



Human Stability Intelligence

A Non-Diagnostic Framework for Detecting Physiological Drift, Supporting Caregiver Response, and Improving Institutional Readiness

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Prepared for: strategic partners, research collaborators, grant reviewers, healthcare innovation teams, government stakeholders, and qualified investors

Document-control boundary

This white paper is intended as a public-safe, investor/vendor-safe overview. It intentionally excludes proprietary scoring weights, sensor-zone logic, calibration methods, algorithmic thresholds, model weights, firmware details, schematics, datasets, and technical build handoff materials. Those materials should only be shared under a signed NDA and written IP/work-for-hire terms.

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Core position

BSS™ supports human decisions. It does not replace doctors, nurses, caregivers, emergency responders, trained supervisors, or licensed clinicians. It is designed to detect patterns of physiological drift and route the right level of review, not to diagnose disease.

1. Executive Summary

BSS™ Human Stability Intelligence is a developing non-diagnostic decision-support platform from BSS Technologies Inc. designed to detect patterns of physiological drift before they become obvious to caregivers, supervisors, clinicians, or institutional teams. The platform is built around a simple operational question: is this person stable, drifting, or requiring review or emergency routing?

Traditional vital-sign workflows are often episodic, siloed, and reactive. A person may appear normal while subtle multi-signal changes are beginning to form across movement, temperature, breathing, skin response, optical signals, posture, fatigue, or other physiological channels. BSS™ is designed to bring those signals into one structured stability framework so authorized teams can act earlier and more consistently.

The platform centers on the BSS™ Bio-Signal Stability Scanner, Fusion Engine™ 2.0, HSI™ Human Stability Index, PPS™ protocol routing, GMCC™ command-center visibility, and BSS Vault™ data-governance layer. Together, these modules convert multi-signal observations into a controlled, explainable, human-reviewed response pathway.

BSS™ is not positioned as a diagnostic device in this white paper. It does not claim to diagnose, treat, cure, or prevent disease. It is positioned as a safety-support, monitoring-support, and workflow-support platform that can help caregivers, institutions, and authorized professionals detect drift, document changes, and route appropriate next steps.

- **Why now:** Aging, caregiver burden, workforce shortages, and institutional safety needs are pushing the market toward better pre-event monitoring and responsible AI support.
- **BSS answer:** A unified Human Stability Intelligence layer that converts whole-body and body-zone signal context into a simple 1-4 HSI™ status.
- **Public-safe status:** This document describes the platform at a strategic and architectural level only; proprietary engineering and algorithm details remain protected.
- **Near-term focus:** Caregiver Stability AI, supervised pilot validation, human-in-the-loop workflows, institutional dashboards, and privacy-first data governance.

White paper thesis

BSS™ creates a new operating category: Human Stability Intelligence. The opportunity is not merely another wearable, scanner, app, or dashboard. The opportunity is a stability layer that connects multi-signal sensing, human review, workflow routing, and institutional command visibility into one practical system.

2. The Problem: Physiological Instability Is Often Seen Too Late

Healthcare and caregiving systems still rely heavily on late recognition. A caregiver may notice that a person is not acting right. A supervisor may see fatigue or imbalance. A nurse may identify abnormal vital signs during a scheduled check. But in many environments, the system does not continuously translate subtle multi-signal changes into a clear operational status.

Older adults are a clear example. Falls remain a leading safety issue in the United States. CDC data reports that falls are the leading cause of injury for adults age 65 and older, with more than 14 million older adults reporting a fall each year. In that same reporting context, about 37 percent of fallers reported injury requiring medical treatment or at least one day of restricted activity, representing an estimated nine million fall injuries.

Caregivers are also under pressure. AARP and the National Alliance for Caregiving reported in 2025 that 63 million Americans, nearly one in four adults, provided ongoing care for an adult or child with a complex medical condition or disability in the prior year. Many caregivers are expected to observe, document, decide, and respond without professional monitoring tools or structured triage support.

This creates a gap: the body may be drifting before the care system can see the drift. BSS™ is designed to address that gap with a practical, supervised, non-diagnostic stability framework.

Current gap	Operational risk	BSS™ response
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Fragmented signals	Vital signs, movement, fatigue, behavior, and environment are often reviewed separately.	Fusion Engine™ organizes multi-signal context into one stability view.
Late escalation	Care teams often react after a visible event or crisis.	HSI™ tiers support earlier watch, review, and routing decisions.
Caregiver burden	Family and direct-care workers are asked to judge risk with limited tools.	Caregiver Stability AI provides structured prompts, documentation, and escalation guidance.
Institutional blind spots	Supervisors may lack a command-center view of safety drift across people or locations.	GMCC™ supports authorized monitoring, documentation, and response coordination.

3. BSS™ Solution Overview

BSS™ is designed as a Human Stability Intelligence platform. Its purpose is to identify and communicate detected instability patterns in a way that is useful to humans responsible for safety, care, readiness, or operational continuity.

The system is designed around whole-body and body-zone review because the source of instability may not be obvious. A person may show drift through posture, breathing, autonomic patterns, movement asymmetry, temperature changes, skin response, or other signal combinations. BSS™ treats these inputs as parts of a broader stability picture rather than isolated readings.

The platform is modular. It can be deployed through scanner-based intake, wearable continuity, caregiver-facing tools, institutional dashboards, or future authorized API integrations. Each deployment should match its use case, risk level, validation stage, and regulatory pathway.

Plain-language definition

BSS™ is designed to answer: Is the person stable, starting to drift, needing review, or needing urgent routing?

- **BSS™ Bio-Signal Stability Scanner:** the intake layer for structured signal capture and stability review.
- **Fusion Engine™ 2.0:** the public-facing name for the signal organization and multi-signal stability-analysis layer.
- **HSI™ Human Stability Index:** a 1-4 operational status that summarizes detected stability state and response urgency.
- **Drift-Origin Engine™:** a high-level body-zone/context layer that helps explain where instability may be emerging without making a diagnosis.
- **PPS™ Protocol Pathway System:** a routing layer that connects HSI™ status to appropriate check-in, documentation, review, or escalation steps.
- **GMCC™:** a command-center interface for authorized visibility across people, sites, and response workflows.
- **BSS Vault™:** a data-governance layer for privacy, access control, auditability, and evidence preservation.
- **BSS-Q™:** a structured questionnaire/context layer for caregiver input, user status, environment, and observed changes.

4. Platform Architecture: Public-Safe View

The following architecture is intentionally high-level. It is suitable for partner, investor, grant, and vendor-readiness discussion. It is not a build package and does not disclose protected engineering logic.

1. Signal Intake	2. Edge/Quality Check	3. Fusion Engine™	4. HSI™ + PPS™	5. GMCC™ + Vault™
Optical, thermal, motion, posture, respiratory, acoustic, bioimpedance/skin-response, wearable, and contextual inputs where validated and appropriate.	Signal quality, missing-data checks, baseline alignment, safety filters, and human-use context.	Multi-signal trend organization, drift pattern detection, whole-body/body-zone comparison, and stability state modeling.	HSI™ level assignment and protocol-routing guidance based on validated use case and human review rules.	Dashboard visibility, documentation, audit logs, access control, response tracking, and secure data governance.

BSS™ may use different signal combinations depending on the product version, setting, validation status, and regulatory strategy. A caregiver-home product would not necessarily use the same sensor stack as an institutional entry scanner or a defense-readiness workflow.

The critical design principle is that the platform should not depend on one isolated reading. BSS™ is designed to make sense of patterns, signal quality, and trends over time. The intended output is not a diagnosis; it is an operational stability status that guides a human-reviewed response.

Public-safe technical boundaries

- This document does not disclose scoring weights, threshold values, final calibration logic, drift-origin confidence rules, model weights, training datasets, firmware architecture, PCB schematics, sensor-zone build logic, or vendor handoff packages.
- Prototype and vendor discussions should begin with a signed NDA, clear work-for-hire terms, IP ownership language, and written restrictions against reverse engineering, reuse, publication, or derivative commercialization.
- Any clinical, medical, or emergency-response deployment must be reviewed against applicable regulatory, privacy, institutional, and human-subject requirements before use.

5. HSI™ Human Stability Index: Response Tiers

HSI™ is the simplified response layer. It translates complex detected stability information into a 1-4 status that caregivers, institutions, or authorized professionals can understand quickly. The language below is public-safe and does not disclose internal scoring rules.

HSI™ Level	Status	Public-safe meaning	Typical response path
1	Stable	No meaningful instability pattern detected within the configured context.	Continue routine monitoring or normal activity.
2	Watch	Mild drift detected; person may need observation, rest, hydration, recheck, or caregiver awareness depending on context.	Prompt check-in and continue monitoring.
3	Review	Moderate drift detected; pattern may warrant caregiver, supervisor, clinician, or authorized professional review.	Document, notify authorized reviewer, and follow local protocol.
4	Emergency Route	Severe drift or urgent safety pattern detected; immediate response may be needed.	Activate emergency protocol, call 911, seek urgent care, or transport to hospital when appropriate.

Important safety language

HSI™ is not a medical diagnosis. HSI™ is a structured safety and workflow signal. All emergency, medical, and care decisions remain with the person, caregiver, licensed professional, supervisor, institution, or emergency responder responsible under the applicable setting.

6. Primary Use Cases

6.1 Caregiver Stability AI

BSS™ Caregiver Stability AI is the strongest near-term public-facing use case because it directly addresses caregiver burden, home-care uncertainty, documentation gaps, and the need for responsible AI tools that help caregivers focus on people rather than paperwork.

The caregiver workflow can include simple check-ins, observed-change questions, HSI™-style status review, safety prompts, documentation support, and escalation guidance. The AI layer should remain grounded, transparent, and human-reviewed. It should avoid unsupported medical claims and should not tell a caregiver that it has diagnosed a disease or predicted a guaranteed event.

- Family caregiver support and documentation
- Direct-care workforce support
- Older-adult safety check-ins
- Care-recipient well-being monitoring
- Caregiver burden reduction through structured prompts and workflow automation

6.2 Healthcare and Clinic Readiness

In healthcare settings, BSS™ can be explored as a pre-visit or intake-support layer that organizes stability context before clinical review. It may help authorized professionals understand trends, recent changes, and signal-quality context before deciding whether further evaluation is needed.

Any clinical deployment must be validated and regulated according to its intended use. BSS™ should not make claims that convert it into a diagnostic system before the correct regulatory strategy and evidence are in place.

- Pre-visit stability context
- Remote monitoring support
- Post-discharge watch workflows
- Documentation of detected drift
- Clinician-reviewed escalation pathways

6.3 Defense, Workforce, and Readiness

BSS™ can support readiness environments where fatigue, heat stress, imbalance, dehydration risk, or other stability changes may affect safety or mission continuity. The platform can provide a structured signal for review without replacing command judgment, occupational health review, or medical personnel.

The defense/workforce version should be framed as readiness visibility and safety support, not as a medical diagnosis.

- Team readiness dashboards
- Heat/fatigue watch
- Shift-safety review
- Training and operational monitoring
- Command-center documentation

6.4 Institutional Entry and Public Safety

BSS™ Entry Intelligence can be explored for high-throughput environments such as facilities, airports, schools, workplaces, or venues where institutions need better safety visibility. This use case must be designed carefully to avoid discrimination, privacy misuse, or overreach.

The correct framing is secure human stability review and non-diagnostic decision support. The system should not be presented as a disease-detection gate or a law-enforcement tool.

- Facility safety check
- Authorized entry-context review
- Event or workplace monitoring
- Supervisor notification
- Privacy-first governance

7. Data Governance, Privacy, Security, and Responsible AI

Human Stability Intelligence will only be trusted if it is governed correctly. BSS™ should be designed with privacy, access control, auditability, explainability, and human oversight from the beginning. This is especially important because the platform touches physiological, caregiver, and institutional safety information.

BSS™ should align its development approach with recognized AI risk-management principles. The NIST AI Risk Management Framework is a strong reference point because it focuses on managing AI risks to individuals, organizations, and society. FDA materials on AI/ML in Software as a Medical Device also emphasize careful management across the product life cycle for AI technologies used in medical-device contexts.

The practical takeaway is clear: BSS™ should not be built as an uncontrolled black box. It should be built as a governed system with traceable inputs, signal-quality checks, version control, human oversight, validated response pathways, and clear limitations.

Governance area	BSS™ design principle	Public-safe implementation direction
Privacy	Collect the minimum data needed for the use case.	Role-based access, retention rules, consent where applicable, and separation of user identity from analytics where feasible.
Security	Protect physiological and caregiver data as sensitive information.	Encryption, audit logs, identity controls, secure cloud/edge design, and incident-response procedures.
Explainability	Make alerts understandable to humans.	Display signal-quality context, detected drift categories, confidence language, and response path without exposing proprietary model logic.
Bias and misuse control	Prevent unsafe, discriminatory, or unauthorized use.	Use-case restrictions, governance review, monitoring for disparate performance, and human appeal/review pathways.
Human oversight	Keep humans responsible for care, safety, and medical decisions.	HSI™ prompts review; it does not replace caregivers, clinicians, emergency responders, or supervisors.

8. Validation and Development Roadmap

BSS™ should advance through staged validation. This protects the company, the user, the partner, and the future regulatory path. It also keeps claims aligned with evidence.

Phase	Goal	Outputs	Claims allowed
0. Governance and IP lock	Protect ownership before technical sharing.	NDA, IP ownership, work-for-hire path, vendor restrictions, data plan.	Platform overview only.
1. Prototype feasibility	Confirm sensor intake, signal quality, and interface flow.	Bench prototype, simulated data, early HSI™ UI, logging.	Development-stage, non-diagnostic support language.
2. Dataset and model validation	Test drift patterns against appropriate datasets and controlled pilots.	Performance metrics, bias checks, signal-quality reports.	Validated detection of defined stability patterns only.
3. Supervised pilot	Use with trained reviewers in selected settings.	Human-in-the-loop workflow, incident logs, usability findings.	Decision-support claims limited to pilot evidence.
4. Regulatory/commercial path	Align intended use, labeling, quality system, and market entry.	Regulatory assessment, quality documentation, risk controls, deployment playbook.	Claims approved by legal/regulatory review.

Development rule

Do not let marketing outrun validation. BSS™ should use “detected drift,” “stability support,” “monitoring support,” “response routing,” and “non-diagnostic decision support” unless and until specific medical claims are validated and legally cleared.

9. Commercialization and Partner Model

BSS™ can be commercialized as a platform, not a single product. Different products can share the same Human Stability Intelligence backbone while targeting different buyers, workflows, and validation requirements.

The strongest early commercialization path is not to overbuild every version at once. The recommended path is to select one lead wedge, prove it, then expand into adjacent institutional products. Caregiver Stability AI is the natural lead wedge because it aligns with active federal interest in responsible AI for caregiving, has a clear human problem, and can be framed safely as documentation, monitoring, training, and escalation support.

Product lane	Buyer	Value	Commercial model
Caregiver Stability AI	Families, home-care providers, aging/disability networks	Reduces caregiver burden; improves documentation and escalation consistency.	Subscription, provider licensing, grants, payer/provider pilots.
Clinic/health system stability support	Clinics, care teams, remote monitoring programs	Organizes stability context for supervised review.	Pilot contracts, enterprise SaaS, device/software licensing.
Defense/workforce readiness	Government, defense, employers, high-risk operations	Readiness visibility and safety-support workflows.	Government contracts, enterprise licensing, integration fees.
Entry/venue/institutional intelligence	Airports, venues, schools, facilities	Authorized, privacy-governed stability review.	Hardware/software package, annual support, command-center licensing.

10. IP Boundary and NDA Requirements

BSS™ should be protected as a layered intellectual-property platform: brand, product names, platform architecture, software, data workflows, model logic, scoring methods, sensor-zone methods, protocol pathways, dashboards, documentation systems, and commercialization strategy.

This white paper is intentionally safe. It explains the category and the system logic at a high level, but it does not disclose the protected technical core. Before giving any vendor, university team, contractor, prototype shop, developer, or investor detailed engineering packages, BSS Technologies Inc. should require signed confidentiality terms and written IP ownership/work-for-hire language.

No research review, validation support, university meeting, investor discussion, vendor estimate, prototype consultation, or informal advice should be treated as transferring ownership, license, revenue rights, equity rights, patent rights, algorithm rights, source-code rights, dataset rights, or commercialization control.

Can share with this white paper	Do not share without NDA / IP terms
High-level market need	Algorithm weights, thresholds, or scoring formulas
Non-diagnostic platform overview	Full Fusion Engine™ implementation details

Public-safe architecture diagram	Hardware schematics, firmware, sensor-zone build package
HSI™ level meanings	Calibration logic and validation datasets
Use-case and commercialization overview	Vendor ZIPs, prototype files, source code, model weights
Safety and governance language	Patent expansion details and proprietary claims strategy

11. Conclusion

BSS™ is positioned to define a new category: Human Stability Intelligence. The platform’s purpose is to give caregivers, institutions, healthcare teams, and readiness operators a clearer way to see detected physiological drift and route the right response.

The opportunity is large because the need is practical. People do not only need more raw data. They need stability context, response clarity, documentation, escalation support, and responsible AI that keeps humans in control. BSS™ can meet that need if it is built carefully, validated honestly, governed responsibly, and protected legally.

The immediate next move is disciplined execution: protect the IP, complete the public-safe white paper, prepare the NDA-first technical appendix structure, align prototype partners around a controlled build plan, and validate the caregiver/institutional workflows before expanding claims.

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