address the evolving needs of residents over the next three to four decades. The ferry system, in concert with air service, has long served as an essential economic and cultural pillar for the island. There is broad consensus on the necessity of modernizing these transportation services to ensure the well-being of the island and its inhabitants. However, true modernization encompasses more than procuring a new vessel—it requires sustained integration, operational coordination, and the development of skilled personnel to support these vital transportation systems.

As part of the Next Generation Ferry due diligence initiative, centralized and modernized transportation operations support services have been assessed within the context of the overall modernization business case. The proposed Shared Services Operations Center (SSOC) establishes a comprehensive framework for integrating and maintaining multiple transportation services by facilitating information sharing, coordinated response, and collaborative decision-making. This approach supports transportation assets, logistics, emergency response, and public safety communications.

The SSOC is specifically designed to inform and assist senior leadership by providing adaptable capabilities and tools that evolve with changing operational requirements. It delivers real-time situational awareness both during routine operations and in emergency scenarios. Notable capabilities include dynamic local and regional weather forecasting, early warning alerts, predictive planning analysis, cybersecurity monitoring and breach notifications, among other advanced tools.

The SSOC is designed as a continuous 24×7 operation, intended to replace the existing reactive and compartmentalized response model with an integrated hub that coordinates land (fire, EMS, sheriff), air (medevac, charter flights), and marine (ferry operators, U.S. Coast Guard) resources. Through the integration of data streams from the Beaver Island Rural Health Center’s imaging and patient-tracking systems, ferry manifests, Automatic Identification System (AIS) vessel information, and local weather sensors into a unified operational platform—alongside established PIO workflows, performance metrics, and automated mass-notification protocols—the SSOC can facilitate rapid, coordinated responses to all medical incidents, severe weather events, or maritime emergencies.

1. Concept and Capabilities

The SSOC will serve as a centralized command and control center, supporting routine traffic management and logistics operations. More critically, it will function as an Emergency Operations Center (EOC), facilitating support for on-scene responders and enabling multiagency coordination. Consistent with established EOC protocols, its purpose is not to supplant on-scene command, but rather to provide essential support services such as resource management, information dissemination, and logistical assistance. As described in a university EOC guide, “...

the EOC is the centralized location of emergency response and recovery support... [and] helps coordinate incident command post operations.” In practice, the SSOC will integrate all relevant agencies—including police, fire, EMS, ferry and air operations, tourism authorities, utilities, Coast Guard, and cyber liaisons—within a unified operational framework, ensuring that decision-makers have comprehensive situational awareness. The overarching objective is effective multi-agency coordination, focusing on the prioritization and allocation of resources—such as fire crews, vessels, and medevac flights—across various transportation modes, in alignment with recognized best practices.

2. Key Capabilities

- **Situational Awareness Dashboards.** Real-time maps showing incidents (fire, medical, road closures), vessel and flight positions (via AIS and Automatic Dependent Surveillance-Broadcast (ADS-B) feeds), weather radar/sensor data, and utility status. Dashboards would draw from public and private data (e.g., National Oceanic and Atmospheric Administration (NOAA) forecasts paired with local modernized automated weather stations approaches that meet the operational use-cases that meet the needs of Beaver Island, ferry GPS, search-and-rescue sensor networks, cyber, local, state and federal insights). This transforms disparate information into a single operational picture.
- **Shared Service Coordination.** The SSOC will oversee all transit modes. It will coordinate with ferry operators (scheduling, emergency dockings), small-airport services (weather briefings for medevac and charter flights), and water safety (liaison with USCG for SAR). It may deploy AIS receivers or partner with Coast Guard stations to track vessels in distress. It will also monitor tourism-related communications (beach safety advisories, cybersecurity alerts for visitors). Integrating these modes ensures no siloed response.
- **Communications Backbone.** A mix of land and satellite comms will be deployed. Due to no cell service, the plan emphasizes satellite broadband (e.g., Starlink terminals) and portable cellular deployables. For example, after Tangier Island lost phones, Virginia agencies loaned a Compact Rapid Deployable (CRD) – a trailer-mounted satellite cell site – to provide first-responder Long Term Evolution (LTE) coverage. Similarly, the SSOC would maintain a satcom kit and could acquire a deployable cell site (FirstNet-compatible) to cover emergencies. Starlink or equivalent satellite internet is recommended: such terminals can be set up in minutes to provide high-speed links in remote areas. Redundancy is crucial: backup generators, battery/solar power, and portable radios (VHF/UHF) ensure connectivity during power or network outages.



Exhibit 1. Shared Services Operations Center

3. Operations

The SSOC is designed to operate around the clock, with staff working in shifts. The center's scope and responsibilities are expected to expand incrementally as additional personnel are recruited and trained, leading to a continuous evolution of its operations.

As part of the proposed Beaver Island Work Force Development Program, the necessary skill sets for managing SSOC functions will be incorporated into the curriculum, supported by two apprenticeship training positions available within either a mobile or fixed SSOC facility once operational. Equipping the next generation of professionals with expertise in multi-modal transportation management, tailored specifically to Beaver Island, is vital to ensuring a safe and progressive future for the Island.

3.1 Communications Infrastructure

Effective communication is essential to the operations of the SSOC. The center, whether fixed or mobile, is expected to expand its capabilities as planning progresses and resources become available. The following suggestions offer possible starting points for consideration.

- **Satellite Connectivity.** We suggest installing at least two Starlink (or equivalent) satellite internet terminals – one primary and one backup – possibly with an integrated battery pack. These provide broadband for email, video conferencing, and data dashboards (Starlink has proven effective in disasters, e.g., 100 terminals rapidly deployed to flood zones in Germany). Starlink kits cost on the order of \$1-2K each, with monthly plans (~\$100-140) per unit.
- **Deployable Cellular.** The SSOC should plan to acquire or borrow a FirstNet-compatible CRD (mobile cell site), which uses satellite uplink to create a local LTE network. Having one in inventory enables on-demand 4G/5G coverage for responders and the public during outages.
- **Radio Systems.** Install a mixed radio suite: VHF/UHF radios (for local fire and law

enforcement channels), NOAA Weather Radio receivers, and possibly HF/VHF marine radios. A UHF repeater with a tall antenna can link to mainland dispatch (if a partner county affords it). Even a hobby-class amateur radio station (HAM) can serve as emergency backup. All these radios tie into the SSOC console for patching calls among agencies.

- **Network and Power.** All digital gear (servers, consoles, displays) should be on an uninterruptible power supply (UPS) and a backup generator. A ruggedized local-area network (wired and Wi-Fi) with a secured firewall/VPN will interconnect workstations. Given limited IT staff, using cloud services (for mapping, data sync, or backup) can reduce hardware overhead – for example, a cloud GIS dashboard or Google Workspace for documents. Wherever possible, leverage free or open-source tools (OpenStreetMap for mapping, AES encryption, FEMA resource inventory spreadsheets, etc.) to minimize licensing costs.

3.2 Technology, Data, and Cybersecurity

The SSOC will leverage secure, real-time, data-driven tools to enhance safety and operational resilience across Beaver Island’s transportation network. Recognizing the operational gaps at BITA, this section integrates solutions to address these deficiencies while embedding a cybersecurity framework that prioritizes a deterministic security model. Unlike conventional approaches that rely on an ever-growing stack of tools to detect threats after they infiltrate, this model enforces security at the kernel level, ensuring only verified code can execute. This proactive approach—using solutions like Warden from Cyber Strategy Institute—prevents unverified or malicious code from running, safeguarding critical systems and eliminating the alert fatigue common in traditional cybersecurity setups.

3.3 Operational Safety and Data Integration

To enhance safety across marine, aviation, and passenger transport systems, the SSOC will address the following critical operational gaps identified at BITA:

- **Marine Operations.** Currently, ferry departure and docking decisions lack real-time, data-driven tools. Without up-to-date wind, wave, visibility, and precipitation forecasts, operations are vulnerable to sudden weather shifts, increasing the risk of accidents and endangering passengers and crew. The SSOC will integrate localized weather data to enable informed, timely decisions, significantly improving safety.
- **Aviation Operations.** At Welke, Charlevoix, and Beaver Island Airports, the absence of localized forecasts for critical conditions—such as icing potential, wind shear, visibility, lightning risk, and runway conditions—compromises flight safety. This gap heightens the risk of unsafe takeoffs, landings, or cancellations. By providing detailed, site-specific weather insights, the SSOC will enhance aviation safety and operational continuity.
- **Passenger Safety.** The lack of an early warning system for hazardous weather, like lake-effect snow and high winds, exposes passengers to unforeseen dangers during travel. The SSOC will implement timely, secure alerts to mitigate these risks, ensuring passengers are protected from weather-related threats.
- **Operational Planning.** Insufficient tools for scheduling, resource allocation, and emergency preparedness currently undermine BITA’s ability to maintain safety during adverse

conditions. The SSOC will deploy robust planning tools and emergency response capabilities.

- **Mobile Accessibility.** Field crews, ferry operators, and airport personnel lack instant access to weather alerts and forecast maps, hindering swift decision-making in safety-critical situations. The SSOC will provide mobile access to real-time data, reducing response delays and enhancing operational safety.

These solutions, inspired by technologies like those from Meteomatics, will close BITA's operational gaps, ensuring safer and more reliable transportation services.

3.4 Secure Data Feeds and Integration

The SSOC will integrate critical data feeds into a secure network to support operations and emergency response, including:

- **Weather.** Use of Advanced weather forecasting software, such as that demonstrated on the Island from Meteomatics, will be accessible on-site or via secure app. All weather data will be protected within the SSOC's secure network to prevent tampering, supporting real-time decisions across marine, aviation, and passenger safety.
- **Vessel and Flight Tracking.** AIS receivers will monitor ferries and boats, while an ADS-B receiver will track private planes, aiding search-and-rescue efforts. Operating on a segmented, secure network, these systems will ensure data integrity and restrict access to authorized personnel, enhancing operational planning and emergency response.
- **Public Alerts.** Mass-alerting systems (e.g., WEA, email/SMS) will deliver emergency, tourism, or weather warnings. Managed by the Public Information Officer (PIO) through secure channels—such as Facebook, the website, and bulletin boards—these alerts will prevent misinformation and cyber interference, providing early warnings and supporting mobile accessibility for field staff.

3.5 Cybersecurity

Small communities like Beaver Island are not immune to cyber threats, as opportunistic attackers target critical infrastructure and personal data. Experts warn there is “no such thing as ‘too small’ ...for opportunistic cybercriminals,” since towns hold critical data (infrastructure, personal info). The SSOC rejects the industry's habit of layering tools (e.g., detection dashboards, cloud scanners) atop a flawed foundation where unverified code can run unchecked. Instead, it adopts a deterministic security foundation that enforces kernel-level control, preventing unauthorized code execution and system modifications. This approach ensures complete visibility and blocks malware or exploits proactively, protecting operations without reliance on endless telemetry.

3.6 Data Analytics

The SSOC uses advanced data analytics and predictive tools to improve situational awareness, monitoring factors like weather, asset performance, operational data, and infrastructure health, all with strong cybersecurity. By aggregating and synthesizing information from various sources, the SSOC provides strategic assessments for better decision-making. The more the system is used, the richer its data becomes, enhancing its effectiveness. Reliable situational awareness also

relies on including context-specific data, which enables the platform to support proactive responses as it develops.

Additional SSOC Use Cases

There exist, many additional use cases that can be developed leveraging the advance analytics capabilities and other tools and capabilities in the SSOC. Below are just a few for further consideration.

1. Ice storm debris management in partnership with Department of Natural Resources/National Guard, including infrastructure assessments.
2. Issuance of real-time visitor alerts for ferry and air travel interruptions via digital channels.
3. Supply chain optimization for critical commodities such as medical supplies and food.
4. Regional logistics center functions to enhance transportation efficiency.
5. Utility outage monitoring and coordination with relevant providers.
6. Fire suppression and detection using GIS and satellite imagery, including mutual-aid coordination.
7. Real-time evacuation guidance during extreme weather or hazardous material incidents.
8. Organization of community drills and after-action reporting for continuous improvement.
9. Management of community shelters and distribution of essential resources during prolonged emergencies.

Through the establishment of the SSOC, Beaver Island stands to significantly advance its transportation and emergency response capabilities, promoting sustainability, safety, and economic opportunity for generations to come.